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Railway Clearing House

At the annual meeting of the Association of American Railway Accounting Officers the question of establishing a central clearing house for the settlement of agreed balances as between railway companies was again brought up. The association had invited T. H. B. McKnight, treasurer of the Pennsylvania Lines West and a member both of the accounting officers association and of the Society of Railway Financial Officers to be present, and he made a short address, going over in outline the plan which he and some of his associates among the financial officers had worked out some years ago for a central clearing house. These plans have been described at some length in the *Railway Age Gazette* and commented on. The objection which has been fatal to their adoption was outlined, in reply to Mr. McKnight, by C. B. Seger, vice-president and comptroller of the Union Pacific. In substance this argument is that about the only thing which a railway company has left to it to manage in its own way is its cash. The management of this cash is a responsibility and a duty that peculiarly belongs to the executive powers of the company. The adoption of a central clearing house for railways by enforcing uniformity would deprive each company of the freedom of action which it now enjoys. This argument will in all probability prevent the establishment of a central clearing house in the immediate future. Whether or not it will be sufficiently strong five or ten years from now to counterbalance the advantages that would result from a central clearing house is a matter which will depend to a large extent on the trend taken by the public regulation of railways in this country.

Alloy Steel in Locomotive Design

The past few years have seen considerable progress made toward improved engineering as regards locomotive pistons, crank pins, etc. Locomotive designers have gradually come to see the advantage of using heat-treated and alloy steels in reducing the weights in the reciprocating parts but there is still much educational work to be done before mechanical railroad men in general are brought fully to realize the advantages to be obtained by the use of special steels. It therefore seems unfortunate that more time could not have been given to the paper on Alloy Steel in Locomotive Design by L. R. Pomeroy, which was prepared for the recent convention of the Master Mechanics' Association and an abstract of which was published in the *Daily Railway Age Gazette* of June 21. The author of this paper has had a great deal of experience both in locomotive design and work connected with steel manufacture and there are points brought out in the paper which should prove enlightening to locomotive designers. For example, the reduction in the weights of finished parts in a 2-10-2 type locomotive, accomplished by the use of special steels, may very easily be made to exceed 4,000 lb. and in a Pacific type locomotive 2,000 lb., both of these figures including the saving made by reducing the weight of the counterbalances. The use of hollow axles alone in a 2-10-2 type locomotive would save in the neighborhood of 1,000 lb. Aside from other considerations the value in a direct way of the saving effected by the substitution of alloy steel for carbon steel in the piston rods, crossheads and pins, side rods, crank pins and valve gear, and the use of hollow driving axles, will be readily seen when it is considered that the resultant reduction in weight would permit an additional weight in the boiler which would add fully two inches to its diameter. Moreover, the increases in power which are being made in American locomotives should prompt designers to look into the future, when it may be necessary to use these special steels in other parts than those named in order to keep the weight within reasonable limits. It therefore behooves railway mechanical men to familiarize themselves with the possibilities of improved design by the use of such materials.

Waste of Time in Conventions

A great deal of time is wasted at conventions by the chairmen of committees or the authors of papers reading the reports in their entirety. These reports are almost invariably printed and distributed to the members in advance so that they may familiarize themselves with their contents and come to the convention prepared to discuss whatever portion of them they may be interested in. When it is the intention that the members shall be familiar beforehand with the contents of papers, why take up the time that might be given to discussion or other work in the convention by reading reports that the members are perfectly capable of reading themselves? The railway mechanical associations could very well profit by the example of the American Society for Testing Materials. This society has definite rules governing the presentation of papers and re-

ports and these rules are printed in the program of the convention. The following is taken from the first page of the program for the nineteenth annual meeting held last week in Atlantic City:

Presentation of Papers. Papers by members in attendance at the meeting shall take precedence over papers by absent members. The latter may, at the discretion of the chair, be presented only by title. Authors will be expected to confine themselves to brief references to the principal features of their papers. In general, the time allotted to the presentation of a paper shall be limited to ten minutes. The time may be extended, however, for special reasons, at the discretion of the chair or by a vote of the meeting.

Presentation of Committee Reports.—Committee reports shall also be limited in their presentation to a brief summary of their principal features; but matters which are to be referred to letter ballot of the society shall either be read *in extenso*, or acted on as printed without reading, according to the expressed sense of the meeting.

As an example of the way this procedure works out in the conventions the report of the Committee on Steel, which constituted a book of 100 pages, was presented in about 15 minutes and the time which would have otherwise been taken in the unnecessary reading of this report was employed in a brisk and instructive discussion of C. D. Young's paper on Heat Treatment of Axles. This waste of time in conventions has been called to the attention of the officers before this and it is high time that something definite was done to make better use of the time spent at conventions, particularly as the number of subjects which demand attention is constantly increasing.

THE INVESTIGATION OF GOVERNMENT REGULATION

THERE is pending in Congress a resolution introduced by Senator Newlands providing for an investigation by a joint committee of Congress of our entire system of government regulation of railways. When it was introduced the financial position of the railways had just begun to show improvement. If it had continued to be bad, or after a slight improvement had grown bad again, probably the resolution already would have been passed. But earnings have continued to be good; and doubtless this is one of the main reasons why the resolution has not been adopted. There are many other subjects of importance pressing upon the attention of Congress, and probably it feels that while the railways are prospering the railway question can wait.

It will be very unfortunate, however, if Congress adjourns without passing this resolution. It is true that the railways are doing better now than they have for some years, but the improvement easily could be, and in fact is being, overestimated. The statistics of earnings and expenses for the Class 1 roads—those earning more than $1,000,000 per year—for the first 10 months of the fiscal year 1916 are now available. These show that the net operating income per mile in these months was 43 per cent greater than in the corresponding months of the fiscal year 1915. But this relatively great improvement is due as much to the fact that the year ended on June 30, 1915, was an extremely bad one as to the fact that the year ended June 30, 1916, was a very good one. The last preceding fiscal year in which the railways had large earnings was that which ended on June 30, 1913. In that year their net operating income on their property investment was 4.87 per cent. The fiscal year just ended will be found, when all the statistics are available, to have made a better showing than 1913, but not much better. The comparative earnings and expenses per mile for the first 10 months of the fiscal year 1913 and the first 10 months of the fiscal year 1916 are as follows:

EARNINGS AND OPERATING EXPENSES FOR TEN MONTHS OF FISCAL YEARS 1913 AND 1916

	Total earnings per mile	Operating expenses per mile	Net operating revenue	Taxes	Net operating income
Ten months fiscal year 1913..	$11,508	$7,928	$3,581	$464	$3,124
Ten months fiscal year 1916..	12,207	7,974	4,233	524	3,709
Increase 1916 over 1913.....	6.1%	0.6%	18.2%	12.9%	18.7%

It will be seen that the increase in net operating income per mile in 10 months was 18.7 per cent; but allowance must be made for the increase in investment on which a return must be paid from this increased income. On June 30, 1913, the cost of road and equipment per mile of Class 1 roads was $73,700, and the net operating income of the 10 months on this was 4.24 per cent. It is safe to assume that the investment in road and equipment has increased as fast in proportion during the last year as it did during the preceding four years. If this is the case it amounted on June 30, 1916, to $79,559, and the net operating income earned per mile during the first 10 months of the fiscal year 1916 would pay a return on this of 4.66 per cent. In other words, the net return which was earned in the fiscal year just closed probably was greater than that earned in 1913 or 1910, but probably was smaller than that earned 10 years ago, and certainly cannot be held to have been excessive.

Besides, this return was earned in a year when gross earnings broke all records. It cannot be assumed in view of past experience that these large earnings can be continuously maintained for a long period. There are bound to be fluctuations in the future as there have been heretofore. Furthermore, the increase in the net return earned has been due not only to a large increase in earnings but also to the fact that the railway managements have been extraordinarily successful in holding down operating expenses. While the increase in total earnings per mile over the same period in 1913 was 6.1 per cent, the increase in operating expenses was only 0.6. This relationship of increases in earnings and in expenses cannot be maintained. The managements recently have had to make numerous advances in the wages of their unorganized employees and are confronted with demands for enormous advances in those of their organized employees. There have been unprecedented increases in the costs of materials and supplies. Many expenditures on the maintenance of way and of equipment have been deferred, but are now being made and will have to be included in the operating accounts. The efficiency of labor, which always reaches its maximum in bad times, always declines in good times. The figures are certain, therefore, to show in future large increases in expenses. In fact, they have already begun to. During the last six months of the calendar year 1915 the increase in operating expenses was very small. Since then it has been large, and is rapidly growing larger.

The recent statistics regarding railway earnings and expenses are to a large extent the expression of abnormal conditions, and, should not in large measure influence the decision of Congress regarding the proposed investigation of regulation. The broad, general influences and tendencies are what determine the results of railway operation in any considerable period of years, and are, therefore, the things with which Congress should familiarize itself and by which it should be governed in shaping the policy of regulation. Now, the broad, general and controlling influences and tendencies are still adverse to the lasting prosperity and satisfactory development of our transportation system. At least, this is the almost unanimous opinion of those who have devoted themselves to special investigation of the subject.

If the managements were free, like those of other business concerns, to deal with the conditions they encounter in their field as they might think fit, or as their competitive relationships might permit, they would be able to maintain in bad years and in good a satisfactory average margin between income and output. But their freedom of action is narrowly restricted. They are subjected to 49 masters—to the national government and 48 states. A large majority of these masters are not intelligent or fair. Even if they were they might differ in the policies of regulation followed, with results harmful to both the railways and the public. Our policy of regulation is extremely defective. It needs to be simplified, unified and made more constructive. The legislation re-

quired can be determined only by thorough investigation. Every day this is postponed the situation tends to become worse and the loss inflicted upon the public to grow greater. Congress should not adjourn without adopting the resolution for an investigation of railway regulation.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS

A MOST interesting and encouraging sign of the spirit in which railway regulation in this country is being accepted was given by the proceedings at the twenty-eighth annual convention of the Association of American Railway Accounting Officers held at Detroit last week. While it is true that in quite a number of individual cases the comptroller of a railroad company has been the right-hand man of the controlling and managing interest in the company, it has too often been the case that the comptroller or general auditor was treated as the confidential bookkeeper for the controlling interest whose only duty was to his employer and whose theories of the general underlying principles which ought to govern sound accounting had to be entirely subordinated to the wishes of the employer. With a company whose securities are held by savings banks and by a great number of dependent individuals the accounting officer of a railroad ought to have a higher conception of his powers of having a voice in the determination of proper accounting principles and the interpretation of these principles than that of the mere bookkeeper. With the further extension of the Interstate Commerce Commission's minute regulation of railroad accounts the accounting officers, more particularly through their association, have necessarily had to assume responsibilities to the commission as well as to their companies. This change was probably viewed with a good deal of suspicion, or at least distrust, by many railway executives or railway boards of directors when its trend first became apparent in 1907.

The Association of American Railway Accounting Officers has so ably conducted itself in this somewhat dual capacity which was thrust on it that it is probably safe to say that the great majority of railroad directors as well as railroad executives recognize their obligation to the efforts of the association.

With the amount of publicity which the Interstate Commerce Commission enforces in regard to railroad companies' accounts there is no excuse for a railroad comptroller to be less than perfectly frank in the annual statement rendered to stockholders. The old air of secrecy which was thought necessary in regard to the work of the railroad accounting officer has become an anachronism. The accounting officer can be of great help to his board of directors by inspiring both in the commission and in the general public, and also in the minds of investors, a feeling of confidence in the frankness of the reports to the commission.

The New York Central has not always been the leader in matters of frankness with its minority stockholders and with the general public, but it has been under the presidentship of the general auditor of the New York Central that the accounting officers' association has made most progress toward a conception of its responsibilities and powers. The emphasis that is laid by President White, in his address before the Detroit meeting, on the necessity for discussing principles, not details, is a sign of the progress which is being made by the association. There are probably many members of the association who, because of the views of their executives, necessarily had to follow a narrow course in their discussion and practice of accounting principles who will be inwardly very glad of the changes which are taking place. There are probably others in whom the older principles are so deeply ingrained that their personal opinion will be strongly against some of the changes which are being made. Nevertheless, the association as an association is putting itself on record as recognizing progress and as directing and aiding in this progress.

HOW THE STRIKE VOTE IS TAKEN

ALTHOUGH scattered reports from various parts of the country indicate that many of the engineers, firemen, conductors and other trainmen are not in favor of a strike, it is evident that the officers of the brotherhoods of train employees are not neglecting any precautions to insure the result they want from the strike vote they are taking.

After having so worded the strike ballot as to give the employees no opportunity to vote on the question of arbitration, and as almost to preclude a negative vote regarding a strike, the executives of the organizations have issued instructions for the purpose of preventing any of their members from indicating that they are satisfied with their jobs by refraining from voting. The circular letter of instructions for the taking of the strike vote, issued to the general chairmen, local chairmen, lodges and divisions of the four brotherhoods, and signed by their chief executives, includes the following (the italics are ours):

"It will be the duty of all general and local chairmen to use their best efforts in securing a full and complete vote. It should be understood that *all members* holding seniority rights or actually employed in service affected by this movement *will be required to vote.*

"In taking the vote the local chairmen will insist that the person voting read the ballot before signing same, but *under no circumstances will he be permitted to take it away with him.* After signing the ballot, have him detach it, place in envelope, seal same and deliver it to the person authorized to take the vote, who shall write the name of the person voting on the outside of the envelop. No influence should be used to induce him to sign one way or the other.

"Members will undoubtedly be approached by officials and others for the purpose of gaining information. *All members are cautioned against giving out information or discussing the question involved.*"

In spite of the naive instruction against using influence, it is not strange that strike votes taken under such conditions usually demonstrate such remarkable unanimity. The ballots on which the employees are asked to sign a promise to throw up their jobs, in the presence of a committee chairman and without discussing the questions involved, read as follows:

"I have personally read the foregoing statement and believe the request for an eight hour basic day with time and one-half time for all overtime worked in all except passenger service a just demand, and hereby authorize the chief executives and general chairman of the B. L. E., B. L. F. & E., O. R. C. and B. R. T. to act as my agents or attorneys in dealing for a settlement of these questions, and if the said chief executives and general chairmen are unable to otherwise effect a settlement satisfactory to them, I hereby cast my vote.....a STRIKE."
(for or against)

While it is, of course possible for an employee to vote that the demand is "just" and to authorize the leaders to represent him, while at the same time casting his vote against a strike, it is apparent that no such result was contemplated when the ballot was written.

The Order of Railway Conductors at its recent convention also took action to make it easier to obtain a vote for a strike by amending its laws to provide that in the counting of votes its territorial associations shall be taken as the units, instead of lines of railroad. If two-thirds of the members in an association vote in favor of a strike, all of the lines in that territory will be counted as having voted in favor of it, although on some individual railroad less than two-thirds may have voted for the strike. The employees on a road under this provision would be called upon to participate in a strike which they had voted against.

The spokesman for the brotherhoods at the conference with the railway committee in New York said that the officers of the organizations had no power "to declare war" until the men had rendered their verdict, but those who write the ballots believe in so writing them that they will have some influence on the verdict of those voting. The expression of the true views and wishes of the members of the brotherhoods is rendered impossible by the wording of the ballot and the instructions issued regarding the voting on it.

Letters to the Editor

ECONOMICAL USE OF TEAM TRACKS

Newark, N. J.

To the Editor of the Railway Age Gazette:

Your editorial of June 16, telling how the New Haven Road can carry and deliver freight twice as fast as consignees can unload it, calls up an evil as old as your oldest subscriber and one which, nevertheless, no one seems to worry about. At least nobody has done any serious constructive thinking on the subject. Freight cars should, indeed, be unloaded at once, on arrival at destination, as you say. The ideal shipment in this respect is a car of cattle; the animals walk out as soon as you give them the opportunity. Reciprocal demurrage is no remedy; two wrongs do not make a right. The "average agreement" of some of the demurrage bureaus was right in principle, but nobody seems to have tackled the problem in business-like fashion. This rule was necessary in the beginning, to get the demurrage principle started; it was necessary to sugar-coat the pill very thickly to get receivers to swallow it at all; but the rule has worked to the benefit of sharp and selfish and short-sighted consignees while the railroads have not only lacked sharpness and selfishness; they have been asleep.

Why should not the railroad offer a premium for cars unloaded the first day? Nothing could be more reasonable, in principle, during periods of stress; and the idea would not be without reason even in dull times; such a rule would tend to simplify switching and to induce receivers to provide themselves with adequate facilities. The average railroad officer would have to revise his whole theory of life to pay out actual money in premiums at a time when he had thousands of cars idle; but he should remember that the consignee is wrenched with equal violence when he pays demurrage on a car that he knows will not be used for a month after he releases it. The premium theory has been too long neglected. It is true that its development might involve a good many difficulties; but difficulties do not deter the determined.

The average agreement does not provide a true premium; the benefit derived by the consignee is so obscured that he does not appreciate it; while the loss to the carrier—the detriment to truly economical transportation—is actual and serious. The business of large industries should be dealt with by itself. Make a separate study of each individual plant, if necessary. It would pay. But the miscellaneous receivers, users of team tracks, should be aroused by a premium scheme. In many a case it would accelerate business to pay for saving a *halfday* in unloading a car. We have been too easily satisfied with an average detention of cars amounting to 1.62 days per car—or some such apparently attractive figure—when very likely the delays, with proper effort, could be reduced far below that.

The true standard to work to is that wherein cars are never used as motionless storehouses. To accomplish this completely would be too costly. To neglect it entirely is also costly. The golden mean should be sought, not by providing more cars and more track room; that course has been pursued too far already, but by providing better unloading facilities. This includes many things; larger coal bins, more and better derricks in team yards, and improvement in team yards. A general movement might show the need in many cases of relocating a team track. Cooperation between teamsters and all proprietors of freight-wagon facilities so as to provide for helping each other in times of stress would accomplish great things; but it could be brought about only through a persistent campaign. A suitable scheme of premiums—applicable to places where cooperation is needed, but not applicable to big industries, with extensive private tracks—would aid in energizing such a campaign.

G. M. D.

WHY LONG TRAINS ARE HARD TO START

Jacksonville, Fla.

To the Editor of the Railway Age Gazette:

When air brakes first appeared in the South about 25 years ago no difficulty was experienced in starting any train which an engine could pull unless the start were made on a hard hill. In those days we had a great many of what were called "barefoot" cars, this term being applied to cars with no brakes. Nearly all brakes hung from the car body with only one lever in the center of the car. When the brakes were released everything fell clear of the wheels and we never had to pull the brakes except when they were left set. For the past several years the conditions have been just the reverse. In handling long trains on level track or when the grade is in my favor it is necessary to hold the brakes until a full stop is made to keep from pulling in two. And in no instance after doing so can the train be started until I have taken slack one or more times to knock the brakes loose from the wheels. This is done time after time each trip and, of course, is hard on draft rigging and the contents of the cars. The average engineer, after finding that his train has got to be started roughly, doesn't fail to put plenty of energy in his movements, for he wants to avoid the necessity of making a second trial—the reverse lever gets harder to handle every time it is put down in the corner.

After some thought relative to the difference between conditions now and years ago, I began to investigate. I found that on making a hard, full stop, unless I gather up 10 or more cars out of 50 in taking slack, there is no chance of starting the train. With the air fully released the brake shoes will be tight against the wheels in the rear part of train, held by the weight and friction in the rigging until shaken loose by the movement of the cars. I have made a careful inspection of many trains of 30 to 40 cars each, after a 20-mile run at 25 miles an hour in which the brakes were applied only at the stopping point and for a few seconds only. I have found the brake shoes hot and smoking. Several trains pulled so hard that I simply closed the throttle and let them stop without applying the air, after which I went back and found car after car with hot brake shoes. One car I found not only had hot brake shoes but the wheels were warm as well. This was not due to sticking brakes as there was no air in the brake cylinder. I thought the car might be adjusted too tight but by pushing one of the levers with my foot I found a movement of four inches and was able to loosen all the shoes from the wheels.

On freight equipment there are no springs such as are used to release the brake beams on passenger cars. The result is that thousands of brake shoes are grinding day and night, not only wearing the face of the brake shoe and the wheel, but reducing the coal pile, the tonnage rating, the earnings, the life of the cars. Last, but not least, they are increasing the strain on the engineer, for no matter how many brake shoes are grinding he is expected to get results—and he often does when he tries to get a long train started. The remedy seems to me to be simple—a coil spring to make the brake rigging follow the piston rod back into the cylinder. Then we shall be able to save coal, draw heads and time. We shall also be able to increase tonnage. I have noted for years that in pulling tonnage on comparatively level track, there is a difference in the pull as of much as one hour per 100 miles and on hilly parts of the road I have sometimes doubled with less than tonnage simply because the brake shoes were dragging against the wheels.

Wm. Bailey Thomas,
Locomotive Engineer.

American Railway Accounting Officers



Record Attendance at Annual Convention—Substantial Progress Made Toward Changing the Fiscal Year

Members and guests of the Association of American Railway Accounting Officers at the Annual Convention in Detroit

THE twenty-eighth annual meeting of the Association of American Railway Accounting Officers was held at the Hotel Statler, Detroit, Mich., June 28, 29 and 30. There were 280 members present, and the total number present, including guests and ladies, was 700. This is the greatest number of members and guests that ever attended a meeting of the association. The meeting was called to order shortly after 10 Wednesday morning by R. A. White, general auditor of the New York Central Railroad, president, and after the invocation by Rev. Dr. E. H. Pence, the members and guests listened to an address of welcome made by the commissioner of police of Detroit, representing the mayor. The meeting was then addressed by Paul King, operating receiver of the Pere Marquette. Mr. King laid stress on the need for a full understanding of the railroad situation by the public, and pointed out how necessary it was that the auditors who stood in a dual relation to the public and especially the public as investors, and to the executive officers of the railroads, use their best efforts to bring about such an understanding.

After Mr. King's address, in memorium resolutions were adopted for William Lewis Greenhalgh, Charles Linnaeurs Loop, Joseph L. Kirk, James A. Pfouts, James Newton Bailey, George Cater Arnold, Llewellyn Snowden, and M. F. Molloy. J. A. Taylor, comptroller of the Central of New Jersey, and second vice-president, paid a special tribute to Mike Molloy and to the esteem and love which was felt for him by the members of the association.

President R. A. White then made the following address:

PRESIDENT'S ADDRESS

The famous scrap of paper known as the Declaration of Independence starts with the words, "When in the course of human events, etc.," and we have now reached that point when in the course of the order of business the president's address is listed. There is a gratifying breadth in the simple phraseology "President's Address" which leaves each president free to determine the exact form which his address shall take, whether it shall be a message, a valedictory, a eulogy, an apology, or an elegy. I am going to combine the features of a message and a valedictory by covering briefly the things which have impressed me most during the past year, as to what has been accomplished in the past, and what should, in my judgment, be accomplished in the future. As to the things which have been accomplished: The reports of the committees show that the membership has increased.

The question of the change in the fiscal year has been carried to the court of final resort; the publications of the association have been put into a more permanent form; the association has co-operated vigorously with other associations in many important moves, and all the committees have been unusually active and, as usual, efficient. I want to lay particular stress upon a comparatively new line undertaken for the first time, and to place the credit where it belongs.

No member of the association has a greater admiration and affection than I for our former secretary, Mr. Phillips; no man could work more earnestly, faithfully or ably than he in fulfilling the duties of his position, and his mantle has fallen on worthy shoulders. Mr. Woodson, realizing the handicap set for him in the splendid record made by Mr. Phillips, has looked for new worlds to conquer, and has evolved what in my judgment is a very important feature, viz., that of publicity. My name, as president, appears at the bottom of two circulars which were issued during the year in connection with the association, but Mr. Woodson's thought inspired both. The results have been very gratifying not only in the increased membership, but in the increased interest shown by the members in the work of the association.

This brings up one of the points which, in my judgment, could with advantage be accomplished for the future. Many of the communications which were received in response to the second circular contained subjects which could naturally be referred to the committees already established, but there were a number of important suggestions and communications for which no committee has been established; the circular recently issued in the name of the Executive Committee will give an idea of the very interesting nature of the communications. It is in connection with the subject matter of that circular and similar suggestions, and communications which are likely to be received from time to time, that I offer for the consideration of the association the question of establishing a standing committee which might be designated as a

Committee on Organization, Methods and Efficiency—the idea being that such a committee could be used as the medium for interchanging among the members of the association important suggestions or outlines of organization, methods, forms, problems and studies. If a committee of that character was established, in my judgment, the membership should be principally selected from the auditors of the so-called small roads. Such men have to be familiar with practically all the branches of accounting work, while on the so-called big roads the very volume of work forces a tendency to develop specialists in the different lines. The auditor of a small road has to "cut his cloth to fit his conditions," and it is in meeting such conditions that the greatest ingenuity and the greatest efficiency is developed.

Another point which has occurred to me is that at the annual conventions it would be well if the chairmen would come equipped with minutes of the proceedings of their committees so that if any question arises as to the exact meaning of the recommendation of a committee the chairman could, as spokesman for it, explain how the conclusion was reached.

Another very important matter, in my judgment, is the constant need of proving that our annual conventions are for business purposes only. Naturally a committee on arrangements desires to justify its selection and to make its work memorable by inserting somewhere in the program an entertainment feature. This is absolutely necessary so far as the wives and other members of the families are concerned. The convention would not be complete without the presence of those who inspire the members to their best efforts, nor would our duty be well fulfilled unless the social side was thoughtfully considered for the benefit of those who must endure but cannot participate in the technical discussions. Still, business should take precedence, and entertainment, except that for the wives and families, should take a secondary place, restricting the entertainment features as far as possible to those hours which are not available for business. We do not assemble for any junketing purposes; serious problems are handled, discussed, decided and reported upon by the convention and, while it is true that "All work and no play makes Jack a dull boy," it is equally true that business must take precedence over pleasure, or the value of our annual occasions where we get together will be lost and a wrong impression created as to the object of the association. Of course, it is essential to differentiate carefully so as to know what is business and what is pleasure, and no one who has watched our golf played at any convention would dream of classifying golf under any other head than "business."

The fact that the Agenda is so admirably prepared, and so voluminous in its reports might lead to the opinion that our conclusions are cut and dried and our discussions only *pro forma,* but a study of our past history will show that recommendations of the committees are not invariably adopted, and that sometimes its own father would not recognize the Agenda after its details had been passed upon by the convention.

When you did me the honor to elect me to this position, the highest in the railroad accounting profession in the United States, and, therefore, the position most to be desired in that profession in the whole world, I just touched upon one thought that is always upermost in my mind, and that is that principles and not practices should govern our decisions. The underlying thought is this: Many cases that are submitted to the various committees of the association present conditions that surround the particular problem which has confronted the member presenting, and the decision is apt to be rendered on the basis of the facts, as presented while a slightly different presentation of facts in an almost identical case might lead to a somewhat different or inconsistent decision. If those who are presenting problems could present them in a general rather than a specific way so as to indicate clearly the underlying principle and if the committee of the association in preparing its reply would establish, first of all, the principle which should govern, the answer ought to be applicable not only to the individual case, but also to any other cases that are in any way analogous. On the other hand, if the question is asked only upon circumstances suggested with the individual case, and the decision is influenced by individual practices or methods, it may meet the individual case, but be totally inapplicable to other similar cases. Practices and methods are almost invariably the result of hard work and study, but, nevertheless, they are liable to be within more or less limited lines and based upon individual conditions. Occasionally a method is a patchwork, contingency after contingency having been met as each has arisen, without an effort to fit each into somewhat analogous methods previously established. Sometimes the method seems to have been hewn out with an axe and rarely, but occasionally, it looks as if the wielder had an axe which he desired to grind. But the work of this association will not so appear if the underlying principle is made the foundation of its decisions. Methods, practices and personal preferences can always be moulded to fit a principle, but a principle can never be changed to fit individual views. Further, if principles alone govern our conclusions, our recommendations will be automatically mandatory.

Asking you to bear with me if I put a little personal touch into these remarks, I want to confess that I have two idiosyncrasies which have shown in some of our committee meetings. I do enjoy trying to drive home a point with an illustrative story, knowing that a laugh or even a chuckle often clears the atmosphere, and I also have a bad habit in the meetings of setting down my ideas, such as they are, in rhyme, such as it is, and at one of the meetings I condensed such a thought in rhyme which I have taken the liberty of amplifying in this connection, as follows:

When the last dread trump is sounded
And all come trooping in,
Some with a confident swagger
And some with a sickly grin,
And we stand 'fore the Judge of Actions,
For whom naught can be hid,
This question will be asked of each
"Now, what are the things you did?"
And some will tell of the fights they made,
And the victories they won,
And hope to hear from the Judge's lips
The verdict of praise "Well done!"
But if the fight was for selfish gain
And not for the right alone
The verdict of praise will not be heard
Though the victory be won.
But those who fought for a principle,
Though their views may have not prevailed.
Will get the credit of having tried
Not blame for having failed.
Let us surely find on that honor list
Where the names of the praised will go
All we have known and fought beside
In the A. A. R. A. O.

This is not the place to discuss any of the current problems of the day which are not associated with our work, it is not the time to talk of peace or party or preparedness, but the air tingles everywhere with the spirit of "preparedness," although so far, thank God! we face only the merest shadow of the hell-cloud that blackens the great nations across the Atlantic; and it is not out of place to voice the thought that is uppermost in the mind of each one here, that here, where a great Detroiter has let his heart get the better of his head in his hatred of war and love of peace; here, just across a narrow stretch of water which separates us from a wonderful nation that is making a glorious record in supporting the mother country's fight; here, where the citizen soldiery of a sturdy state are awaiting the call from the northern border of

our land, where our neighbor is true, and ambitious, and civilized, to the southern border of our country, where our neighbor is treacherous, lazy and barbarous, here and now we cheer for those of our associates and subordinates who have answered the call, we welcome the end of watching and waiting, and we raise a standard of loyalty, loyalty to the railroads; loyalty to our principles; loyalty to the association and loyalty to the Stars and Stripes.

EXECUTIVE COMMITTEE'S REPORT

Following the president's address the executive committee, R. A. White, chairman, made its report, of which the following is an abstract of the more important points:

Your committee has held five meetings since the last annual meeting of the association.

Your committee is of the opinion that, under the supervision of the Executive Committee, there should be issued, from time to time, "Executive Committee Circulars" embodying the advices or queries received from members as to accounting methods, forms, etc., which would not properly come within the scope of any of the present standing committees of the association.

Changes in Fiscal Year.—It will be recalled that the association at its annual meeting in Atlanta, Ga., April 28-30, 1915, adopted resolutions stating that it is desirable that the fiscal year for reporting to federal and state railroad commissions be changed as rapidly as possible to terminate on December 31 instead of June 30, and empowering the Executive committee to deal with the federal and state commissions regarding the matter.

Your committee informally placed this subject before two of the Interstate Commerce Commissioners, who indicated a desire to know the attitude of the state commissions and also to learn what proportion of the chief executive railway officers were in favor of this change. Your committee has ascertained that the suggested change of the fiscal year is:

Favored by the chief executive officers and the accounting officers of railways operating ..... 40,784.87 miles, 14.7 per cent

Opposed by the chief executive officers and the accounting officers of railways operating ..... 40,784.87 miles, 14.7 per cent

With the approval of your committee, the president is now actively engaged in obtaining expressions on this matter from the various state railroad commissions. The replies so far received would indicate that the suggested change is looked upon favorably by quite a number of the state commissions.

Under date of April 6, 1916, the president, R. A. White, wrote the chairman of the Interstate Commerce Commission, Hon. Balthasar H. Meyer, in part as follows:

So far, replies [in regard to the change of the fiscal year to end December 31] have been received from 31 state railroad commissions, 21 of which are in favor of the suggested change, 6 will make the change if the Interstate Commerce Commission and the other state commissions do likewise, 2 will advise further at a later date if any opposed to the suggested change. In the case of those states where alteration of the statute would be required to accomplish the suggested change, the state railroad commissions have indicated that they would be glad to recommend to the legislature that such an alteration be made.

The following arguments have been submitted in favor of changing the period for reporting to the various commissions to end December 31:

(1) It ought not to be necessary to define what is meant by a year or a date, and when reference is made by the commission to 1915 or the year 1915, it ought not to be necessary to use the paraphrase, "the twelve months ending June 30, 1915." The word "year" has a definite meaning.

(2) Many carriers are required to make extensive reports to state commissions, covering a calendar year period, for purposes of taxation; thus largely duplicating the work included in the fiscal year report. The two reports may present more or less apparent variance, which would be overcome by having both cover the same period.

(3) Many carriers make a complete report to the stockholders, covering the calendar year. The suggested change would be a decided convenience to them.

(4) On the majority of the railways of the United States the annual business year coincides more consistently with the calendar year than with a year ending June 30.

(5) On most railways, the program of maintenance work conforms naturally to a calendar year, and in reporting the details of said work, a year ending December 31 has decided advantages over a year ending June 30. The maintenance forces are at the maximum and the heavy work is in progress on June 30, while December 31 is the natural close of the maintenance year.

(6) The suggested change would [illegible]

(7) Annual reports to the Interstate Commerce Commission and to the various state commissions can be more fully prepared during the winter than during the summer months, as the clerical force in the offices for operations in the general offices.

(8) The officials on the lines seem to indicate that the calendar year will present new advantages from time to time rather than new disadvantages.

The following reasons have been advanced by the interests opposed to the changing of the present reporting period:

(1) A change would necessitate one partial report covering the transition period.

(2) Comparisons would be disturbed.

(3) At December 31 the crops have not been moved, and the end of a corresponding period [illegible] year is better represented by June 30 than by December 31.

(4) It would be necessary to have stockholders of various carriers change the fiscal year for those reporting for some period other than December 31, to the end that the annual reports to stockholders might conform to the fiscal year of the controlling lines.

As to the basis of submitting comparisons of past years, your attention is invited to the fact that the commission has from time to time changed its accounting classifications, which has, of course, resulted in disturbing comparisons unless the figures were re-worked or the conclusions drawn from the figures modified to conform to the changes made. The suggested changes in the reporting period would not disturb comparisons to any serious extent for the reason that the commission might for the first period require one report covering the twelve months ending June 30, and one report covering the twelve months ending December 31. In this way the comparison on the June 30 basis would be maintained through the first year of the change and also there would be established a new basis for comparison thereafter for the twelve months ending December 31.

The programs of maintenance and improvements conform naturally to the calendar years as such programs are commenced during the early part of the calendar year and are completed during the latter part of the calendar year. This is particularly true upon such roads as lie in a portion of the country which is particularly affected by climatic conditions, such as heavy snow falls or other unusual storms. Under such conditions June 30 is the busiest part of the work; neither the maintenance nor the improvement projects have been completed; the amount of material taken out of the track, for example, is heavy, but until the work is completed it is not known what if any part of this will be put back. Where bank improvement and maintenance work are involved the exact amount of earth is not known until the work is completed. Therefore, a report for twelve months ending June 30 will contain no closing transactions and the adjustment of a portion of the year with the commencement of a perhaps extensive program of the following year. On the other hand, a report for a year ending December 31 will include both the commencement and termination as well as any adjustment that may be necessary in carrying out the accounting in connection with the work—so that a report for twelve months ending June 30 may be inaccurate and will be incomplete, while a report for a year ending December 31 must be both accurate and complete.

In regard to the suggested necessity for changing the period for rendering reports to stockholders for the calendar year instead of the year ending June 30, in case the commission should make the suggested change in the reporting period. This is a feature which has been borne in mind by all those who have considered this subject, and it is my understanding that most of the railways are prepared to take the necessary action.

I should like to emphasize the following humanitarian reason for changing the period of reporting to the commission. Nearly all of the officers and as many as possible of the clerical force take their annual vacation at a time of the year when it really counts for something. Few men can really have a good time in winter, most of them want to get away during the summer for rest and recreation. No one would maintain that a vacation should take place during even months of the year, but with the fiscal year closing on June 30, the heaviest work for the clerical forces of a railroad occurs in July, August and September, during which time the weather conditions are most enervating and during the very time when these men would like to have vacations. During the period of the preparation of annual reports, it is necessary for the clerks to work overtime more or less, and the officers who have to supervise the preparation of the reports must perform such supervision in addition to their regular duties during the heated season of the year. If the fiscal year closed at December 31, this pressure would come during January, February and March, a time of the year when the weather conditions inspire vigor and activity.

You have [illegible] offered to present this matter, which had been discussed informally with you, to your associates on the commission, and I very gratefully take advantage of your offer. The Association of American Railway Accounting Officers respectfully urges that the Interstate Commerce Commission issue an order changing the closing of the fiscal year from June 30, as at present established, to December 31. Section 20 of the act to regulate commerce provides that the commission may require annual reports and may fix the time and prescribe the manner in which such reports shall be made, so that it is the understanding of the association that the commission has it in its own power to make this alteration. It is understood from the replies received from the various state commissions that their action depends only upon that taken by the Interstate Commerce Commission. In many instances the change will be welcomed, and in all instances will be followed.

If the association can be of any assistance in the matter or if any of the points brought out in the foregoing can be amplified or further explained, please advise me, as president, and the association will be very glad indeed to comply promptly.

Your committee respectfully recommends that the subject be left with it for further handling.

Interline Waybilling.—In accordance with the resolutions adopted by the association at its Atlanta meeting, your committee has endeavored to obtain a greater extension of through

waybilling and has also endeavored to present forcefully to traffic organizations the necessity for practicable, economical means of apportionment of revenues between carriers. To this end, at the request of your committee, the president has appointed separate committees to meet with each freight traffic organization in North America, and each of such committees was particularly urged to agitate the subject of extending interline waybilling and obtaining percentage division bases.

Your committee recommends that all members of the association be requested to place before their traffic departments the advantages of obtaining, individually and through the traffic organizations, the promulgation of joint through rates and the production of proper percentage division bases for apportioning the revenue among the interested carriers.

Your committee also recommends that inasmuch as the American Railway Association is concerned with this subject from a loss-and-damage-to-freight standpoint, the attention of that association should be called to the service in this matter which might be rendered by the traffic people, particularly in connection with inaugurating through rates and producing percentage division bases therefor.

Publicity.—Apparently it has been the policy of the association to let its work speak for itself, and in the past no systematic effort seems to have been made to inform railroad people generally with regard to what the association is accomplishing. It seems to your committee that inasmuch as the association is maintained by the railways, it would be eminently proper to have railway people in general fully informed as to what is being done by the association. Your committee feels that this is for the best interests of the association, as well as the common good of the railways.

In line with this thought and with the sanction of your committee, the president and the secretary, during the past year, have from time to time issued pamphlets and circulars which might inform the new members and remind the old members regarding the opportunities offered by the association. The efforts made in this direction have met with encouraging responses from the members, have stimulated interest in the work of the association, and have resulted in a material increase in the association's membership.

Distribution of Association's Publications.—In its report to the twenty-seventh annual meeting your committee recommended a liberal policy with regard to furnishing the association's publications to other than members, which recommendation was approved by the association. It seems desirable that the association specifically indicate its wishes on this matter, and your committee therefore respectfully recommends the adoption of the following resolutions:

RESOLVED, That honorary members shall be furnished with only agendas for and reports of annual meetings; that the Interstate Commerce Commission and the state railroad commissions, upon proper request, may be furnished, without charge, with copies of reports or other A. A. R. A. O. publications; that libraries, universities or schools may be furnished, gratis, with copies of reports or other A. A. R. A. O. publications, if it should appear to the executive committee that such libraries, universities or schools may utilize the publications for a useful purpose; that railway periodicals, approved by the executive committee, may be supplied, free of cost, with copies of the A. A. R. A. O. publications, reports, etc.; that persons not eligible to membership in the association may be furnished with copies of its reports and other publications at the stipulated price.

Invitation to Governmental Representatives.—Your committee authorized the president to invite the Interstate Commerce Commission and representatives thereof, including the valuation division of that commission, to attend the twenty-eighth (1916) annual meeting, and also authorized him to extend invitations to the interested governmental departments of the United States, Canada and Mexico to have representatives attend the twenty-eighth (1916) annual meeting of the association.

Honorary Members.—The following former members of the association were severally presented by two members for honorary membership: H. G. Waters, O. H. Nance, J. E. Denison, Theo. F. Brown.

Your committee, acting under Article III of the constitution, unanimously accepted such persons as honorary members, and directed that their names form a part of the report of your committee.

Making Rulings of the Association Mandatory.—In accordance with the instructions of the association, your committee has given consideration to the matter and is of the opinion that the proposed amendment to the constitution of the association should not be adopted at this time; but that it be suggested that when members do not comply with the findings of the association, such specific cases should be brought to the attention of the Executive Committee.

Bills for Car Repairs.—Your committee considered the following letter of August 18, 1915, from Joseph W. Taylor, secretary, Master Car Builders' Association, Chicago, addressed to secretary Woodson:

I send you under separate cover a copy of our code of rules for the interchange of cars and would refer you to Rule 91, page 49, which is practically a rule of your association.

The question has been raised quite frequently by members of this association as to fixing a time limit in which to submit bills for repairs to cars under these rules. It is not an infrequent occurrence to have bills rendered in which are charges running back for periods of a year or a year and a half and possibly longer, which means a considerable addition to the clerical expense in order to properly check up these charges. It would seem that a reasonable time in which to present such bills could be agreed upon, and all charges not submitted within this time should be cancelled, as introducing them into the accounts tends to distort the operating figures and destroy the value of comparisons.

I am directed by the executive committee to ask whether your association would approve of the introduction of a rule when bills for car repairs are not presented within six months from the date the repairs were made that such bills should be considered as outlawed.

Your committee does not favor the introduction of a rule that when bills for car repairs are not presented within six months from the date repairs were made, such bills shall be considered as outlawed. Your committee is of the opinion that this is a matter which each company should handle for itself.

Your committee is of the opinion that the association should have a committee for conference with the Master Car Builders' Association.

Committee for Conference with the American Railway Association.—It appears that the association has for several years had a committee for conference with the American Railway Association, and that such committee has never had a subject referred to it. As there do not seem to be any substantial results to be accomplished through such a committee, the executive committee is of the opinion that the standing committee for conference with the American Railway Association should be abolished.

Revision of Freight Synopsis.—Being informed that there is in course of compilation a revised synopsis relating to freight accounts, your committee discussed the question of issuing the synopsis in permanent form.

Membership Changes.—During the current year your committee has admitted into the association 64 new members. As of April 21, 1916, the association has 643 active members, representing 291,360 miles of railroad, also certain express companies and water carriers—an increase (as compared with April 21, 1915) of 46 active members and 15,300 miles of railroad.

There are 72 honorary members.

The report was signed by R. A. White, president.

All of the above recommendations were adopted by the association.

COMMITTEE ON CORPORATE, FISCAL AND GENERAL ACCOUNTS

Costs on Account of Betterment Regulations.—The subcommittee appointed to consider this subject having reached the opinion that it is impossible even for the future to determine the additional cost incurred by the railways on account of reports required under governmental regulation, referred back to your committee for further instructions.

Since the sub-committee reached its conclusions the chairman of your committee has received a letter from Frank

H. Dixon, chief statistician, Bureau of Railway Economics, dated December 9, as follows:

I am in receipt of a letter from L. E. Johnson, chairman of our general executive committee, in which he quotes from a letter of Frank Trumbull, chairman of the president's advisory committee. Mr. Trumbull says: "One thing is clear to me—that we should not ask the railways to compile the cost of making these reports. I think the resolution of the accountants' committee demonstrates this conclusively."

In view of this decision of Mr. Trumbull's, Mr. Johnson has requested me to write to you, stating that we will not call upon you for any further work in connection with the compilation of the cost of making these reports. I assume that the sub-committee has not yet presented the resolutions referred to to the committee of twenty-five, and that it will at the next meeting follow that procedure.

Mr. Trumbull had a copy of the resolutions in advance of their adoption by your committee, and so had reached his conclusion in advance of the formal submission of the resolutions to him. I am, therefore, writing this letter to you rather as a matter of information, in order that you may know that the formal adoption of the resolutions by the committee of twenty-five will finally end the matter.

Permit me to express my own personal gratification and appreciation of the disposition which the committee has made of this question.

Your committee approved the report of the subcommittee; but in view of the letter from Mr. Dixon your committee is of the opinion that the matter should be considered as closed without further action.

Railroad Clearing House.—Your committee referred this subject to a sub-committee, of which A. H. Plant was chairman, which sub-committee held a joint meeting with a committee of the Society of Railway Financial Officers—T. H. B. McKnight, treasurer of the Pennsylvania Lines West, chairman—and this joint committee adopted the following resolution: This joint sub-committee reaffirms its belief in the general principle of clearing house settlements for agreed balances, but is not prepared at this time to recommend the establishment of a general railway clearing house. The joint sub-committee suggests that the various railroads should follow the principal family or neighboring lines with the hope that the experience thus gained will offer sufficient information to determine the desirability or undesirability of a central clearing house.

Your committee recommends approval of the foregoing resolution.

Separation of Expenses Between Passenger Service and Freight Service.—The introduction to the "Rules governing the separation of operating expenses between freight service and passenger service on large steam railways, effective July 1, 1915," issued by the Interstate Commerce Commission, in reporting the proceedings of the hearing before the commission on May 21, 1915, contains the statement "There was apparent acceptance generally of the necessity for such division of expenses."

The representatives of the Association of American Railway Accounting Officers did not, at that hearing, argue against such division only and solely for the reason that the Interstate Commerce Commission had previously announced its decision to demand that the carriers make such division and had, thereby, made that question a closed issue, not open to further argument.

It is therefore resolved that this association regrets that the introduction to the order contained the statement above quoted, which, in the association's judgment, does not correctly reflect the views so frequently expressed by the Association of American Railway Accounting Officers; namely, "that the results produced by the application of the formula are not to be considered as accurate or authoritative, knowing that no uniform basis can be adopted which will be fair to all railroads or to the same road under all conditions and that cost as a measure of specific rates cannot be accurately established by a separation of all expenses."

Amplification of Monthly Reports to the Interstate Commerce Commission.—The following is a letter dated September 10, 1915, from W. J. Meyers, statistician for the Interstate Commerce Commission, addressed to the chairman of your committee:

I shall very much appreciate a statement of the views of your committee regarding several matters now under consideration in the division of statistics of this commission. These matters are:

1. The adoption of a revised form of monthly report of railway earnings and expenses which shall include in addition to the items now required a statement of certain operating ratios and one showing the changes in account reflecting investment in road and equipment, improvements on leased railway property, capital stock actually outstanding and unmatured funded debt actually outstanding. Several copies of such revised form are submitted herewith for the purpose of showing in detail what is under consideration and also to elicit detailed suggestions from the committee in case it is favorably disposed toward the idea of amplifying the commission's requirements in connection with the monthly reports.

2. The inclusion in the annual report form of schedules requiring a detail of the principal items in account No. 712, "Loans and bills receivable," and No. 715, "Miscellaneous accounts receivable," similar in character to the details now required in connection with accounts No. 758, "Loans and bills payable," and No. 761, "Miscellaneous accounts payable."

3. The standardization of the methods of reporting for various affiliated companies. The rules under consideration in this connection are as follows:

(a) Every railway corporation that files or causes to be filed a tariff on file with the Interstate Commerce Commission shall be considered to be a common carrier engaged in interstate or foreign commerce and shall be required to file an annual operating report.

(b) Every railway company owning but not operating a railway used in interstate or foreign commerce shall be required to file an annual non-operating report.

(c) Any actually existing inactive corporation coming within the scope of rule (b) given above may be relieved from the requirements of that rule if it has no outstanding stocks or obligations not held by or for its controlling corporation, and such controlling corporation reports for the inactive corporation such facts as the commission may require to be reported.

(d) Reports of a controlling corporation and its controlled corporations must exclude duplications in respect of investment in railway plant and equipment and in respect of securities outstanding.

While the matters suggested under this third head are essentially legal in character, it may be that your committee will feel that the accounting officers are also affected by them and that their views should have consideration in the matter.

Your committee took the following action (the numbers refer to the numbered paragraphs in Statistician Meyers' letter):

1. Your committee recommends that no change be made in the present form of monthly report to the Interstate Commerce Commission.

2. Your committee is of the opinion that the suggested information should not be requested, as the detailed information would reach the public at such a late date as to be of no practical value to it.

3. Your committee is of the opinion that these matters are of a legal character and would not come within the province of the committee.

Fines in Connection with Operating Features.—Your committee recommends that the following action of the association be reaffirmed: Resolved, that it is the opinion of this association that fines and penalties in connection with operating features are charges to an appropriate account in operations rather than in profit and loss.*

Mileage Statistics.—A letter was received, dated May 30, 1916, from W. J. Meyers, statistician for the Interstate Commerce Commission, asking for the consideration by this committee or sub-committees of definitions or rules for defining the procedure to be followed in counting tons of freight carried, number of passengers carried, ton-miles of freight transported, and passenger-miles of passengers transported. Your committee is having a canvass made to ascertain the practices of various carriers and hopes to be able later to submit for the consideration of the association a uniform method of handling these matters.

Expenses of Seperate Operating Divisions.—A letter was addressed to the committee by W. J. Meyers, statistician for the Interstate Commerce Commission, enclosing a tentative draft of a circular asking for information relative to expenses of transportation by operating divisions. This matter is still under consideration by your committee and the committee expects to be able to make a report on it later.

Industrial Sidings.—A letter was received from Fred W. Sweney, chief examiner of accounts of the Interstate Commerce Commission, enclosing a discussion of typical cases of the accounting practice followed in connection with the construction of industrial tracks. Your committee is of the

*The Interstate Commerce Commission's present classification provides for the charging of these fines to profit and loss.—EDITOR.

opinion that case 183 covers the principles applicable to such cases. Where title to the land is in the name of the industry, but where and so long as exclusive use rests with the carrier, the land should not be considered "of the industry" but the property of the carrier.

Index to Annual Reports to the Interstate Commerce Commission.—Your committee is of the opinion that the index to the commission's form of annual report should be carefully revised and amplified, and Statistician Meyers, of the commission, has indicated that he would be glad to have the views of any accounting officers as to the improvement of the index.

The report was signed by A. H. Plant, chairman.

The above recommendations and resolutions of the committee were adopted by the association.

COMMITTEE ON FREIGHT ACCOUNTS

This association has made the following recommendations:

(a) *Section* 14, *Freight Synopsis,* 1912.—Responsibility for Through Rates and Correctness of Charges.

Shipments Destined to Agency Stations

"1. The destination carrier is responsible for the correctness of through rates and must collect the full amount of charges due, in accordance with correct weight and rate, and account to each carrier in interest for its proportion.

"2. While it is the generally accepted rule that the destination carrier shall be responsible for the collection of proper charges accruing to all carriers in interest, this rule should not be so construed as to relieve the initial, billing or intermediate carrier from responsibility for its errors which lead to loss of revenue and are impossible of detection by the delivering carrier.

Shipments Destined to Non-Agency Stations

"3. The initial or billing carrier is responsible for loss of revenue resulting from failure to waybill shipments destined to non-agency stations fully prepaid.

"4. When such shipments are billed collect or insufficiently prepaid they should be accepted from connecting carrier and forwarded to destination or to nearest agency station, as the destination carrier may elect.

"5. The destination carrier shall make reasonable effort to collect the amount due, but if unsuccessful, may correct the waybill to read fully "Prepaid" if the shipment is waybilled through from point of origin to destination; when rebilled en route the adjustment shall be made through Freight Claim Channels, and in such cases the Freight Claim minimum should be waived."

(b) *Section* 4, *Paragraph* 6, *as corrected, on Page* 92, *Thirtieth Report* (1914).

"6. All corrections, including those based on joint or local rates, miscellaneous transportation charges, weight, etc., shall be accepted by junction agents at any time before or after the month's account has been closed, and included in current settlements; provided, however, that when it is impossible for destination carrier to detect undercharge by a proper revision of waybills or junction transfer, and such undercharges are uncollectible, they shall be borne by the carrier at fault and adjusted through Freight Claim Channels."

(c) "That a thorough revision of waybills at stations and in the general office be provided for." (Section 13, Page 48, Freight Synopsis, 1912.)

(d) *Section* 13, *Paragraph* 3, *Freight Synopsis,* 1912.

"When it is impossible for destination carrier to detect undercharges by a proper revision of waybills or junction transfers and such undercharges are for any reason uncollectible, they should be borne by the carrier at fault, and if settled by destination carrier shall be adjusted through Freight Claim Channels. When the delivering carrier fails to collect undercharges for which it is responsible, it should assume the loss."

Your committee recommends that the association approve the following resolutions:

This association recognizing the importance of this subject reaffirms its previous recommendations with respect to revision of waybills, acceptance of corrections at junction points for immediate settlement, and the assumption of responsibility for adjustment of the charges to tariff basis.

Sections 13 and 14 of the freight synopsis, 1912, be consolidated and revised to embody not only the recommendations of this association with respect to the responsibility for collection of tariff charges, and immediate settlement of corrections, but also to provide for a definite plan for the adjustment between carriers of the many troublesome features in connection therewith.

This association approves the revised section 13, as submitted herewith, and recommends immediate adoption by all carriers of the plan of procedure contained therein.

The secretary be directed to furnish the Freight Claim Association a copy of these resolutions with request that their rules be amended to conform therewith.

SECTION NO. 13.

RESPONSIBILITY FOR CORRECTNESS OF CHARGES AND ADJUSTMENT OF UNDERCHARGES AND OVERCHARGES.

1. When through rates and percentage divisions are published, freight should be waybilled through from point of origin to final destination, thereby minimizing over and under charges, and facilitating the adjustment of differences.

2. The number of undercharges and overcharges would be greatly reduced by a thorough revision of waybills at originating or receiving stations, or in the accounting department. When shipments are to be rebilled at junction points the charges accruing to the junctions should be revised by the inbound carriers before the transfer freight bills are tendered to the rebilling carriers.

3. It shall be the duty of the destination carrier to collect all tariff charges from original point of shipment to final destination, regardless of bases for the charges or whether the shipment is rewaybilled en route or waybilled through or billed to a non-agency station, and shall promptly account to each carrier in interest for its proportion.

4. It being the duty of the destination carrier to collect all tariff charges, it shall collect all undercharges and refund all overcharges discovered after original settlements have been made with consignees or shippers.

5. Undercharges or overcharges detected by the initial or intermediate carriers shall be promptly tendered at junctions, accepted for immediate settlement and passed to destination agent for collection or refund. When refund cannot be made it shall be disposed of in accordance with the rules of the Interstate Commerce Commission.

6. Overcharges or undercharges in "Advances" or "Prepaid" shall be disposed of by correction notices, "Advances Only" or "Prepaid Only" waybills, or through Freight Claim Channels, subject to the association minimum of twenty-five (25) cents.

7. The adjustment of differences arising from interline freight settlements between carriers parties to the interline waybill is a matter of accounting and should not be referred to the claim department for settlement.

8. The initial carrier shall be responsible for the failure to collect all tariff charges from original point of shipment to final destination, for shipments, carloads and less carloads, destined to prepaid or non-agency stations, and shall assume all uncollectible undercharges on such shipments. When such shipments are billed collect or insufficiently prepaid, they should be accepted from connecting carrier and forwarded to destination. The destination carrier shall endeavor to collect the amount due, but if unsuccessful may correct the waybill to read fully "Prepaid," if the shipment is waybilled through from point of origin to destination; when rebilled en route, the adjustment shall be made through Freight Claim Channels, and in such cases the Freight Claim minimum shall be waived. (See Rule 226 of the Freight Claim Association.)

9. While accepting the principle that the destination carrier shall assume the duty of collecting all tariff charges, this will not relieve the initial or intermediate carriers from responsibility for their errors that are impossible of detection by the destination carrier. (See Paragraph 10.)

10. While recognizing the difficulty of enumerating all of the various classes of undercharges, the following are some of the losses which should not be borne by the destination carrier:

(a) Miscellaneous charges for switching, demurrage, storage, icing or feeding, detention or stop-off charges, etc., omitted from billing and not a part of or included in the through rate.

(b) Undercharges due to error in rates published in tariffs to which destination carrier is not a party.

(c) Undercharges due to failure to collect tariff charges on shipments destined to prepaid or non-agency stations.

(d) Undercharges due to the insertion of incorrect rates in export bills of lading issued by initial or intermediate carrier.

(e) Charges waybilled as prepaid, subsequently changed by correction to collect.

(f) Demurrage charges accruing at point of origin and not noted on bills of lading.

(g) Undercharges due to failure of weighing carrier to state correct

gross carload weight on waybills when charges are collected on that scale or shippers agreement weights.

11. Destination carrier shall receive all possible assistance from initial or intermediate carrier in its efforts to make collection or refusal.

12. When destination carrier is unable to collect tariff charges due to errors of the initial or intermediate carrier, which were responsible for collection on the part of the destination carrier, the destination carrier shall submit all papers in the case and request authority to charge the carrier responsible or to resort to legal means to enforce collection. In the event of failure to make collection, the carrier responsible for the error must assume the amount uncollectible and the cost of the legal proceedings. The adjustment to be made through Freight Claim Channel. If the destination carrier cannot secure the authority of carrier responsible, then adjustment shall be made through Freight Claim Channel.

13. It must be recognized that these recommendations are made to cover only the disposition of undercharges and overcharges as between carriers, and should not be construed as defining the policy of a carrier with respect to its relations with the public.

Assignment of Special Numbers to Carriers.—Because of its many disadvantages, it is thought that carriers using tabulated machines would not generally adopt numbers assigned by this association to carriers. It was resolved that assignment by this association of a number to each carrier for freight accounting purposes is not advisable.

Auditor's Revision of Billing in Local Offices at Large Terminal Points.—This association has previously recommended that a thorough revision of waybills at stations and in the general offices be provided for. It is resolved that this association recommends the establishment at principal stations of bureaus under joint jurisdiction of the accounting department for the purpose of effecting a complete revision of both inbound and outbound waybills, and that at stations where no accounting department revision bureau is located the station forces should be required to revise both outbound and inbound waybills, and that this plan should be considered supplementary to the general office revision work.

Unit Waybill.—It is resolved that this association recognizes that conditions of different carriers vary so widely that a plan of unit waybilling, manibilling and combining of reports and records cannot yet be recommended for general adoption. The committee recommends that the various blanks and methods be submitted for further consideration of carriers for study and development.

Shipping Orders, Preparation of.—It is the sense of this association that when shipping orders or straight bills of lading are prepared at the same time by the carbon process the shipping order should be on top and that on an order bill of lading the number of packages be spelled out as well as given a numeral*

Settlement Between Carriers for Undercharges.—Your committee recommends that section 14 of the 1912 synopsis be changed to read as follows:

1. When the destination agent discovers an undercharge in the advances of a waybill, he shall send the waybilling junction agent a prepaid-only waybill or a correction notice for the amount of the undercharge.

2. Freight accounting officers are morally obligated to correct any tendency on the part of their agents to absorb these undercharges instead of refunding them to the creditor roads.

3. At the junction, the waybilling agent when he receives the prepaid-only waybill or the correction notice shall promptly refund the amount of the undercharge to the agent of the connecting line.

4. In the event all or a part of the undercharge belongs to a road beyond the said connecting line, then the agent of the connecting line shall refund it to the junction agent of the road beyond, proceeding as in Rule 1.

5. When the freight accounting officer of either the destination road or of an intermediate road discovers an undercharge in the advances of a waybill, he shall notify the freight accounting officer of the creditor road, using therefor A. A. R. A. O. Standard Form No. 118, Notice of Undercharge in Advances, sending copies to accounting officer of all lines interested, and shall indicate on the form whether settlement shall be made through freight claim or junction account.

6. It should be recognized that, inasmuch as carriers are dependent on one another as to collection and apportionment of transportation charges, each freight accounting officer is morally bound to exert himself to refund undercharges to the roads that the undercharges belong to.

7. Upon receipt of a notice of undercharge in advances, the freight accounting officer of the creditor road shall collect the undercharge, either through claim channel or through the junction agents, according as the [illegible] In collecting through the junction agents, he should send the notice to the agent together with A. A. R. A. O. Standard Form No. 147, Waybill Correction Notice or Notice of Undercharge in Advances, A. A. R. A. O. Standard Form No. 118.

8. At the junctions, the agent of the creditor road shall present the said notice to the agent of the debtor road, and the latter shall promptly pay the undercharge to the former, using the notice itself to support the relief claim or the credit due him for the moneys so paid out.

Waybill to Show Information as to Weighing of Freight.—It is recommended that the association approve an amendment to its former recommendations to provide that waybills or transfer freight bills to connecting carriers for all freight should show in the weight column how obtained, using "R" for railroad scale, "A" for weighing bureau or agreement, "T" for tariff, classification or minimum, "S" for shippers' agreement or tested weight, "E" for estimated—weigh and correct.

Manibill.—See recommendations in regard to unit bill.

The report was signed by Bertram Young, chairman.

All of the recommendations and resolutions of the committee as shown above were approved by the association and the president announced that more subjects had been covered this year in the report of committee and there had been less discussion than at any previous meeting.

COMMITTEE ON PASSENGER ACCOUNTS

Your committee has held two meetings during the year.

Interline Tickets Diverted or Exchanged En Route.—Your committee recommends that all exchanges en route of interline tickets should be made with the approval of the passenger traffic department, either under specific or general authority; lifted tickets to be sent by the agent to the auditor's office promptly. Where the exchanges are via the same routes on account of illness, insufficient coupons, error in limit, etc., the lifted coupons should be sent to the interested lines with a joint letter requesting them to look to the issuing line for a report of revenue; and where the exchange is made on account of insufficient coupons, the coupons covering two or more lines should be sent to the first connecting carrier. Where tickets with insufficient coupons are honored without exchange, the terminal line should address a letter to the issuing carrier requesting that revenue be reported the same as though proper coupons had been provided, sending a copy to all interested lines.

Where exchanges were via different routes on account of missing connections, etc., the lifted coupons should be sent to the issuing line, with the request that it report all revenue thereon beyond the point of exchange to the exchanging carrier, with the understanding that in the acknowledgment advising when the revenue will be reported it would show a division of the revenue via the route traveled.

Adjustment of revenue to be made between lines interested in optional joint route arrangement should be with the understanding that if separate coupons are provided for the optional route only such portion of the tickets will be exchanged. The adjustment of revenue on account of tickets diverted without exchange will also be made between the interested carriers.

Excess Valuations, Collections—Baggage.—The committee recommends the adoption of a resolution that each line shall retain the charges collected on account of the excess valuation of baggage, except when such charges are covered by C. O. D. checks of other companies' issues. The same shall be reported to the issuing line in all cases.

Interline Tickets Reduced to Lower Grade in Contract, But Not in All Coupons.—After correspondence with Fred W. Sweney, chief examiner of accounts of the Interstate Commerce Commission, Mr. Sweney wrote that the Interstate Commerce Commission had amended conference ruling 481 to read as follows:

481. [illegible] Issuance of Passenger Tickets.—The agent of an initial carrier issues half-fare or lower-class tickets and properly punches contract portion and some of the coupons, but fails to punch the other coupons; [illegible] When adhering to the principle expressed in Conference Ruling 377

*The importance of this resolution lies in the fact that the waybill is made out from the shipping order, and where heretofore the bill of lading has been the original and the shipping order a carbon, errors due to the slipping of the carbon were carried into the waybill, whereas under the method now adopted by the association errors due to slipping of the carbon would not be carried into the waybill.

that initial carriers must bear the full burden of the mistakes of their agents and settle with other lines on the basis of class of tickets honored, provided that in cases of this kind where the conductors or ticket collectors of the carriers honoring the unmarked or unpunched coupons indicate thereon that the contract portion of the ticket was properly marked or punched, and that half-fare or lower-class transportation was furnished, such carriers may accept their proportions of the fares applicable to the transportation furnished, otherwise the initial carrier must settle with other carriers on the basis of fares applicable to class of transportation indicated on the coupon lifted.

The following resolution is respectfully submitted:

It is the sense of this association that where the selling agent in error fails to reduce any coupons of an interline ticket to conform with the contract and as a result passenger obtains transportation thereon in excess of the fare paid for the ticket, the initial carrier must bear the full burden of the mistake. The recommendation as contained in paragraph 21 of the 1915 synopsis is hereby repealed.

The report was signed by L. C. Esschen, chairman.

The above recommendations and resolutions of the committee were adopted by the association.

Standing Committee on Disbursement Accounts.

Your committee has held three meetings during the year.

Standard Form of Voucher.—Your committee recommends that the association reiterate its previous action, which was in part that voucher check should be of standard size and in the standard draft form, which should be 3½ in. wide by 8½ in. long, and that voucher check should be in the form of a state check or draft and endorsement of the payee thereon be accepted as the only receipt required and that the voucher check be in negotiable form.

Injuries to Persons.—The committee recommends that the association express the opinion that the general account under operating expenses chargeable with amounts for injuries to employees should be determined by the class of train causing the injury where practicable; otherwise the account should be determined according to the class of service in which the employee is engaged at the time of the injury.

Accounting for Fuel Used in Producing Power for Self-Propelled Motor Cars.—The committee recommends that the association suggest, in view of the more extensive use of self-propelled motor cars, that a separate account be provided for fuel used for producing power for such cars.

Rebuilding Bridges and Maintaining Traffic During Progress of Work.—The committee recommends that the association adopt a resolution that it is the sense of this association that the item of $1,000 representing the estimated increased cost of erecting steel under traffic over cost of erection without traffic being maintained is not a proper charge to operating expenses; and further, that operating expenses should be charged only with the actual cost of special expenses incurred in maintaining and protecting traffic during the progress of additions and betterments work and not with any amounts estimated to be the increased cost of the additions and betterments work due to the same being done while traffic is maintained.

The report was signed by John Hurst, chairman.

The above recommendations of the committee were adopted by the association.

COMMITTEE ON TERMINAL COMPANIES' ACCOUNTS

Your committee held two meetings during the year. Its recommendations and resolutions, which were of a detailed nature, were adopted by the association. The report was signed by H. D. Heuer, chairman.

COMMITTEE ON ACCOUNTS WITH GOVERNMENTS

Your committee has not held any meetings since the last annual meeting of the association.

Bill of Lading for Postal Service.—The committee has handled this subject by correspondence with the fourth assistant postmaster general and informally submitting some criticisms and suggestions on the proposed bill of lading.

Government Transportation Requests.—The following letter was received dated February 9, 1916, from W. W. Galbraith, commander United States Navy, Bureau of Navigation, Washington, D. C.:

The chief of bureau directs me to advise you that the different government departments recently adopted a new form of transportation request, a sample of which is included in a circular issued by the comptroller of the treasury, copies of which were forwarded the different railroad companies. All the departments will shortly be using an identical transportation request, the only difference being that the name of the particular department or independent branch of the service issuing the request will appear at the top, the signatures will be different, and there will be a different letter to designate each particular service.

The bureau is writing this letter to call particular attention to the different letters preceding the numbers on these requests. These letters were placed on the request with the object of assisting transportation companies in identifying the department issuing a request that may have been lost. Letters have been received in the past from transportation companies advising that a government request of a certain number has been lost and asking if the department issuing it could be determined. With this letter it will always be easy to determine the department.

In view of this fact it is requested that you notify all lines in your association to take particular care to always include the letter as well as the number in every case on vouchers and in correspondence.

The report was signed by W. H. Williams, chairman.

The report of the committee was accepted by the association.

OTHER BUSINESS

The committee, R. E. Berger, chairman, reported that prompt action was taken to arrange for joint meeting with the standing committee on methods, accounts and forms of the Freight Claim Association, but that these efforts were not successful and recommended that the collection of deficits in freight charges, a substitute for the present Freight Claim Association rule No. 226 covering prepay on shipments destined to non-agency stations, and the proposed change in rule 100 of the Freight Claim Association in regard to the handling of astray freight be left with it for further consideration. The association approved of this action.

It was decided to appoint a special committee to attend the convention of the National Association of Railway Commissioners.

MR. BAILEY'S ADDRESS

The following address on Organization was delivered by W. E. Bailey, General Auditor of the Atchison, Topeka & Santa Fe, at the evening session on Thursday:

The Association of American Railway Accounting Officers was built upon the foundation of necessity. It came into existence at a time when increasing business demanded a closer co-operation between carriers. Railways were growing in size by construction and by consolidations, and new and large lines were being built. Inter-railway transactions were increasing, calling for closer working relations among officials and especially in the accounting for these transactions. It was natural, therefore, that railway accounting officers should wish to organize for discussion of matters of mutual interest and benefit.

During the life of the association the accounting department has assumed a more and more important position, not only in the internal affairs of the corporation but in the position it holds with the public—both the investor and the user.

During this time material advance has been made in railway accounting practices and methods. Interline accounting has been improved and simplified, the ascertaining of revenues and profits, preparation of financial statements, development of statistical and other data for the use of the management in the operation of the property have been brought to a high standard. It has been said by one well qualified to speak that railway accounting has been brought to its highest perfection in this country.

We all realize, nevertheless, that the final word has not

been said nor the last advance made, but that there is still much to be done by the association as a whole and its members individually. In casting about for a topic for an address it has occurred to me that it would be interesting to give some thought to one of the most important problems confronting the railway accounting officer, increasing attention to which has been responsible in a large measure for the position railway accounting has attained. It is a feature in which we are all very much interested—one that is present in all undertakings involving more than individual effort—I refer to the problem of organization.

Organization is defined as the process of arranging constituent or interdependent parts into an organized whole, and the accounting executive would add to that, the maintaining and constant strengthening and improving of that organic whole, as well as the molding and remodeling of it to meet changing conditions.

An organization is in reality a means for accomplishing a certain purpose. What that purpose is will depend upon the nature of the business. In accomplishing this purpose, however, it is the universal aim to make each organization efficient, and this is true of the accounting department. The closer its several units are co-operating and its continuous life and growth provided for the more perfectly will it accomplish the purpose for which it was created.

In recent years the claims for scientific management have received considerable attention. If the conclusions of efficiency experts are accepted without question, all that appears to be necessary to transform an inefficient organization is to secure some one skilled in the art of detecting waste and apply his suggested remedies. While fully recognizing the fact that no group of individuals can be molded into a working organization that is not susceptible of improvement, those experienced in matters of this kind know that an efficient organization is not a creation of a day. The ultimate efficiency depends upon the selections made at the recruiting station, supplemented by good training. The desired results can be obtained only by constant, hard work and not by the application of magic. The point to be emphasized, therefore, is the necessity for a solid building up of the organization from the bottom, and the molding of it into a co-operative structure, taking care in doing this not to destroy individual initiative or the incentive for greater effort.

In every organization more or less change is going on in the personnel of its component parts. There is also in a varying degree, a natural growth due to increase in business or enlargement of the property. Both these conditions place upon the executive the important responsibility of providing new members.

The ideal practice is to provide new members at the bottom, and train and educate them for advancement in the organization as opportunity, experience and ability permit. In actual practice this has been found to be the correct course to follow, although there are, and rightly will be, exceptions made necessary by the exigencies of a particular situation.

The training of employees continues throughout their service with the department. Much of their education in the different branches of accounting work will be acquired through observation and assimilation while performing their assigned tasks. It should be the aim to arouse in every employee the habit of studying his work. One of the greatest assets of an accountant is that of being a real student. It should be the endeavor to know that every employee understands what he is doing and the relationship of the task in hand to other work of the department.

In the endeavor to maintain reasonable stability in the force there is a somewhat natural tendency to continue employees of more than ordinary ability too long in one position for the ultimate good of the organization. This practice will not be harmful, either to the individual or the department, during the early training period, but as time goes on the individual's further training must be given serious consideration; otherwise the organization will suffer through failure to develop and secure the full benefit of the potentialities of the individual. In building up and maintaining the force at a high standard the head of an organization must be constantly on the alert for talent of more than ordinary ability and where he finds an employee who shows more than usual activity and possibilities, it is the part of wisdom to assign him to different classes of work as opportunity permits.

Every individual should be anxious to secure a broader education than that which comes to him in the performance of his daily duties. Because of the more or less limited education which employees as a rule have acquired on entering the service of the accounting department, they should be encouraged in every way possible to overcome their deficiencies by such means as may be available. Educational work of the sort which should be particularly encouraged is that which is correlated with their life work—railway service; not to the neglect, however, of the cultivation of knowledge. Such work as is undertaken should be with some definite aim and pursued systematically and intelligently.

Young men as a rule when first starting work have no very definite ideas as to what they are fitted for or what occupation they would like to follow. Owing to this condition clerical work seems to appeal to many boys, and is looked up by them with more favor than a trade because it it comparatively easy and offers a better immediate financial return. The accounting officer in making selections from among the large number seeking positions, has to choose as best he can the individuals who are likely to develop into satisfactory accounting department employees. The confining nature of clerical work demands good health and a robust constitution. The possession of these are essential for the reason that they are the bases of energy and mental activity. The nature of accounting work is such that it demands intelligence with evidence of possible mental growth. In the nature of things it is of course difficult for the employer to determine with any degree of satisfaction the fitness of these inexperienced young men for clerical work prior to their entering the service. Their employment is therefore largely a matter of experiment.

Plans for examining applicants in the fundamentals of an education are followed by many, with a further test at the close of a period of say a year's service. These tests are of much help in selecting boys and in determining later on the advisability of retaining them if in other respects their services have been satisfactory. It is not often that an individual realizes until it is perhaps too late to make a change, that the line of work he is following is not that for which he is naturally fitted. The head of an organization should therefore feel no hesitancy in counselling a young man to seek some other line of endeavor when satisfied that he would not make even an ordinary success in accounting work. It is no hardship to make at this stage of his business career a change for which in later years he may have cause to be thankful.

In the handling of every organization involving as it does the human equation, intelligent discipline is an imperative necessity. All employees should be treated justly and impartially. The problem of discipline is an important one with boys just entering business life. They bring with them all the characteristics which belong to their boyhood days. They are about to give up more or less freedom and it is to be expected that the restraint of obeying orders, performing prescribed tasks and keeping regular hours with other features of discipline, will be resented. These characteristics of boyhood must be reckoned with in administering discipline. A discharge should not be forth-

coming every time some boyish break occurs. Through hasty action on such occasions the department may lose an employee of unusual promise.

Responsibilities in organization work are not alone in the interests of the employer. Responsibilities towards the members of the force have to be considered. The difficulty in this connection is to determine to just what extent these efforts may be extended without having the appearance of undesirable paternalism. Care of health should be insisted upon. Education through study and reading should be encouraged, particularly in the line of their work, but not to the neglect of those subjects in which they may be interested and which make for a better and broader view of life and its duties.

The one incentive that can be held out to employees is that they will be given opportunities to advance as occasions offer and as they by their own efforts qualify themselves for promotion. To this end the salaries should be graded in harmony with the importance of the work, with operations grouped and arranged in the order of time, interrelationship, and difficulty. Natural paths or promotion lines should thus be established not only within a department but between departments by arranging the salaries in accordance with the demand for experience and ability in performing the duties of the various positions.

There is probably nothing which works more for the loyalty and organization spirit, so essential for continued success, as the maintenance of these promotion lines and close adherence to the promotion principle in filling vacancies. When the rank and file becomes thoroughly satisfied that this is the policy of the management and that opportunity is open to each and all, this spirit is sure to prevail. While promotion lines will converge and extend to the highest positions it is natural that the requirements should become increasingly exacting. Other factors than being next in line or the employee's service record and experience must be considered. Executive possibilities will commence to be the important characteristic sought for when selecting a department head or an assistant.

For the accounting department employee every position to the highest is possible of attainment. There is probably no other profession in which so large a proportion of those holding executive positions have arisen from the ranks. Every employee therefore, when entering the service should have the right to hope ultimately to rise to the highest position the department offers. The executive head for his part, should aim to keep the door of hope constantly open before all employees. There can be nothing more discouraging to any employee than to feel that opportunity for advancement no longer exists for him.

In the natural order of things there will be a tendency for the department at times to slacken up a little in efficiency, to stagnate or grow stale as it were, from causes not always apparent at the moment. This is one of the accounting officers' serious problems as it is with the head of every organization. There must be a reasonable amount of activity in every department if this situation is to be prevented. Energy and activity as well as ability must be recognized in advancing employees. The taking away from the department occasionally some of its finished products through demands from the outside affords opportunities to overcome such a situation at times by placing energetic employees where they may be needed.

One of the problems of the mechanical engineer is the so-called friction load. While this cannot be eliminated in its entirety the engineer can measure it with mathematical exactness and therefore has positive data for use in solving his problem of keeping it at the minimum. The head of every organization is confronted with a similar problem. While his friction load cannot be determined by the application of a mathematical formula it is reflected in the pay roll, and his problem, like that of the engineer, is to keep the non-productive energy at the minimum. Although the auditor is interested only to a limited extent in the utilization of mechanical aids he is very much concerned in the efficient application of human energy to the end that results may be secured with the least possible loss of time and labor. In an accounting organization, as in other organizations, the one in charge should have some "yard stick" for measuring the efficiency of the department as a whole, by groups, and by individuals. Just what form this should take will depend upon the nature of the work performed, as well as the judgment of the department head as to his need. This will govern the quantity and details. That required by the head of an organization will naturally be more condensed and general than the information required by the department head. These measures will serve not only as a guide to the quantity and regularity of the output, but also as indices to the department head or the auditor himself as to those features of the work which need personal investigation or as to those individual employees who may be in need of particular attention.

In the last analysis responsibility for results rests with the executive head of the organization. He is the one who must finally decide upon the selection and retention of members of the organization, the inauguration and carrying out of methods and practices. His value to his company is measured by his ability to operate his department so as to produce a first class output at a minimum expense.

Naturally it is to be expected that he will have had the necessary experience and be possessed of the ability, energy and activity, as well as the other characteristics essential for such a position. While an executive head is a necessity for every undertaking, one test of success as such a head is to have so built up an organization that it will run efficiently without his assistance or direction as occasion demands, and that has within it the material for its perpetuation. After all has been said there is probably nothing which so impresses the one in charge of an organization as that "eternal vigilance is the price of success." This is a modern version of an old saying but it is so appropriate when applied to business that I am inclined to believe the originator of the expression must have had a long and varied experience in the handling of an accounting organization.

OTHER BUSINESS

The secretary read the report showing the financial condition of the association. The report showed that there was a balance on hand at the beginning of the year of $2,189. The receipts during the year were $13,337, and disbursements $9,557, leaving a balance on hand at the end of the year of $5,971.

The business meeting of the association closed with the election of officers. L. A. Robinson, comptroller of the Chicago & North Western, was elected president; J. A. Taylor, comptroller of the Central of New Jersey was elected first vice-president; R. E. Berger, assistant auditor of the Wabash, was elected second vice-president, and E. R. Woodson was re-elected secretary. The executive committee was elected as follows: F. O. Waldo, H. H. Laughton, H. D. Foster and E. S. Benson.

ENTERTAINMENT

On Wednesday afternoon at two o'clock an automobile ride for the ladies was arranged by courtesy of the automobile owners and manufacturers of Detroit. On Thursday the members and guests were taken on two trips made by the steamer Pleasure which had been chartered for the occasion. The first trip was through St. Clair lake and St. Clair flats, and the second trip, which started at nine o'clock in the evening, was a moonlight ride on the Detroit river. On Friday parties were made up for the inspection of various automobile factories.

American Society for Testing Materials

A Brief Report of the Proceedings of the Nineteenth Annual Meeting Held Last Week in Atlantic City, N. J.

THE nineteenth annual meeting of the American Society for Testing Materials was held at the Hotel Traymore, Atlantic City, N. J., June 27-30, 1916. The proceedings included committee reports on Wrought Iron, Methods of Sampling and Analysis of Coal, Steel, Heat Treatment of Iron and Steel, etc., with a number of interesting individual papers. The president, Mansfield Merriman, addressed the convention on the Work of Committees.

COMMITTEE ON STEEL

The Committee on Steel, C. D. Young, Pennsylvania Railroad, chairman, presented recommendations for revisions of a number of the present standard specifications, among these being those for carbon steel bars for railway springs, structural steel for locomotives, quenched and tempered carbon steel axles, etc., carbon steel forgings for locomotives, cold rolled steel axles, lap welded and seamless steel boiler tubes, safe ends and arch tubes, boiler and firebox steel, wrought solid carbon-steel wheels, and steel tires. Seven of the present tentative specifications were recommended for adoption as standard. These include specifications for chrome-vanadium steel bars for springs, helical springs for railways, elliptical springs for railways, alloy steel forgings and quenched and tempered alloy steel axles, shafts and other forgings for locomotives and cars. Tables for the permissible variations in weight and thickness of sheared plates were presented for adoption as standard.

Rails and Accessories

The sub-committee on steel rails and accessories consisting of E. F. Kenney (chairman); C. S. Churchill, A. L. Colby, J. C. Crawford, P. E. Carhart, F. E. Abbott, H. B. MacFarland, F. N. Speller, F. A. Robbins, Jr., J. P. Snow, M. H. Wickhorst, and J. B. Young, presented specifications for steel track spikes, steel screw spikes and steel tie plates which are given below. A brief report of the rail situation was also given.

Specifications for Steel Tie Plates.

1. The steel shall be made by the open-hearth process of manufacture.

2. The steel shall conform to the following requirements as to chemical composition:

Phosphorus	not over 0.05 per cent

3. An analysis from each melt of steel shall be made by the manufacturer to determine the percentages of carbon, manganese, phosphorus and sulphur. This analysis shall be made from drillings taken at least ⅛ in. beneath the surface of a test ingot obtained during the pouring of the melt. The chemical composition thus determined shall be reported to the purchaser or his representative, and shall conform to the requirement specified in Section 2.

4. An analysis may be made by the purchaser from a finished tie plate representing each melt. The phosphorus content thus determined shall not exceed that specified in Section 2 by more than 25 per cent.

5. (*a*) Except as specified in Paragraph (*b*), the tie plates shall conform to the following minimum requirements as to tensile properties:

Tensile strength, lb. per sq. in.	64,000
Yield point, lb. per sq. in.	[illegible]
Elongation in 2 in., per cent	18

(*b*) Tie plates in which the material required to be punched is ⅝ in. or greater in thickness, shall conform to the following requirements as to tensile properties:

Tensile strength, lb. per sq. in.	[illegible]
Yield point, min., lb. per sq. in.	[illegible]
Elongation in 2 in., min., per cent	[illegible]

6. The bend test specimen specified in Section 7 shall bend cold through 180 deg. around a pin the diameter of which is equal to twice the thickness of the specimen, without cracking on the outside of the bent portion.

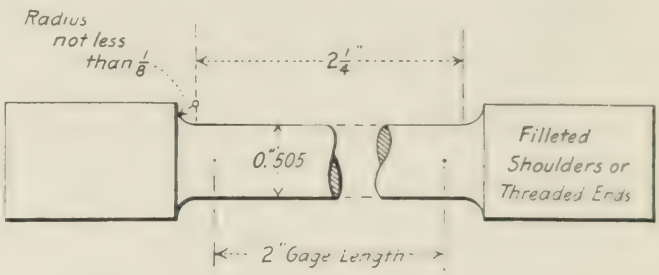
7. (*a*) The tension and bend test specimens shall be taken from the finished tie plates. They shall be cut so that the sides of the specimens are parallel with the direction in which the tie plates have been rolled.

(*b*) Tension test specimens may conform to the essential dimensions shown in the drawing. In this case they shall have filleted shoulders, or threaded ends, to fit into the holders on the testing machine in such a way that the line of action of the force exerted by the testing machine shall coincide with the axis of the specimen.

Or, tension test specimens may be rectangular in section, in which case they shall be not less than ½ in. in width between the planed sides, and shall have two parallel faces as rolled.

(*c*) Bend test specimens shall be rectangular in section, not less than ½ in. in width between the planed sides, and shall have two parallel faces as rolled, with the corners rounded to a radius not over 1/16 in.

(*d*) When the tie plates are of such a design that the rectangular specimens cannot be obtained without projecting ribs, these shall be planed off before the tests are made.



Note:—The Shoulders required when Threaded Ends are not Used may be Formed by the Fillets Terminating the Body or by other Fillets Continuing these, or may be Formed in the Ends beyond these Fillets.

Tension Test Specimen

8. (*a*) One tension and one bend test shall be made from each melt.

(*b*) If any test specimen shows defective machining or develops flaws, or if it breaks outside the gage length, it may be discarded and another specimen substituted.

9. (*a*) If the percentage of elongation of any tension test specimen is less than that specified in Section 5, a retest shall be allowed.

(*b*) If any tension test specimen breaks more than ¾ in. from the center of the gage length, a retest shall be allowed.

10. The tie plates shall be smoothly rolled, true to templet, and shall be straight and out of wind on the surface which will form the bearing for the rail. They shall be sheared to the length and punched to the dimensions specified by the purchaser, with the following permissible variations:

(*a*) For plates with shoulders parallel to the direction of

rolling, a variation of 1/32 in. in thickness, and ⅛ in. in width and length will be permitted.

(*b*) For plates with shoulders perpendicular to the direction of rolling, a variation of 1/32 in. in thickness, ⅛ in. in width and ¼ in. in length will be permitted.

11. The finished tie plates shall be free from burrs and other surface deformations caused by the shearing and punching; they shall also be free from other injurious defects and shall have a workmanlike finish.

12. The name or brand of the manufacturer, the section and the year of manufacture shall be rolled in raised letters and figures on the outside of the shoulder of the plate, and a portion of this marking shall appear on each finished tie plate.

13. The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the tie plates ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the tie plates are being furnished in accordance with these specifications. All tests (except check analyses) and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

14. (*a*) Unless otherwise specified, any rejection based on tests made in accordance with Section 4 shall be reported within five working days from the receipt of samples.

(*b*) Tie plates which show injurious defects subsequent to their acceptance at the manufacturer's works will be rejected, and the manufacturer shall be notified.

15. Samples tested in accordance with Section 4, which represent rejected tie plates, shall be preserved for two weeks from the date of the test report. In case of dissatisfaction with the results of the tests, the manufacturer may make claim for a rehearing within that time.

Specifications for Steel Track Spikes

1. The steel may be made by the Bessemer or open-hearth process.

2. The full-size finished spikes, or the full-size bars from which the spikes are made, shall conform to the following minimum requirements as to tensile properties:

Tensile strength, lb. per sq. in.	55,000
Yield point, lb. per sq. in.	0.5 tens. str.
Elongation in 2 in., per cent.	25

3. (*a*) The body of the full-size finished spikes shall bend cold through 180 degs. flat on itself, without cracking on the outside of the bent portion.

(*b*) The head of the full-size finished spikes shall bend backward to the line of the face of the spike without cracking on the outside of the bent portion.

4. (*a*) One tension and one bend test of each kind shall be made from each lot of 10 tons or fraction thereof.

(*b*) If any test specimen develops flaws, it may be discarded and another specimen substituted.

5. If any tension test specimen breaks at a point more than ¾ in. from the center of the gage length, a retest shall be allowed.

6. The spikes shall conform to the dimensions specified by the purchaser. A variation of 1/64 in. under the specified dimension of the body of the spike, measured from the face to the back, and a variation of 1/32 in. over the specified dimension of the body of the spike, measured across the face, will be permitted. A variation of 3/32 in. over and 1/32 in. under the specified dimensions of the head of the spike will be permitted. A variation of ⅛ in. from the specified length of the spike, measured from the under side of the head to the point, will be permitted. A variation of 1 deg. in the specified angle of the under side of the head of the spike will be permitted.

7. The finished spikes shall be free from injurious defects and shall have a workmanlike finish.

8. The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the spikes ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the spikes are being furnished in accordance with these specifications. All tests and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

9. Spikes which show injurious defects subsequent to their acceptance at the manufacturer's works will be rejected, and the manufacturer shall be notified.

Proposed Tentative Specifications for Steel Screw Spikes

1. The steel may be made by the Bessemer or open-hearth process.

2. The heads of the spikes shall be formed and the threads rolled at a temperature not less than 750 deg. C.

3. The full-size finished spikes shall conform to the following minimum requirements as to tensile properties:

Tensile strength, lb. per sq. in.	60,000
Yield point, lb. per sq. in.	0.5 tens. str.
Elongation in 2 in., per cent.	20

4. The full-size finished spikes shall bend cold through 90 deg. around a pin the diameter of which is equal to three times the diameter of the spike, without cracking on the outside of the bent portion.

5. (*a*) One tension and one bend test shall be made from each lot of 100 kegs or fraction thereof.

(*b*) If any spike tested develops flaws, it may be discarded and another spike substituted.

6. (*a*) If the percentage of elongation of any tension test spike is less than that specified in Sec. 3, a retest shall be allowed.

(*b*) If any tension test spike breaks more than ¾ in. from the center of the gage length, a retest shall be allowed.

7. The spikes shall conform to the dimensions specified by the purchaser. The head shall be concentric with, and firmly joined to, the body of the spike. The threads shall be sharp and true to gage and of the pattern specified by the purchaser. A variation of 1/32 in. over and under the specified diameter of the unthreaded portion of the body of the spike will be permitted. A variation of 1/32 in. over the specified diameter of the threaded portion of the spike will be permitted. A variation of 1/16 in. under and ⅛ in. over in the reach of the head of the spike will be permitted. A variation of ⅛ in. from the specified length of the spike will be permitted.

8. The finished spikes shall be free from injurious defects and shall have a workmanlike finish.

9. A letter or brand indicating the manufacturer shall be pressed on the head of the spike while it is being formed.

10. The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the spikes ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the spikes are being furnished in accordance with these specifications. All tests and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

11. Spikes which show injurious defects subsequent to their acceptance at the manufacturer's works will be rejected, and the manufacturer shall be notified.

HEAT TREATMENT OF CARBON-STEEL LOCOMOTIVE AXLES: WATER VS. OIL QUENCHING

By C. D. Young
Engineer of Tests, Pennsylvania Railroad, Altoona, Pa.

The investigation reported in this paper was made in order to show the difference between the physical properties of a large forging quenched in water and those of a similar forging quenched in oil.

The results obtained indicate that there is an advantage in the use of water as a quenching medium, as might be expected from its physical properties. Results obtained at a large heat-treating plant, which has turned out thousands of tons of quenched and tempered carbon steel, indicated that no disastrous effects on the forgings are to be anticipated from the use of water as a quenching medium, providing proper care is taken in the handling of the steel throughout the process.

The forgings used for this experiment consisted of two

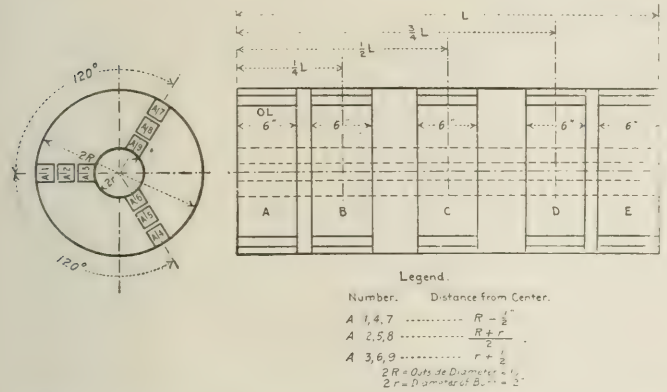


Diagram Showing Positions of Test Specimens in the Axles

ten-inch locomotive driving axles having a center bore two inches in diameter extending the entire length. Both axles were from the same melt of steel, and preliminary chemical analysis indicated the same chemical composition. One axle was treated at the Juniata shops of the Pennsylvania Railroad by water quenching, and the other axle by a steel company which makes a practice of oil quenching.

Water Quenched.—The axle was heated to 1,550 deg. F., and at that temperature quenched in water at about 60 deg. F. Then, in a furnace maintained at 1,175 deg. F., it was heated to that temperature and cooled therefrom in the air on a dry ground floor. That is, this axle, after being quenched from 1,550 deg. F. in water at about 60 deg. F., was "drawn" to a temperature of 1,175 deg. F.

Oil Quenched.—Similarly, the other axle was quenched in a heavy oil from the same temperature (1,550 deg. F.) and drawn in a furnace to 1,200 deg. F., the cooling being done in the air the same as in the case of the water-quenched axle.

The object aimed at in the above treatment was to have the tension tests on both axles show an elongation in 2 in. of about 22 per cent.

After treatment, the axles were laid off for cutting up into tension test specimens as shown in the diagram. It will be noted in effect that out of each axle there were cut—axially and for the full length, 120 deg. apart—three radial and straight slabs of the overall-thickness of a test specimen, and out of each slab five 6-in. lengths, each identified as to its original location in the axle, whether cut from the end and from which end, or whether from the center, or from midway between center and end, and from which slab; and then each 6-in. length was cut lengthwise into three specimens and their location further identified as to whether cut from the inner or outer circumference or from the middle of the wall. The identification marks for the five 6-in. lengths, in order from one end, are respectively *A, B, C, D,* and *E*. It is also shown that the specimens from length *A*, for example, are numbered radially from the outside of the axle toward the axis, the three specimens from the first slab being numbered, as described, 1, 2, 3 throughout; second slab 4, 5, 6; third slab 7, 8, 9, respectively. The specimens from lengths *B, C, D* and *E* also have the same numbering as those of length *A*. The letter *W* applies only to the water-quenched axle and *O* only to the oil quenched. Altogether there were 45 specimens per axle, 15 specimens from the three longitudinal planes through the axle, and 9 specimens from all three slabs from each of the five 6-in. lengths.

The test specimens were turned up to the standard 2-in. gage length, ½ in. in diameter. The elastic limit was determined by means of a strain gage. All tests were conducted on the same 100,000 lb. tension testing machine using a machine speed of ⅛ in. per minute for both the elastic limit and the tensile strength.

The results are summarized in Table I, in which it is shown that the average results are more nearly uniform with respect to the length of the axle than with respect to distance from the axis. This is probably due to segregation, as it was found by chemical analysis that the carbon content was not uniform throughout the section. Segregation is perhaps to be expected in the ordinary output of commercial forgings, but not to the extent found here. (See Table II for chemical segregation.)

A comparison of the average physical properties of all test specimens from both axles shows that with an elongation 4.5 per cent less than that of the oil-quenched axle, resulting from the difference in treatment, the water-quenched axle

TABLE I—SUMMARY OF RESULTS OF TESTS

Location from		Specimen Marks		Elastic Limit. Lb. per sq. in.		Tensile Strength. Lb. per sq. in.		Elongation in 2 in. Per cent		Reduction of Area. Per cent	
End	Axis	Water Quenched	Oil Quenched	Water Quenched	Oil Quenched	Water Quenched	Oil Quenched	Water Quenched	Oil Quenched	Water Quenched	Oil Quenched
				Location from End							
OL	.....	*WA*	*OA*	54,857	51,250	97,111	97,650	22.1	23.2	39.9	42.9
L/4	.....	*WB*	*OB*	52,634	52,160	96,637	97,304	23.3	25.2	40.3	45.7
L/2	.....	*WC*	*OC*	55,626	51,250	96,457	96,880	23.7	25.1	44.0	46.8
3L/4	.....	*WD*	*OD*	56,064	51,170	96,457	96,030	23.1	23.5	42.5	40.7
L	.....	*WE*	*OE*	53,376	49,780	95,720	94,210	23.6	24.0	44.3	41.7
Average	.....			54,509	51,118	96,482	96,415	23.1	24.2	42.2	43.4
				Location from Center							
.....	*R*—½ in.	*W* 1, 4, 7	*O* 1, 4, 7	55,216	51,423	94,187	93,719	25.6	26.0	52.7	49.7
	$\frac{R+r}{2}$	*W* 2, 5, 8	*O* 2, 5, 8	51,064	48,390	95,508	92,572	24.4	25.5	44.5	45.8
.....	*r*+½ in.	*W* 3, 6, 9	*O* 3, 6, 9	57,255	53,543	99,751	102,962	21.1	21.2	29.7	34.5
.....	$\frac{R+r}{2}$	Minimum permitted by A. S. T. M. specifications		50,000		80,000		20.0		40.0	

gave an elastic limit 6.6 per cent greater, about the same tensile strength and nearly the same reduction of area.

Table I gives the average results from all test specimens located equidistant from the axis in each axle. The average results from the outer test specimens at the location *R*—½ in. show the water-quenched axle to have about the same elongation as the oil-quenched axle, 7 per cent greater elastic limit, 5 per cent greater tensile strength and 6 per cent greater reduction of area.

The test specimens from the middle of the wall show lower elastic limit and tensile strength than either the outer or inner test specimens, except that the strength of the water-quenched axle at the middle of the wall was found to be somewhat higher than in the outer specimens. It is evident that this mid-region of the section was less affected by the heat treatment. The water-quenched axle, however, shows higher elastic limit and tensile strength in this region than the oil-quenched axle, although, as already stated, the average strength of the entire section came out very closely the same for both.

The results obtained from test specimens from the inner surface of the wall are not so consistent; that is, they show a higher elastic limit and a lower tensile strength, elongation and reduction of area for the water-quenched axle.

All of the forgings tested meet the requirements of the specifications of the American Society for Testing Materials, except that the elastic limit found in the middle of the wall in the oil-quenched axle is somewhat low.

Table II—Chemical Composition of Specimens

Specimen Marks: Water Quenched	Specimen Marks: Oil Quenched	Carbon. Per cent	Manganese. Per cent	Phosphorus. Per cent	Sulfur. Per cent	Silicon. Per cent
WA 4	.....	0.53	0.56	0.019	0.031	0.159
WA 5	.....	0.53	0.56	0.018	0.030	.....
WA 6	.....	0.61	0.58	0.019	0.039	0.158
WE 4	.....	0.53	0.56	0.019	0.030	0.162
WE 5	.....	0.53	0.56	0.019	0.032	.....
WE 6	.....	0.61	0.57	0.025	0.040	0.299
WD 3	.....	0.62	0.57	0.023	0.042	0.176
.....	*OA* 4	0.55	0.56	0.018	0.030	.....
.....	*OA* 5	0.55	0.57	0.018	0.033	0.190
.....	*OA* 6	0.63	0.59	0.019	0.041	0.195
.....	*OE* 4	0.52	0.55	0.021	0.036	0.167
.....	*OE* 5	0.54	0.56	0.019	0.031	0.182
.....	*OE* 6	0.60	0.59	0.019	0.038	.....
.....	*OD* 9	0.62	0.57	0.020	0.044	0.176

Table II gives the chemical analysis of representative test specimens taken from each axle. The water-quenched axle samples, taken from the *A* end, show that the outside and midway specimens *WA*4 and *WA*5 have the same carbon content, but when compared with analysis from specimen *WA*6 of the inner wall there appears a segregation of 15 per cent. The same is true of the samples taken from the opposite end of this axle.

In the oil-quenched axle also, the same segregated condition is present, the outer and middle test specimens having about the same carbon content, while the specimens *OA*6 and *OE*6 taken close to the inner surface, show a segregation of 14.5 and 11 per cent, respectively, when compared with the corresponding samples taken from the middle of the wall.

The segregation found in both of these axles indicates a condition which increases the difficulty of securing a satisfactory treatment of the forgings, and points to the desirability of including in all specifications for forgings which are to be heat treated, a clause to govern the allowable amount of segregation; otherwise it may be expected that extreme segregation will be found, as in the forgings here discussed.

CEMENT

The committee on cement, lime, gypsum and clay products submitted a draft of a proposed American specification and Method of Tests for Portland Cement which are given below:

These specifications represent several years' work of special committees representing the board of direction of the American Society of Civil Engineers, the United States Government department committee and the American Society for Testing Materials. It is considered highly desirable for both domestic and export trade that there be a single uniform American specification for Portland cement.

A proposed revised standard specification for drain tiles covering farm drain tiles, standard drain tiles and extra quality drain tiles was also submitted.

Specifications and Methods of Tests for Portland Cement

Specifications

1. Portland cement is the product obtained by finely pulverizing clinker produced by calcining to incipient fusion, an intimate and properly proportioned mixture of argillaceous and calcareous materials, with no additions subsequent to calcination excepting water and calcined or uncalcined gypsum.

2. The following limits shall not be exceeded:

Loss on ignition, per cent	4.00
Insoluble residue, per cent	0.85
Sulfuric anhydride (SO_3), per cent	1.75
Magnesia (MgO), per cent	4.00

3. The specific gravity of cement shall be not less than 3.10. Should the test of cement as received fall below this requirement, a second test may be made upon an ignited sample.

4. The residue on a standard No. 200 sieve shall not exceed 22 per cent. by weight.

5. A pat of neat cement, after 24 hrs. in moist air, when immersed in steam, shall remain firm and hard, and show no signs of distortion, cracking, checking, or disintegration.

6. Initial set shall develop in not less than 30 min. when the Vicat needle is used or 45 min. when the Gillmore needle is used. Final set shall be attained within 10 hr.

7. (*a*) Test pieces of standard mortar composed of one part cement and three parts standard sand, by weight, shall give tensile strengths equal to or higher than the following:

Age at test, days	Storage of test pieces	Tensile strength, lb. per sq. in.
7	1 day in moist air, 6 days in water	200
28	1 day in moist air, 27 days in water	300

(*b*) Each value shall be the average of the results of tests from not less than three test pieces. The tensile strength of standard mortar at the age of 28 days shall be higher than the strength determined at the age of 7 days.

8. The cement shall be delivered in suitable bags or barrels with the brand and name of the manufacturer plainly marked thereon unless shipped in bulk. A bag shall contain 94 lb. net. A barrel shall contain 376 lb. net.

9. The cement shall be stored in such a manner as to permit easy access for proper inspection and identification of each shipment, and in a suitable weather-tight building which will protect the cement from dampness.

10. Every facility shall be provided the purchaser for careful sampling and inspection at either the mill or at the site of the work, as may be specified by the purchaser. At least 10 days from the time of sampling shall be allowed for the completion of the 7-day test, and at least 31 days shall be allowed for the completion of the 28-day test. The cement shall be tested in accordance with the methods hereinafter prescribed. The twenty-eight-day test may be waived if ordered.

11. The cement may be rejected if it fails to meet any of the requirements of these specifications.

(*a*) Cement shall not be rejected on account of failure to meet the fineness requirement if upon retest after drying at 100 deg. C for one hour it meets this requirement.

(*b*) Cement failing to meet the test for soundness in steam may be accepted if it passes a retest using a new sample at any time within 28 days thereafter.

(*c*) Packages varying more than 5 per cent from the specified weight may be rejected; and if the average weight of packages in any shipment, as shown by weighing 50 pack-

ages taken at random, is less than that specified, the entire shipment may be rejected.

Methods of Tests

12. Each sample tested, whether individual or composite, should weigh about 8 lb. and shall represent not more than 200 bbl.

13. A car test sample from cement shipped in packages shall consist of at least ½ lb. of cement taken from 1 sack in each 40 sacks (or 1 bbl. in each 10 bbl.), combined to make one sample.

A car test sample of cement shipped in bulk shall consist of at least ½ lb. of cement from approximately each 40 cu. ft., combined to make one sample.

Cement may be sampled at the mill by any of the following methods, as may be agreed upon:

(*a*) From the conveyor delivering to the bin.
(*b*) From filled bins by means of sampling tubes.
(*c*) From filled bins at points of discharge.
(*d*) From packages ready for shipment.

14. Samples preferably shall be shipped and stored in airtight containers.

Samples shall be passed through a sieve having 20 meshes per linear inch in order to thoroughly mix the sample, break up lumps and remove foreign materials.

(Chemical analysis omitted.)

SPECIFICATIONS FOR COMPRESSIVE STRENGTH OF PORTLAND CEMENT MORTAR

1. (*a*) A test piece of standard mortar composed of one part cement and three parts standard sand, by weight, shall give compressive strengths equal to or higher than the following:

Age at test, days	Storage of test piece	Compressive strength, lb. per sq. in.
7	1 day in moist air, 6 days in water	[illegible]
28	1 day in moist air, 27 days in water	[illegible]

(*b*) Each value shall be the average of the results of tests from not less than three test pieces. The compressive strength of standard mortar at the age of 28 days shall be higher than the strength determined at the age of 7 days.

THE STRENGTH OF CLAMPED SPLICES IN CONCRETE REINFORCEMENT BARS.

By E. L. Lasier

U-Bolt clamped splices of both 17 and 21-in. lengths of splice were tested to determine the load at first slip, and the maximum load the splice would resist. The splices tested were: Lap splices not embedded in concrete, butt splices not embedded in concrete and lap splices embedded in concrete.

The reinforcement steel in all cases consisted of 1-in. square cold-twisted bars.

The loads necessary to produce first slip had a range of from 7,000 to 50,000 lb. The maximum loads which the splices withstood varied from 23,000 to 69,000 lbs. The ratios of load at first slip to yield point of bar for clamped splices not embedded in concrete varied from 12 to 21 per cent, and for splices embedded in concrete from 53 to 83 per cent. Ratios of maximum load to tensile strength of bar ranged from 31 to 61 per cent for unembedded splices, and from 79 to 95 per cent for embedded splices.

It was found that clamped lap splices embedded in large masses of concrete undoubtedly can safely withstand a unit load equal to the unit stress in the steel reinforcement.

PREPARATION OF IRON AND STEEL SURFACES FOR PAINTING

The preparation of a steel or iron surface for painting should be such as will secure proper adhesion of paint to that surface. It is improbable that paint ever acts chemically on these metals; and the persistence of paint on iron is primarily a matter of adhesion, which may be lessened or destroyed by (1) any unsatisfactory surface, and (2) by the entrance or intrusion of solid or fluid material between the paint film and the metal.

Recently-rolled steel or iron is covered with a mill scale of anhydrous oxide, and if painted at once, the paint never touches the metal, but is applied to the mill scale. If this mill scale ever comes off, the paint comes with it, sometimes in scales. If the metal begins to rust by access of air and moisture, the rust penetrates under the mill scale and loosens it. Ordinary rust is hydrated oxide, and stimulates further corrosion, but the anhydrous mill scale does not, and it is objectionable because it may crack off by unequal expansion or from other causes.

In addition to mill scale and rust, other objectionable surface coatings which are frequently encountered are dirt, grease, oil, water and frost.

In considering methods for preparing these surfaces for painting it is well to take account of the methods used to secure the adhesion of substances other than paint to iron or steel. Such cases are, for example, the electrodeposition of copper or other metals; the plating of iron by molten metal; the coating of steel or iron with a vitreous enamel, which is practiced in making enameled vessels for cooking and the like; and the application of varnish enamels, such as are used on bicycles and many other metal surfaces. In all these processes it is essential that the adhesion should be perfect; that is, that the coating should wear off from the outside, not peel off from the metal; and this is what is desired with paint. In all these cases, it is universally believed to be necessary that the coating material should come in actual contact on all parts of the surface with the actual metallic surface of the iron or steel: the latter must be freed from all dirt and grease, and from all scale and rust, before the coating is applied. This is done by (1) cleaning the surface with chemically active liquid, such as sulphuric acid; (2) by the sandblast, and (3) by other mechanical means, such as filing or polishing with an emery belt, and the like. Unless this is done, it is found that the superimposed coating is likely to scale or flake off.

The thorough methods of cleaning by sand-blasting and pickling can be and sometimes are applied to structural and car steel for painting and for repainting, and undoubtedly are the best methods known for the purpose. They are, however, much more expensive than the ordinary method, which consists in scraping, wire-brushing and wiping grease and oil spots with gasolene or benzine.

The sand-blasting method has the advantage over the pickling method in that it is more general of application, the pickling method being confined to the shop and generally to the material before assembling. It may, however, be of interest to know that good authorities maintain that iron or steel cleaned by pickling holds a coating more securely than that which is sand-blasted, and that this is owing to the rougher surface, viewed with a microscope, of the acid-etched metal.

The scraper and wire brush do not remove the firmly adhering mill scale, in consequence of which most of the structural and freight-car steel is painted over mill scale. It must be remembered that all platers and enamelers insist absolutely on the complete removal of mill scale; therefore it must not be regarded as harmless, it certainly is less dangerous than ordinary rust.

Builders of ships for service in sea waters have frequently required the pickling or sand-blasting of the steel parts which are to be submerged, in order to remove the mill scale, and it is the common practice to do likewise for steel passenger-car bodies. The removal of mill scale at the expense of incipient rusting is also sometimes attempted by the erection of steel structures without paint and allowing them to stand exposed to the weather for several months before painting.

In addition to cleanliness of surface, freedom from dampness, severe cold and frost is considered essential to the

proper adhesion of paint. This may be accomplished by painting outdoors only in warm, dry weather, or by keeping the material under cover in warm dry air during the process of cleaning and painting. Heating of surfaces is also resorted to.

While for some purposes, such as seagoing ships and passenger-car bodies, there seems to be little question as to the final economy of incurring the additional first cost of the more thorough methods of cleaning, the economy of such methods for ordinary steel structures and freight cars is not so certain.

The report is signed by A. W. Carpenter, chairman.

A NEW FORM OF SPECIFICATIONS FOR CONCRETE AGGREGATES

By Cloyd M. Chapman

To be generally acceptable specifications for concrete aggregates should fulfill two requirements, namely: (1) they should insure the production of suitable concrete if the aggregates are properly used; and (2) they should permit the use of materials found in the vicinity of the work, if such materials are capable of producing concrete of the required quality.

The present method of specifying may insure the quality of the material, but it does not permit the use of a wide choice of aggregates from which first-class concrete may be made.

Concrete is a cheap building material because it is composed largely of inexpensive aggregates, and for economic reasons these aggregates should be secured from deposits in the vicinity of the point of use. The material at hand capable of making concrete of fair quality will generally be used in preference to a better material which must be brought from a distance at considerable cost for transportation.

It is generally true that even a very poor sand, that is, one which compares very unfavorably with standard Ottawa sand when tested in 1:3 mixtures with cement, will give a suitable compressive strength if sufficient cement is used. When the only available sand is of such a quality, it is necessary to increase the proportion of cement until the required strength is obtained. Our present specifications for sand require that it shall, when tested as prescribed, show a compressive strength approximately equal to that obtained with standard Ottawa sand. A rigid adherence to these specifications would mean that in many sections of the country no concrete work could be done without importing aggregates from a distance. The result is that the specifications are ignored in those localities and the work done without them.

On the other hand, where most excellent materials are available, the present specifications for sand do not permit of a variation of the proportions used, no matter how good the materials may be. For instance, some well-graded sands show strengths 40 per cent higher than that obtained with Ottawa sand in 1:3 mortar, and in 1:3½ or even 1:4 mortar show compressive strengths equal to that obtained with Ottawa sand in the proportion of 1:3. Yet this sand receives no credit for quality under the present form of specifications.

By specifying the results required and permitting the use of such materials as will produce these results when tested under specified and standardized conditions, it is possible not only to properly safeguard the product but to permit the use of such materials as are available in each locality.

It is also true that in many cases the local materials are of such poor quality and would require such a large proportion of cement to fulfill the specifications, that it would be economical to bring in better material even from a considerable distance, the saving in cement paying the freight. Specifications of this kind might take some such form as the following, in which all figures are purely arbitrary and in no sense proposed as standard:

"The materials used shall be of such quality, and shall be used in such proportions as to produce a concrete which shall show a compressive strength of 2,500 (or 2,000 or 1,500) lb. per sq. in. at the age of 28 days, when tested in accordance with the standard methods of testing."

This form of specification is obviously susceptible to modification to cover varying conditions and qualities. For instance, to insure against a material which sets or hardens slowly, and consequently requires forms being kept in place an unusual length of time, the specifications may require a certain minimum strength to be attained in three days. When compressive strength is not the prime requisite, as for instance, in sea wall or tunnel work, the requirements as to impermeability or density may be inserted, either in place of, or in addition to, the strength requirement.

It would probably be desirable to add some further qualifying clauses to the specifications, such as the limit of size of particles, the character of the materials composing the aggregates, freedom from constituents liable to cause deterioration, etc.

The standard methods of testing referred to in these specifications would have to be very carefully worked out, as the value of the specifications is largely dependent upon the reliability of the test, just as is the case in almost all specifications of a like nature which are dependent upon tests.

The method at present most commonly employed, except in the cases of some of the railroads and on government work where aggregates, particularly the sand, are systematically tested, is practically to ignore the quality of materials, except the cement, and to specify arbitrarily proportions that will give good enough results with almost any aggregates. By requiring that all concrete in a reinforced structure shall be made in the proportions of say, 1:1½:3 or 1:2:4, we are simply "playing safe." Mixed in these proportions all but the poorest material will produce good concrete. They, in principle, are the specifications under which thousands of yards of concrete are laid every year.

In operating under such specifications, it is of great importance that specimens of the concrete produced on the job be regularly made and tested. It is also of the greatest importance that a close day-to-day check be maintained on the quality of the materials used, to insure a reasonable uniformity, and to know that these materials are at least equal in quality to the materials used in arriving at the proportions required to give the quality of concrete called for in the specifications.

When the materials used on the job are from the same sources as those tested and from which tests the proportions to be used were determined, it is a simple matter to check up their qualities. Sand and stone from the same source do not vary much in quality, except in so far as quality is influenced by size of particles. Having once established by test the suitability of sand and stone for any grade of concrete and having determined the proper proportions in which to use them to attain a certain desired result, it is only necessary thereafter to see that the size, grading and proportions of these materials are reasonably constant to insure uniform quality of concrete.

The regular and systematic testing of the size of the aggregates gives data which will permit the engineer to tell without further tests, whether the aggregates will produce a better or poorer concrete than that produced by the original or standard sample. This is carried out in practice by Westinghouse, Church, Kerr & Co. in the following manner:

The engineer in charge secures samples of the available concrete aggregates, both fine and coarse, and sends them to the laboratory for test. The tests show that although the best available sand has a strength in 1:3 mortar only 70 per cent of that of standard Ottawa sand, yet mixed in the proportions of 1:1¾:3¾ with the cement and coarse aggregates to be used, the resulting concrete has a compressive strength of 2,600 lb. per sq. in. at 28 days. Other proportions give

higher and lower strengths, depending on their richness, but as the design of the structure requires concrete having a compressive strength of 2,500 lb. per sq. in. the 1:1¾:3¾ proportion is used. For the foundations and footings, the designs being based on a compressive strength of 1,500 lb. per sq. in. in the concrete, the proportion of 1:2¼:4½, which gave in the test a compressive strength of 1,550 lb. per sq. in., is chosen. Under the present standard method of specifying sand, this particular sand could not have been used in concrete.

Several granulometric-analysis charts are made on the sand in the laboratory with a sand tester with five screens having 6, 10, 20, 35, and 65 meshes per in. The charts are averaged and a special guide chart is prepared for the use of the inspector on the job. In making up this guide chart a permissible variation of about 2.5 per cent each way from the mean of the tests made on the sample, is allowed. As the sand arrives on the job the inspector makes tests and compares the resulting chart with the guide chart. By this method the quality of the aggregates is recognized and provided for in the selection of proportions for the concrete, and enough cement is used to produce the desired quality. Experience with this form of specification has shown it to be advantageous in localities where the available aggregates are not up to the standards now specified.

Other Business

A paper on "National Standard Specifications and Their Relation to Export Trade," was read by William R. Webster. The author stated that before foreign engineers will consider the adoption of these specifications for orders to be placed in this country, they will want to know how they were arrived at by the society, whether they are in general use here and how they compare with the specifications of the British Engineering Standards Committee. Instances were cited of the difficulties met in enforcing some of the requirements of foreign specifications from the author's own practice. In conclusion he indicated the advantages to be derived from the use of the American Society for Testing Materials standard specifications for export orders, and recommended a definite plan for keeping these specifications abreast of the best engineering practice.

The following officers were elected for the coming year: President, A. A. Stevenson, vice-president Standard Steel Works, Philadelphia; first vice-president, S. S. Voorhees, engineer-chemist, Bureau of Standards, Washington, D. C.; members of executive committee, W. H. Bassett, John Brunner, G. W. Thompson, and F. E. Turneaure.

It was decided to publish what is now termed the Year Book of the Society, biennially in future.

THE PROPOSED CONGRESSIONAL INVESTIGATION

By W. L. Stoddard

Washington, July 5.

Senate joint resolution 60, providing for an investigation by a Congressional committee into the need for railroad legislation, is having a hard time of it. More than once in recent weeks it has come up in the House on what is known as the unanimous-consent calendar; but every time it has been objected to by Representative James R. Mann, of Illinois, minority leader of the House, and a sharp critic of legislative procedure.

This resolution came up, for example, on the sixteenth of June and when the Speaker asked if there was objection to its consideration at that time, Mr. Mann replied, "I object," and the bill was necessarily set aside until in regular rotation it should again be placed before the House. Last Saturday the same procedure was gone through, and again Mr. Mann rose to say "I object."

Last week a new resolution was introduced by Chairman Adamson of the House Committee calling for a special rule to bring the resolution to a vote. This has gone to the rules committee for a hearing and report. But the rules committee has no regular day of meeting and no one knows what will come next.

Under the present parliamentary system of the House, it is almost impossible for a bill, no matter what its merits, to be passed without a special rule of some kind. The kind of rule proposed by Mr. Adamson is popularly known as a "gag" rule, for it absolutely limits debate to the time prescribed by its terms and makes it impossible to set aside the bill without definite action. The pending revenue bill, for example, was brought out to the floor of the House under precisely such a rule, and its prompt passage was thus assured. Mr. Adamson fully expects to see this resolution passed by the House before the next month or so shall have passed.

TRAIN DESPATCHERS' ASSOCIATION

The twenty-ninth annual convention of the Train Despatchers' Association of America was held in Labor Temple, Toronto, Ontario, June 20 and 21, Charles Forrester, superintendent of the Grand Trunk at Stratford, in the chair. The despatchers were welcomed to the city by Mayor T. L. Church, and U. E. Gillen, general superintendent of the Grand Trunk at Chicago, welcomed them to Canada, on behalf of the railways of that country.

A. J. Hills, general superintendent of the Canadian Northern, followed with an address of welcome on behalf of that road, in which he gave some interesting information in regard to its extent and construction.

President E. W. Weston, of the Train Despatchers' Association, on taking the chair reported 81 members in attendance. Thirty-nine new members were elected. The association at the end of the last fiscal year had 1,239 members, to which were added during the year by election 96 and by re-instatement 8, making a total of 1,343. There had died during the year 7, withdrawn 25, lapsed at close of the year 229, leaving total present membership 1,082, of whom 305 had failed to pay dues at the time the annual account closed. The total receipts during the year amounted to $4,184; total disbursements were $3,770, leaving a balance of $414; but the debit balance from last year ($507) left a debit balance to be carried to next year of $93. This balance, however, was entirely wiped out during the convention, by contributions from the members present. The secretary appealed to members to use their best endeavors to increase the membership and to secure subscriptions to the official organ from other than members, and also to individually subscribe so that the official organ might, in future, be placed in a position to earn all that it costs the association.

A paper entitled "Time and the Train Despatcher," by Frank M. McCabe, a life insurance agent, at St. Paul, and formerly a despatcher on the Northern Pacific, was read by the secretary, and Paul E. Odell, chief despatcher of the Illinois Central at Carbondale, Ill., read one on "Efficiency." These are given, in part, below.

The constitutional amendment submitted to all members in the May issue of the Bulletin was brought up for action and defeated. The convention ordered separate publication of its proceedings. The Canadian Northern, through D. Crombie, superintendent of transportation, invited the entire convention to take a steamboat trip to Port Dalhousie and a trolley trip thence to Niagara-on-the-Lake, which trip was originally designed for the ladies only. Mr. Crombie explained that a room on the steamer could be used for convention purposes and that in accepting this invitation there need be no interruption to the deliberation of the convention. The invitation was accepted with thanks.

The Train Rules Committee presented its report through

W. T. Quirk (A. T. & S. F.). This report cited a number of questions on train orders as to which the opinion of the members present was desired. One was in regard to the exclusive use of the "19" train order. This was unanimously approved after a statement by several members that this form of order was thus used on their roads with entire safety and that their experience had demonstrated its superior usefulness as well as its safety.

The change in Form "F" submitted a year ago by the Train Rules Committee was discussed by the convention and after debate was not approved. The positive meeting point as between trains of the same class, which was likewise submitted by the committee a year ago, was unanimously approved as desirable where conditions make it practicable. There was an animated debate on the caution indication of automatic signal practice, as to whether a train observing the signal should reduce speed at once and throughout the block, or simply prepare to stop before reaching the next signal. The majority favored reduction of speed.

The question of allowing a flagman to except certain trains when out flagging was debated, but no vote was taken; also the question of what are the objections to the 19 train order for orders under form "F." The opinion of the majority was that the 19 order was quite as safe as the 31. The question was also debated as to what roads use the clearance order and as to what roads use the "complete" severally or for all orders at one time.

The election of officers resulted in the selection of Frank I. Felter (N. Y. C.), New York City, as president; H. P. Riggs (C. G. W.), St. Paul, vice-president, and C. C. Barnard (St. Joseph & G. I.), St. Joseph, Mo., as a member of the executive committee in place of A. L. Crabbs. J. F. Mackie was re-elected for two years as secretary-treasurer and editor. Fresno, Cal., was selected as the next place of meeting, and June 19, 1917, as the date. There were present altogether 127 despatchers and 95 visitors and ladies.

In view of the increase in the joint train rules committee representation of the Superintendents' Association by three members, it was ordered that the train despatchers' membership in this committee be also increased by the same number, making the whole number of members fifteen; and the president was authorized to appoint the additional members. The propriety of the creation of district committees to look after the interests of the association locally was debated, and the executive committee was directed to look into the matter and take proper action if found feasible, and define a plan of action.

There was an evening luncheon on Wednesday, at which Mayor Church presided. The Canadian Northern steamer trip to Port Dalhousie on Thursday and the trolley trip were most delightful. The visitors were admitted to Camp Niagara, where some thousands of volunteers were being drilled for duty overseas. On Friday there was a trip by special train over the Grand Trunk to Niagara Falls and dinner at the Clifton House

Time and the Train Despatcher

By Frank M. McCabe

Preparedness is the slogan of the hour. Suppose the call should come tomorrow, brother despatcher, for a superintendent, can you say honestly that you are prepared to step in and at once take care of the position in a manner acceptable to the company and satisfactory to yourself? If not, why not? Is it that the knowledge necessary for the proper handling of a superintendent's position is beyond you, or is it because you have neglected to prepare?

Train despatchers, above all other classes of men, are in a position to know the value of time. It is an hourly occurrence to place train orders giving but a few minutes to an inferior train to aid it in making many miles for a superior train. The lesson of the wait-order should be patent to every train despatcher. Time is everything. It is more valuable than money for money cannot buy it.

The philosopher tells us there is a reason for everything. Why, do you suppose, a few years ago, promotions to superintendencies and similar positions from the ranks of train despatchers began growing less frequent and the higher officers of the various companies began drawing on the other departments to fill these vacancies? The answer is, gentlemen, that the employees of the other departments had sufficient foresight to see the need for preparedness and prepared.

Outside of the Book of Transportation Rules and the current time-table, what do you study? What do you know about locomotives—the kind your company owns? What do you know about the roadbed over which these locomotives travel, stop and head-in day after day at your direction? What can you say, with confidence, in regard to the laws in force in your State governing the actions of railroads?

A superintendent must have at least a working knowledge of these and many other phases of his job. He must have them before he takes the job. This knowledge is obtainable—for the asking—for a little study. There is no reason why you should not be as completely informed as the civil engineer, the chief clerk, or the young passenger conductor that slips in ahead of you.

The work of the train despatcher, it may be argued, does not place him in touch with these various things so necessary to his securing an efficient and accurate perception of the superintendent's work. How about those twelve, fourteen or sixteen hours you are off duty? Keep a tab on them. For one week, make a record in writing of how each and every half-hour is spent. The result will astonish you, as well it should.

Transportation Efficiency

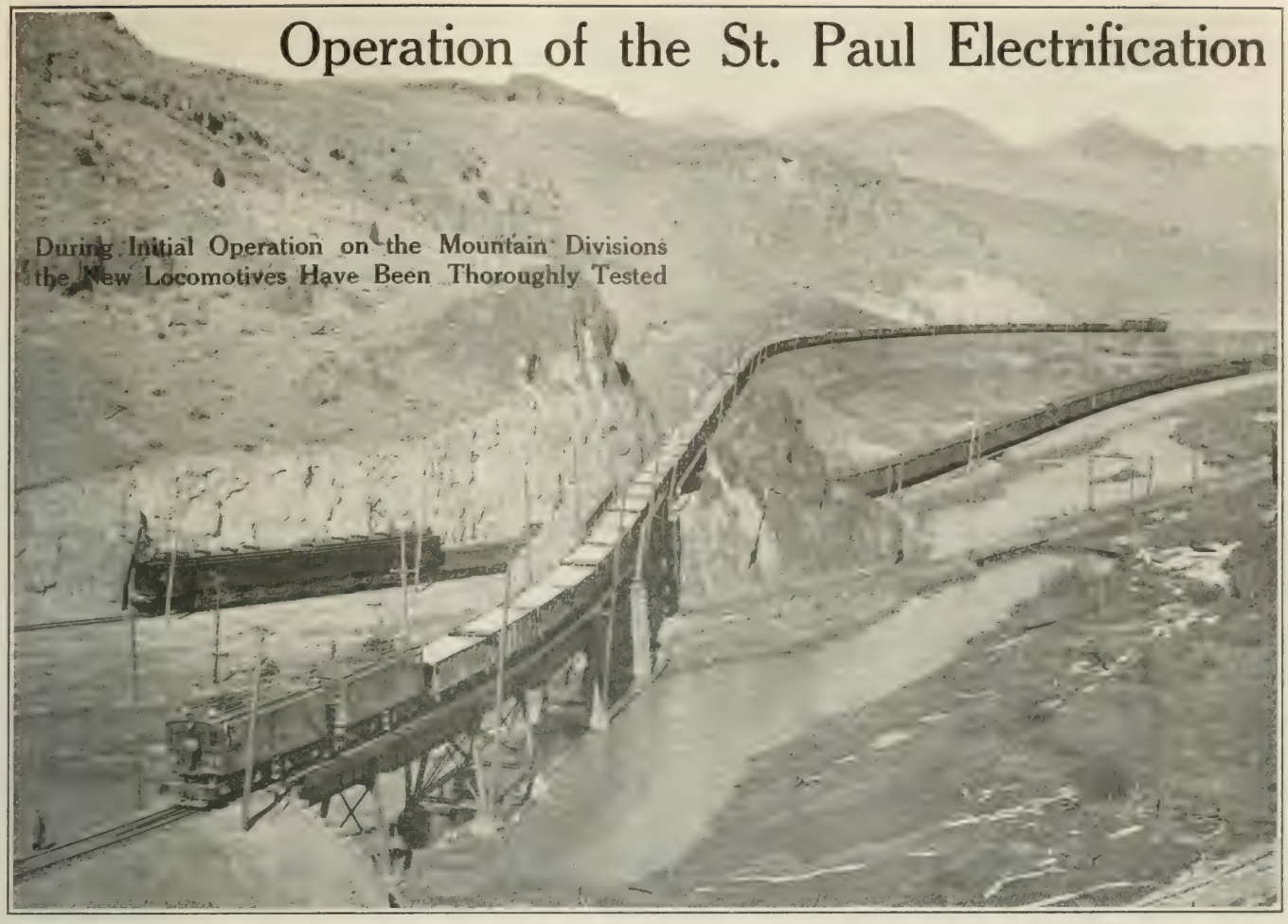
By P. E. Odell

In the attempt to secure a theoretical foundation for efficiency some people confuse efficiency with system, and there is always the danger that system will degenerate into red tape and that it will have a deadening effect on personal initiative and enthusiasm. The great motive in securing efficient human industry today is *interest in the work.* When we can come to feel more complete responsibility for our particular tasks we create a driving motive of great force.

The successful superintendent is the one who surrounds himself with a competent, experienced and loyal staff. His confidence, once established, relieves him of worry and the annoyance of detail, and fits him to handle the weighty problems of a division. Contentment and peace of mind are essential to all railroad employees, but more especially to the superintendent, for he is the one man on a division to whom all look for precept and example. A grouchy superintendent breeds discontent and chaos by his very presence. Trainmasters, roadmasters and road foremen of engines are the superintendent's outside men to whom he looks for the proper handling of affairs. The efficient trainmaster today has his office in his grip, and is not burdened with correspondence. No man can successfully handle train and enginemen from an office. Personal contact is absolutely necessary to determine whether or not the best service is being performed. Dissension and ill feeling among employees have caused many an accident resulting in destruction of property and in personal injury. Trainmasters and traveling engineers who mingle with their men generally discover bad conditions and correct them before annoying grievances are brought to the attention of the superintendent.

British Rail Exports.—Total British exports of rails in 1915 were only 242,289 gross tons against 500,117 tons in 1913, a decrease of over 51 per cent.—*Iron Age.*

Operation of the St. Paul Electrification



During Initial Operation on the Mountain Divisions the New Locomotives Have Been Thoroughly Tested

Ore Train on the Butte, Anaconda & Pacific and Freight Train on the Chicago, Milwaukee & St. Paul

WHILE a number of steam roads have electrified terminals or tunnels for the purpose of eliminating smoke, taking care of surburban traffic or other local conditions, the Chicago, Milwaukee & St. Paul electrification* was the first project of the kind where electric locomotives were installed to operate over several engine divisions.

The Electrified Divisions

The four steam engine divisions which were selected for electrification aggregate 440 miles in length. Steam engines were first abandoned on the Three Forks-Deer Lodge Division, 115 miles long, and crossing the Main Continental Divide, thus giving the electrical equipment its initial tryout under the severest service conditions of the entire system. The first electric locomotives were placed in regular service on December 9, 1915, and during the month of April, 1916, service was extended to Harlowton, Mont., making a total of 220 miles of electrically operated road. By the first of November, 1916, it is expected that steam engines will be superseded over the entire distance of 440 miles from Harlowton, Mont., to Avery, Idaho. The length of track between Harlowton and Avery is approximately equal to that from New York to Buffalo or from Boston to Washington.

In crossing the three mountain ranges included in the electric zone, there are several grades of one per cent or more, the most difficult of which is the 21 mile two per cent grade between Piedmont and Donald, and the longest is the 49 mile one per cent grade on the west slope of the Belt mountains.

The curvature is necessarily heavy, the maximum being 10 degrees. There are also numerous tunnels in the electric zone, 36 in all, of which the longest is the St. Paul Pass tunnel, over a mile and a half in length, through the ridge of the Bitter Root Mountains.

The passenger service consists of two all-steel transcontinental trains in each direction, the "Olympian" and the "Columbian," and a local passenger train in each direction daily between Deer Lodge and Harlowton.

Freight traffic through the electric zone comprises from four to six trains daily in each direction. Westbound, the tonnage is made up of manufactured products and merchandise for Pacific Coast points and foreign shipment. Eastbound tonnage includes grain, lumber, products of the mines and some live stock.

As a larger part of the traffic is through freight, trains are made up of an assortment of foreign cars, including box and flat cars, coal and ore hoppers, stock cars, refrigerators, etc., varying in weight from 11 to 25 tons empty and as high as 70 tons loaded. These cars being owned by many different railway systems are equipped with air brakes adjusted for different conditions of operation, and in accordance with different standards as to braking power and type of equipment, thus making the problem of holding the long trains on the heavy down grades by air brakes a most difficult one.

Electrical Operation

Electrification promises a material reduction in running time. It has been found, for example, that on the 21-mile two per cent grade from Piedmont to Donald, the electric locomotive can reduce the running time of passenger trains from an hour and five minutes to approximately 40 minutes. On the run from Deer Lodge to Butte, which, under the steam

*An extensive study of the St. Paul electrification was published in the *Railway Age Gazette* of October 15, 1915, page 683. An article on its operation appeared in the *Railway Age Gazette* of April 28, 1916, page 957.

locomotive schedule, required an hour and 20 minutes, a saving of approximately 30 minutes can be made.

In the freight service, it has been found that on the first division, where the steam locomotives have required 10 to 12 hours to make 115 miles, electric locomotives can meet a schedule of from seven to eight hours for the same distance. The heavy grades and frequent curves at certain points offer serious obstacles to steam locomotive operation even in the summer time, but with winter temperatures as low as 40 deg. F. and heavy snowfalls in the Bitter Root mountains, serious delays have occurred, owing to engine failures or to inability to make steam. The capabilities of the electric locomotives are in no way impaired by cold weather or by inability to obtain fuel or water in case of snow blockades. During a series of record-breaking temperatures in December, 1915, Mallet engines were frozen up at different points on the system and the new electric equipment was rapidly pressed into service to replace them. On several occasions electric locomotives hauled in disabled steam engines and trains which would otherwise have tied up the line.

During initial operation on the Rocky Mountain division, the capacity of the new locomotives has been thoroughly tested. Trains of 3,000 tons have been hauled east and 2,800 tons west, using a helper on the heavy grades. From the operating data obtained on the first division, it is evident that much heavier trains can be hauled with the electric locomotives than with steam engines, and all passing tracks are being lengthened to take advantage of longer trains. On some of the runs where the grades are less than one per cent trains of as many as 130 cars and as heavy as 4,000 tons have been hauled with a single locomotive.

The four through passenger trains, "Olympian" and "Columbian," are taken across the two mountain ranges by a single passenger locomotive. These trains at present consist of eight full vestibuled steel coaches, weighing approximately 650 tons. Instead of changing locomotives at Three Forks, as has been the practice under steam operation, the same locomotive is run through the 220 miles from Deer Lodge to Harlowton, changing crews midway. Passenger trains will travel over the entire electrified division in approximately 15 hours, including all stops, and the tourist thus will have an opportunity of traversing by daylight some of the most beautiful scenic regions in the United States and without suffering the annoyance of cinders and smoke incident to the use of steam locomotives. The local passenger train operating in the electric zone between Deer Lodge and Harlowton is handled by a half unit weighing about 150 tons with equipment similar to the main line locomotives.

The Electrical Equipment

The main line electric locomotives are constructed in two units permanently coupled together, the halves being duplicates and each capable of independent operation. The enormous tractive effort of these electrical giants will be appreciated when it is stated that the wood burning locomotive of 50 years ago weighed 20 tons and had a tractive effort of only 5,000 lb. The modern Mallet steam locomotive weighing 278 tons with tender, which has been released, has a tractive force of 76,200 lb., while the electric locomotive, weighing 282 tons, has a running tractive force of 85,000 lb. and a starting tractive force of 136,000 lb.



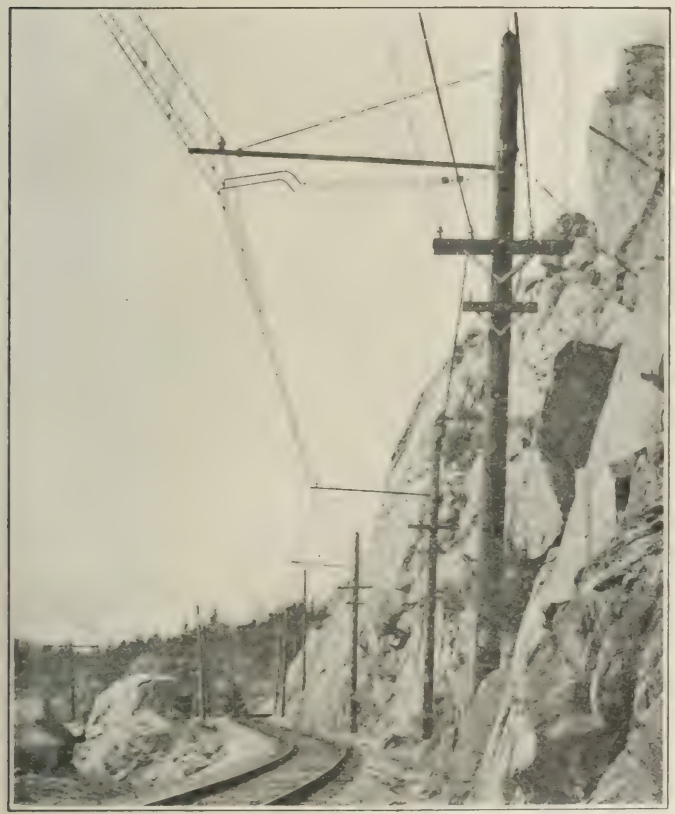
Train No. 16 Descending Two Per Cent Grade on Eastern Slope of the Rockies

There are 42 of these main line locomotives (30 freight and 12 passenger) and two switching locomotives. The locomotives are the first to be used for railroad service with direct current motors operating at a potential as high as 3,000 volts and the first to use direct current regeneration. The passenger locomotives are equipped with a gear ratio permitting the operation of 800 ton trailing trains at speeds of approximately 60 miles per hour on tangent level track. The average passenger train weighs from 650 to 700 tons and is hauled over the two per cent grade without a helper. The freight locomotives are designed to haul a 2,500 ton trailing train at approximately 16 miles per hour on all grades up to and including one per cent. On two per cent grades the

trailing load was limited to 1,250 tons, although this figure has been exceeded in actual operation.

The switching locomotives are of the swivel truck type, weighing 70 tons each, and equipped with four geared motors. A single pantograph of construction similar to that used on the main line locomotives is mounted on the cab and in other ways the locomotives represent the standard construction commonly used with the steeple cab type of switcher. Many of the switching locomotive parts are interchangeable with those used on the main line locomotives; for example, the air compressors, small switches, headlights and cab heaters.

Utmost precautions were taken by the railway company in making plans for this electrification to insure a reliable source of power. The Montana Power Company, with whom the contract was closed for electric power, operates a network of transmission lines covering a large part of Montana, which are fed from a main plant at Great Falls, and a number of other widely separated water power plants of adequate capacity at all seasons of the year. A notable feature of this



Overhead Catenary Trolley Construction on a Curve on a Two Per Cent Grade

pioneer electrification is, therefore, the conservation of fuel consequent upon the utilization of water powers. The Montana Power Company's transmission lines tap into the railway system at seven different points where the power is most needed. The railway company's transmission line extends the entire length of the system on wood poles. With this completely inter-connected transmission system, each substation may be fed from either direction and also at the tie-in points from a third source of power.

Electric locomotion has been adopted by the Chicago, Milwaukee & St. Paul with the expectation of effecting a sufficient reduction in the cost of operation to return an attractive percentage on the investment required, as well as to benefit by all the operating advantages of electric locomotives. According to statements made by the railroad officers, about $12,000,000.00 will be expended, and with the work more than half completed there is every reason to believe that the cost of construction will come inside the estimates.

Results of Electric Operation

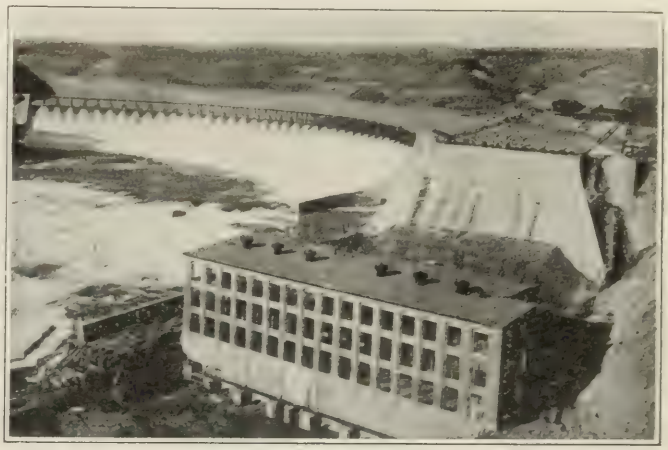
The results expected from electrical operation are as follows:

Marked reduction in cost of electricity as compared with cost of coal.

Reduction in maintenance cost of locomotives.

Elimination of delays due to coaling, taking water, oil, etc.

Elimination of delays due to natural causes, such as freezing of locomotives, loss of steam in cold weather, bucking snow drifts.



Great Falls Dam and Power House at Volta, Mont.

Elimination of non-revenue trains hauling coal and water for steam locomotives.

Increased tonnage per train.

Increased train speeds on grades.

Greater reliability and certainty of maintaining schedules.

Reduction in train crew hours per ton mile.

Reduction in damage to rolling stock due to rough handling by steam engines.

Greatly increased safety of operation on grades due to regenerative braking.

Saving in power and reduction in wheel and track wear by use of regenerative braking.

Improvement of tunnel conditions due to smoke and gas, absence of smoke and cinders which obscure scenic attractions, uniform speed and absence of grinding brake shoes on grades, all of which accrue to the benefit of the traveler on the transcontinental passenger trains.

Harder Alloys of Copper.—An alloy of copper, having a degree of hardness not usually obtained, is secured by incorporating with the copper not more than 1 per cent of any one of the alkaline earth metals, calcium, barium, strontium and magnesium, according to a recent patent. The patentees assert that these alloys make sound castings, harder than pure commercial copper and of high electrical conductivity.—*Iron Age.*

Measurement of Bolts.—Bolts are generally measured from beneath the head to the first thread at the end. There is usually a point about 1/16 inch beyond the first thread. Cap-screws with square and hexagonal heads are provided with a thread cut three-quarters of the length for screws one inch and less in diameter, when the screw is less than four inches long. For longer screws the tread is usually cut one-half the length. Fillister-head screws are threaded two-thirds of the length. Screws are classified as set-screws only when the head is not more than 1/16 inch larger in diameter than the body of the screw. When the head is larger they are classified as cap-screws.

FREIGHT CLAIM AGENTS' CONVENTION

The recent annual session of the Freight Claim Association held at the New Willard Hotel, Washington, May 17, 18, 19, was more largely attended than any in the history of the association, there having been 220 of its 475 members present or represented by proxy.

Address of Commissioner Harlan

Hon. James S. Harlan, Interstate Commerce Commissioner, under whose direction have been conducted during the past several years the conferences between representatives of that body and the Conference Committee of The Freight Claim Association, was introduced by President E. Arnold (Grand Trunk), and made the opening address. He spoke of the various features of transportation in which the work of the Commission and of the freight claim agents are much alike. The railroad officer, like the government officer, is doing a public work; is administering a statute. Both must take broad views.

"When the rates of a particular carrier are involved we endeavor to ascertain what influence a change in its rates may have upon the revenue of other lines serving the same general territory. With a growing frequency the Commission makes complaints as to individual rates or schedules the occasion for an order of general investigation, so that we may have a record that will give us a full view of the general rate structure of which the particular rates are a part. We are dealing more with rate schedules and less with particular rates. Our findings in these broader cases, it is sincerely hoped, will have a tendency to remove the defects and inconsistencies often found in more or less extensive rate schedules and in the end may result in a reduced number of rate controversies.

"The Interstate Commerce Commission has always had the most cordial and pleasant associations with the state commissions. No member of a state commission, so far as I know, has ever accused us of reaching out and asserting jurisdiction over rate matters that are within the cognizance of the state authorities. We have troubles enough of our own without coveting the troubles of others. But since the decision in the Shreveport Case, it is the settled law of the land that the Interstate Commerce Commission is under the duty of protecting interstate commerce against the burdens of discriminatory state rates. Before the case arose relatively few instances were brought to our attention where there was a serious conflict, in their effect upon interstate commerce, between state and interstate rates. But since the decision was announced, judged by the complaints that have been filed with us, there seems to be an increasing number of such discriminatory rate adjustments. What the explanation of this may be I do not know. But it is a serious and a significant tendency that seems to be developing.

"I have said that in some respects the work of the Commission is like the work daily performed by the members of the Freight Claim Association. An interesting case is now pending. While two carloads of coal were in transit a substantial part of the load in each car disappeared. When the cars arrived at destination the consignee was called upon to pay freight charges upon the marked capacity of the car which was the minimum weight; and this he did. Unfortunately he did not file with the carrier his claim for the value of the coal lost in transit, until after the period of four months prescribed in the bill of lading had expired; for that reason the claim was declined by the carrier. Thereupon an action in court was brought to recover the value of the lost coal upon the basis of its price at the mine. That part of the shipper's troubles is still in the hands of the court. But to recover the freight charges on the weight of the lost coal he came to the Commission. He had paid charges on the whole shipment at the legally established rate based upon the only authorized minimum weight, which, as I have just stated, was the marked capacity of the car. There had been delivered to him, however, much less than that amount of coal. His complaint, therefore, attacked the reasonableness of the charges that had been exacted from him. In presenting the matter to us the carrier contended that it was bound to collect the charges on the basis of the legal rate and minimum weight, and that the shipper's demand for a return of the charges on the weight of the coal lost in transit was a part of the claim for the loss of the coal, which, not having been presented within the four months' period, was therefore outlawed. The view urged by the shipper was that the carrier, having delivered to him only a portion of the coal shipped, ought not to have exacted freight charges on the whole of it; and he insists that his challenge of the reasonableness of the charges collected is, under the circumstances of the case, a rate question for the Commission to consider and dispose of, and not a loss and damage claim at all. The Commission is still wrestling with the problem, and I may say to you, parenthetically, that helpful suggestions leading to a just and sound solution of it will be gratefully received. (Applause and laughter.)

"During my ten years of service on the Commission so many complaints had come to me of the delay in the payment by carriers of the claims of shippers that I had come to think that the matter of claim adjustments was a very weak spot in our railroad administration. I was, therefore, particularly interested in the data gathered last year for the purpose of ascertaining the length of time taken in settling the claims of shippers. The results that were tabulated by the Commission on the answers returned by the carriers were so surprising to me and to my colleagues and were considered by us of such importance that we at once reported the facts to the Congress as useful public information. I wish to congratulate the association on the showing made. The trouble with us was that we had made no distinction between claims that had been declined, or that were without merit and therefore still pending, and claims that were well founded and had been promptly adjusted. The shipping public should know that instead of being a weak spot in the railroad service, the work of your association has been so systematized as practically to eliminate all reasonable and fair criticism."

Response of Chairman Stanley

Commissioner Harlan's remarks were responded to by the chairman of the Association's Conference Committee, W. L. Stanley (S. A. L.) He referred to the meeting in 1909 at Old Point Comfort, when it was first proposed to more fully co-operate with the Interstate Commerce Commission. There was some reluctance, but it was quickly dispelled and there has been great progress. There has not been a day that the friendship between the Conference Committee and the representatives of the Interstate Commerce Commission from 1909 to this good hour has not grown. Long since all question of the good faith of either party has disappeared. We thank Commissioner Harlan and the commissioners in general for that courteous consideration that has at all times actuated negotiations with the Freight Claim Association. So far as I know, the Freight Claim Association is the only body in the railroad world that has ever stood the acid test of scrutiny of the Interstate Commerce Commission and come out with flying colors and with its commendation.

Address of R. C. Wright

Robert C. Wright, recently appointed to the new position of traffic manager of the Pennsylvania Railroad, made a brief address. He expressed appreciation of the work of the Association. "I can say that in our staff meetings, whereas a few years ago the constant matter of discussion was the dissatisfaction of our patrons on account of the claim situa-

tion, today we do not hear much about it. There has been a remarkable change in that respect, and I think the machinery of your Association is largely to be credited with bringing about this betterment. When the Pennsylvania Railroad issued its circular, not long ago, asking for reasons why the public failed in its confidence in the railroads, a great many replies were in regard to claims—in spite of the improvements that have been made in that direction. We must make the public understand this claim situation. There are some people who never can understand that payment is often delayed because it is so difficult to decide who is responsible for the loss and who should pay the claim. Your machinery has made a wonderful improvement in this respect. When you decline a claim, try and decline it in such a way that the man will understand why you decline it. I think that 99 business men out of 100 are satisfied with a good, fair, honest, business reason for the declination of a claim. Uniformity in the handling of claims is very desirable. That is to say, if one road in its honest opinion deals more liberally with the situation than another road, that is apt to cause odious comparisons. They both may be honest as to the merits of the case, but the more uniform the practice can be made the less chance there is of irritation. Do not hold a claim because you cannot decide whose fault it is, but if due, pay it, and settle the other matter afterwards."

Annual Address of President

The remarks of Messrs. Harlan, Stanley and Wright were responded to by President Arnold, who then spoke as follows: The past year has been a prosperous one for our Association. There have been 35 additions to our membership, and the principal express companies of North America have applied for membership and been admitted. We have started to make a study of claim causes and the application of preventive measures, and the Cause and Prevention Committee has accomplished a start during the last year. Of course, we are all aware that in the final analysis, the matter of claim prevention rests largely with the individual carrier. It is quite possible there has been too much of the "help out" prorate in the past, and that the Association in formulating our rules in the future should honestly endeavor to place more reliability on the initial or destination carrier in the distribution of proratable claims for loss or damage where the investigation warrants the belief that due care in the inspection of cars or freight, etc., was not given, or that the freight was not checked or handled as carefully as it should have been at either end.

We have had some trouble during the year on account of a few members refusing to abide by the decision of the Arbitration and Appeal committees, several such members taking the stand that their opinions were better than the majority opinions of those committees. Nearly all those difficulties have been smoothed over and all but one of the insurgent members have decided to abide by the final decision of the committees. I appeal to all members to be broad-minded and not let any such selfish view impair the usefulness of our Association.

It is our understanding that the Interstate Commerce Commission will, in the very near future, approve our book of rules, and when this is done it will probably strengthen our authority and also increase our membership.

Your president during the current year was admitted to membership in the American Railway Association and attended several interesting meetings of that body at Boston, New York and Chicago. During the year the American Railway Perishable Freight Association appointed F. E. Winburn (A. & W. P.), H. C. Howe (C. & N. W.) and your president, members of its Conference Committee with the view of getting our Association's opinion as to responsibility, liability, etc., in cases of claims presented by members. The information obtained by such bodies in connection with loss and damage claims and the handling of perishable and fragile freight would be, in our opinion, of much value to our Association, and we believe such information, together with the proceedings of the New York, Chicago and South Eastern Claim Conferences should be available in printed form for the benefit of our members. I believe we might seriously consider the appointment of some of our members to attend the annual meetings of the Master Car Builders' Association, the Superintendents' Association, and other associations whose line of work at times is along the line of claim prevention and the better loading and handling of freight.

We might also advantageously consider the matter of consecutively numbering our Loss and Damage and Overcharge Rules. Some of our members have not as clear and correct ideas of the reading and meaning of the various numbered Rules as was the case previous to the new numbering system brought about by the recent re-codification of our Rules.

On January 20, 1916, a special committee of your Conference Committee held a meeting at Washington with representatives of the coal and coke roads with the view to formulating a rule that would enable our Association to adjust coal and coke claims to the mutual satisfaction and advantage of all interested parties. Progress was made and we believe that possibly in the near future such a rule or rules will be adopted.

It is to be sincerely hoped that in the near future all of our members will see their way clear to be governed by our rules in their entirety in the adjustment of all proratable claims, Our rules, we believe, are good. They have been amended from time to time to make them fair for all concerned from geographical and other standpoints, and our rapid growth in membership during the past few years proves, I believe, that they are justly appreciated by a large majority of our members.

The arbitration work has been very heavy during the current year; no less than 1,336 claims having been handled by the three Arbitration committees. It is, as you are all aware, very essential that there should be as little delay as possible in the time required to reach a decision on the part of the Arbitration or Appeal committees. The Constitution and By-Laws Committee will make a recommendation to increase the number of the Arbitration committees.

Reports of Standing Committees

Reports of the following standing committees were presented by their respective chairmen in the order named: Joint meeting of Committees on Loss and Damage Rules and Constitution and By-Laws; Committee on Constitution and By-Laws; joint meeting of Committees on Loss and Damage Rules and Overcharge Rules; joint meeting of Committees on Loss and Damage Rules and Cause and Prevention; Committee on Loss and Damage Rules; Committee on Overcharge Rules; Committee on Cause and Prevention; Committee on Methods and Topics.

Amendments to the Constitution were offered providing that the annual sessions shall be held on the third Tuesday, instead of the third Wednesday, in April, May or June, and increasing the number of Arbitration committees from three to six.

Claims for Concealed Loss and Damage

The rules dealing with claims for concealed loss and damage to freight had during the past year received special consideration at the hands of the Conference Committee, including a conference between that committee and representatives of the National Industrial Traffic League and other similar commercial bodies and shippers, at which conference were also present representatives of the Interstate Commerce Commission. As a result forms were agreed upon and rec-

ommended by that conference to the two main organizations involved—the National Industrial Traffic League and the Freight Claim Association—for adoption, the understanding being that these forms, after being approved by those organizations, would be submitted to the Interstate Commerce Commission for its tentative approval. The National Industrial Traffic League having given its formal approval at its Spring meeting in April, the Freight Claim Association took similar action and the matter is now in shape for submission to the Commission.

This subject of claims for concealed loss and damage to freight is of particular importance to both shippers and carriers and the verbatim proceedings of the conference above mentioned have been widely distributed to all interests.

Election of Officers

The following officers were elected: President, W. O. Bunger (C. R. I. & P.), Chicago; first vice-president, F. E. Winburn (A. & W. P.); second vice-president, H. C. Pribble (A. T. & S. F.); secretary and treasurer, Warren P. Taylor (R. F. & P.), Richmond, Va.

On invitation of the Canadian Pacific it was voted to hold the next annual meeting at Banff, Alberta, June 19, 1917.

A TRACTOR FOR FREIGHT HANDLING SERVICE

An electric storage battery tractor truck to be used with trailers in freight handling service has been introduced recently by the Lansing Company, Lansing, Mich. This tractor embodies a number of interesting features. It is designed solely for use as a tractor rather than a carrier truck, no space being available for loading freight on it.

The frame is composed of 4-in. structural steel channels, stiffened and braced according to standard practice. An

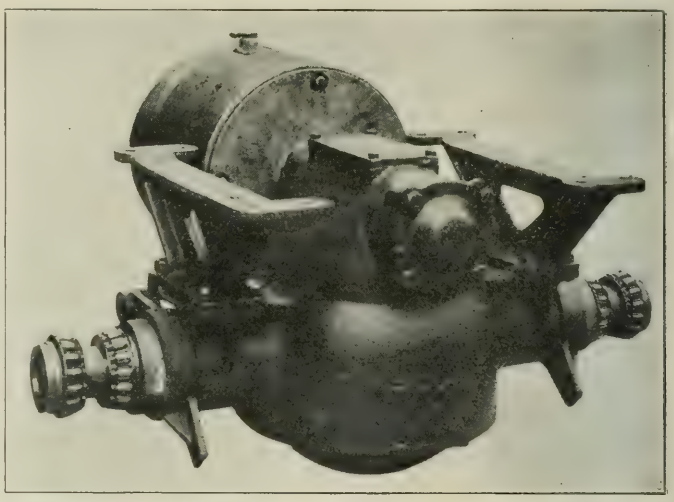


The Car, Showing Position of Operator

upright portion in the front serves as a controller box and a seat for the driver. The battery compartment occupies the rest of the frame and is equipped with a wooden container for the battery cells mounted on rollers and securely anchored in place. The operator's platform and seat on the forward end are arranged for driving from either a standing or a sitting position. The position of the steering wheel and controller handle was established after continued trials to determine the position best suited for the average size man. The steering is accomplished either with a standard automobile steering wheel, as in the accompanying photograph, or with a steering lever operating in a vertical plane and placed on the left side of the operator.

A special feature of this machine is an interlocking device making the operation of the controller dependent upon the position of the brake, which is operated by a foot pedal. If the brake is set, the controller cannot be moved from the shut-off position, and with the car running and the motors in operation the setting of the brake automatically shuts off the power. This arrangement eliminates the intermediate switch or circuit breaker and provides an effective emergency stop, since all that is necessary is to place the foot on the brake pedal.

The tractor is also unique in the design of the drive axle,



The Drive Axle

which consists of a single steel casting enclosing the drive shaft, gears, differential and bearings in an oil chamber. This casting also includes a bracket which carries the motor, thereby giving the most direct connection between the motor and the gears, and facilitating the alignment, assembling and dismantling.

These tractors are made in two sizes, Model C and Model D. The former is for use with a maximum trailer load of 5,000 lb. and the latter with a maximum trailer load of 12,000 lb. The weights of these tractors are respectively 2,500 and 3,000 lb.

Iron Mining by Districts.—The principal iron mining districts in the United States, except the Adirondack district, are interstate, and statistics of production by districts are of more interest and importance than statistics by States. The Lake Superior district mined nearly 85 per cent of the total ore in 1915 and the Birmingham district about 8.5 per cent, or a little more than one-tenth as much as the Lake district. None of the other districts mine as much as 1,000,000 tons.

Largest Iron Ore Mines.—There were 7 mines that produced more than 1,000,000 tons of iron ore each in 1915. First place in 1915 was held by the Mahoning mine at Hibbing, Minn., second place by the Hull-Rust mine at the same place, and third place by the Red Mountain group near Bessemer, Ala. The production of these mines in 1915 was respectively, 2,311,940 tons, 2,307,195 tons, and 2,138,015 tons, compared with 1,212,287 tons, 458,468 tons, and 2,008,465 tons in 1914. The increase in production of the Hull-Rust was more than 400 per cent.

Transportation Officers' Convention at Boston

Large Attendance of Freight Car Specialists. Continuous Home-Route Card Enthusiastically Endorsed



THE summer meeting of the Association of Transportation and Car Accounting Officers was held at the Copley-Plaza Hotel, Boston, Mass., June 27 and 28, with President J. T. King (A. C. L.) in the chair and about 150 members present, the largest or nearly the largest attendance on record at the summer meeting of the association.

The members were welcomed to Boston Tuesday morning by James H. Hustis, president of the Boston & Maine. Mr. Hustis not only gave a warm welcome to the city, but also invited the members to a two-day excursion to the White mountains for the two days following the convention, which invitation, later, was largely accepted. The speaker, by way of illustrating the importance of the association, gave some figures showing the magnitude of the service done by the freight cars of the country. Estimating the 2,500,000 freight cars in the country as worth $900 each, the interest, depreciation, insurance and taxes on these cars will aggregate over 200 millions a year; and by adding the cost of repairs we double this sum, and have an amount equal to 7 per cent of the gross revenue of the railroads. "On you, the members of this association," said Mr. Hustis, "rests the primary responsibility of seeing that these cars earn their salaries. It is important to impress upon all interested, down to the lowest yard clerk, that every time a car day is wasted, 45 cents is lost." Speaking of the value of the individual car, and the amount charged consignees for demurrage, Mr. Hustis said that at important yards in Boston and in other cities where real estate is costly, the ground occupied by a freight car, as, for example, on a team track, is worth $8,000; and the interest on this sum is more than $1 a day—the usual demurrage rate.

The principal address on Tuesday morning was by A. M. Schoyer, vice-president of the Pennsylvania Lines west of Pittsburgh, at Chicago. Mr. Schoyer is a member of the National Conference Committee of the Railways, which has been conferring with the brotherhood leaders in New York city concerning the requests of the employees for increased pay, and he gave a vivid account, in outline, of what was done at the conferences. The fundamental question whether the employers as well as the employees may bring their demands before the body which shall finally arbitrate or decide the present controversy is yet to be settled. In the case of the conductors' demands in the east four years ago, the railroads formulated their demands too late. In the subsequent case of the enginemen in the western states, the question was laid aside at the request of President Wilson because of the European war. Now, or rather in August, after the strike vote has been taken, the matter will come to an issue. If the strike does take place, it will be a calamity of calamities. The Mexican disturbance in comparison will be insignificant. Whatever happens, the roads have their duties to perform as common carriers, and, said Mr. Schoyer, "you car service officers may be called upon to serve in the yards. Every railroad employee and officer who feels that the requests of the brotherhoods are unreasonable, should use his influence with other employees to engender a suitable and right public sentiment. It looks as though the time had come when the companies should take a definite stand."

The executive committee reported that the membership of the association, active and associate, now numbers 378; and the length of road represented is 244,540 miles. These roads operate 2,459,154 cars. The committees on freight transportation and passenger transportation have been abolished, and now there are three standing committees of six members each, those on car service, on office methods and accounting, and on conducting transportation. Auxiliary committees, to aid standing committees, have been established in different parts of the country; in the northwest E. E. Betts (C. & N. W.), chairman; in the west and southwest O. C. Castle (Southern Pacific), chairman, and in the southeast, E. W. Sanders (A. & W. P.), chairman.

The Per Diem Reclaim

The first general discussion was on the method of determining the arbitrary allowance to be made under per diem rule 5 in allowing reclaims to switching roads. Switching roads, moving cars to or from side tracks for carrier roads, must be allowed something by the carrier because of the excessive per diem charge resting on the switching road; and, for convenience, this allowance is based on the average actual number of days that the car is in the possession of the switching road. In computing this average, there is a limit; on cars standing too long, the full time must not be counted. The question was whether this limit should be 10 days, 7 days, or some other figure. The committee on car service, G. H. Alexander (N. Y. C.), chairman, at a former meeting, had recommended that it be 10 days. The association changed this to 7, and recommended that the rule, with this limit, be approved, for transmission to the American Railway Association. The resolution came over from the last meeting.

There was a long discussion on the inequitable working

of the rule. Where the actual detention is low, the carrier objects to using a high arbitrary in averaging the number of days; where it is high, the switching roads object to the low average which satisfies the carrier roads. This subject has been before the association so many times that to some of the members it has become tiresome, and there was a motion to lay it on the table; but this was lost by a vote of 25 to 35.

W. T. Aylesbury (T. R. R., St. Louis) made a vigorous argument against the adoption of a single rule for use everywhere. The amount of the reclaim should be settled locally, as it has been in the past. It is not businesslike to settle this important matter, in a meeting of this kind, by a vote of 35 to 25; that is to say, by a small majority and by what may in reality, considering the views of the whole membership of the association, be a minority. E. C. Tomlinson (C. N. O. & T. P.) and L. M. Betts (Belt Ry., Chicago) supported the argument for local action. Illustrations were given of large numbers of cars on which a switching road paid per diem of 10, 15 or 20 days, and yet could reclaim only 5 days per car. Mr. Betts gave figures showing a loss, on a moderate number of cars, on his lines, of $1,717 a month. The discussion was finally closed by a unanimous vote referring the question back to the committee.

Committee on Car Service.

The Committee on Car Service reported concerning its conferences with the Freight Claim Association and the action of that association in changing the rules for apportioning the loss when freight bills which are uncollectable include demurrage charges. In general the whole of the uncollectable bill is to be pro rated, among all the carriers, on the basis of transportation revenue.

The report of the committee concerning proposed changes in car service rule 10, after brief discussion, was referred back to the committee.

Committee on Office Methods

The committee on office methods reported a revised list of accepted assignments of reporting marks for cars owned by the railroads, and a separate list for private cars. These lists were approved and will be transmitted to the American Railway Association. In the discussion of this report reference was made to errors in repair bills, and elsewhere, because of inefficient marking of cars. Members were urged to report to their superior officers all cases where money or time is lost in detecting errors.

This committee made a report giving data, collected from 135 roads, for a period of five months, showing the number of unreported per diem items detected, and how many of the claims of this nature made for losses had a reasonable basis. Out of about 600,000 claims, 41 per cent were made properly and 59 per cent improperly. It was proposed that further investigation should be made, with a view to action by the committee which should show each road its faults or weaknesses, and thus induce an improvement; but it was finally concluded that individual action rather than association action would be the best course in this matter. In the discussion J. D. Altimus (C. P.) reported that by careful investigation of errors and direct appeals to connections the cost of his clerical work in this connection had been reduced from $260 a month to $18 a month. A revised form for a per diem adjustment report, presented by the committee, was adopted.

Complaints having been made that junction cards are not transmitted daily as required by the per diem rule, this committee has taken up the matter. It is found that a large number of roads are forwarding junction cards weekly or semi-weekly, apparently to save postage and stationery. The committee was authorized to confer with the proper committee of the American Railway Association with a view to securing an improvement. Similar action was taken concerning complaints of missing junction reports.

The general neglect in this feature of car-service work appears in many cases to have become an abuse; and the meeting warmly approved the proposal of the committee to have the matter taken up by the American Railway Association; but after considerable discussion the proposal that the committee should deal direct with the A. R. A. Committee was rejected, and it was the sense of the meeting that this committee should report to this association.

The committee made a recommendation for standard perforations in letter heads, for use in filing, which was approved.

Handling Railroad Business Mail

The committee on handling railroad business mail, Guy Adams (U. P.), chairman, reported resolutions recommending the installation of central mailing bureaus in general office buildings and recommendation that mailing lists be regularly checked to discover names which ought to be cut out. Both of these resolutions were approved and ordered transmitted to the American Railway Association.

The committee presented photographs of envelopes, some with and some without "windows," designed to economize in this feature of railroad business mail. This matter was ordered sent to the American Railway Association as information. The Southern Pacific has a standard envelope of this kind 12 1-2 in. by 10 in. The Santa Fe has one 11 in. by 5 in. with an open window, the practice being to write the address on the exposed part of the letter after it has been put into the envelope. The New York Central has an envelope 9 1-2 in. by 4 1-4 in., with spaces for 12 addresses. The Rock Island has an envelope 13 in. by 10 in. with 12 spaces. The Illinois Central has a large envelope (14 3-4 in. by 9 1-2 in.), to be used between offices which have frequent exchanges of bulky correspondence, etc., the envelope being fastened with a string, and so designed as to be used with a flap one side cut for movement in one direction, and the other side out when sent in the opposite direction. The Baltimore & Ohio has an envelope 5 in. by 11 1-2 in., which can be used 46 times; it has 23 lines for the address on one side, and 23 on the other. Each address, after being used, is to be scratched out.

Committee on Conducting Transportation.

The Committee on Conducting Transportation, C. B. Phelps (L. & N.), chairman, reported on light weight marks on freight cars, on the method of handling embargo notices and on rules for the interchange of passenger cars.

The meeting approved the recommendation that $1.90 be the charge of remarking cars on which rental is paid by the day and leaving the rate for stock cars ($1.25) and cars not in the per diem agreement the same as at present. Rule 20 would be eliminated. This action will be submitted to letter ballot. It is in conformity to action taken by the Master Car Builders' Association, June 15. The rules for the interchange of passenger cars were briefly discussed, and the subject was referred back to the committee. It was recommended that the Master Car Builders' Association be asked to make a rule to have the capacity of baggage cars and express cars marked on the inside of the car, and this was approved.

The committee reported what it had done since the last meeting on the question of handling embargo notices, and this action was approved. The committee had sent to the American Railway Association, in May, the following resolutions:

Resolved, That the first essential in the handling of embargoes is that this duty shall be assigned only to thoroughly competent and experienced employees in the department of the designated officer.

Resolved, That embargoes before being issued should be carefully analyzed and transmitted only to interested direct connections.

RESOLVED, That provision should be made that lines originating embargoes shall confine the issuance of same to connections and not supply information relating thereto to shippers located on other lines through channels other than those prescribed by Per Diem Rule 15.

The committee recommended to the American Railway Association that the advanced demurrage rate be continued; that there be a rule providing that cars held short of destination should be placed constructively; and that when a car is placed on a public delivery track for a consignee who does not unload within the free time, all cars for him awaiting placement on the same tracks should be tendered by notice, and the time counted from the next morning after the notice is given.

CONTINUOUS HOME ROUTE CARDS

The committee on this subject, M. B. Casey (D. L. & W.), chairman, made no recommendations, as the former action of the association now awaits a formal vote in the American Railway Association; and the discussion therefore was wholly informal. J. W. Roberts (Pennsylvania Lines West of Pittsburgh) challenged those who do not wish to see the general adoption of the continuous home route card to give their reasons. What has delayed the adoption of the plan by the American Railway Association? Under adverse circumstances it has proved satisfactory to those roads which have had the courage to try it. Should not the deliverances of this association have weight with the American Railway Association? Nine-tenths of the effective legislation which has been adopted by that association has originated in this one. Fifteen months' experience on the Pennsylvania Lines West of Pittsburgh has verified the predictions which were made of the good results to be had from the home route card. Car efficiency has been increased, per diem expenses have decreased, switching expenses and the demands on the car record office for information have decreased and there has been a general awakening among all the men on the road who have to do with the prompt moving of freight cars. Still better results could have been accomplished if all roads had adopted the card. "I have made careful inquiry," said Mr. Roberts, "to get the views of trainmasters, yardmasters, division car service men, clerks and everybody, and I have letters from all these giving unanimous and warm approval. G. W. Taylor, of the Southern Railway, says that our experience is the same as that of his road. This is the greatest reform in car service since the adoption of the per diem car service rate in 1902.

"This association has a moral responsibility to promote its own proposal. A commonly heard objection to the plan is that cards are lost, especially in large terminals; but experience on the Southern Railway, the Baltimore & Ohio, the New York Central, and on the Pennsylvania System refutes this argument. As to the point that the questions connected with sending cars home should be decided at headquarters instead of elsewhere, it is found that yardmasters and car distributors are better acquainted with the geography of the country than is the average car record office clerk, I have studied this question of car movement since 1896, and I have never had a substantial adverse argument."

Mr. Roberts closed by moving that, inasmuch as the continuous home route card system is of great value, and since car service rule 5 provides for the compulsory adoption of the card by all roads on January 1, 1917, this association, the originator of the plan, shall now give evidence of faith in its own work by agreeing to adopt by August 1, at latest, the continuous home route card; with the exception that there may be only one card instead of three as provided in the former resolution; rule 19 to be changed, as necessary, and submitted to the American Railway Association.

The motion was seconded by F. Price (Grand Trunk). His road uses such a card, and is extremely desirous to see all roads come in. As long as its neighbors do not adopt the card, the good results can be seen ahead, but cannot be grasped.

T. S. Bell (Pennsylvania Railroad) endorsed Mr. Roberts' position. The subject was fully investigated by a committee of the Pennsylvania Lines, East and West, five years ago, and the report of the committee, after a six weeks' study, was unanimously favorable. Before the use of the card on the Pennsylvania, the number of requests for information about routing cars coming to Mr. Bell's office amounted to 1,000 a day, but this has now been reduced greatly. Mr. Bell is now able to answer inquiries in from six to eight hours. Telephones have been put in at all of the larger yards so that prompt communication may be had with headquarters at any hour. The investigating committee found that the average delay, on hold tracks, of cars waiting for information as to how they should be sent home was two days, a loss in each case of at least 90 cents, besides the cost of switching the car. To educate all of the men has been something of a task, but the work has been well repaid.

J. E. Roberts (D. & H.):—Why do we come to conventions and agree on what ought to be done, and then go home and do as we please? We ignore or neglect a salutary rule because some little feature is disliked. With energetic treatment, the card effects marked savings. The Delaware, Lackawanna & Western, exchanging cars with us, made a perfect record for ten days. That is an example of the results of careful management; but if a large number of railroads are going to stay out, we shall have to give up.

W. T. Aylesbury (T. R. R., St. Louis) told of the difficulties and delays on a large terminal road because of the lack of the home route card. Recently he had received a string of 25 empty cars from an eastern road, and 19 of those cars had to be set out because of lack of cards; and to do this each car had to be switched four times. Missionary work is still necessary. The speaker mentioned two or three large systems which are not opposed, but are lukewarm. It is "absolutely ridiculous for us to let a connection deliver cars to us which we do not want."

G. F. Malone (B. & O.) said that on his road there was at first some trouble in the use of the continuous card especially in the coal mining territory where the cars had to be left on tracks not in charge of any agent of the road. Finally boxes, in which the cards could be kept, were put up at the mines and the men in charge of loading the coal were requested to use them. Today the Baltimore & Ohio has on its tracks a daily average of 40,000 foreign cars, and the speaker corroborated Mr. Bell in the statement that the average detention of a car waiting for instructions is two days. Mr. Malone has about 100 requests daily for routing. On the average he replies to these requests within 15 minutes. Clerks are on duty night and day. He will continue the use of the cards whether other roads do or do not adopt them.

R. R. Harris (C. C. C. & St. L.) corroborated Mr. Aylesbury in regard to difficulties at St. Louis. J. W. Smith (W. M.), has used the home route card 15 months and finds it most satisfactory. He agreed with Mr. Roberts (P. W. P.) that one card is sufficient. Only two things are necessary to make the home route card a success: (1) all roads to join, and (2) to take sufficient care to prevent cards being lost.

J. D. Altimas (C. P.).—A home route card has been used throughout the Canadian Pacific lines for 20 years with great success. With the card in universal use we could still further reduce switching and empty mileage. We must all pull together to force the lukewarm roads to the conclusion that the universal use of the cards is necessary. The Canadian Pacific uses a single card and feels sure that that

is sufficient; but for the sake of uniformity will use three cards if the majority should so decide.

L. V. R. Clum (Erie).—We have long used the continuous card and are heartily in favor of it. We will agree to the use of a single card if that is the wish of the majority. For 10 days in this month one of our superintendents reported that on 10 cars, by the use of the cards, he had saved the Erie 2,722 car miles and had saved other roads 2,374 miles. On a single car 273 miles were saved for the Erie and 265 miles for the Lackawanna. In another case 44 cars were routed so as to save 13,539 miles for the Erie and 15,701 miles for other roads, an average of 307 and 356 miles per car saved. With the card in use, requests for routing have been reduced from 400 a day to 200 a day. If cars lose 2 days each when waiting for instructions, the Erie thus has saved 400 car days daily. If all would join we could work wonders.

J. W. Nowers (A. T. & S. F.).—The Santa Fe defers the adoption of the card simply because too many of its neighbors are lukewarm.

M. B. Casey (D. L. & W.).—This committee has worked zealously. At Galveston unanimous action was taken. What more can be done? Speaking for the committee, I can say that it will accept Mr. Roberts' proposal to use one card instead of three.

After some further discussion and favorable testimony from the Boston & Albany and other roads, the roll was called by the secretary for a vote on the adoption of Mr. Roberts' amendment; and it was adopted by a vote of 129 affirmative to 12 negative votes. The negative votes were by the Chicago & North Western, the Chicago, Burlington & Quincy, the Elgin, Joliet & Eastern, the Fort Worth & Denver City, the Green Bay & Western, the Seaboard Air Line and the Union Railroad (Pittsburgh). The negative vote of the Union Railroad was explained by a statement that a new system of delivery of cars to connections is just being put in effect and it is feared that any change would increase the possible trouble.

C. B. Packer (S. A. L.) said that his road had tried the home route card, but there were so many errors on the part of connections that the savings were very small. His road recognizes only owners' cards; and it is found that 25 per cent of the cars come without owners' cards on them. The amount of mileage saved thus far, per month, so far as could be estimated, was less than the additional cost.

The larger roads which thus far have taken no favorable action—mostly lines northwest of Chicago—were not represented at the meeting. One of their chief objections is understood to be the expense—the cost of the cards and additional clerk hire. It is claimed also that the plan is inadequate because it is necessary to depend for its efficiency on agents, yard clerks, etc., who are not qualified to handle the intricate matter of car distribution.

Loading Cars to Capacity

The committee reports, as above outlined, occupied the time of the meeting until noon of the second day. The discussions of new questions then taken up were wholly informal. Mr. Casey (D. L. & W.), who was a member of the Eastern Freight Accumulation Conference, sitting recently in New York to deal with the unparalleled congestion in that region, and who was chairman of important committees of the conference, gave an account of some of his experiences. He had been impressed with the great importance of securing full loading of cars and the cost of carelessness in this respect. The movement of cotton into New England amounts to 3,500,000 bales a year, and the average number of bales carried in a car is from 30 to 35; but a 36-foot car holds 70 bales, and by loading every car to its full capacity, cotton shippers could save 50,000 cars in a year. The average movement of a shipment of cotton may be roughly estimated at 1,000 miles, and this means, therefore, 50,000,000 car miles saved. A shipment of 500 tons of spelter from St. Louis to Waterbury, Conn., was found to be occupying twice as many cars as was necessary. This spelter, because of the exigent demand, was run through by special train, at $1.50 a mile, the unnecessary expense being thus multiplied.

O. C. Castle (S. P.) told of the practices in connection with cotton in Texas. That state produces 4,500,000 bales yearly. Cars are loaded with from 35 to 50 bales each. At some loading points there has been an improvment, and 100 bales or more are put into a car, but the sharp competition between rival roads prevents efficiency in many cases. At one point in Louisiana whence large quantities of salt are shipped, on which the minimum carload weight is low, a large shipper was induced to put two carloads—carloads measured by the limit in the tariff—into a single car, and in one month, 576 carloads were thus put into 288 cars, the loads being subsequently divided when they did not go to the same destination.

Mr. Roberts (Pennsylvania Lines).—During the past four years our efforts to increase the loading of miscellaneous freight have brought about an average loading per car of 18,000 lb. in place of the former average of 8,500 lb. It is estimated that in these four years no less than 1,693,887 cars have been saved. Some of the consolidating of loads at first displeased shippers; but they now see the benefits and are advocates of the new method.

Mr. Price (G. T.) spoke of the need of revising rule 15, dealing with embargoes. The 24-hour limit ought to be modified. Embargoes ought not to be repeated from road to road; the road issuing them should send direct to the shipping territory.

A Variable Per Diem Rate

J. E. Roberts (D. & H.) proposed that the proper committee take up the question of recommending a variable per diem rate for the use of interchanged freight cars. He would have a central office to which the aggregate mileage of freight cars on each road should be reported promptly at the end of each month, and the officer in charge of this office, about the tenth or the twelfth of the month, could then report by wire to all concerned the density of freight traffic for the month, and the rate to be paid for the use of cars in that month could be increased according to the value of the cars (in busy seasons), or decreased according to the lack of value which would result when freight was slack. When cars are not needed economy demands that we do not send them off our own road; on the other hand, if cars are in demand there should be a high demurrage rate to induce the foreign roads to return them. Mr. Roberts said:

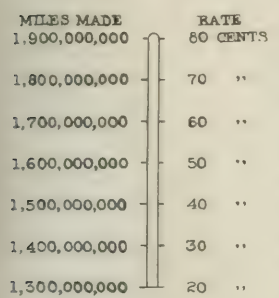
"A variable per diem rate will, in my opinion, do more to produce greater car efficiency and will remedy more of the really uneconomical conditions which now exist than any other single thing which can be done. A variable per diem rate can be applied automatically. For instance, assume any representative number of railroads you please; have them report to a central authority by the tenth of the subsequent month the total car mileage made in the previous month and have your per diem rate for that particular month vary in accordance with the car mileage actually made in that month. What cars are worth for any particular month depends entirely upon the utilization made of them during that month. Such an arrangement would do more to increase car efficiency when cars are needed, and to lessen the vicious practices which result in unnecessary empty mileage when cars are not needed, than any other arrangement.

"The freight car movement in the United States runs from 1,300,000,000 to 1,900,000,000 miles a month and the per

diem rate could be automatically determined with a little thermometer-like arrangement as shown below.

"For January the figures should be made up, by each road, by February 10. The total, when determined, if telegraphed to the various roads by the twelfth of the month would be received in ample time to avoid any delay from an accounting standpoint.

"It is more essentian that the minimum rate should be low than that the maximum rate should be high. Even with a low minimum rate one will find that there will be periods like July and August of last year, when many roads were in a sense forced to let foreign cars go home empty and send side by side with those empties loaded cars of their own for the reason that those roads did not have space in which to store the cars which they themselves owned. On the other hand, the results from the maximum rate, whatever it may be, will be disappointing during periods like January, February, March and April of this year, when no per diem rate, however high, would have had any marked result in quickening the movement or release of cars on intermediate roads leading to a congested district. To accomplish this an increased demurrage rate in the congested district itself is the only recourse.



"During the past two years I have endeavored to make a serious study of this question, and I believe the view here expressed is sound in so far as it relates to the territory north of the Potomac and east of the Ohio River."

The place chosen for the winter meeting of the Association is Atlanta, Ga. The election of officers for the ensuing year resulted as follows: President, J. W. Nowers (A. T. & S. F.), Topeka, Kansas; first vice-president, C. B. Phelps (L. & N.); second vice-president, J. W. Smith (W. M.); secretary, G. P. Conard, 75 Church Street, New York City; treasurer, F. M. Luce (C. & N. W.); members of the executive committee, T. S. Bell (Penn.); J. A. Wagner, Des Moines Union.

THE WAGE CONTROVERSY WITH THE TRAIN EMPLOYEES

The executive officers of the Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen, the Order of Railway Conductors and the Brotherhood of Railway Trainmen, in a circular letter of instructions to their local and general chairmen regarding the taking of a strike vote, have directed that the local chairmen have the votes taken in their districts and forwarded to the chairmen on each road not later than July 26. The general chairmen in Eastern and Southeastern territory are directed to report at headquarters in the Broadway Central hotel, New York, not later than August 1, and the general chairmen in Western territory are to report not later than August 5.

The instructions provide that the local chairmen shall take the vote of the men under their jurisdiction, not allowing the men to take the ballots away with them, but placing the signed ballots in a sealed envelope with the voter's name on the outside, to be delivered to the general chairmen. All non-union employees in the classes represented by the organizations are to be voted in the same manner as if they were members. On roads where white firemen and hostlers are employed, and where the firemen's brotherhood has no committee or organization, the engineers' brotherhood will take the vote of the men.

The Order of Railway Conductors, at its recent convention, adopted an amendment to its law providing that strike votes shall be counted with its territorial associations as the units instead of lines of railroad, so that if two-thirds of the members in an association vote in favor of a strike, all of the lines in that territory will be counted as having so voted, even though on some individual road less than two-thirds may have voted in favor of a strike. To meet the conditions where a company refuses to be represented by a conference committee of managers the president was also empowered to exclude the committee for that line from participation in negotiations or from becoming a party to the collective settlement.

At the convention of the Brotherhood of Locomotive Firemen and Enginemen at Denver, Colo., last week a resolution was adopted, directing the secretary and treasurer to send to Washington a protest against any action by Congress on the wage controversy.

Railroads throughout the country are issuing circulars to their engineers, firemen, conductors and trainmen, explaining the results of the recent conference in New York City between the National Conference Committee of the Railways and the representatives of the brotherhoods, and of the proposals of the railways for a peaceful settlement of the controversy, which were rejected by the brotherhoods. A circular issued by T. J. Foley, general manager of the Illinois Central, says in part:

"In their reply to this communication your representatives stated that it would be necessary to submit the matter to the individual members. Doubtless, you will be called upon in the near future to express your desires as to further action to be taken by your representatives.

"Because of the impersonal character of these negotiations, the management of this company feels it a duty to address you directly in the premises in order to briefly outline a statement of its position.

"While this company feels very strongly that the existing basis of pay yields adequate compensation and provides favorable working conditions, it recognizes that where opinions differ neither party should reserve to itself the exclusive right to settle them. Therefore, the offer of the railways to refer the pending questions to the Interstate Commerce Commission or to arbitration under the federal law is eminently reasonable.

"I trust that after careful consideration your judgment will decide in favor of a peaceable solution based upon the equities of your request, and that you will take no action which will involve a possibility of the interruption of traffic on this line."

Theodore Speiden, Jr., assistant general manager of the Nashville, Chattanooga & St. Louis, has issued a similar circular pointing out that since 1910 its engineers in road service have received increases in pay amounting to 17.95 per cent, engineers in yard service, increases amounting to 19.71 per cent, firemen in road service, increases amounting to 25.56 per cent and firemen in yard service, increases amounting to 32.34 per cent. Conductors have received increases amounting to 28.89 per cent; brakemen and flagmen, increases amounting to 45.42 per cent; yard conductors and foremen, brakemen and helpers, increases amounting to 30.63 per cent, and that hostlers have received increases amounting to 15.23 per cent. The schedule now asked, the circular says, would, if granted, amount to increases in wages in some cases more than 90 per cent. It is also shown that applying the proposed new basis to the conditions which existed on this line in October, 1915, would have raised the pay as shown in the table on the following page.

This is equivalent to paying annually in increases in wages of train service employees only an amount equal to the monthly payroll of all departments.

A. G. Whittington, general manager of International & Great Northern, included in his circular a brief statement of the financial history of the road, saying in part:

"It will be apparent from the above that the International

& Great Northern railway represents an investment of many millions of dollars on which its owners are not making any returns whatsoever, therefore, the road is not able to bear any additional expenses at this time.

"With the exception of one year—1912-13—the road has never in its history paid any dividends whatsoever on its capital stock, which at the present represents an investment of only $4,822,000.

"The receiver has been spending and is spending a good deal of money in the way of ballasting tracks, new yards and badly needed shops at San Antonio, and has also purchased 1,000 new freight cars. Every dollar of this money has been borrowed on receiver's certificates, and when the road is finally taken out of the hands of receiver will constitute a debt against the property that must be assumed by the owners after that time.

PROPOSED NEW BASIS APPLIED TO OCTOBER, 1915, CONDITIONS ON N., C. & ST. L.

		For October	Proportionate increase for one year	Actual cost during fiscal year ended June 30, 1915
Yard engineers and firemen	$7,903.89			
Yard conductors and switchmen	15,716.00	$23,619.89	$283,438.68	$300,856.00 94% Inc.
Main Line:				
Through freight crews..	$482.04			
Mixed freight crews....	844.55			
Work train crews.....	1,808.68			
Helper crews	1,181.48			
Local crews	4,760.58			
Total Main Line		$9,077.33		
Branch Line		8,415.39	$209,912.88	$1,190,837.00 19.3% Inc.
Hostling		$1,247.98	14,975.76	
			$508,327.32	

"These improvements all tend to the direct benefit of employees in making for safety of operation, better movement of trains and consequent ability to earn salaries with less effort and in shorter time.

"The careful study and consideration which this company has given to the situation convinces me that whether the service be revised by changes in runs, additional facilities, etc., the present revenues are not adequate to take care of the increased cost.

"People living in the interior of Texas are absolutely dependent upon the railroads as their only means of transportation, and any interruption to the service would most seriously affect their welfare."

W. B. Scott, president of the Southern Pacific Lines in Texas and Louisiana, has issued a letter to train employees in which he says:

"The action of your chief brotherhood officials in conference with the railroad representatives in New York June 15 in denying a consideration of matters other than those suggested in your original demands for an 'eight-hour day'; in withdrawing from further sessions of conference and refusing to submit the questions to arbitration or adjustment by the Interstate Commerce Commision, has apparently created an issue that, as announced by the brotherhoods, can only be settled by a vote of their membership throughout the entire country.

"The issue is up to you individually and the responsibility for whatever may happen as a result of the action taken can not be divided, for the railroads had announced their willingness to go to their full limit to meet your demands and fulfil their obligations to both their stockholders and their patrons.

"I wish now, to request with all the earnestness at my command, that each and all of you give to these questions your most careful consideration, with a view of fully understanding and appreciating the predicament in which the owners of the railroads find themselves, being wholly unable to comply with the demands made upon them, without a substantial increase in revenues, which they are not permitted to increase, and that you weigh carefully the results which will certainly follow hasty and ill considered action, disrupting relations of many years' standing—relations which are not only friendly, but most profitable and advantageous to you, your co-laborers and your families.

"I write this to express the hope that the good judgment of the employees of these lines, involved in the forthcoming possible strife, may be exercised in an effort to prevent what may easily become a calamity to all concerned; a two-edged sword cutting down alike the employees of all classes, the owners and the general public, and creating conditions that must cripple the industrial, agricultural and commercial life of our whole country, destroying existing development and making readjustment a question of years, during which all interests must bear the burden imposed by these demands.

"Catastrophes sometimes are due to natural conditions; but others, none the less real, frequently more far reaching and disastrous in their effects, have their source in the misdirected and misguided activities of men who fail to consider the rights of their fellow men.

"May we not confidently hope that the great masses of the wholesome, industrious, right thinking employees of these lines will, on sober reflection, join with us in submitting to a wholly disinterested and unprejudiced board the differences which have been demonstrated to be irreconcilable through negotiations—a board which will have not only the power to measurably determine the cost of operations of the railroads, but to regulate the income with which to discharge such costs —to the end that much waste as disastrous to the prosperity of the country as the ravages of warfare, much unhappiness, discord and permanent suffering may be avoided."

The Pennsylvania Railroad has posted in all its stations a large placard, signed by President Samuel Rea and headed "An Appeal by This Railroad System to its 225,000 Men," which reads as follows:

"Eighteen per cent of your number--the Enginemen, Conductors, Firemen and Trainmen--are being polled for a strike.

"No just reason for thus interrupting the service exists. The railroads have offered to arbitrate every question raised by the demands which have been presented.

"The representatives of the men, however, rejected this offer and have issued strike ballots.

"The Management of the Pennsylvania Railroad System earnestly hopes:

"1. That the men receiving ballots will vote *against* a strike.

"2. That all other employees will use their influence to that end.

"The Management reiterates its position favoring the settlement of all questions in dispute by arbitration.

"Such a course will preserve to each one of you unbroken earning power; to the public, uninterrupted service, and to the railroad continuance of the earnings by which alone it can perform its public duties."

Responses to a call of General Manager S. C. Long, of the Pennsylvania Railroad, to all employees indicate that at least 50,000 men stand ready for special duty to prevent, if possible, interruption in service. Included among these are some of the enginemen, conductors, firemen and trainmen who will remain loyal to the company. A majority of the shop men have also placed their services at the disposal of the company. In addition many of the pensioned employees stand ready to re-enter the service, and one of the stockholders has volunteered his services free for three months and has promised to recruit others for similar service. A fireman who declared he would not go out, said, "The officers of my division have been very good to me. It is my duty to do likewise. I shall do all in my power to prevent this trouble." A yardmaster with 31 years' experience said that not one in 10 of his 100 men would strike if ordered to. "He would have to get a gatling gun to drive them away."

The Railways and the National Guard

Troop Movement to Mexican Border Continues. Arrangements for Routing. Holiday Traffic Inconvenienced

PRESIDENT WILSON has addressed a letter to W. W. Atterbury, President of the American Railway Association, expressing his appreciation of the action of the association in appointing the Special Committee on Co-operation with the Military Authorities, the organization of which was described in last week's issue. The president says:

"The Secretary of War has just called my attention to the arrangements made by the American Railway Association for co-operation by the railroads of the country with the Quartermaster General and the Quartermaster's Corps, and to place at the service of the government for military purposes the railroads of the country in the emergency created by the call to arms of the National Guard.

"I beg to express to your associates my appreciation of the effectiveness of this co-operation and of the patriotic impulse which led to its spontaneous suggestion by the American Railway Association."

The movement of the first troops to leave for the border from the east was described in last week's issue. After the first two days the war department imposed a censorship on news regarding details of the movement, giving orders to the railroads not to give out information regarding the movement of troops and requesting the newspapers not to publish the schedules of the troop trains or their destination.

Illinois

The principal movement of the western troops has been from Illinois, from the mobilization camp at Springfield, via the principal southwestern roads to various points in Texas and Arizona, including Brownsville, San Antonio, El Paso, Laredo and Nogales. Last week there were also movements from Sacramento, Cal., Clackamas, Ore., and Nevada, Mo. The western lines also, of course, have handled the trains from the eastern mobilization camps from their various gateways to points on ar near the Mexican border and in many cases their facilities have been taxed to the utmost. This is particularly so of the terminal lines in Texas serving the concentration camps. Most of the eastern troops have passed through Chicago, St. Louis, Hannibal, Memphis and Vicksburg.

The first Illinois regiments to leave were routed via the Illinois Central to New Orleans, thence via the Southern Pacific; via the Chicago & Alton to Higbee, Mo., and thence via the Missouri, Kansas & Texas; via the Alton to St. Louis, St. Louis Southwestern to Waco, Tex., and thence via the San Antonio & Aransas Pass; and via the Wabash to Hannibal, Mo., the Missouri, Kansas & Texas to Sinton, Tex., and thence via the St. Louis, Brownsville & Mexico. Pullman standard sleeping cars were furnished for the officers and tourist cars for the men wherever possible, but there were not enough sleeping cars on hand to accommodate all. Governor Dunne of Illinois on June 30 telegraphed to the secretary of war a protest against transporting the men in day coaches and asking that the movement of the remaining members of the Illinois contingent be delayed until sleeping cars could be furnished. The various regiments were handled in trains of three sections each. There was some delay in the movement of two of the regiments after the time appointed for their departure because sleeping cars were not delivered promptly, and there was some criticism of the railroads, although the movement of the tourist cars is controlled from Washington.

Routing

The routing of the various troop trains has been worked out in co-operation with the office of the quartermaster general by the military committees of the various territorial passenger associations, in accordance with a military agreement between the railroads and the government which was formulated some time ago. This agreement provides for an equitable distribution of military traffic between the railroads and for the routing of the traffic by the most direct routes at the lowest available rates to the government and in such a way as to avoid congesting any one line.

Hundreds of charts, showing the routing in detail from the various military posts to all possible destinations, had been made up in advance by the railroad committees in co-operation with Col. Chauncey B. Baker, deputy quartermaster general at Washington. The members of the western committee are E. L. Bevington, chairman of the Trans-Continental Passenger Association, chairman; E. E. MacLeod, chairman of the Western Passenger Association, and J. E. Hannegan, chairman of the Southwestern Passenger Association; while E. L. Hunter, vice-chairman of the Trunk Line Association, and F. C. Donald, commissioner of the Central Passenger Association, are chairmen of similar committees of the eastern lines.

Mr. Bevington and other members of the committees went to Washington as soon as it was decided to mobilize the National Guard, and in five days detailed routings from the mobilization camps to the various destinations near the border had been completed and promulgated to the department and local quartermasters and to the railroads. The routings were so planned as to give the various railroads an equitable share in the traffic and at the same time to utilize as many gateways as consistent with direct routing to avoid congestion. In planning the routes the available equipment and the facilities of the various lines were taken into consideration.

The government is given the lowest available combination of rates, taking into consideration the land grant reductions on various lines, and a horizontal reduction is made from the net rates.

Additional A. R. A. Representatives

Supplementing the list of the representatives of the American Railway Association assigned to the various districts as published in last week's issue, A. Robertson, chief operating officer of the Missouri Pacific, has been appointed A. R. A. representative at St. Louis, Mo., at the headquarters of Col. D. S. Stanley, department quartermaster.

In addition to the representatives of the American Railway Association Committee, the Pullman Company has had two district superintendents and an expert car distributor from the Chicago office stationed at Washington working in co-operation with the War Department.

War Department Disarms Criticism

Although the railroads, with one or two exceptions, have apparently made a good job of moving the troops entrusted to their care there has been some criticism. The statement of the War Department in this connection deserves attention:

"Complaints have appeared in the last few days in the metropolitan press with regard to the railroad service furnished the militia organizations on the journey to the border. In the opinion of the War Department these criticisms are

entirely unjustified. The Pullman Company and the railroads are doing everything possible to move all organizations with despatch and with as much comfort as is possibly consistent with the desire for their immediate departure for the border.

"At the time orders for the mobilization were issued the Pullman Company placed at the disposal of the War Department over 500 tourist cars. These cars, however, were scattered in various parts of the United States, and in some local instances, due to the pressure for quick departure, troops had to be transported for a portion of the journey in day coaches. In such instances the men have been accommodated on the basis of three to each two double seats, leaving one-fourth of the space in which they could place their accoutrements.

"The accommodations furnished troops in this mobilization are far superior to those furnished by any other nation in similar circumstances."

As it naturally happened the troops from the states that had the honor of mobilizing their regiments quickest were subjected to somewhat greater inconvenience primarily because of the lack of tourist cars. The 71st New York regiment, which was the first to leave its state, did not have tourist cars even when leaving St. Louis. The 7th, which left New York at almost the same hour on another road, received tourist cars at Indianapolis, after having ridden in day coaches from New York to that city.

Lackawanna Gives Men of 12th New York Shower Baths

One of the best jobs of moving a regiment of troops was that done by the Lackawanna in moving the 12th New York from Hoboken to Buffalo. The regiment's 1,100 officers and men travelled in a train of three sections, each of 20 cars, made up as follows, the cars being named in order back from the locomotive: First, one box car, two gondola cars, three stock cars, six coaches, one baggage car (fitted with a cook stove), six coaches and a standard sleeping car; second section, same as the first; third section, one box car, two gondola cars, four stock cars, six coaches, one baggage car (with cook stove), six coaches and one vestibuled coach. The coaches were wooden suburban cars to replace which the Lackawanna had to run on its regular trains a number of old cars which it recently sold to the Mexican government. Each man was given a seat to himself. The road was unable to provide tourist sleeping cars at Hoboken, but they were secured for the troops before they left Buffalo.

The three sections were ready to leave Hoboken at 5 p. m. according to schedule, but they were delayed because the horses and mules were not ready to load. The three sections left, however, at 3 a. m., 3.18 a. m. and 3.23 a. m., respectively, arriving in Buffalo at 4.05 p. m., 4.15 p. m. and 4.25 p. m., respectively, covering the distance in 13 hours. The Lackawanna's fastest train makes the trip in only three hours less.

The most interesting feature of the trip, however, was the shower bath given each man at East Buffalo. By telegraphing ahead special arrangements were made to use a concrete pit near the paint shop. The men were supplied with soap and thoroughly washed with tempered water from hoses. The stock were also taken out, watered and fed at East Buffalo. The regiment left Buffalo at 8 p. m., there being a slight delay in waiting for the tourist cars.

Other roads helped make records for themselves in handling the troop trains, but owing to Secretary of War Baker's censorship, the details are not yet available.

The Boston & Albany on June 27 and 28 handled 13 trains from Framingham, Mass., to Albany, N. Y. The Erie took a large number of trains from the New Haven and Central New England at Maybrook, N. Y., making the run from there to Chicago in about 36 hours. The Erie also moved the 23rd New York from Jersey City, N. J.

Conditions at St. Louis

Forty-eight trains of troops and supplies were handled in the yards of the Terminal Railroad Association of St. Louis last week in interchange between eastern and western lines. Before any of them were received a committee of operating officers had been organized and had planned the arrangements. Extra employees were assembled and additional water pipes, icing stations and gas pipes were arranged in the yards so that the cars could be served without running them into the Union Station. The trains were handled and inspected and transferred to the southwestern lines without delay and without interference with regular traffic. On July 1, 25 trains of troops and supplies passed through St. Louis in the space of 12 hours.

Holiday Traffic Inconvenienced

The proximity of the movement of the National Guard to the heavy traffic of the Fourth of July holiday seriously handicapped many of the railways because of the demands upon their equipment. On some roads many of the usual excursion trains were withdrawn and on nearly all of the lines on which considerable movements of troops originated both regular and excursion trains were short of the usual number of cars. The New Haven was particularly hard hit inasmuch as it supplied equipment for a large share of the Massachusetts militia and the National Guard of Rhode Island and Connecticut. It borrowed a number of cars from other roads and put back in service many old cars, but even then its trains were short and in many cases so crowded that trainmen were almost unable to make their way through the aisles.

The suburban patrons of the Lackawanna were rather surprised the day following the departure of the Twelfth New York regiment from Hoboken to see presented for their use newly painted coaches bearing the name "Constitucionalistas de Mexico" and the notation "Primera" or first-class. The Lackawanna gave the troops 36 of its better wooden suburban coaches and to replace them had to put back in service about 400 wooden coaches, recently superseded by steel equipment, which it had sold to the Mexican Government. The patrons found the cars perfectly satisfactory, but some of the passengers could not understand why the railroad had not sent the troops in the cars and thus taken the opportunity to deliver them.

Railway Men Await Call at Border

Many American locomotive engineers and railroad mechanics have arrived at Laredo and other Mexican border points in response to a recent official announcement by the United States military authorities that the services of such men would probably be needed to operate trains and take charge of the repair shops in Mexico. It is expected that these men will be given employment should intervention take place. Many of them have had experience in railroad work in Mexico.

The War Department has notified the railroads of an opinion issued by the Attorney General that the 28-hour law applying to the movement of livestock will not apply to the transportation of horses for the army.

Storing Up Trouble.—The simple truth is that the country's manufacturers and workers in lines which have to do with munitions contracts while seeming to be prosperous, are storing up untold trouble. The war has really set them at variance in many cases as it has set the actual belligerents, and there are as certainly ahead of them years of painful readjustments.—*Iron Age.*

General News Department

The Atlantic Coast Line has advanced the wages of telegraphers, telephone men and signalmen 9 per cent.

The legislature of Georgia is now in session and already bills have been presented to provide for the extension of the railroad owned by the state, the Western & Atlantic, from its southern terminus at Atlanta eastward or southeastward to the seaboard.

Pensions on the Florida East Coast

The Florida East Coast Railway announces the establishment of a pension department. It began business the first of this month. The general plan is the same as that in force on the principal northern railroads, but the rate is two per cent per year. For example, an employee who has been in the service 40 years, will receive 80 per cent of the average salary which he has received during the last ten years of his active service.

Disastrous Collision in Mexico

A press despatch of June 29 reports a butting collision of passenger trains on the National Railway of Mexico, at Tlalnepantla, 7 miles north of the city of Mexico, in which 36 persons were killed and about 40 injured.

First New Large Steamer in United States With Superheater

While there are about 1,500 steamers, representing over 2,000,000 hp., sailing from foreign ports equipped with fire tube superheaters, the recent launching of the Pearl Shell at the ship yards of the Harlan & Hollingsworth Corporation, Wilmington, Del., represents the first installation in a new steamer built in this country.

The Pearl Shell is an oil tanker, is to be operated by the Shell Oil Company of San Francisco, and will for the present sail out of New York harbor. It is over 400 ft. long, represents a gross tonnage of over 5,600 tons, and is equipped with three Scotch marine boilers fitted with Locomotive Superheater Company fire tube superheaters, supplying superheated steam to triple expansion engines, developing 2,400 h. p.

The superheater was applied to the Pearl Shell after the purchasers had determined the economies and reliability in operation of a superheater of the same design, applied to one of their existing steamers of approximately the same size. They have also contracted for sufficient superheater equipment to convert five more of their existing ships.

Cost of New York Subways

William A. Prendergast, Comptroller of the City of New York, in testifying before the recent legislative investigating committee, gave an exhaustive account of the negotiations which resulted in the contracts entered into by the city for the operation of the city's new subways, now being built, in which he reviewed the financial operations as follows:

"The new subways will cost more than $300,000,000 to build and equip. The old subway, which will be a part of the new dual system, cost about $56,000,000. Thus the contracts were for the operation of a property involving the expenditure of more than $356,000,000.

"The part to be paid by the city amounts to about $260,000,000, of which $170,000,000 has already been paid. The Interborough Rapid Transit Company's share for construction amounts to $58,000,000. The share for construction paid by the New York Municipal Railway Corporation (the Brooklyn Rapid Transit Company) amounts to $14,000,000. In addition each company will provide its own equipment.

"All contracts for construction are let by the city. The subways belong to the city from the beginning whether they were paid for by the companies or not. They will pay for themselves before the end of the lease. This is the largest engineering feat ever undertaken in the United States by a municipality, and with the possible exception of the Panama Canal is the greatest work ever done in this country by public enterprise."

Railways and Their Men In the National Guard

In addition to the railroads mentioned in last week's issue the Chicago & North Western has issued a notice saying, "It has been determined that all employees of this company who are members of the National Guard, or who desire to become members thereof, and are called away from their regular employment with this company for service in the army, will be granted leave of absence with the understanding that their regular positions will be held for them while absent, and that they can return to their regular employment at any time on being relieved from service by the government." The Atchison, Topeka & Santa Fe and the St. Louis & San Francisco have also given notice that their employees who are members of the guard will be reinstated in their former positions at the expiration of their service with the army.

The Southern Pacific announces that those of its employees who were members on June 17, 1916, of the National Guard of any state its lines traverse, and who are called out for army service, are granted leave of absence with the understanding that they will retain their promotion rights and they can resume their positions with the company when the government relieves them from service.

While such employees are serving in the army, the company will also allow, until September 30 of this year, to enlisted men, whether non-commissioned officers or privates: 1. To those married, full pay. 2. To those unmarried, with families dependent upon them for support, three-quarters to full pay, according to controlling circumstances. 3. To those unmarried, without dependent families, half pay. The company will allow to commissioned officers above and including the grade of second lieutenant: 1. To those married, the difference between company and government pay, when government pay is less. 2. To those unmarried with dependent families, three-quarters full pay, but with government pay added thereto, not to exceed regular salary. 3. To those unmarried without dependent families one-half full pay, but, with government pay added thereto, not to exceed regular salary.

The Lehigh Valley has notified employees who respond to the call to military service that they will be restored to their positions or positions of equal rank or value, provided they are competent to fill them and make application within 30 days after release from military service; and will also retain any rights they may have in connection with seniority in service, etc. From July 1 a married employee, living with his wife or family, will receive from the company full pay; an unmarried employee, who is the support of dependent relatives, from one-half to full pay, as may be determined, and all other unmarried employees one-half pay. No payments, after July 1, to exceed $100 monthly.

The Baltimore & Ohio

President Daniel Willard, of the Baltimore & Ohio, speaking at the annual conference of officers at Deer Park Hotel, Maryland, last week, said: "We of the Baltimore & Ohio have enrolled in the colors for service and, like the soldiers donning their uniforms, we shall hold ourselves in readiness to meet any emergency until the impending crisis shall have been adjusted to the honor of the American people. The boys who are answering the call of President Wilson to mobilize are doing so with a determination to follow the colors wherever they may go. They shall have the right of way over everything moving over our railroad, except the President of the United States, and shall be treated exactly as if they were members of our individual families."

Defining the policy of the company with respect to its public relations, Mr. Willard said that the motto of the Baltimore & Ohio is "Deal with the public just as two honorable men deal with each other." Extending the thought, he said that the company should aim to render the greatest possible degree of service to the public under every circumstance with a view to being regarded at all times as a good neighbor whose first concern is the interest of the communities it serves. He said that the

company will do anything which it legally may in time of emergency and that nothing shall stand in the way when calamity threatens or danger impends.

Looking to the future Mr. Willard said that with the completion of the much-needed improvements, which have provided additional tracks, terminal facilities and equipment adequate to take care of trade requirements, all of which was accomplished at a time when business was more or less unstable—though the burden was borne successfully—the company is now in position to undertake active campaigns of development of its territory with the assurance that the increased business secured will be handled to the satisfaction of shippers, barring accident. While moving the largest business handled in any year in its history, the Baltimore & Ohio has held 100 of its best engines in reserve. Incontrovertible evidence of the efficiency obtained is found in the increase made in the average trainload, which has been brought up from 500 tons in 1910 to more than 750 tons this year. The percentage of steel or steel-supported equipment has been brought up from 40 per cent seven years ago to 91 per cent today. The Baltimore & Ohio has assigned a superintendent to the State encampments where the National Guard is mobilizing. F. G. Hoskins is at Laurel, Mo.

Santa Fe to Pay Death Benefits to Employees

The Atchison, Topeka & Santa Fe has adopted a death benefit plan for its employees, effective on July 1. It proposes to pay to the beneficiaries of each employee, dying while in the company's service and who has been in its employ continuously for two or more years, a sum equal to five per cent of the pay received by him during the 12 months preceding his death, multiplied by the number of years of unbroken service. In no case, however, may a benefit exceed $3,000 or be less than $250.

In a circular letter to the employees announcing the plan, President E. P. Ripley says:

"For some time past the directors and officers of this company have been considering a plan of making donations or paying benefits to the families of employees dying while in the service of the company.

"It has been believed that regardless of the amount of wages a man may receive he will derive comfort in the knowledge that in the event of his death those dependent on him will not be in absolute want.

"It has been exceedingly difficult to ascertain with any reasonable exactness the cost of such a scheme as has been discussed. It is felt that the amount of donation or benefit should be based somewhat on length of service and on rate of pay, and it is practically impossible to forecast what will be the ultimate cost of such a plan.

"But the present year has been one of unusual prosperity, and feeling that the results attained are in part due to the efforts of our employees it is desired to recognize these efforts in a substantial way.

"The above plan is put forth in the hope that conditions may enable us to continue it in effect for the future, but it must be distinctly understood that at this time the company intends to try out such plan for two years only, and distinctly reserves the right at any time after the expiration of such two-year period to cancel or modify all or so much of the arrangement as may seem necessary or expedient to it.

"For the time being the plan will be administered in this office. All designations by employees of beneficiaries and all applications for benefits should be addressed to me. A card for designations will be furnished each employee shortly."

The following illustrations are cited in the circular: A has been in the service of the company six years at a salary of $1,200 during his last year; at his death his beneficiaries will receive five per cent of $1,200 for each year of service, or $360. The beneficiaries of B, who has been with the company two years at the wage of $75 per month during his last year, will receive the minimum benefit of $250, as five per cent of $900 for each year would amount to only $90. The heirs of C, who has served 16 years at a salary of $4,000 during his last year, will receive the maximum of $3,000, as five per cent of $4,000 for 16 years would amount to $3,200.

The benefit applies only to employees dying while in the service of the company and not to pensioners. To facilitate the application of the plan, blank forms have been sent to each employee on which he is asked to inscribe his record of service with the Santa Fe, his present rate of pay, and the names of his beneficiaries. If no beneficiary is named, the benefit will revert automatically to the deceased's next of kin dependent on him.

General Baggage Agents

The American Association of General Baggage Agents held its annual meeting at Boston, June 29. W. A. Kellond, (M.K. & T.) Parsons, Kan., was elected president; J. B. Calkins, (C.C.C. & St.L.) Cleveland, Ohio, vice-president; and J. E. Quick (G.T.R.) Toronto, Ont., secretary. The next annual meeting will be held at Los Angeles, Cal.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meetings.

Air Brake Association.—F. M. Nellis, Room 3014, 165 Broadway, New York City.

American Association of Demurrage Officers.—F. A. Pontious, 455 Grand Central Station, Chicago.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, 1916, New Orleans, La.

American Association of Freight Agents.—R. O. Wells, Illinois Central, East St. Louis, Ill.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.

American Association of Railroad Superintendents.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Annual meeting, August 16-18, 1916, Memphis, Tenn.

American Electric Railway Association.—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.

American Electric Railway Manufacturers' Association.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Railroad Master Tinners', Coppersmiths' and Pipefitters' Association.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago.

American Railway Association.—J. F. Fairbanks, general secretary, 75 Church St., New York.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, 1916, New Orleans, La.

American Railway Engineering Association.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 20-22, 1917, Chicago.

American Railway Master Mechanics' Association.—J. W. Taylor, 1112 Karpen Bldg., Chicago.

American Railway Tool Foremen's Association.—Owen D. Kinsey, Illinois Central, Chicago. Annual meeting, August 24-26, 1916, Hotel Sherman, Chicago.

American Society for Testing Materials.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., New York.

American Wood Preservers' Association.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

Association of American Railway Accounting Officers.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C.

Association of Manufacturers of Chilled Car Wheels.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

Association of Railway Claim Agents.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J.

Association of Railway Electrical Engineers.—Jos. A. Andreucetti, C & N. W., Room 411, C. & N. W. Sta., Chicago.

Association of Railway Telegraph Superintendents.—P. W. Drew, Soo Line, 112 West Adams St., Chicago.

Association of Transportation and Car Accounting Officers.—G. F. Conard, 75 Church St., New York.

Bridge and Building Supply Men's Association.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

Freight Claim Association.—Warren F. Taylor, Traffic Manager, R. F. & P., Richmond, Va.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

International Railroad Master Blacksmiths' Association.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next meeting, August 15-17, 1916, Hotel Sherman, Chicago.

International Railway Fuel Association.—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago.

International Railway General Foremen's Association.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, August 29 to September 1, Hotel Sherman, Chicago.

Maintenance of Way and Master Painters' Association of the United States and Canada.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

Master Boiler Makers' Association.—Harry D. Vought, 95 Liberty St., New York.

Master Car and Locomotive Painters' Association of the United States and Canada.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 12-14, 1916, "The Breakers," Atlantic City, N. J.

Master Car Builders' Association.—J. W. Taylor, 1112 Karpen Bldg., Chicago.

National Railway Appliances Association.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago. Next convention, March, 1917, Chicago.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 30 Church St., New York. Annual meeting, December, 1916, New York.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

Railway Development Association.—H. O. Hartzell, B. & O. R. R., Baltimore, Md.

Railway Electrical Supply Manufacturers' Association.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

Railway Fire Protection Association.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Annual meeting, October 3-5, 1916, New York.

Railway Real Estate Association.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 10, 1916, Chicago.

Railway Signal Association.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 12-14, 1916, Grand Hotel, Mackinac Island, Mich.

Railway Storekeepers' Association.—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio.

Railway Supply Manufacturers' Association.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Associations.

Railway Telegraph and Telephone Appliance Association.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

Roadmasters' and Maintenance of Way Association.—L. C. Ryan, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Salt Lake Transportation Club.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

Signal Appliance Association.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

Society of Railway Financial Officers.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Washington, D. C.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga.

Southern & Southwestern Railway Club.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of Newark.—Roy S. Bushy, Firemen's Bldg., Newark, N. J. Regular meetings, 1st Monday in month, except July and August, The Washington, 559 Broad St., Newark.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Traffic Club of Pittsburgh.—D. L. Wells, Gen'l Agt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

Traffic Club of St. Louis.—W. S. Crilly, 620 South 7th St., St. Louis, Mo. Annual meeting, December 5, 1916, Noonday meetings, October to May.

Train Despatchers' Association of America.—J. F. Mackie, 7122 Stewart Ave., Chicago.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next meeting, September 5-8, 1916, Hotel Sherman, Chicago.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The Delaware & Hudson has discontinued the sale of liquors on its dining cars.

The Lehigh Valley is now running a sleeping car between New York and Muskoka Lakes, on the Grand Trunk, 112 miles north of Toronto. Northbound, the car leaves New York at 9 p. m., and arrives at Muskoka Wharf the next day at 3:50 p. m. The Lehigh Valley also runs sleeping cars between Rochester and Washington, D. C., and between Buffalo and Washington, by way of South Bethelehem, the Philadelphia & Reading, and the Baltimore & Ohio.

Half Billion Bushels of Grain

The Western railroads in the six months ending June 30 moved 507,917,000 bushels of grain to primary markets; the largest traffic ever handled. The increase over last year's great movement was 120,976,000 bushels, or 31.3 per cent, and compared with 1913, the previous high period, there was a gain of 77,583,000 bushels, or 18 per cent.

Daylight Saving in Practice in England

The Railway Gazette (London) notes in a recent issue that the authorities have observed that there has been a marked decrease in the number of street accidents in London since the Summer Time act came into operation. It also believes that very great benefits are being experienced on the railways. The change has effected a noticeable improvement in the working of long-distance night freight trains. The extra hour of daylight is useful in making up the trains and it brings the goods that are to be despatched to the stations earlier, and they are consequently loaded with greater rapidity. On all hands the agreement is now general that the change is a proper one and should be made permanent, the eight-hours men, in particular, appreciating the alteration. Whatever turn of duty these men may be on, whether they commence the eight hours at 6 a. m., 2 p. m. or 10 p. m., they either start or leave work in the daylight, which is, in many instances, a benefit in itself. Now that the scheme has been adopted in France the principal difficulty, so far as transportation was concerned, has been removed.

Quarter-Million Verdict Against the Pennsylvania

In the Supreme Court of Pennsylvania, on July 1, Samuel D. Hall, a coal merchant of Philadelphia, secured a verdict for $248,658 in a suit against the Pennsylvania Railroad for overcharges in the transportation of anthracite coal. Reversing the rulings of Court of Common Pleas No. 5, Justice Frazer, in an exhaustive opinion, rendered judgment in the sum named. The suit was to recover penalties for unlawful discrimination. In addition to claiming compensation for the actual damage done him by the granting of rebates to favored shippers, Hall invoked the penal clause of the Act of 1883, and claimed redress in a sum treble the amount of the actual verdict rendered by the jury in his favor. The company contested the claim strenuously, and also appealed from some of the rulings of the lower court. This is the first time the Pennsylvania Supreme Court has allowed a shipper-complainant in a rebate case to obtain treble damages after a lower court had refused such a claim.

Hall's suit was entered on February 1, 1906, and the shipments on which the discrimination charges were based took place between June, 1891, and July, 1901. The original statement of claim asked for $100,000 damages, Hall complaining that he was obliged to pay a greater freight rate on his shipments of coal than was charged favored shippers. He also averred that the road paid the rent of a coal yard and offices of one of its favored shippers.

In 1909, in an amended statement, Hall made the further charge that the railroad's acts violated the constitution of Pennsylvania. After a hearing in the lower court, Hall's suit resulted in a verdict by the jury in his favor for $51,090. The verdict included a damage item of $25,870.62, to which the jury added $25,219.17 as damages for delay in payment.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Complaint Dismissed

Wyeth Hardware & Manufacturing Company v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner McChord:

Rates on harness and saddlery, boxed, from St. Joseph, Mo., to the Atlantic and Gulf Ports, for export, are not shown to have been unreasonable or discriminatory. (39 I. C. C., 697.)

State Corporation Commission of the Commonwealth of Virginia v. Chesapeake & Ohio et al. Opinion by Commissioner McChord:

The commission finds that defendants' class rates from Richmond, Norfolk, Suffolk, Petersburg, Lynchburg, and Roanoke, Va., known as the Virginia cities, to points in eastern North Carolina are not unreasonable either in themselves or relatively. It is also found that the rates do not discriminate against the Virginia cities or favor unduly Cincinnati and Louisville. (40 I. C. C., 24.)

Joint Rates Between Rail and Water Lines

Indiana Transportation Company v. Grand Rapids, Holland & Chicago. Opinion by Commissioner McChord:

The Indiana Transportation Company operating a line of boats on Lake Michigan between Chicago and Saugatuck, Mich., asks that the defendant be required to join with it in the construction and maintenance of a physical connection at Saugatuck, and for the establishment of through routes and joint rates on interstate traffic over such connection to all points on defendant's line, and that proportional rates be established from the port of Saugatuck to points on the line of defendant. The commission holds that the evidence fails to show such public necessity for the route and rates asked for as to warrant the exercise of the authority granted by the act to regulate commerce. Complaint dismissed. (39 I. C. C., 757.)

Rates on Cottonseed Oil

Oklahoma Cottonseed Crushers' Association v. Missouri, Kansas & Texas et al. Opinion by Commissioner Meyer:

In the original report in this case, 35 I. C. C. 94, it was held that the rates on cottonseed oil from Oklahoma producing points to Kansas City, Mo., and on cottonseed cake, meal, and hulls from the same producing points to points in other states were unreasonable and discriminatory. This finding is now adhered to, but the mileage schedules of maximum rates proposed in the original report are revised and the revised schedules are prescribed as just and reasonable maxima for the future. (39 I. C. C., 497.)

Rates to Concordia, Kan.

Concordia Commercial Club et al v. Atchison, Topeka, & Santa Fe et al. Opinion by Commissioner Clark:

Rates on classes and certain commodities to Concordia, Kan., from St. Louis, Mo., and points taking the same rates or rates based thereon are found to be prejudicial to Concordia to the extent that they exceed the rates on light traffic from the same points of origin to Salina, Kan. Rates on butter, eggs and dressed poultry in carloads, from Concordia to St. Louis proper, and also when destined to points east of the western termini of the trunk lines are found prejudicial to Concordia insofar as they exceed by more than 3 cents per 100 lb. the rates from Washington, Kan. Rates on canned goods from Louisville, Ky., and Baltimore, Md., to Concordia are found prejudicial to Concordia insofar as they exceed rates from the same points of origin to Salina. Rates on certain commodities from New Orleans, La., Beaumont and Port Arthur, Tex., to Concordia are found prejudicial to Concordia insofar as they exceed the rates to Salina by more than certain amounts stated in the report. (39 I. C. C., 675.)

COURT NEWS

Assumption of Risk

A locomotive fireman sued for injuries received by stepping on a clinker hook in going from the cab of the engine to the rear end of the tender over the heaped up coal. It was his duty to look after the equipment of the engine before making a trip and to make the place safe. The Kentucky Court of Appeals held the railroad was not responsible, especially as a step and handhold on the rear of the tender were provided for the performance of such duties.—L. H. & St. L. (Ky.), 185 S. W., 861.

In an action for death at a crossing in the outskirts of a town it appeared that the right of way was inclosed by wire fences on either side from the crossing, and there were cattle guards with wings extending to the fences. The tracks were on a fill, there was no path on the right of way, no houses on either side fronting thereon, and no necessity for the occupants of nearby houses using the tracks. The Kentucky Court of Appeals holds that it could not be said that the railroad acquiesced in the use of its tracks as a walking way, and the deceased was a trespasser to whom it owed no duty except to exercise ordinary care for his safety after having discovered his presence on the tracks.—Watson's Admr. v. Chesapeake & Ohio (Ky.), 185 S. W., 852.

Warning to Man Loading Car

In an action by a drayman injured while loading a car on a side track when it was run into by an engine making a coupling, the Arkansas Supreme Court holds that the duty of a railroad to warn a person engaged in loading a car of intention to make a coupling is fulfilled by warning one of several persons working in the car, and it is not necessary to give notice to all of such persons.—Memphis, Dallas & Gulf v. Yandall (Ark.), 185 S. W., 1,096.

Excessive Damages for Ejectment

A passenger was ejected from his train at a flag station, eight miles from his destination, because he refused to sign a scrip sufficient to cover his fare before it was detached from the scrip book. One of the conditions printed on the cover of the book was that he should write his name on the scrip "whenever detached by the conductor." In an action for damages he recovered a judgment for $800, which was reformed and affirmed by the Texas Court of Civil Appeals so as to allow a recovery of $100 only.—St. Louis Southwestern v. Reed (Tex.), 185 S. W., 1,025.

Purchaser Not Liable for Claims Against Receiver

As a general rule, the purchaser of a railroad at a sale, made under an order of a court, takes the property free from claims against the receiver arising out of the operation of the road, unless the court imposes liability for such debts as a part of the consideration of the purchase. Where a railroad, after receivership, purchased and paid for its former property, including money on hand and current assets sold by the receiver under order of court, the Texas Court of Civil Appeals holds that it was not liable, in the absence of its assumption of liability in some manner, for a claim against the receiver for loss of goods in transit.—International & G. N. v. Perkins, 185 S. W., 657.

Liability for Libel of Express Messenger

What is known as the I. & G. N. Bill of Texas provides that a new railroad company or other purchaser of a railroad takes it "charged with and subject to the payment of all subsisting liabilities and claims for death and personal injuries sustained in the operation of the railroad by the sold-out company and by any receiver thereof." The Texas Court of Civil Appeals holds that "personal injuries" within the act includes injuries to character or good name through libel. The action was one by an express messenger, who also handled baggage for the railroad, which repaid to the express company a portion of his salary, for damages for libel in a letter from the superintendent of the railroad to the superintendent of the express company asking the plaintiff's discharge because he had carried a passenger in his baggage car. It was held that, though such a letter is a privileged communication, a false statement therein made with reckless disregard of

whether it was true or false would justify a jury in finding express malice. The injury was held to be "sustained in the operation of the railroad" within the meaning of the act.—I. & G. N. v. Edmundson (Tex.), 185 S. W., 402.

Contributory Negligence in Jumping Off Moving Train

A passenger recovered damages in the lower court for injuries received in jumping off a train which was passing his destination, where it should have stopped, at the rate of 15 miles an hour. On appeal, the Kentucky Court of Appeals holds that, where the uncontradicted testimony shows that the speed of the train at the time the passenger attempted to alight was such as to render it probable to a reasonably prudent person that it would be unsafe to undertake to get off the train, his action in so undertaking constitutes negligence per se and bars recovery. To allow him to recover compensation for the injuries which might result from his reckless conduct would be to place a premium on negligence and offer an incentive for him to disregard the injunction of "safety first." The court cited several cases decided by the Kentucky courts where recovery was refused, in none of which the train was moving faster than eight miles an hour.—L. & N. v Derrickson (Ky.), 185 S. W., 1,114.

Defense of Lack of Notice of Claim for Damages Cannot Be Waived in Interstate Shipments

A bill of lading under which three carloads of hogs were shipped in interstate commerce stipulated that to recover damages written notice must be given before removing or slaughtering the stock, and three days' time allowed, before removal, for investigation, and that action must be commenced within six months. In an action for delay against the initial carrier the Kansas City Court of Appeals holds that, as the shipment was an interstate one, the effect to be given to the provision was governed by decisions of the federal courts, which hold that such provisions are valid. The railroad did not waive the provision by receiving notice of the claim after the time provided, and by afterwards holding the claim for investigation for more than six months, and then declining to pay on other grounds. The United States Supreme Court holds, Phillips v. Grand Trunk (1914), 236 U. S. 667, that the prohibition of the federal statute against unjust discriminations forbids the waiver of defenses open to the carrier.—Thompson v. Atchison, Topeka & Santa Fe (Mo.), 185 S. W., 1,145.

Defense of Lack of Notice of Claim May Be Waived in Intrastate Shipments in Kentucky

The Kansas City Court of Appeals holds that the rights and liabilities of parties to an intrastate shipment of hogs by rail are covered by the Public Service Commission Act of 1913. Where hogs were shipped at a limited liability rate, instead of at a common law liability rate, the requirement that the shipper give notice of his claim within ten days was valid and enforceable, being supported by the independent consideration of the reduced rate. But where a railroad accepted and treated the claim of a shipper of hogs for shrinkage in weight as having been filed in time and as formally sufficient, denying liability on the merits, it waived formal compliance with the 10-day provision of the contract.

"The cases in this state," the court said, "uniformly hold that a failure to reject the claim for failure to give notice, coupled with a denial of liability on the merits, or with a refusal to investigate, is a waiver of notice. The federal courts, in construing provisions for notice in interstate contracts, hold that such notice cannot be waived, but this rule is based on the rigid and indomitable purpose of the Interstate Commerce Act to prevent all manner of discrimination and favoritism in the attitude of carriers to shippers, a purpose not emphasized, and, so far as we are informed, not even referred to in our Public Service Commission Act. We do not regard this federal rule, which pertains to a purpose peculiar to the Interstate Commerce Law, as one we should allow to overturn a settled rule long recognized in the jurisdiction of this state. If this case involved an interstate shipment we would apply the federal rule, but since it does not, the rights of the parties must be governed by the laws and juridical policies of this state."—Hull v. Chicago Great Western (Mo.), 185 S. W., 1,155.

Railway Officers

Executive, Financial, Legal and Accounting

C. M. Ingram has been appointed comptroller of the Georgia Coast & Piedmont, with offices at Brunswick, Ga., and New York City.

Frank C. Batchelder, whose appointment as vice-president and executive representative at Chicago of the Baltimore & Ohio, has been announced, was born at Fall River, Wis., on May 27, 1857. He entered railway service on December 13, 1873, as a telegraph operator on the Chicago, Milwaukee & St. Paul, subsequently becoming agent, train despatcher and chief despatcher of the same railroad. From February, 1888, until 1893, he was train despatcher of the Minneapolis, St. Paul & Sault Ste. Marie, and on the latter date was promoted to assistant superintendent of the same road. From February, 1899, until July 1, 1899, he was superintendent of the Wisconsin and Peninsula division of the Soo Line.



F. C. Batchelder

From July 1, 1899, to July, 1916, he has been successively superintendent, general superintendent and assistant to the president of the Baltimore & Ohio. From April 1, 1910, to April 11, 1912, he was also vice-president of the Baltimore & Ohio Chicago Terminal, and since April, 1912, has been president of that road. As vice-president of the Baltimore & Ohio, he will continue to have headquarters at Chicago.

Charles W. Galloway, whose appointment as vice-president of the Baltimore & Ohio Southwestern, general manager of the western lines of the Baltimore & Ohio system, and general manager for the receivers of the Cincinnati, Hamilton & Dayton, has been announced, was born on December 11, 1868, and entered railway service in 1883, as messenger in the telegraph department of the Baltimore & Ohio. He was subsequently clerk and stenographer to the master of transportation, the manager and to the general superintendent; secretary to the superintendent of car service, superintendent of transportation and to the general superintendent. From September 23, 1897, to July 1, 1899, he was trainmaster on the Baltimore division. He was then appointed assistant superintendent of the main line, first division, and on November 1, 1901, was promoted to superintendent of the Cumberland division. From April 1, 1903, to December 1, 1906, he was superintendent of the Baltimore division at Baltimore, Md., and from the latter date to July 1, 1910, he was superintendent of transportation with headquarters at the same city. He was general superintendent of transportation of the Baltimore & Ohio and



C. W. Galloway

the Baltimore & Southwestern from July 1, 1910, to September 20, 1910, when he was transferred to Cincinnati, Ohio, as general superintendent of the Baltimore & Ohio Southwestern. From April 24, 1912, to July, 1916, he was general manager of the Baltimore & Ohio, with headquarters at Baltimore, Md. In his new capacities Mr. Galloway will have offices at Cincinnati, Ohio.

J. S. Jones, who has been appointed president of the Wisconsin & Northern, with office at the Steger building, Chicago, Ill., began his railroad career as a telegraph operator on what is now the Cleveland, Cincinnati, Chicago & St. Louis, afterwards entering train service on the same railroad. Later he was appointed trainmaster on the Toledo & Ohio Central, and subsequently filled a similar position with the Toledo, St. Louis & Western. Following his service with Ohio railroads, Mr. Jones became superintendent of the Milwaukee, Lake Shore & Western now a part of the Ashland division of the Chicago & North Western, which position he held up to the time he entered private business.

Walker D. Hines, who has been elected chairman of the board of directors of the Atchison, Topeka & Santa Fe, with headquarters at New York, as has been announced in these columns, was born on February 2, 1870, in southern Kentucky. He graduated from Ogden College at Bowling Green, Ky., with the degree of bachelor of science, in 1888. Previous to graduation, he had served as official stenographer of the State Circuit Court for the county in which Bowling Green is situated, and in 1889 he went to Trinidad, Colo., where he was engaged in stenographic work in law offices and in court. He then returned to Kentucky and in March, 1890, became secretary to the assistant chief attorney of the Louisville & Nashville, at Louisville, Ky. He served for over two years in that position, then went to the University of Virginia and studied law, taking the degree of bachelor of laws, in June, 1893. He then returned to the law department of the Louisville & Nashville as an assistant attorney, and later, for about six months, was on leave of absence, returning to work in the early part of 1894. In 1897 he became assistant chief attorney of the same road, and in 1901 he became first vice-president, his duties being to supervise the work of the law department and to assist the president in supervising the work of the traffic department. In July, 1904, he resigned to enter the general practice of the law in Louisville as a member of the firm of Humphrey, Hines & Humphrey. In May, 1906, he went to New York to engage in the general practice of the law, and also to become general counsel of the Atchison, Topeka & Santa Fe. Two years later he became also chairman of the executive committee of the board of directors of the A. T. & S. F., and since that time he has continued in these two positions, and has also continued in the general practice of the law. On September 1, 1916, he retires from the general practice and becomes chairman of the board of directors of the Atchison, Topeka & Santa Fe, and continues also as general counsel of that road.



Walker D. Hines

F. J. Hughes has been elected president, treasurer and general manager of the Dekalb & Western (formerly the Sanoody Valley), with office at Electric Mills, Miss., and E. H. Jones has been appointed assistant to president.

E. W. Grice, general superintendent of transportation of the Chesapeake & Ohio and the Chesapeake & Ohio of Indiana, has been appointed assistant to president, with office at Richmond, Va., and the office of general superintendent of transportation has been abolished.

John Marcus Davis, whose appointment as vice-president, in charge of operation and maintenance of the Baltimore & Ohio, with headquarters at Baltimore, Md., has already been announced in these columns, was born on November 5, 1871, and began railway work in 1888 as a freight brakeman on the San Antonio & Aransas Pass. From September, 1891, to July, 1898, he was consecutively stenographer to the superintendent of the Gulf, Colorado, Santa Fe; chief clerk to the superintendent of the Mexican Central; clerk in the general manager's office of the Great Northern, and assistant superintendent of the Great Northern. In 1898 he was made superintendent of the Breckenridge and Montana divisions of the Great Northern, and left that road in 1900 to go to the Erie as superintendent at Scranton, Pa. Two years later he was made superintendent of the Union Steamboat Line of the Erie at Buffalo, N. Y., and from August, 1902, to May, 1903, was superintendent of the Allegheny division of the Erie. He then returned to the Great Northern, where he served as superintendent on various divisions until July, 1905, when he was promoted to assistant general superintendent of the central district. In 1907 he went to the Oregon Short Line as assistant general superintendent, with headquarters at Salt Lake City, and was subsequently made acting general superintendent and later general superintendent. In 1910 he was appointed general superintendent of the central district of the Southern Pacific, with headquarters at San Francisco, Cal. On January 1, 1914, he was appointed assistant general manager at Cincinnati, Ohio, of the Baltimore & Ohio, Southwestern-Cincinnati, Hamilton & Dayton lines, and later in the same year was promoted to general manager of these lines, which position he held at the time of his recent appointment as vice-president of the Baltimore & Ohio, as above noted.



J. M. Davis

Operating

R. P. Dalton has been appointed superintendent of the St. Louis & O'Fallon, vice W. E. Dudenbostel, resigned, effective July 1.

E. W. Scheer, superintendent of the Indiana division of the Baltimore & Ohio Southwestern at Seymour, Ind., will on July 10 be promoted to general superintendent of the Baltimore & Ohio Southwestern, with headquarters at Cincinnati, Ohio, to succeed R. N. Begien.

F. C. Smith, assistant superintendent of the Southern Pacific at Sparks, Nev., has been transferred to Ogden, Utah, to take the place of H. L. Bell. B. A. Campbell, assistant superintendent at Oakland Pier, Cal., has been appointed assistant superintendent at Sparks, Nev., vice Mr. Smith.

T. B. Coppage, superintendent of transportation of the St. Louis & San Francisco at Springfield, Mo., has been appointed general superintendent of the first district, vice J. A. Frates, resigned. J. H. Doggrell, assistant superintendent of transportation at Springfield, has been appointed superintendent of transportation, vice Mr. Coppage, and the position of assistant superintendent of transportation has been abolished.

J. P. Stevens, general superintendent of the Chesapeake & Ohio and the Chesapeake & Ohio of Indiana, at Huntington, W. Va., has been appointed general manager, with office at Richmond, Va. L. B. Allen, division superintendent, has been appointed general superintendent of the Central general division, with office at Huntington. E. L. Bock, assistant division superintendent, has been appointed superintendent of the Huntington division, with office at Huntington. G. J. Derbyshire, trainmaster at Peru, Ind., has been appointed superintendent of the Chesa-

eake & Ohio of Indiana, with headquarters at Peru, vice W. L. Booth transferred.

J. T. Loree, assistant general superintendent of transportation of the Delaware & Hudson, at Albany, N. Y., has been granted leave of absence for military service, and J. A. McGrew, superintendent of the Saratoga and Champlain divisions, has been appointed acting assistant general superintendent of transportation, with office at Albany, N. Y.; M. F. Leamy is acting superintendent of the Saratoga and Champlain divisions, vice Mr. McGrew.

E. P. Goodwin, superintendent of freight transportation of the Chesapeake & Ohio and the Chesapeake & Ohio of Indiana at Richmond, Va., has been appointed general inspector of transportation and station service, with headquarters at Richmond. W. L. Booth, superintendent of the Chesapeake & Ohio of Indiana at Peru, Ind., has been appointed superintendent of freight transportation of both roads with headquarters at Richmond, and J. B. Parrish, assistant to general superintendent at Huntington, W. Va., has been appointed assistant superintendent of freight transportation, with headquarters at Huntington.

M. A. Fullington, superintendent of district No. 3 of the Eastern division of the Canadian Pacific at Montreal, Que., has been appointed superintendent of district No. 5, with office at Smiths Falls, Ont., vice J. R. Gilliland, transferred; R. McKillop, superintendent on the Atlantic division at Woodstock, N. B., has been appointed superintendent of district No. 3 of the Eastern division, with office at Montreal, Que., vice Mr. Fullington; T. A. Wilson, assistant superintendent at Schreiber, Ont., has been appointed assistant superintendent of district No. 5, with office at Smiths Falls, vice W. Coulter, transferred; W. M. Neal, car service agent, has been appointed assistant superintendent of district No. 2, with office at Montreal, Que., succeeding W. B. Brown, transferred, and J. E. Ryan has been appointed car service agent.

B. B. Greer, assistant general manager, lines west of the Missouri river, Chicago, Burlington & Quincy, with headquarters at Omaha, Neb., has been appointed assistant to the vice-president in charge of operation, with headquarters at Chicago, Ill. W. F. Thiehoff, general superintendent of Nebraska district, with headquarters at Lincoln, Neb., has been appointed assistant general manager at Omaha, Neb., vice Mr. Greer. L. B. Lyman, superintendent of the Aurora division, has been appointed general superintendent with office at Lincoln, Neb., in place of Mr. Thiehoff. H. W. Maxwell, superintendent of the Burlington division at Burlington, Iowa, has been transferred to Aurora, Ill., as superintendent of the Aurora division, vice Mr. Lyman. M. F. MacLaren, trainmaster, with headquarters at Burlington, Ia., has been promoted to superintendent of the Burlington division, vice Mr. Maxwell, effective July 1.

D. W. Campbell, assistant general manager of the Southern Pacific at Portland, Ore., has been transferred to Los Angeles, Cal., with jurisdiction over the southern district, vice H. V. Platt, resigned to accept service with another company. J. H. Dyer, superintendent of the Sacramento division, has been appointed assistant general manager of the northern district, with headquarters at Portland, Ore., in place of D. W. Campbell, transferred. T. H. Williams, superintendent of the Tucson division, has been transferred to the western division with headquarters at Oakland Pier, Cal., vice J. D. Brennan, transferred to the Sacramento division with headquarters at Sacramento, Cal. J. W. Fitzgerald, assistant superintendent at Oakland Pier, Cal., has been appointed superintendent of the Tucson division with headquarters at Tucson, Ariz., vice T. H. Williams, transferred. G. E. Gaylord, trainmaster at West Oakland, Cal., has been appointed assistant superintendent of the western division with headquarters at Oakland Pier, Cal., vice J. W. Fitzgerald, promoted, effective July 1.

Traffic

E. T. Willcox, assistant general freight agent of the Seaboard Air Line at Birmingham, Ala., has been appointed general freight agent, with office at Norfolk, Va.

G. H. Hamilton has been appointed assistant general freight agent of the Missouri Pacific-St. Louis, Iron Mountain & Southern, with headquarters at St. Louis, Mo.

H. F. Bell has been appointed commercial agent of the Cincinnati, New Orleans & Texas Pacific and the Alabama Great Southern, with headquarters at Havana, Cuba.

Roberto A. Nanne has been appointed general freight, express and passenger agent of the International Railways of Central America, with headquarters at Guatemala City, C. A.

Eugene Fox, assistant general traffic manager of the El Paso & Southwestern system, has been appointed general traffic manager, with headquarters at El Paso, Tex., vice A. N. Brown, deceased, effective July 1.

E. W. Long, commercial agent of the Seaboard Air Line at Greenville, S. C., has been appointed commercial agent, with office at Charlotte, N. C., vice E. J. Parrish, promoted; T. R. Thompson, commercial agent at Kansas City, Mo., succeeds Mr. Long, and W. H. Miller, contracting freight agent at St. Louis, Mo., succeeds Mr. Thompson.

William F. Griffitts, who has been appointed general passenger agent of the Delaware, Lackawanna & Western with headquarters at New York, as has already been announced in these columns, was born on March 2, 1871, at Philadelphia, Pa., and was educated in the common schools. He began railway work on November 1, 1884, in the passenger department of the Chicago, Burlington & Quincy, and served consecutively until April, 1897, as clerk, rate clerk, chief rate clerk, successively at Omaha, Neb., at Chicago, Ill., and at St. Louis, Mo. From April, 1897, to August, 1899, he was chief clerk in the passenger department of the Kansas City, Pittsburg & Gulf, now a part of the Kansas City Southern, at Kansas City, Mo., and then to January, 1905, was chief rate clerk on the Delaware, Lackawanna & Western at New York. From January, 1905, to November, 1911, he was chief clerk in the passenger department, and then was promoted to assistant general passenger agent which position he held at the time of his recent appointment as general passenger agent of the same road, with headquarters at New York, as above noted.

J. L. Smith, whose appointment as assistant general passenger agent of the Delaware, Lackawanna & Western, with headquarters at New York, has already been announced, was born on March 23, 1866, at Candor, N. Y., and was educated in the common schools. He began railway work in August, 1889, in the freight office of the Delaware, Lackawanna & Western at Elmira, N. Y., and early in the following year was promoted to ticket clerk. In 1896 he was promoted to city passenger agent at Buffalo and three years later was made city ticket agent at New York, becoming city passenger and ticket agent at Binghamton in 1901. He was appointed city passenger agent at New York in 1906 and the following year was appointed division passenger agent at Syracuse. He was transferred in the same capacity in 1908, to Newark, N. J., and in 1909 was promoted to general eastern passenger agent at New York, which position he held at the time of his recent appointment as assistant general passenger agent of the same road, as above noted. Mr. Smith's entire service has been with the Delaware, Lackawanna & Western.

Engineering and Rolling Stock

E. H. Pudney has been appointed supervisor of signals of the Atlanta & West Point, effective June 15.

A. West has been appointed district master mechanic, district four, Canadian Pacific, with headquarters at Edmonton, Alta., vice A. J. Ironsides, transferred.

D. W. St. Clair has been appointed master mechanic of the Missouri, Oklahoma & Gulf of Texas, with headquarters at Denison, Texas, in place of J. R. Greiner, resigned.

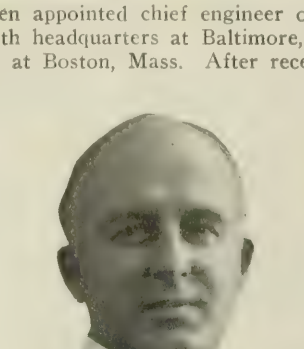
G. L. Marick, has been appointed assistant office engineer of the Gulf, Colorado & Santa Fe, with headquarters at Galveston, Tex., effective July 1. This is a newly created position.

Arthur E. Owen, principal assistant engineer of the Central of New Jersey, has been appointed chief engineer, with headquarters at New York, succeeding Joseph O. Osgood, deceased.

W. H. Keller, general foreman of shops of the Texas & Pacific, at Fort Worth, Tex., has been appointed master mechanic of the eastern division with headquarters at Marshall, Tex., with jurisdiction extending over the shops at Texarkana, Tex., where the office of master mechanic has been abolished.

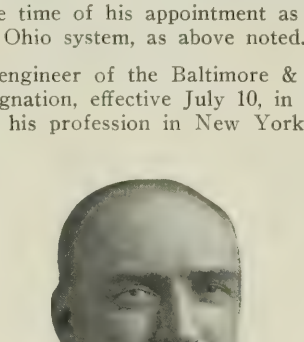
A. M. Bears, signal supervisor on the Manitoba division of the Canadian Pacific, has been granted a leave of absence for over-seas service in the Twelfth field ambulance for active duty with the Canadian expeditionary forces.

R. N. Begien, who has been appointed chief engineer of the Baltimore & Ohio system, with headquarters at Baltimore, Md., was born on March 15, 1875, at Boston, Mass. After receiving a public and high school education at Medford, Mass., and completing the engineering course at Harvard University, Mr. Begien went to Central America and served for more than three years as a member of the Nicaraguan Canal Commission. He then went to South America, where he spent a year as a railway engineer in Ecuador, returning to the United States to enter the engineering department of the District of Columbia. He entered the Baltimore & Ohio service on August 1, 1902, as assistant engineer at Somerset, Pa., and in June, 1908, became division engineer at Philadelphia. He was promoted to assistant to the chief engineer of the Baltimore & Ohio under A. W. Thompson on May 1, 1910, and when Mr. Thompson became general manager, Mr. Begien continued as his assistant, becoming assistant to the third vice-president on May 1, 1912. In December of the same year, he was promoted to assistant general superintendent, with headquarters at Baltimore; and in July, 1913, was appointed general superintendent of the Baltimore & Ohio Southwestern, which position he held at the time of his appointment as chief engineer of the Baltimore & Ohio system, as above noted.



R. N. Begien

Francis Lee Stuart, chief engineer of the Baltimore & Ohio system, has tendered his resignation, effective July 10, in order to engage in the practice of his profession in New York, and R. N. Begien, general superintendent of the Baltimore & Ohio Southwestern, at Cincinnati, Ohio, has been promoted to chief engineer of the Baltimore & Ohio system. Mr. Stuart was born on December 3, 1866, at Camden, S. C., and graduated from Emerson Institute, Washington, D. C., in June, 1884. The same year he began railway work in the office of the consulting engineer of the Baltimore & Ohio and served consecutively as rodman, levelman, transitman and resident engineer on the same road. From 1887, to February, 1888, he was engineer of the Cahaba Coal Mining Company at Blockton, Ala., and from June, 1888, to the spring of 1889, he was engaged in miscellaneous engineering work with headquarters at Birmingham, Ala. In 1889 he was appointed resident engineer in charge of construction on the Briarfield, Blockton & Birmingham, and later became engineer maintenance of way of the same road. He became engineer of the Corona, Coal & Coke Company at Corona, Ala., in 1891 and the following year went to the Baltimore & Ohio as resident engineer; two years later he became supervisor in charge of construction of the same road. From 1895 to 1897, he was general engineering and supervising engineer for contractors United States experimental model tank at Washington navy yard, and then until 1899, was assistant engineer of the Nicaragua Canal Commission. He was division engineer of the Isthmian Canal Commission in charge of surveys on Upper San Juan river from July, 1899, to January, 1900; the following month he returned to the Baltimore & Ohio as assistant engineer on location work; three years later he became district engineer, and from March, 1904, for one year was engineer of surveys. In March, 1905, he was appointed chief engineer of the Erie and again returned to the service of the Baltimore & Ohio on January 1, 1911, as chief engineer of that road and the Cincinnati, Hamilton & Dayton. Under Mr. Stuart's direction as chief engineer an extensive program of rehabilitation was completed by the Baltimore & Ohio. The Magnolia cut-off in West Virginia was built under his direction, and he also built double track tunnels at the two summits of the company's main line over the Allegheny mountains, at Sand Patch, Pa., and Kingwood, W. Va.



F. L. Stuart

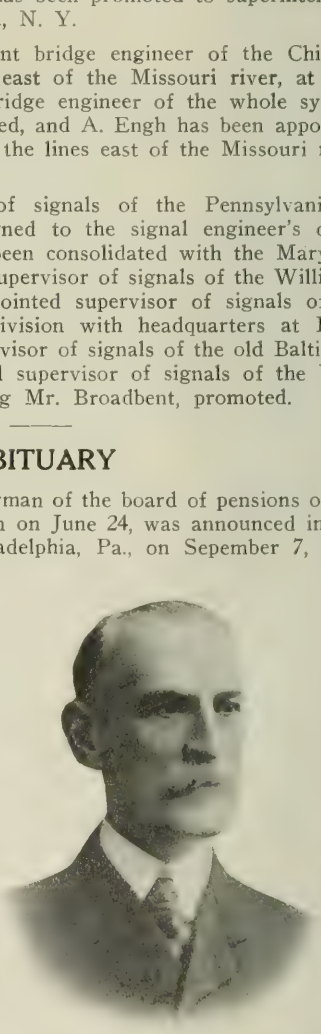
John F. Mullen has been promoted to assistant master mechanic of the Buffalo, Rochester & Pittsburgh in charge of the Buffalo division, with headquarters at Buffalo Creek, N. Y., and Edward F. Houghton has been promoted to superintendent of shops at East Salamanca, N. Y.

G. A. Haggander, assistant bridge engineer of the Chicago, Burlington & Quincy, lines east of the Missouri river, at Chicago, has been appointed bridge engineer of the whole system, vice C. H. Cartlidge, deceased, and A. Engh has been appointed assistant bridge engineer of the lines east of the Missouri river, effective July 1.

W. I. Bell, supervisor of signals of the Pennsylvania at Media, Pa., has been assigned to the signal engineer's office, as the Media division has been consolidated with the Maryland division. J. H. Broadbent, supervisor of signals of the Williamsport division, has been appointed supervisor of signals of the new main-line Baltimore division with headquarters at Baltimore, Md. Guy Toft, supervisor of signals of the old Baltimore division, has been appointed supervisor of signals of the Williamsport division, succeeding Mr. Broadbent, promoted.

OBITUARY

C. A. Beck, formerly chairman of the board of pensions of the Illinois Central, whose death on June 24, was announced in our columns, was born at Philadelphia, Pa., on Sepember 7, 1836. After completing high school, he entered the employ of the Baltimore & Ohio in a clerical capacity at Harper's Ferry, W. Va., and was subsequently employed by the Western Union Telegraph Company. On September 19, 1856, he first entered the service of the Illinois Central at East Dubuque, then Dunleith, Ill., as a freight clerk. East Dubuque was then the western terminus of the Illinois Central and a transfer point for freight from the railroad to Mississippi river boats. From April, 1860, to February, 1871, he was agent of the Illinois Central at that point. From East Dubuque, Mr. Beck went to Centralia, Ill., where he was superintendent of the Chicago division until July 22, 1881. From July 22, 1881, to January 1, 1886, he was assistant general superintendent with headquarters at Chicago. He was general superintendent with headquarters at the same city until September 2, 1889, when he was made acting general manager. From January 1, 1890, to October 1, 1891, he was general manager, and from the latter date



C. A. Beck

ntil January 1, 1898, assistant second vice-president. He was eneral purchasing agent until June 1, 1901, when he was made airman of the board of pensions. He held this position until ctober 31, 1906, when he retired after 50 years of service with e Illinois Central. His death followed an attack of heart ilure.

J. R. Christian, general freight agent of the Southern Pacific es at Houston, Texas, died in that city on June 30.

Joseph O. Osgood, chief engineer of the Central of New Jery, whose death on June 28, at Newark, N. J., was noted last eek in these columns, was born on December 28, 1848, at hasset, Mass. He was ucated in the public hools of his native wn and later attended e Massachusetts Insiute of Technology, here he took special urses. He began railay work in July, 1865, a rodman, on conruction on the Eastern ore Railroad, now a rt of the New York, hiladelphia & Norfolk. e subsequently served evious to 1874 on the assachusetts Central d on a line in Vernt. From 1874 to 78 he was in the servof the Massachusetts oard of Harbor Comissioners, engaged in gineering work at Boston. Then to 1881 he was with the gineering department of the Atchison, Topeka & Santa Fe, construction work in Colorado and New Mexico. In Sepnber, 1881, he went to San Diego, Cal., and was engaged for o years in building the California Southern. From 1883 to 84 he was chief engineer of the Boston, Hoosac Tunnel & estern, and then for about one year was out of railway work. e was appointed chief engineer at Toledo, Ohio, of the Toledo, . Louis & Kansas City, now a part of the Toledo, St. Louis & estern, in April, 1886, and was in charge of the work of anging that road from narrow to standard gage; he subseently served as a director of that road. In January, 1888, he as appointed chief engineer of the Lake Shore & Michigan outhern, at Cleveland, Ohio; fourteen months later he went to ew York, and then was engaged as a consulting railway enneer until July 17, 1901, when he was appointed chief engineer the Central of New Jersey.



J. O. Osgood

A Subaqueous Tunnel.—One of the most notable achieveents in gas engineering is the successful construction of a baqueous tunnel connecting Astoria, L. I., with the borough The Bronx, New York City. The tunnel lies beneath the aters of the East river at an average depth of 225 ft. below ean sea level. It is 19 ft. wide, 18 ft. high and 4,662 ft. long. accommodates two 72-in. gas mains, with abundant space for her utilities. The route of the tunnel lies through a long retch of disintegrated rock where the water pressures ran up 95 lb. per sq. in., thus making it impossible to use compressed r to exclude water.—*Jour. Amer. Soc. of Mech. Eng.*

Railway Links Greece with Rest of Europe.—The closing the remaining strip of 56 miles necessary to the final linking of Greece with the rest of Europe was recently reported. s soon as the war is ended through trains will be run from aris and other European capitals to Athens-Piræus. The time om Paris will be shortened to some 60 hours, and through ning and sleeping cars will run over the lines. This hitherto issing link in communication lay between Gilda, on the Salonikionastir line, and Pappapuli, on the Thessalian frontier. Temorary bridges of wood will span streams and valleys until rmanent steel and concrete structures replace them after the ar. Twenty American locomotives, now ready at Athens, will raw these trains at high speed through the picturesque Vistritza lley and along the Ægean coast to their destination.

Equipment and Supplies

LOCOMOTIVES

The Philadelphia & Reading is building 10 switching locomotives in its own shops.

The Tremont & Gulf has ordered one Mikado locomotive from the American Locomotive Company.

The Chicago, Burlington & Quincy is expected to place an order shortly for a number of locomotives.

The Minnesota Transfer has ordered 2 eight-wheel switching locomotives from the Lima Locomotive Corporation.

The Wabash has revived its inquiry for 25 locomotives, and is now receiving prices on that number of Santa Fe, Mikado or Consolidation locomotives.

The Pennsylvania Equipment Company, 1438 So. Penn Square, Philadelphia, is in the market for 6 or 7 second-hand standard gage Consolidation locomotives: Weight on driving wheels, about 140,000 lb.; total weight, not in excess of 150,000 lb.; driving wheels, about 44 in. centers; steam pressure, 180 to 200 lb., and tractive effort, 33,000 to 35,000 lb.

Mexican Government.—The Constitucionalistas de Mexico placed an order a short while ago with the Hocking Valley for 20 second-hand Mikado locomotives. It also ordered 400 or 500 second-hand freight cars from two Western railroads, and 40 or 45 second-hand passenger coaches from the Delaware, Lackawanna & Western. Delivery has not yet been made on this equipment, and naturally, may not be made for some time to come.

FREIGHT CARS

The Delaware & Hudson is in the market for 1,000 hopper cars.

The Baltimore & Ohio is inquiring for an additional 1,000 box cars.

The Illinois Central is inquiring for 500 steel underframe refrigerator cars.

The Bethlehem Steel Corporation has ordered 50 hopper cars from the Pressed Steel Car Company.

PASSENGER CARS

The Union Pacific has ordered a combination mail and baggage 300 hp. motor car from the McKeen Motor Car Company.

The Nashville, Chattanooga & St. Louis has ordered 8 passenger car underframes from the Pressed Steel Car Company.

IRON AND STEEL

The Russian Government is reported to have given the United States Steel Corporation orders for 200,000 tons of rails.

The Pennsylvania Lines West have ordered 4,000 tons of steel for a bridge across the Beaver River at Rochester, Pa., from the American Bridge Company.

MISCELLANEOUS

The Pennsylvania Lines West of Pittsburgh have purchased four 600 ampere electric arc welding equipments from the Westinghouse Electric & Manufacturing Company.

The Pennsylvania Equipment Company, Philadelphia, Pa., is in the market for a second-hand 40 to 60 ft. span electric traveling crane, of 15 tons capacity, and operating on 220 volts d. c.

The Baltimore & Ohio has purchased from the Westinghouse Electric & Manufacturing Company three 500 kw. rotary convertors; three 500 kva., oil insulated, self cooling, 3 phase, 25 cycle, 13,200 volt high tension, rotary low tension transformers;

four 50 kva., single phase, 25 cycle, 13,200/550 volt transformers, and one 17 panel switchboard for installation in the Curtis Bay substation at Baltimore. This substation will supply energy to the Curtis Bay coal pier, one of the largest coal piers in the country. Energy will be furnished to the substation by the Baltimore Consolidated Gas & Electric Company.

SIGNALING

THE NORTHERN PACIFIC will install a small General Railway Signal mechanical interlocking plant at Clear Lake, Wash. The machine is an S. & F. type and comprises 10 working levers and 2 spare spaces. The plant will be installed by railroad forces.

THE BOSTON & ALBANY will install a 56-lever electric interlocking plant at Pittsfield, Mass. There will be 45 working levers, 23 for the operation of signals and 22 for switch movements. The plant will be furnished and installed by the Federal Signal Company using Federal type 4 signals and type 4 switch movements.

THE NEW YORK CENTRAL, LINES EAST, has let a contract to the Federal Signal Company for three style A mechanical interlocking plants, one at Poughkeepsie, N. Y., with a 59-lever frame and 50 levers, one at Hoffmans, N. Y., with a 72-lever frame and 69 working levers, and one at Carman, N. Y., with a 60-lever frame and 59 working levers.

THE LEHIGH VALLEY will install a small General Railway Signal, alternating current, electric interlocking plant at Scott street, Buffalo, N. Y. The installation comprises a 16-lever Model 2, unit-lever type machine, alternating current Model 5 switch machines, alternating current Model 2a, dwarf signals and alternating current crossing gates.

THE SOUTHERN PACIFIC LINES in Texas are to install approximately 50 miles of automatic signaling, principally on the Houston & Texas Central north of Hempstead and on the Galveston, Harrisburg & San Antonio between Houston and Galveston. It is expected that construction work will be undertaken in the near future and completed early in the fall.

THE BALTIMORE & OHIO will install during this year automatic signals on the Cumberland division: West Cumbo to Millers, 9.5 miles; Millers to Orleans road, 24.3 miles; Magnolia to Green Spring, 14.6 miles; Patterson Creek to Cumberland, 5.4 miles; Connellsville division: Cumberland to Connellsville, 92.4 miles; Pittsburgh division: Willow Grove to Goehring, 37 miles; New Castle division: New Castle Junction to Ravenna, 53.1 miles. It is expected that the Connellsville and New Castle divisions' installation will be alternating current signaling and the remainder direct current.

THE NORTHERN PACIFIC has authorized the installation of 216 miles of single track automatic block signaling of the "absolute permissive" type on the Yellowstone division between Mandan, N. Dak., and Glendive, Mont. This installation will require about 360 signals and the auxiliary apparatus. Work is also under way at present on an installation of 1½ miles of automatic signal protection at Mandan, covering the connection between the main line and a branch. An authority has been passed for the double tracking of the Grassy Point line between West Duluth and Superior, which will involve a number of changes in interlocking on a bridge and at the connections with the Minneapolis, St. Paul & Sault Ste. Marie, which uses this line jointly with the Northern Pacific.

THE MISSOURI, KANSAS & TEXAS is to install six mechanical interlocking plants, with electric distant signals, at crossings with the Missouri Pacific. The towers in four of these plants will be of concrete construction and in the other two the machines will be situated in stations. The crossings referred to are at Kincaid, Kan., Selma, Moran, Ft. Scott, Chetopa and Wagoner, Okla. The first mentioned has a 16-lever machine with 4 spare spaces; the second, fourth and fifth 16-lever machines with one spare space; the third, a 24-lever machine with five spare spaces; and the sixth, a 56-lever machine with 10 spare spaces. Work has been begun on these plants which will be constructed by railway forces. A mechanical interlocking plant with electric distant signals is also being constructed at the crossing with the Missouri, Oklahoma & Gulf at Durant, Okla. The tower for this plant will be of concrete. The work is being done by the railroad's forces, and it is now about 20 per cent completed.

Supply Trade News

The Lidgerwood Manufacturing Company, New York, on July 1 moved its Seattle, Wash., office from 807-809 Western avenue to new quarters at 63-65 Columbia street.

Willard Wilson, assistant manager of sales of the Tennessee Coal, Iron & Railroad Company, has been appointed general manager of sales of the company succeeding F. A. Burr, who has left the company to become general manager of sales of the Aetna Explosives Company.

E. R. Marker, district manager of the T. L. Smith Company, has opened new quarters at 609 Wells Street, Milwaukee, Wis., where he took charge of the business of the company as Wisconsin representative. He has a stock of concrete mixers and other supplies for concrete construction on display.

W. H. Ivers, formerly with the Baldwin Locomotive Works, has been appointed southwestern representative of the Gold Car Heating & Lighting Company, New York, with headquarters at St. Louis, Mo., succeeding George F. Ivers, who has resigned to become manager of the railway supply department of the Shapleigh Hardware Company, St. Louis, Mo.

Death of John T. Cade

John T. Cade, vice-president of the Federal Signal Company, died at his home in Arcola, N. J., on June 30 after an illness of about five weeks. Mr. Cade was born in Huntingdon, England, January 7, 1861, and became connected with the business with which he was associated throughout his life in 1875, when a mere boy, going to work for the English firm of Stevens & Sons, railway signal manufacturers and contractors. He came to America in 1882, when signaling in this country was in its infancy. Entering the employ of the Union Switch & Signal Company of Pittsburgh, he rose rapidly to positions of responsibility and was directly or indirectly connected with all the larger installations of signaling and interlocking made by that company for about 13 years. In 1895 he resigned his position with that company and in 1896, with the late Henry Johnson, he founded the Standard Railroad Signal Company, of Arlington, N. J. This concern was merged into the Pneumatic Railway Signal Company, of Rochester, which in turn was one of the constituent companies forming the present General Railway Signal Company. Mr. Cade held important positions in all these companies until 1903. In 1904 he organized the Federal Railway Signal Company; and in 1908 this was reorganized as the present Federal Signal Company, of Albany, N. Y.



John T. Cade

Mr. Cade had thus been constantly active in the field of American railway signaling from its earliest days, and his name will hold a prominent place in the history of the development of the art on this side of the ocean. As a signal engineer he was thoroughly grounded in the conservatism of English practice, while yet he was abreast of the best American enterprise. His ability was recognized by the profession and by railroad officers, and a number of patents on improvements in signaling bear witness to his ingenuity and originality.

Mr. Cade had a wide acquaintance among railroad officers, who appreciated his force of character and enjoyed his

genial, kindly manner. The signal world has lost a useful promoter and his associates mourn a valued friend who cannot be replaced. He leaves a widow and two daughters.

The Goodyear Tire & Rubber Company, Akron, Ohio, has presented to Battery B, Ohio Field Artillery, stationed at Akron, a fully equipped military kite balloon, which is the first of its kind ever owned by the national guard of any state. The balloon is similar to the one recently delivered to the United States Navy for use at the naval aeronautic station at Pensacola, Fla. It was designed and made entirely in the Goodyear factory. The Goodyear Tire & Rubber Company recently sent an aeronautic expert abroad to make a scientific study of kite balloon development to be better able to assist the United States government in building up its aeronautic service.

Henry Alden Sherwin, chairman of the board of directors of the Sherwin-Williams Company, died of heart failure on June 26, at his country place, near Cleveland, Ohio. Mr. Sherwin was born at Baltimore, Vt., on September 27, 1842, and began his business career at the age of 13. In 1862, he went to Cleveland, where he secured a position as a clerk and bookkeeper with a dry goods company. In July, 1866, he left this business to organize Dunham & Co., the name of which was changed to Sherwin, Williams & Co. in 1870, when E. T. Williams was taken into the firm. In 1884, this company was incorporated as the Sherwin-Williams Company. For the past few years he was chairman of the board of directors of the company, although not as active in the affairs of the organization as in former years. Mr. Sherwin was well known to the older men of the railway supply field. He began his career as a salesman by selling to the railroads, and was proud of the fact that his first order was a carload of paint sold to the Atchison, Topeka & Santa Fe. He established the first factory lunchroom to provide noon-hour lunches for employees, a plan which has since been adopted by many other industrial firms.



H. A. Sherwin

TRADE PUBLICATIONS

Steel Pipe.—The National Tube Company has recently issued a third edition of its catalogue of National Matheson joint pipe. This is a system of piping for high or low pressure natural or artificial gas lines, water works, mines, mining, hydro-electric plants, irrigation and engineering uses. The catalogue takes up the characteristics of the pipe and shows its advantages for different kinds of service. The book is extremely well illustrated with views of typical installations of many different kinds. One of the interesting features is a series of drawings or cartoons emphasizing some of the points that are made in the text.

Du Pont Products.—The Du Pont companies have recently issued a 111 page book, 5 in. by 8 in. in size, giving a complete list of the products made by E. I. Du Pont de Nemours & Co., the Du Pont Fabrikoid Company, the Du Pont Chemical Company and the Arlington Company. The book contains list of products arranged under the following heads: high explosives; low explosives; black blasting powder; sporting powders; explosives for military uses; miscellaneous commodities; blasting supplies; Fabrikoid; chemicals; Pyralin; special products and by-products. In each case a brief description of the commodity is given, followed by a list of its users and also its uses. In a section headed customers, are given the names of all kinds of users alphabetically arranged followed in each case by a list of commodities available for that particular industry. The book itself is bound in Fabrikoid.

Railway Construction

Big Blackfoot.—Clifton, Applegate & Toole, Spokane, Wash., have been awarded a contract for a 22-mile extension of this road from Blackfoot Junction, Mont., to Clearwater. The work involves about 250,000 cu. yd. of cut and fill. The Big Blackfoot is a subsidiary of the Chicago, Milwaukee & St. Paul. (Page 1113, May 19.)

Cowlitz, Chehalis & Cascade.—The Nettleton-Bruce-Eschbach Company, Seattle, Wash., has the contract for the construction of a railway from Chehalis, Wash., 20 miles up the Newaukum valley in an easterly direction. The work includes the construction of three bridges, from 80 ft. to 100 ft. in length. The railroad is about one-third completed, and will be used largely for the transportation of lumber and live stock. J. E. Corlett, president, 837 Henry building, Seattle, Wash.

Eagle Pass & Aransas Pass.—This company has been organized at Aransas Pass, Tex., it is said, to build a line between Aransas Pass, Tex., and Eagle Pass, about 250 miles. The proposed route is through a ranch region that of late years has undergone considerable agricultural development. Bonuses aggregating $50,000 cash and considerable land have been pledged in aid of the project.

Grand Trunk.—This company recently finished work on a 5-mile spur line to Borden station, 2.75 miles southwest of Angus station, Ont., and work is under way on 3.75 miles of sidings and spur tracks, a total of 8.75 miles. The improvements include building a 35-ft. steel girder span, also the construction of a soldiers' unloading platform, 16 ft. by 2,800 ft., a passenger, express and baggage building, 30 ft. by 416 ft. and a passenger platform, 18 ft. by 800 ft. The new line was built to carry military supplies and visitors to the camp at Borden.

Great Northern.—This company is building 36 miles of new line from Wildrose, N. D., west to the Montana border.

Holston River Lumber Company's Line.—An officer of this company writes, regarding the report that bids will be received for the construction of a 20-mile line to the Clinch mountain district in Virginia, that it has not yet been decided when bids will be asked for the work. E. M. Allen, president, Abingdon, Va.

New York Subways.—All bids submitted to the New York Public Service Commission, First district, for the construction of Route No. 31, the Livonia avenue elevated extension of the Eastern Parkway subway in the borough of Brooklyn, have been rejected and the commission will readvertise for new bids. Bids were opened on May 23, at which time Dennis E. Conners, New York, was the lowest bidder, at $1,376,122.

Pennsylvania Roads (Electric).—Residents of Hershey, Pa., have under consideration the question of building an electric line from Manheim, Pa., northwest via Mastersonville, Colebrook, Lawn and Bachmansville to Hershey, about 25 miles. The promoters expect to develop a traffic in milk and passengers. John Snyder, Hershey, may be addressed.

Port Jervis & Delaware Valley (Electric).—J. A. Vandergrift & Company, Inc., New York, will finance and build this projected electric line from Port Jervis, N. Y., southwest via Matamoras to Milford, Pa., about 7 miles. The grading work involves handling 7,000 yd. to the mile. The maximum grade will be 2 per cent, and the maximum curvature except in the streets of towns, 3 deg. One 60-ft. steel girder bridge will be required, also one 300-ft. wooden trestle, four culverts and about 34,000 feet of timber. J. A. Vandergrift, president, 149 Broadway, New York City, and W. E. Soden, chief engineer, Port Jervis.

Yellville, Rush & Mineral Belt.—Grading has been completed on this road which is being built from Yellville station, Ark., via Summit, Yellville, Cowan, Barrens and Clabber Creek to the mouth of Rush Creek on the Buffalo river, about 19 miles. Approximately 15 per cent of the track has been laid and 65 per cent of the bridging done. The work involves the construction of 42 bridges with a total length of 3,100 ft. The maximum grade is four per cent and the maximum curvature

16 deg. The work is being done by company forces and is under the supervision of H. E. Cochran, superintendent of construction, Yellville, Ark. (December 31, 1915, page 1262.)

RAILWAY STRUCTURES

Akron, Ohio.—The Northern Ohio Traction & Light Company plans to open bids on July 5, for the construction of a freight and passenger station to cost about $300,000. It will be a reinforced concrete, brick and terra cotta structure, 80 ft. by 155 ft., and from 35 to 45 ft. in height.

Aldrich, Ala.—Work on a new frame combination station to replace the structure destroyed by fire on February 5, will be begun by the Southern Railway as soon as the necessary building material can be assembled. The work will be carried out by company forces.

Cleveland, Ohio.—The Terminal Properties Company has completed plans for a 12-story hotel building, 138 ft. by 233 ft., to be built at an estimated cost of $1,750,000. The building will be a steel frame, tile-fireproofed structure with concrete floors and brick exterior. The structural steel has been ordered from the American Bridge Company, and the general building contract has been let to the Crowell-Lundoff-Little Company, Cleveland, Ohio. C. M. Norris, purchasing agent, 1951 East 57th St., Cleveland, Ohio.

Harrisburg, Pa.—The Philadelphia & Reading has given a contract to the James McGraw Company, Philadelphia, for the concrete foundation and to the Pennsylvania Steel Company for the steel superstructure, of a bridge to be built on the Lebanon Valley branch at Harrisburg.

New York.—The New York Public Service Commission, First district, will open bids on July 14, for the construction of station finish for the Grand Central Station of the Queensboro subway. This work is to include the lengthening for about 500 ft. of the island platform of the present station of the Queensboro subway in Forty-second street, which is between Lexington and Third avenues. Connecting with this extension there will be an underground passageway to the present Grand Central station of the first subway.

The contract for the construction of the One Hundred and Eightieth street yard on Route No. 18, in the borough of the Bronx, has been awarded by the New York Public Service Commission, First district, to the Thomas J. Buckley Construction Company, the lowest bidder, at $269,222. (June 30, p. 1610.)

Poughkeepsie, N. Y.—A steel bridge on concrete foundation is to be built over the Central New England tracks at North street, Poughkeepsie, at a cost of $22,283, and a steel bridge on concrete foundation is to be built at North Clinton street to cost $6,858. Bids were received recently for the steel work, but have not yet been asked for the concrete foundation.

Proctor, Minn.—The Duluth, Missabe & Northern has awarded a contract to Macleod & Smith for a 100-ft. reinforced concrete roundhouse designed for 60 stalls, one half of which is now being built.

Sioux City, Iowa.—The Great Northern has awarded a contract to the E. G. Evansta Company, Minneapolis, Minn., for the construction of a 10-stall engine house, a power house, store and oil houses, a 100,000-gal. water tank and treating plant, a cinder pit and a turntable. A contract for the erection of a coaling station has been awarded to the Ogle Construction Company, Chicago. The cost of the improvements has been estimated at about $150,000.

Texarkana, Ark.—The Missouri Pacific-St. Louis, Iron Mountain & Southern is building an eight-stall, 85-ft., frame roundhouse with its own forces.

Washington, D. C.—Plans are reported being made for an office building, to be built at Washington for the Southern Railway.

West Elizabeth, N. J.—Plans for an addition to the facilities at West Elizabeth have been announced by the Lehigh Valley. A general re-arrangement of the layout will be made, and nearly two miles of new sidetracks will be constructed; a new freight house and a new milk station will also be built. The new track layout will provide room for about 150 cars. The passenger station will be reconstructed into a modern and up-to-date suburban station.

Railway Financial News

Buffalo & Susquehanna Railroad Corporation.—This company, which took over a part of the old Buffalo & Susquehanna, has declared an initial dividend of 1 per cent on the common stock.

Chicago, Rock Island & Pacific.—Holders of the collateral 4 per cent bonds of the old Chicago, Rock Island & Pacific Railroad, generally spoken of as the Iowa Company, are to receive a further distribution of $8.50 on the principal of each $1,000 bond and 16 2/3 cents on each $20 coupon. The holders of these bonds were given the privilege of exchanging them at par for Chicago, Rock Island & Pacific Railway Company (the operating company) stock. A certain number of the holders of bonds did not exercise this option and therefore received their proportion of the cash bid which was made by the reorganization committee for the collateral securing the bonds. This amounted to $98.10 per $1,000 bond, or a little less than 10 per cent. The further distribution is the result of the settlement of the suit brought against former directors for loss made in the management of the company. Kean, Taylor & Co., New York, are offering $2,050,000 5 per cent receiver's certificates, series A, of the Chicago, Rock Island & Pacific Railway Company, to be dated July 3, 1916, and maturing January 3, 1917, at 100¼, yielding about 4½ per cent. The proceeds of these certificates will be used to retire a like amount of certificates due July 3, 1916.

Fitchburg.—The company has sold $5,000,000 5 per cent notes issued to refund a like amount of 4 per cent bonds which mature July 1, 1916.

Pennsylvania Company.—See Pennsylvania Railroad.

Pennsylvania Railroad.—It was erroneously said in this column last week that this company had declared a semi-annual dividend of 4 per cent. The Pennsylvania Railroad pays quarterly dividends of 1½ per cent, being at the rate of 6 per cent yearly. The Pennsylvania Company, all the stock of which is owned by the Pennsylvania Railroad, paid a semi-annual dividend of 4 per cent on June 30. In June, 1915, 2 per cent was paid, and in December 4 per cent. If, therefore, the semi-annual declaration next December is also 4 per cent, this company will have paid in the 1916 calendar year 8 per cent as compared with 6 per cent in the previous year.

See also Pittsburgh, Cincinnati, Chicago & St. Louis.

Pittsburgh, Cincinnati, Chicago & St. Louis.—A semi-annual dividend of 2 per cent has been declared on the $29,916,200 preferred stock, of which the Pennsylvania Company owns $24,886,700. This compares with 4 per cent declared in January, 1916, and with nothing declared in 1915.

See Pennsylvania Railroad.

Western Pacific.—The California railroad commission has approved the reorganization plan of the Western Pacific Railway. This plan provides for the sale of all of the Railway company's property to the new Western Pacific Railroad Company and the issue of $75,000,000 stock and $20,000,000 bonds and the mortgaging of the property to secure $50,000,000 additional bonds. The Corporation Trust Company has filed a certificate of incorporation in Wilmington, Del., for the Western Pacific Railroad, with capital stock of $75,000,000.

Rust-Proofing of Iron and Steel.—The rust-proofing of iron and steel remains one of the greatest economic problems, in spite of the numberless efforts to solve it. The purer an iron the more non-corrosive it is, but at the sacrifice of strength. Painting lasts but a few years at best. Enameling is prohibitive for most purposes on account of the first cost, to say nothing of its tendency to crack off under blows. An Italian chemist claims to have solved the problem by giving iron or steel a protective coating of oxide. The metal is heated in a muffle into which superheated steam is turned. The fumes of a powdered chemical (of unstated composition) are then blown upon the metal, producing an iron oxide that adheres permanently.—*Engineering and Contracting.*

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Private Concerns and Preparedness

President Wilson, in a recent speech, raised the question of whether the business men of the country are willing to do their share to prepare the country for war by giving men in their employment freedom to enlist, presumably while keeping them on the payroll. The National Association of Manufacturers has been circularizing its members to find out whether they will encourage their employees to undergo military training and will permit them to engage in such training without loss of wages, provided the training is within their own city or town. Many of the companies circularized are railway supply concerns. The railway supply concerns of the United States are owned and managed by men who are second to no other class of citizens in patriotism, and doubtless they will give their employees as much freedom and opportunity to get military training as any others. But, in this connection one point ought to be emphasized. This is, that it is the business of the government, and not that of private concerns, to do the work and bear the expense of preparing the country to defend itself. The two very primary functions of a government are to maintain order at home and to protect the nation from foreign powers. It is a remarkable commentary upon our governments that they are constantly assuming functions which are of secondary importance, as compared with these, and which in many cases are not necessarily functions of government at all, and that at the same time they call upon the business interests of the country to help them do the work and bear the expense of performing those functions which peculiarly belong to every government. Only when the government out of its own revenues adequately provides for preparedness will the burden of national defense be fairly distributed among those who should bear it.

Clifford Thorne's Automobile

The Hon. Clifford Thorne, chairman of the Railroad Commission of Iowa, we infer from the expressions of the Iowa press, has become the possessor of a new automobile. Whether it is a real automobile or merely a flivver doth not appear, but it seems that it is a gift. One ought not, to paraphrase an old saying, to look a gift automobile in the mouth, but this advice was extended to the recipient of the gift and not to innocent bystanders, and there are certain of the latter class in Iowa who are disposed to look askance at Clifford's new car. We quote the following from the Cedar Rapids (Iowa) Republican:

> While the newspapers are discussing Mr. Thorne, who is still railroad commissioner, after being defeated for Congress, we would at least suggest to him as kindly as we can, for we do not want to be unkind even to Clifford, that he return that automobile, the gift of which was so much heralded by the givers. If those shippers who presented that automobile should have any question about rates or regulation come up with the railroads and they should appeal to the railroad commission, how would Mr. Thorne as chairman of that commission act and vote? What chance would the railroads have against those shippers who made the present of the automobile—not now accusing Mr. Thorne of any desire except to be fair—but how could a man be uninfluenced? If the railroads could present an official with an automobile, what would be said of it? Why should shippers do so without criticism? The whole thing looks bad on the very face of it. It is regrettable, for in Iowa we have generally managed to keep pretty clean.

The *Railway Age Gazette* does not pretend to know either whether Mr. Thorne has a new automobile or where he got it. But suppose that he has one and that he did accept it from the shippers, is there anything wrong about that? A virtuous man like Mr. Thorne has a great advantage over the wicked. He can do anything that he likes, and it becomes virtuous because he does it. Not only can he make the worse appear the better part, but the worse part automatically becomes the better part when he takes it. Besides, when the chairman of a railroad commission has appeared as an attorney for shippers in rate cases before they have given him an automobile how can he be expected to do more for them after they have given him an automobile?

Fruitful Results from Apprenticeship

Does an apprenticeship system based on modern methods pay? Ten years ago when attention was being directed to the vital necessity of doing something to recruit the ranks of the mechanical department and insure a good supply of capable well-trained workmen, there were not a few who objected to the expense involved in installing an adequate apprenticeship system and who scoffed at the possibility of retaining graduate apprentices in the service. These criticisms have proved groundless to a large extent on both the Santa Fe and the New York Central Lines, where approved modern apprenticeship methods were first introduced. The results in the case of the New York Central are not so pronounced because of changes which have taken place in the organization since the apprenticeship system was first introduced, and the fact

that this work has not received the same hearty interest and backing from the higher officers as in the earlier days. On the Santa Fe, however, where the fundamental principles of modern apprenticeship have been given a thorough trial, receiving hearty co-operation from President Ripley down, the results are truly remarkable. Of the 479 apprentices graduated in the four years, 1912 to 1916 inclusive, 83 per cent. have remained in the service. Since the reorganization of the apprentice system in 1907, 99 of the graduates have been promoted to responsible positions. More important than these figures, however, is the feeling of loyalty which has been engendered and the improved efficiency throughout the mechanical department—and the work has only fairly begun. The possibilities, if similar methods were to be introduced in all departments of the railway, are practically limitless. It is greatly to be regretted, however, that railway officers generally cannot visualize these possibilities and are so slow in taking aggressive steps to promote the training and selection of their men.

WHO WANTS A STRIKE?

SPOKESMEN for the labor brotherhoods, desiring to throw the responsibility for a possible strike of train and engine employees upon the railroad companies, are indulging in some curious mental contortions in their endeavor to explain their refusal to submit the wage controversy to an impartial arbitration. Their position before the public is seriously weakened, however, by the fact that while criticising the railroads' proposals for a settlement, they have offered no alternative plan but a strike unless their demands are granted in full.

A statement issued by the Transportation Brotherhoods' Publicity Bureau declares that the proposal of the railways to refer the question to the Interstate Commerce Commission means "anything for delay" and that "railroad officials well know that the Interstate Commerce Commission has no power to fix the rate of wages after an investigation of the subject and the whole controversy would, after an investigation, be in the same condition as it is at the present moment." This is hardly a satisfactory explanation of their rejection of the proposal "that we (the railways and the employees) jointly request Congress to take such action as may be necessary *to enable the commission* to consider and *promptly dispose of* the questions involved."

An editorial in The Railroad Trainman intimates that the railroads are desirous of bringing the controversy to the point of a strike, and says that "they stand to win by either of two ways, first, if the men win, by teaching the public the need for uninterrupted railroad service for which the public must pay, or by defeating the men, destroying their organizations temporarily, and saving the cost of a strike by a readjustment of wages and service conditions." If this is true, the railroads are in a rather enviable position. According to this version, they have two chances to win, the brotherhoods have one chance, but the public, which would have to suffer the effects of a strike in either event, and to stand an increase in rates if the men should win, has no chance at all.

If the railroads could have any confidence that an advance in rates would be the certain result of an increase in wages, they would view the prospect with equanimity, but in view of the difficulty they have experienced in securing a slight increase in rates as a partial offset to the advances in wages and other expenses during the past 10 years, it would seem to be the safer policy for them to try to win the strike. If they should lose they could not meet the increased expense by higher rates except with the approval of the Interstate Commerce Commission.

The 300,000 train employees would profit by an increase of wages, whether secured as the result of a strike or of arbitration, considerably more than they would have to pay as their share of a general increase of freight or passenger rates. They are not worrying about the increase in rates or the effect on the public of a strike. They believe that their chances for winning are greater if the controversy is to be settled by force than if it is to be adjusted by some impartial body.

This being the case, unless they advance some other alternative, the responsibility for a strike will rest squarely upon those who propose a strike, not upon those who propose a peaceful settlement.

The Railroad Trainman expresses the belief that "the proposition made by the railroads was not offered in good faith," and that "if a proposition had been made by the men to arbitrate under the Newlands law, the railroad companies would have refused it." If the confidence of the brotherhoods in this belief had been strong enough to induce them to make such a proposal they might have been able to put the railroads in the hole they are now trying to dig for them, but the fact remains they did not; that the railroads did propose arbitration under the Newlands law, and that the brotherhoods rejected it and proposed only a strike.

The brotherhood organ also says: "The owners of the railways have a perfect right to participate in the earnings on a fair and equitable basis, but they have no right to fix that fair and equitable profit on a basis that is manifestly unjust to the employees." If the present basis is "manifestly unjust" it should not be difficult for the employees to convince either the Interstate Commerce Commission or a board of arbitration that such is the fact.

THE PUBLIC'S ATTITUDE TOWARD GOVERNMENT MANAGEMENT

IT is usually essential to the successful management of any kind of a property or business that those who own a controlling interest in it shall know the manner and results of its management, and shall take an active interest in them. In order to get good management they must hold the managers responsible for results, and they cannot do this if they do not know what the results are. One of the principal reasons why some of the railways of the United States have been badly managed has been that their stockholders have been too uninformed or have not acted on the information they have had, thus giving the managers opportunity to disregard the duties of their trusteeship.

As little as the stockholders of many private railways know about the affairs of their companies, they know a great deal more about them than the public usually knows about the results of railways which it owns. When railways are owned and operated by private companies the government usually will at least compel their managements to so keep their accounts and make their reports that anybody who will devote some time to the examination of their operating and financial statistics can tell whether or not they are being grossly mismanaged, and whether they are making or losing money. When railways are owned and managed by the government, on the other hand, the government is quite likely to so keep their accounts and make their reports that even those experienced in the study of railway affairs may have difficulty in ascertaining the exact results secured, and that a large majority of the public will have wrong impressions, and misleading information or none, regarding them.

The government railways of Canada afford striking evidence in support of these views. The first one-half of an article on the results of government management in that country is published in this issue of the *Railway Age Gazette*. The second one-half will be published next week. The data presented show conclusively that the Canadian government railways always have been, and are now, an utter failure from a financial point of view, and have inflicted enormous losses upon the public. The official reports furnish ample

basis for the demonstration of this proposition. But they do not tell the whole truth. They do not disclose how much interest the government has to pay on the capital belonging to the public which has been invested in the railways. Consequently, the only point regarding the results of these railways, and especially of the Intercolonial, the oldest of the large government lines, to which Canadian public men and the most intelligent part of the public seem to give any attention, is as to whether the road earns its operating expenses. And, although they do pay some attention to the earnings and operating expenses, it is a remarkable fact that the public men and the people of Canada, and even many of the newspapers, do not seem even to know that the road does not earn even its operating expenses. For example, the Toronto World ought to be well informed, and yet it said in an editorial in its issue for June 14, 1916, that the Intercolonial has "given good service at low rates and more than pays operating expenses." Now, the fact is that, as shown in the article published elsewhere in this issue, the Intercolonial during 47 years of government management failed by $9,565,000 to earn its bare operating expenses, and that it has continued down to the present time to fail to do so. It has had operating deficits in each of the last three years, and its operating deficit during the last 10 years has been $1,352,156. The Toronto World also says: "Everyone knows the Intercolonial was built as a military road for military purposes, and was never expected to pay commercially." This statement is simply not true. It is demonstrable by the official documents that the Intercolonial was not built as a military road. Even if it had been the so-called "military purposes" would long since have ceased to exist, and if the management had not been a mixture of low politics and incompetency it would many years ago have begun to be handled in an entirely different manner.

These statements are not made in criticism of the officers who are now, or have been in the past, in direct charge of the operation of the property. Many of them have been conscientious and able railway men. The present general manager, F. P. Gutelius, is such a railway man. The failure of government management in Canada has been due to the political and other demoralizing influences whose presence seems to be unavoidable in the case of commercial concerns managed by democratic governments.

The ignorance and indifference shown by the public regarding business enterprises managed by governments is attributable, doubtless, to many causes, but among them are two of leading importance. First, the standard of intelligence of the public as a whole is almost sure to be lower than that of the stockholders of a private company. When a man acquires stock in a railway it is a pretty sure sign that in thrift and intelligence he has risen above the level of a large majority of the people. Second, the individual members of the public, even though equal in intelligence to the individual stockholders of a railway, are not likely to take nearly as much interest in the affairs of a government railway as the stockholders are likely to take in those of a private railway. The stockholders of a private railway are a comparatively small number of people, and they receive, or hope to receive, dividends from it, and may at the same time suffer losses by it. The owners of a government railway are millions of people, and any benefits it confers on them, or losses it causes them are spread over all the people, are indirect and general, and, therefore, while none the less real, are of such a nature as not to excite much interest or concern on the part of individuals.

The main reason why the business of democracies usually is badly managed is that those who have ultimate control of the government—that is, the great majority of the people themselves—are ignorant or apathetic, or both, regarding public affairs. Since they are ignorant, or apathetic, or both, regarding other public affairs, how can it rationally be assumed that they will not be regarding the management of government railways? And if they are ignorant, or apathetic, or both, regarding government management, then the government railways are sure to be badly managed.

THE TRANSPORTATION OF THE NATIONAL GUARD

THE part played by the railroads in the mobilization of the National Guard, while perhaps not entirely free from imperfections, nevertheless seems to have compared very favorably with the work of other factors in the movement. While there were not always enough sleeping cars available for the use of the troops when desired, the same statement can be made as to such important items of a soldier's equipment as shoes, guns and horses, and if some of the published comments by officers of the militia on the comfort and pleasure of their journey to Texas in July did not exactly correspond with the portrayal of the charms of summer vacation travel to the mountains or the seashore in railroad advertising literature some of the comments of the men on Uncle Sam's cooking would not look well on the posters used in front of the army recruiting stations.

Some of the newspapers were able to make very effective use in editorials and cartoons of the contrast between the summer tourist riding in electric-lighted Pullmans and the militia traveling in day coaches, but the government that has charge of such matters evidently differentiates between a vacation and a war because the regulations of the war department governing the transportation of troops by rail do not provide for the use of standard Pullman cars (except for officers), but specify tourist cars and day coaches. Article 123 of the department regulations says: "If tourist sleepers are not readily available, coaches should be substituted, on the basis of one man to each double seat, and an endeavor made to secure the tourist sleepers and transfer the men thereto at a convenient place en route."

This was exactly the method followed. As there were only between 500 and 600 tourist sleepers available in the country, and on the basis of 40 men to a car it would take five or six weeks to transport 120,000 men to the border, allowing an average of six days for the round trip from the Eastern and Central States, the mobilization would have proceeded rather slowly without the use of day coaches.

In the emergency which was believed to exist when the troops were first called out there was not sufficient time for assembling, at the points where they were needed, cars scattered all over the country, and the quartermasters and the railroads simply did the best they could. In a few days all of the available tourist cars were on their way to Texas and it was necessary again to resort to the use of day coaches for a part of the men, at least from the initial point to some intermediate place en route where they could be transferred to the cars being deadheaded back. In this way the most effective use was made of the available equipment, and most of the soldiers had sleeping cars for at least part of their trip.

In one or two cases there were delays in getting started, owing to the difficulty of assembling tourist cars. In the instance of one Illinois regiment there were cars in the vicinity of Springfield, but the quartermaster-general's department at Washington, which reserved to itself the ordering of tourist cars, for some reason overlooked them and ordered cars from Chicago instead, while the regiment slept in the streets.

The outstanding feature of the situation has been the remarkable facility with which the entire movement has been handled, both by the railroads and by the war department, as compared with the experience during the Spanish-American war, and considering the short notice on which it was undertaken. It is a noteworthy fact that the criticisms which have been published have come from state officers and political

colonels rather than from regular army officers. In fact the war department has declared these criticisms "entirely unjustified." The railroads have displayed a degree of preparedness so far as organization is concerned, which has been in marked contrast with that of either the federal government or of the state militia.

President Wilson has expressed his public appreciation of the work of the American Railway Association special committee on co-operation with the military authorities, which promptly placed at the disposal of the war department a complete organization of operating men to assist it in co-ordinating the facilities of the various roads. Little has been said, however, about the important work by the military committees of the railroad passenger associations and the quartermaster-general's department in systematizing the business relations between the railroads and the government concerning the handling of military transportation. As briefly outlined in last week's issue, a complete military agreement had been reached between the railroads and the government, which practically provides for a pool of the resources of the railroads for the transportation of troops, and under which detailed routes have been worked out in advance so as to give each road its equitable share in the traffic and at the same time insure the most direct routes, a reduction from the lowest combination of land grant rates and the avoidance of congestion either at terminals or at junction points. When the emergency arose members of the military committees went to Washington and completed the arrangements in a very short time. The railroads also, in most cases, gave the troop trains right of way over other trains, and many of them greatly curtailed their Fourth of July and other excursion, or special service, in order to give preference to the military traffic.

The real deficiencies in the preparations are not to be ascribed to the trained railroad and army officers who have been called upon to make a public demonstration of their ability, but to the pork-barrel politics which has interfered with carrying out the recommendations of those whose business it was to know what was needed and to the indifference of a public that has allowed such politics to prevail in its government.

NEW BOOKS

Application of Agency Tariffs. By John P. Curran, LL.B., of the Central Freight Association, Chicago. 420 pages, 6 in. by 9 in. Bound in paper. Published by LaSalle Extension University, Chicago.

One of the most important duties of the traffic man is to be familiar with the application of some part of the large number of freight tariffs, applicable upon traffic moving between various points, to his own particular work. This publication is devoted to the agency tariffs published by the various tariff-issuing bureaus throughout the country, and gives in concise form, arranged so that it can be readily located, the number and the description or name of each tariff issued by the various agencies, together with a statement of the points to which they apply. The author states in the preface that as to local tariffs it is not possible to put into permanent form any considerable amount of information relative to the application of each tariff, but that as to the agency tariffs, applying between competitive points, it is possible to give information relative to the application with some degree of accuracy, because they are usually given a series number, which is continued with each reissue by the use of a letter appearing before or after the number. Information given in the book is divided into two classes. When it is desired to know the scope of tariffs issued by some specific association the reference is found in Section A; when it is desired to know when agency tariffs apply from a specific state, regardless of what association issues the publication, the tariffs may be located by the list in Section B.

Letters to the Editor

END SLOPES FOR HOPPER CARS

Pontiac, Mich.

To the Editor of the Railway Age Gazette:

The fundamental of a dump car is to dump; but many railway officers content themselves with cars which are partial dumpers, when for the same money they could have complete dumpers. It is just a matter of placing the end slopes at the proper angle of inclination, so that the entire load will run out when the doors are opened.

By examining the general run of coal cars in service it will be found that their end slopes are only 30 deg. from the horizontal. Watch the unloading of such cars; from two to eight men are employed, and from the moment they begin on a car until they are through with it they consume 40 min.—the 8 men taking 5 min., or the 2 men 20 min. Multiply this 40 min. for the one car by the thousands of unloadings which occur daily on the railroads throughout the country and the waste of time and money is seen to be enormous.

By simply steepening the end slopes this time can be reduced to one minute per car; but so long has this faulty design been adhered to, that the 30 deg. end slope is accepted by the majority of railway officers as inspired. However, it can be changed, and it has been changed, notably on a large number of cars which have been running on the Chesapeake & Ohio for more than two years. These cars have their end slopes 20 deg. steeper, or 50 deg. from the horizontal, notwithstanding the fact that car builders and others said it could not be done. They have a rated capacity of 70 tons, and one of them has been loaded with 79.9 tons of soft coal, thus proving that the cubic capacity was more than ample for the rating. Frank S. Ingoldsby.

RAILWAY CLEARING HOUSE

Chicago, Ill.

To the Editor of the Railway Age Gazette:

Referring to the editorial comment on page 1 of the issue of the *Railway Age Gazette* of July 7, 1916, concerning the above subject, I beg to say that the argument advanced by Mr. Seger as the reason for his opposition to the establishment of a clearing house, to which you refer, is comparatively a new one. In fact, Mr. Seger is the only person, to my knowledge, who has mentioned it and I think I would have heard of it if others who have considered the subject had employed it, as I have been on the committee of the Society of Railway Financial Officers which has had consideration of this subject for many years, which committee has held joint sessions with committees representing the accounting officers.

It was at such a joint meeting held in New York a few months ago that Mr. Seger mentioned this argument, but it was considered of such trifling importance at that time that the members of the committee of the Society of Railway Financial Officers did not consider it important enough for consideration. Besides, Mr. Seger admitted at that time that he had not seen or studied the clearing house plan, and our committee, wishing to avoid as much argument as possible, depended upon the merits of the plan to win its way.

Mr. Seger has still evidently omitted to study the clearing house plan as developed by the committee of the Society of Railway Financial Officers, or he would not have used such an argument. Those plans provide for the establishment by the railroad companies of a clearing house to be under the control and management of the railroads, and ample provisions made for revising and improving the same in any

way found necessary. In other words, it is to be a creature of the roads, operated for the benefit of the roads, and is not an "outside" institution. To argue, therefore, that the clearing house takes from the railroad companies the control of cash seems to me as far fetched.

If this argument had merit, it certainly would have been discovered earlier by certain persons who have strenuously opposed the clearing house, and when every objection has been met, they have been hard pressed for an excuse for their opposition.

In view of the economy and benefit the railroads would receive from the establishment of a clearing house, it is unfortunate that it cannot speedily be established, and on account of opposition of certain individuals who are in a position to block the efforts, it seems possible that its realization may be postponed as you surmise.

I may add that the family clearing house plan as suggested in the resolution of the joint committee referred to on page of your last issue, is now in operation with the Pennsylvania and New York Central Lines and possibly others, to their entire satisfaction, I understand. If it is advantageous to those systems, it certainly would be if extended to include all roads.

BYRON CASSELL,
Treasurer and Assistant Secretary, Chicago, Indianapolis & Louisville.

WIRELESS ON THE UNION PACIFIC

OMAHA, Nebr.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read with pleasure the report of the meeting of the Association of Railway Telegraph Superintendents in the *Railway Age Gazette* of June 30. I was particularly interested in the portion relating to wireless telegraph and telephone communication, since I have been experimenting along these lines for 10 years. You are undoubtedly aware that the Union Pacific was the first road to suggest and carry out this means of communication on a railroad and has con-



Car Fitted for Wireless Experiments on the Union Pacific

ducted experiments, the value of which is immense if the railroads could be made to see it. This is sometimes difficult, however, on account of the lack of precedent and money to spend for such work.

The accompanying illustration shows our "Communication Car," just completed. It is a converted diner and is peculiarly fitted for experimental work, both in telegraph and telephone service with and without wires. We have a station on the roof of the headquarter's building in Omaha and one already for operation at Grand Island, with a prospective one at North Platte, Nebr.

The only error so far discovered in the construction of this car is the use of turnbuckles in compression instead of tension for placing the antennae under tension. This will be changed later, these pieces having been made with the intention of fastening them at the ends of the car, but it was found impossible to secure a satisfactory fastening.

FREDERICK H. MILLINER.

NOISE NUISANCE ON SLEEPING CARS

PORTLAND, Ore.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Referring to the letters published in the *Railway Age Gazette* May 19 and June 2 on the subject: "Noise Nuisance," I feel that it is my duty to offer a few suggestions, which, if carried out by the traveling public, will diminish complaints, without the least inconvenience on the part of the passenger. I am working equally hard to make a success *as a porter* as my superintendent is working to make a success of his position. If the arriving and departing passengers would maintain quiet at night, our troubles and theirs would be over.

1. Should you have no berth reserved when entering car at night, quietly inform the porter who will immediately summon the conductor, or if the porter is waiting upon another passenger, wait patiently until he can get to you. Remember when you go to a theatre how patiently you wait for the usher to direct you to your seat. Your waiting does not indicate that you are not able to find your seat, but the fact that others are present, and you do not want to disturb them —so you will wait for the usher, and I beg you to give the sleeping car porter similar consideration.

2. Should you desire to use the upper berth for your clothing, don't wait until the porter reaches the far end of the car and then shout, "Porter, will this upper be occupied?" Should it fall to your unfortunate lot to leave the car between the early hours of 3 and 6 a. m. and you should find it a bit difficult to locate your shoes or baggage, summon the porter; it might be that he has taken the grip that you left in the aisle upon retiring, and placed it in some upper berth, or, it might be that some one in passing has accidentally kicked your shoe back out of your sight and reach. Should you have need to ring the bell during the night, remember the annunciator is located at the men's end of the car. Should the porter be at the opposite end, it would be necessary for him to pass your berth on his way to see who was in need of his service. You look out and see that it is the porter, don't shout to him. Just wait, he will return as soon as he has consulted the annunciator.

3. When boarding a sleeper after others have retired, kindly refrain from loud talking. When two or more passengers board a car together, they invariably congregate in the middle of the car and begin to ask each other, "What berth have you?" "What time are you going to get up?" "I left a call for 7 a. m., get up and have breakfast with me," and by that time they have awakened every one.

LEE ANDERSON,
Porter, The Pullman Co.

RELATIVE EFFICIENCY OF GERMAN AND AMERICAN RAILWAYS

AUSTIN, Tex.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

H. W. Faus' article on relative efficiency of American and German railways in the *Railway Age Gazette* of June 16 is the most conclusive presentation of the subject I have seen. The argument on the effect of the average length of haul on freight receipts is particularly appropriate.

I am sure the writer will welcome any justifiable exception to his statements; so I submit a couple of minor corrections.

Mr. Faus speaks in a derogatory way of German freight cars—seems to think them out of date and inefficient. A close

study of their design, construction and manner of use, will, I think, put this matter in an entirely different light. As to couplers, the screw-coupling used on the Continent is very efficient, although apparently not quite as safe as our automatic coupler. In proportion to the car capacity the screw-coupling is much lighter. As to car capacity, a German railway official made me this explanation: "If it is desired to move 40 tons, on four axles, what matters it whether we have a single car platform, or two platforms connected by coupling? Except in minerals, average carloads are small, and we get a better availability of loading capacity with small cars than with large." This seems a reasonable proposition. In 1911 the average loading of German cars was about 9 tons, their average capacity 14 tons; per cent utilized 64 per cent; in 1911 the average loading of American cars was about 13 tons, average capacity 37 tons; per cent utilized 36 per cent. Other factors enter in, of course, but the argument for high capacity merchandise cars is not very strong from a railroad efficiency standpoint. I may remark that the Bureau of Railway Economics computes the average carrying capacity per German freight car as 15.7 tons instead of 14 tons.

The short time allowance given German shippers is certainly in the direction of efficiency. Every American railway manager would wish that he could abridge the free time now allowed shippers. Generally speaking, these allowances are much longer than necessary. If we assume that the average haul is 150 miles, and the average daily mileage per car is 25, then it takes six days to complete a movement. If two days of this is now given as free time, and this free time were cut in two, there would be an apparent reduction of one-sixth in the number of cars to transport the country's business. One-sixth of 2,400,000 freight cars is 400,000, representing an investment of some $300,000,000 and 3,000 miles of track and yard room. I do not contend that the cure for this inefficiency lies with our managers; it probably lies with our regulatory bodies, and with a more far-sighted and co-operative attitude on the part of the larger shipping associations. But in this very particular, Mr. Faus has proven an efficiency, not an inefficiency, of German operation.

In regard to capitalization, Mr. Faus makes the broad statement that the Germans burden their capital accounts with items that are really operating expenses, and attempts to prove his assertion by saying the German capitalization per mile has increased $20,000 in the last 21 years. I do not believe there is much merit to this contention. Net capitalization per mile of line has increased $12,000 in the United States in the last 20 years. Much of this is due to heavier standards of construction, double tracking and terminals. The same causes have been operative in Germany, where 40 per cent of the mileage is double tracked, and where there are six-tenths of a mile of yard tracks, etc., for each mile of line. The corresponding figures for the United States are: 10 per cent double tracked, and less than four-tenths of a mile yard track, etc., for each mile of line. That $20,000 per mile is not an undue increase in 21 years is shown by the valuations placed upon railroads in Texas in this period. In 1894 the roads of this state were valued at $15,926 per mile. This was a careful inventory and engineering estimate, based on current costs for construction. It was a fair value for the character of roads traversing that region at that time and included no water, nor fancy land values. The Railroad Commission of Texas has kept up the valuations of the roads year by year, as new lines were built and old ones improved. The valuation in 1915 was $26,304 a mile, or an increase of $10,378 in 21 years. There is no double track in Texas; and the traffic density of Germany is about four times as much per mile of line as that of Texas. The areas are about the same.

In comparing costs per mile in America and Europe, we must constantly bear in mind the favorable treatment accorded railroads here in the matter of donated or cheap lands, with broad right of way. In Europe the cost of condemnation (including structures removed, cost of highway crossings and protection, etc.), has been very high, and the construction has been made more expensive due to the use of narrow right of way.

I do not believe Mr. Faus can maintain that, on the average, American railroads have entailed a greater construction cost than German roads, whether on the mile of line, or mile of track basis. German rail is generally heavier; tie-plates are more substantial and more generally used; ballasting is generally superior, also bridging, there being less timber trestles. American materials have been cheaper; this, and the use of more wholesale construction methods, largely offsetting the higher labor cost.

With these small amendments, I heartily endorse Mr. Faus' analysis, and think it a fair statement of the relative efficiency of railroading in the two countries.

It would be interesting to see a similarly handled comparison of English and American, or English and German efficiencies.

R. Emerson.

THE CLERK PROBLEM

Michigan.

To the Editor of the Railway Age Gazette:

May I take a few exceptions to the letter in your issue of March 17 signed "One of the Clerks?"

I do not think the statement that railroad clerks as a class are "in a blind alley" is due to any other reason than that the average clerk works the stipulated number of hours, and performs only that amount of work that he has to in order to hold his job.

The ambitious railroad clerk will succeed, and the higher he aims the greater his reward; if a clerk puts the same amount of study into his duties, as he would have to in order to qualify as a steam shovel man, his annual income would compare favorably.

Three and a half years ago I was getting into the rut myself, and had practically decided to take up a correspondence course; but while thinking it over, I decided to put the same amount of energy and enthusiasm into my work that I would have to put into my course. My salary was $60 a month, and I was in "a blind alley." My salary is $120 a month now, and although I see nothing definite before me in the way of promotion, I am not at all prepared to say I have reached my limit.

Possibly I am wrong, but I believe many of the higher officers of the railroads were clerks once, with "nothing ahead of them" except ambition and the power to use the brains that God gave them!

Another Clerk.

Railway Extensions in Caucasia.—The railway extension from Julfa, on the river Araxes, to Tabreez has been completed. The gage of the new railway, which is 93 miles long, is the same as that of the Russian railway system, namely 5 ft. The railway is under Russian control and management, and is not at present intended for the conveyance of passengers. The track follows between Julfa and Tabreez the line of the Indo-European telegraph system to India. From the town of Sophian, about 25 miles from the Tabreez, a branch of the railway has already been completed to Lake Urumiah, around which is one of the richest districts of Persia. This railway, with its branch line, will doubtless cause an enormous development through all this part of Persia. Much new land will be opened up to agriculture, and various mines, chiefly copper and wolfram, will be worked which have not been developed because of transportation difficulties. The railway may be extended to Teheran, thence southeast to Ispahan, and into Baluchistan, whence it could connect up at Nushki with the railway system of British India.

Failure of Government Ownership in Canada*

History of the Results of Operation of the Intercolonial for Forty-Seven Years Shows Bankrupt Condition

By Samuel O. Dunn

PART I

THE subject of government ownership of railways is of perennial interest in the United States. Discussions of the subject usually move along two lines. One class of speakers and writers base their reasoning on certain assumptions as to the honesty, public spirit, and efficiency which would characterize a railway management representing the public. Their conclusions naturally correspond with their assumptions. Another class analyze the results of government management in one or a few countries, find them good or bad, and base on them conclusions as to whether the results in the United States would be good or bad.

Both of these kinds of reasoning have the same defect. They do not take enough account of the conditions in any given country under which a railway policy must be carried out. These conditions are of various kinds, physical economic, political, and so on; and they largely determine the results of railway management and operation under either private or public ownership.

One of the mistakes most often made is that of ignoring the political conditions under which government ownership is, or would be, tried. The question is often treated as if it were merely one of economics. It is one both of economics and of political science. The efficiency and economy of a government are determined largely by how much it is influenced by politics of the low kind; and the influence of this kind of politics depends on the organization of the government and the attitude of the people. As the efficiency of a government as a whole must depend largely on the part played by politics, the way its railway department would be managed would necessarily be determined largely by the same cause.

The results of government railway management being largely determined by conditions, and especially by political conditions, the experience with government management in a single country, where the conditions are similar to those in the United States, may throw more light on the question in this country than much abstract reasoning, or than large amounts of data drawn from the experience of countries where the conditions are widely different.

There is no country whose conditions, physical, economic, and political, are more similar to those of the United States than those of Canada. The Dominion is an adjacent part of the same continent. The larger part of it is extremely like the conterminous larger part of the United States. Its natural resources, industries, and products are similar. Both countries are inhabited mainly by descendants of the peoples of Northern Europe, although this point might be pressed too far. With its big French population, Canada has a large representation of the Latin races. But the ancestries of the people of the United States are not all traceable to Northern Europe; and the French in Canada have as much political capacity as our many voters from Southern Europe, not to mention our millions of negroes. The government of the United States is a democratic republic. That of Canada is not a republic in form, but its people are as self-governing and its institutions are as democratic in fact as those of any country. There are considerable economic differences; but these are unimportant in comparison with the points of resemblance.

The results of government ownership and management of railways in Canada should, therefore, afford the most reliable indication available as to what would be the results in the United States. Canada has tried public ownership and her experience has been long and on a large scale. The Dominion has owned the Intercolonial Railway for forty-seven years, and certain of the colonial governments owned parts of it before. It has owned the Prince Edward Island Railway for forty-three years, and acquired it from the government of the island. The Intercolonial and Prince Edward Island have 1,736 miles of line; and the Dominion has recently built and is operating the National Transcontinental Railway, which has 2,067 miles. The Canadian government railways now have, combined, 3,803 miles of line.

The construction, by the government, of the National Transcontinental led to a scandal. The plan for its building was adopted in 1903. It was to run from Moncton to Quebec, and from Quebec to Winnipeg, and on its completion was to be leased to the Grand Trunk Pacific for 3 per cent on its cost of construction. The minister of finance presented to parliament a "liberal" estimate. Eighteen hundred miles were to cost $61,415,000, or $34,083 a mile. A government commission was created to handle the work. On September 30, 1911, the expenditures had reached $109,000,000; by the end of 1914 no less than $173,000,000, or about $99,000 a mile, had been spent; and at latest reports the total was about $200,000,000.

A new government commission was appointed in 1912 to investigate the work of the original government commission. It reported in 1914 that there had been gross mismanagement and extravagance, and the waste of many millions of dollars; and the Grand Trunk Pacific refused to take the property over for operation because it could not afford to pay 3 per cent on its excessive cost.

The reports regarding the mismanagement of the construction of the National Transcontinental attracted much attention in the United States. As a matter of fact, the results of government construction of the National Transcontinental are typical of the results of public ownership in Canada ever since the various parts of the Intercolonial were acquired by the Dominion forty-seven years ago.

The Intercolonial, the Prince Edward Island, and the National Transcontinental all failed to earn their operating expenses in the year ended on June 30, 1915, their combined deficit from operation being $350,000. A stranger to the facts might attribute the results in 1915 partly to the effects of the war in Europe. For that reason, in the following study of government management in Canada, the statistics used are chiefly those for the year ended on June 30, 1914. The most attention has been given to the Intercolonial, because it is the only large road on the North American continent which has long been managed by a government.

The Intercolonial in 1914 had 1,457 miles of line. Its main lines run from Sydney and Halifax to Moncton, and thence to Quebec; and it serves the provinces of Nova Scotia, New Brunswick and Quebec. The Prince Edward Island is a narrow-gage road of 279 miles, serving the island of

*Reprinted by permission from The Journal of Political Economy, July, 1916.

that name, and is managed by the same organization. The acquisition of the Intercolonial was provided for by the act of federation of July 1, 1867. It was originally purchased and developed by the government mainly to bind together more firmly the French and English provinces. In 1876 it had 348 miles in New Brunswick, 222 miles in Nova Scotia and 375 miles which had been constructed by the government from Moncton, New Brunswick, to Rivière du Loup, Quebec—a total of 945 miles. From Rivière du Loup to the city of Quebec it leased a line from the Grand Trunk. The Prince Edward Island became a part of the government system when the island came into the confederation on July 1, 1873.

One of the arguments advanced for government ownership in the United States is that under it the profits made by the railways would be received by the public instead of going to private capitalists. Those who reason thus often forget that while railway companies, if successful, yield profits to private capitalists, they also, unlike state railways, pay taxes to the public. The experience of the world shows that the public, while sure to collect large taxes from private railways, is not certain to receive any profits at all from state railways. Most of them do not earn interest on their investments.

Those of Canada afford an extreme illustration. The statistics which make the deepest impression on the student of their official reports are those showing their heavy losses; and official figures tell but a fraction of the story. The Canadian people and public officials have only the haziest idea as to what the losses actually have been. No one heretofore has gone thoroughly into the matter. Many know that in some years the roads have not earned their operating expenses, but that in other years the Intercolonial has done so. Therefore, most of them apparently believe that the total losses incurred, while considerable, have not been very great. No impression could be more erroneous. The total losses sustained have been enormous.

The combined cost to June 30, 1914, of the Intercolonial and the Prince Edward Island, as shown by the official reports, was $112,351,000, or $64,718 per mile. The cost per mile of the Intercolonial had been $70,815, and of the Prince Edward Island, $31,973.* Computed in a more correct way, their total cost to the public had been $381,000,000, or $219,000 per mile. This figure includes expenses and interest which they had failed to earn, but nothing for the taxes which the public would have collected from them if they had been privately owned. These railways are almost entirely single-track lines; they are not very well constructed, maintained or equipped; and yet their cost per mile to the public, properly computed, has exceeded the average capitalization of any railways in the world except those of Great Britain. Their losses in the fiscal year 1914, as shown by the official reports, were $445,000, this being the difference between their expenses and earnings. Properly computed, their losses in

TABLE I—INTERCOLONIAL RAILWAY

Years*	Operating revenue	Operating expenses	Net earnings or operating deficit (—)	Official cost of construction	Actual cost to the public
1867	.....	.....	.....	$10,766,725.54	$10,766,726.00
1868	$420,752.58	$359,961.08	$60,791.50	11,250,079.19	11,619,957.00
1869	455,022.76	387,548.47	67,474.29	11,532,694.37	12,299,896.00
1870	471,245.09	445,208.75	26,036.34	13,262,075.86	14,495,237.00
1871	565,713.52	442,993.31	122,720.21	16,178,857.99	17,869,108.00
1872	622,900.56	595,076.22	27,824.34	21,309,999.50	23,687,190.00
1873	703,458.26	1,011,892.60	—308,434.34	26,511,449.87	30,144,562.00
1874	893,430.17	1,847,175.24	—953,745.07	30,126,348.68	35,918,988.00
1875	861,593.43	1,532,589.62	—670,996.19	33,552,448.23	41,452,843.00
1876	848,861.46	1,277,197.79	—428,336.33	34,660,769.82	44,647,615.00
1877	1,154,445.35	1,661,673.55	—507,228.20	35,979,122.01	48,259,100.00
1878	1,378,946.78	1,816,273.56	—432,326.78	36,387,938.75	51,030,608.00
1879	1,294,009.69	2,010,183.22	—716,083.53	36,614,577.94	54,014,555.00
1880	1,506,298.48	1,603,439.71	— 97,131.23	38,662,592.54	58,320,283.00
1881	1,760,393.92	1,759,851.27	542.65	39,271,325.34	61,287,699.00
1882	2,079,262.66	2,069,657.45	9,605.18	39,856,894.13	64,287,699.00
1883	2,370,910.10	2,360,373.27	17,547.18	41,473,527.09	68,458,293.00
1884	2,384,414.92	2,377,433.62	6,981.30	44,163,216.58	73,879,323.00
1885	2,441,203.66	2,519,751.56	— 78,547.90	45,410,223.03	78,160,050.00
1886	2,450,093.88	2,583,999.67	—133,905.79	46,090,579.37	82,100,714.00
1887	2,660,116.93	2,922,369.62	—262,252.69	47,014,309.44	86,570,726.00
1888	2,983,336.05	3,366,781.74	—383,445.69	48,727,292.73	92,129,984.00
1889	2,967,801.00	3,244,647.73	—276,847.73	51,340,586.76	98,705,325.00
1890	3,012,739.87	3,560,575.74	—847,835.87	53,310,431.46	105,471,219.00
1891	2,977,395.38	3,662,341.94	—684,946.56	54,260,512.44	111,325,096.00
1892	2,945,441.97	3,439,377.00	—493,935.03	54,577,296.40	116,588,819.00
1893	3,065,499.09	3,045,317.50	20,181.59	54,874,186.83	121,529,080.00
1894	2,987,510.17	2,981,671.98	5,838.29	55,311,720.61	126,821,939.00
1895	2,940,717.95	2,936,902.74	3,815.21	55,638,755.12	132,218,037.00
1896	2,957,670.10	3,012,827.62	— 55,187.52	55,897,860.35	137,821,051.00
1897	2,866,028.02	2,925,968.67	— 59,940.65	56,046,972.87	143,542,947.00
1898	3,117,669.85	3,327,648.51	—209,978.66	56,299,729.67	149,747,401.00
1899	3,738,331.44	3,675,686.21	62,645.43	57,381,659.61	156,756,582.00
1900	4,552,071.71	4,431,404.69	120,667.02	60,637,007.81	166,161,526.00
1901	4,972,235.87	5,460,404.64	—488,186.77	64,270,844.38	176,930,011.00
1902	5,671,385.91	5,574,563.30	96,822.61	68,897,685.43	188,537,229.00
1903	6,324,323.72	6,196,653.19	127,670.53	71,151,952.11	198,205,314.00
1904	6,339,231.43	7,239,982.04	—900,750.61	73,032,808.71	208,915,135.00
1905	6,783,522.83	8,508,826.75	—1,725,303.92	77,770,430.64	223,734,666.00
1906	7,643,829.90	7,881,914.36	61,915.54	81,535,601.54	236,387,308.00
1907	6,248,311.00	6,030,171.83	218,139.17	83,041,810.80	247,130,870.00
1908	9,173,558.80	9,157,435.53	16,123.27	87,424,304.00	261,382,476.00
1909	8,527,069.46	9,328,021.55	—800,952.09	91,291,536.00	276,505,959.00
1910	9,268,234.99	8,645,070.33	623,164.66	92,569,945.00	288,221,441.00
1911	9,863,783.40	9,595,976.79	267,806.61	93,332,814.00	300,245,361.00
1912	10,593,785.84	10,591,035.84	2,750.00	95,141,659.00	314,061,270.00
1913	11,984,482.69	11,984,482.69†	.....	97,533,647.00	329,020,209.00
1914	12,878,549.00	12,878,549.00‡	.....	103,430,848.00	348,089,518.00
Total, Intercolonial Railway, 47 years	$184,707,592.00	$194,268,891.00	—$9,565,036.00	$103,430,848.00§	$348,089,518.00
Total, Prince Edward Island Railway, 40 years	7,759,846.00	11,040,128.00	— 3,280,282.00	8,920,369.00	32,902,398.00
Total, both government railways, since act of confederation	192,467,438.00	205,309,019.00	—12,845,318.00	112,351,217.00	380,991,916.00

* Until 1907, the fiscal year ended on June 30; since that date on March 31. The figures for 1907 as given in the table are for nine months.

† Of this total $4,500 was paid for "compassionate allowances" by special vote of Parliament.

‡ Of this total $11,300 was paid for "compassionate allowances" by special vote of Parliament.

§ Total capital cost of the Intercolonial reported in Railway Statistics, published by the department for June 30, 1914. The cost as given in the annual report—$101,468,073—does not include several construction items carried in separate accounts, but which are included in accounts showing results of operation.

*Railway Statistics for the Dominion of Canada, published by the Department of Railways and Canals, 1914, p. xii. Capital cost per mile of the Intercolonial, as shown by Railway Statistics for 1915, was $75,066.

that year were almost $15,000,000. They can hardly have a physical value exceeding the $112,000,000, or $64,718 per mile, which they are officially represented to have cost. Assuming that they are worth this, the difference between their present value and the total amount they have cost the Canadian public is $268,000,000, or $154,378 a mile. This represents the absolute loss they have inflicted on the taxpayers of Canada. And this estimate, as already indicated, is really an underestimate, for it makes no allowance for the taxes the government would have collected from them if they had been privately owned. If the Intercolonial and Prince Edward Island were taxed at the same rate as the railways of the United States, their taxes would be $600,000 a year.

Conclusions so startling should not be stated unaccompanied by the reasoning and method of calculation used in arriving at them. Let us consider in more detail, then, the official figures and the computations which may properly be based upon them.

The management of the Intercolonial by the Dominion government has covered forty-seven years. The official figures show that in twenty-two of these years its earnings have exceeded its operating expenses, its combined net earnings in these years having been $1,967,000. In the other twenty-five years its operating expenses have exceeded its earnings, and its combined deficits from operation in these years have been over $11,500,000. Therefore, under government management its net deficit—allowing nothing for taxes or interest—has been $9,500,000. Still worse has been the plight of the Prince Edward Island. Its operating expenses have exceeded its earnings in every year the government has owned it, its total operating deficit in the years 1875-1914 having amounted to $3,280,000. The deficits from operation of the two roads under government management have been $12,800,000. Detailed statistics regarding the cost of construction, the operating expenses, the total earnings, and the net earnings, or deficits from operation, of the Intercolonial are given in columns 1 to 4 of Table I. Totals of similar figures for the Prince Edward Island Railway and for the government roads combined are appended to the table.

The figures of these first four columns, bad as they are, take no account of one of the most important factors to be considered. This is interest charges. Interest is as unavoidable a part of the cost of conducting any business as operating expenses. If the interest charges of a private railway are not earned, it becomes bankrupt. If those of a state railway are not earned, they must be paid from taxes. Nominally, the state railways of Canada have no debt. Actually, the investment represented and the losses incurred by them appear in the government debt and the interest paid on it, for, if the earnings of the railways had sufficed to pay their expenses and interest, the government debt and the interest on it would be proportionately smaller. Therefore, to ascertain approximately the true amount which the government railways have cost the public, we must ascertain not only what has been spent for their construction, but the expenses and interest that they have not earned.

To do this the author has recast the official figures. To the original investment in the Intercolonial and the Prince Edward Island have been added the expenditures for new construction during the first year of public management, and interest on the original investment; and the net earnings or the net deficit from operation in the year—whichever resulted—has been deducted or added. This gives approximately the true cost of each railway to the public at the end of the first year of government management. This true cost has been taken as a new starting point, and made the basis of a similar calculation for the second year; and this process has been repeated year by year for the entire history of each road. The rate of interest used in the calculations is 4 per cent. When the Dominion acquired the railways the rate it had to pay on its general indebtedness was more than this. It appears in official reports that it paid 5 per cent to the provincial government of Quebec for railway purposes up to 1905, and has paid 4.5 per cent since. The use of an average rate of 4 per cent for the entire period is, therefore, conservative. The results for both roads of the computations thus made are shown in the last column of Table I.

The combined total cost of construction of these lines on June 30, 1914, as officially reported, was $112,351,217, and the unearned interest on this lost in that year, at 4 per cent, was $4,494,048. Their combined operating expenses in the same year, as reported in Railway Statistics, the official publication, exceeded their total earnings by $445,380. (The actual deficits shown in the annual reports of 1913 and 1914, as existing at the end of the fiscal years ending on March 31, were ostensibly wiped out by "compassionate allowances" under special votes of Parliament!) Therefore, in 1914, their total deficit, after adding interest, as indicated by official figures, and allowing nothing for taxes, was $4,939,788. But this deficit for the year, which is demonstrable by the official figures, is small compared with the deficit shown by the corrected figures. The true total cost of the railways to the end of the fiscal year 1913 was $360,285,010. Unearned interest on this at 4 per cent for the next year amounts to $14,411,400. This, together with the deficit from operation, makes a total deficit for the year 1914 of $14,856,780.

Since the Prince Edward Island Railway is a narrow-gage line, serving only the island of that name, it may be that in its case the obstacles to profitable operation are insuperable. Entirely different is the situation of the Intercolonial. It is a standard-gage road with a large mileage in a territory similar to parts of Eastern Canada and the United States in which privately managed railways operate with profit. Considering the Intercolonial separately, its cost of construction, to 1914, as officially reported, was $103,430,848, or $70,815 a mile.[1] The unearned interest on this in 1914 at 4 per cent was $4,137,233. Its actual deficit from operation was $291,270. Therefor, its total loss in that year, as demonstrable by the official figures, was $4,428,503. But its total cost, including its losses, up to the beginning of the fiscal year 1914, amounted to $348,089,518. Unearned interest on this at 4 per cent was $13,923,580, which together with the operating deficit makes a total deficit for the year ended June 30, 1914, of $14,214,850. And this allows nothing for the taxes the road would pay if privately owned. Such is the price the taxpayers of Canada are paying for government ownership!

There is in Intercolonial history a minor illustration of the fact that government ownership is less fatal to financial success than governmental management. The Windsor branch, from Windsor Junction to Windsor, Nova Scotia, is a part of the road. It is thirty-two miles long. Since 1881 it has been leased to operating companies and since 1911 it has been operated under lease by the Canadian Pacific. In every year but one since 1881 the government has received net earnings from it. It is maintained by the Intercolonial, and the government receives as rental one-third of its gross receipts. In the last twenty years the amount of net earnings, after deducting maintenance expenses, has varied from $15,000 to $39,000 per year.[2] The net earnings of the branch, in the aggregate, from 1881 to 1914, were $662,555; and they account for more than one-third of all the net earnings the Intercolonial has made since 1867.

The Canadian state railways are an utter financial failure. The losses are due to low rates, to extravagant managemnet, or to both. Many consider it expedient to make low rates on state railways, even if this causes deficits; and it can be said for this practice that those who pay the rates gain what the taxpayers lose. If the losses are due to wastefulness,

[1] Railway Statistics of the Dominion of Canada, 1914, p. xii.
[2] Annual Report, Department of Railways and Canals, 1914, p. 420.

the management obviously cannot be defended on any ground.

Before we inquire to what extent the losses incurred have been due to the rates made, let us consider whether it can be sound policy for railways to make unremunerative rates at the expense of the taxpayers. Either those who pay non-compensatory rates and those who pay the taxes levied to meet the deficits they cause are the same people, or they are different people. If they are the same people, what they gain by the rates is taken from them in increased taxes. If they are different people, those who pay the rates get their transportation for less than cost and those who pay the taxes pay for something they do not get. It is hard to see how anybody can be benefited by saving money through low rates and having it all taken away in increased taxes. It is also hard to find justice in giving some people low rates at the cost to others of higher taxes.

Both common-sense and equity require rates to be so fixed that those who receive transportation service shall pay for it in full. The application of this principle to the situation in Canada makes it easy to decide in regard to the soundness of the rate-making policy followed on the government railways, if to it are due their losses. These railways serve only the people of the eastern provinces, and but part of them. The people of the entire Dominion must pay the taxes levied by the government. Therefore, if the trouble with the government railways is that their rates are too low, the few who use their service are unfairly benefiting at the expense of all the people of the country.

In spite of its chronic deficits, the freight rates of the Prince Edward Island Railway are very high, averaging over 4 cents per ton per mile. Its passenger rates are relatively low, averaging about 1.75 cents. But the Prince Edward Island is small and serves a restricted territory. The rates of the Intercolonial are more instructive. The average rate per passenger per mile on the railways of the United States in 1914 was 1.98 cents, and on all the railways of Canada, 2 cents.[1] On the Intercolonial it was 1.67 cents.[2] The average rate per ton per mile in the United States was 7.33 mills, and in Canada, 7.42 mills.[3] On the Intercolonial it was only 6 mills.[4]

But comparison of the rates of a single railway with those of the railways of a whole country may be misleading. For example, while the average freight rate of the Intercolonial is lower than the average rate of all the railways of the United States, there are many individual lines in this country whose average rates are lower than its average rate. The average in 1914 for the entire eastern district of the United States, in which one-half of all the freight tonnage is moved, was only 6.39 mills.[5]

In the eastern parts of both Canada and the United States the rates generally are lower than in the western parts. This is due to various causes. In the eastern part of this country the freight traffic is dense, and the rates for years were determined by fierce competition, which reduced them to a low basis. The effects were felt in Eastern Canada. There is a great deal of traffic which moves on railways partly in that country and partly in the United States. Among these lines are the Canadian Pacific, the Grand Trunk and the Michigan Central. In fighting for their shares of this competitive business, these roads made their through rates the same as those of rival lines in the United States, and had to put their local rates in Canada on a corresponding basis. The rates of the Intercolonial were affected by this policy.

The territory through which and the conditions under which the International operates are, of course, similar to those of the private railways of Eastern Canada. Therefore, its rates may most fairly be compared with theirs. The principal privately owned lines serving that section are the Canadian Pacific and the Grand Trunk. Unfortunately, it is not easy to compare their rates with the Intercolonial's. The Intercolonial's lines begin at Montreal and extend to the Atlantic seaboard at St. John, Halifax and Sydney. The Canadian Pacific divides its western and eastern lines at Port Arthur and Fort William, on the western boundary of Lake Superior. Therefore, while its eastern lines extend as far east as the Intercolonial's, they include a mileage extending more than 1,000 miles farther west than the Intercolonial extends. The Grand Trunk has more mileage west of Montreal than east of it. Because of these facts the average rates of the Grand Trunk and the eastern lines of the Canadian Pacific probably would be higher than those of the Intercolonial, even if their absolute rates in the parts of their territory corresponding to its territory were the same.

There is another factor of no small importance to consider. This is the relatively great length of the Intercolonial's lines between its main terminals. The immediate purpose of its original acquisition and development by the Dominion[6] was to bind more firmly together the maritime provinces, whose population was chiefly French, and the rest of the Dominion. To accomplish this it was necessary to build a line to Montreal. There was friction between Canada and the United States. It was feared that if this line was built nearer the border it would, in case of war, fall into the hands of the United States.[7] Therefore, a route was surveyed as far as possible from the border. This extended northward to the wild, inhospitable, and almost unpeopled shores of the Gulf of St. Lawrence and the St. Lawrence River, and thence southward to Quebec and Montreal, making a roundabout and expensive way to handle traffic moving between Sydney, Halifax and St. John, and Quebec and Montreal.

Friction between the United States and Canada long ago ceased. The Canadian Pacific has built a much shorter line, partly in Canada, and partly in the state of Maine, to the Atlantic seaboard, and has almost completed another which runs entirely in Canada and is also shorter than the Intercolonial. An enterprising management would years ago have built a cut-off to shorten the mileage of the Intercolonial between important points, thereby enabling it to compete more successfully for through traffic and to reduce the cost of handling it. Recently the government has built the National Transcontinental, with a shorter line between Moncton and Quebec; but it was intended to lease this to the Grand Trunk Pacific, a private corporation, and the government has assumed its operation only because the Grand Trunk declines to pay a rental of 3 per cent on its excessive cost. Because of the original location of the Intercolonial and the persistent error made in not reducing its length, its mileage between Halifax and Montreal is 837 miles, while that of the Canadian Pacific is only 758 miles. From St. John to Montreal by the Intercolonial is 740 miles; by the Canadian Pacific, only 483 miles.[8] The Intercolonial in moving a ton of freight from Halifax to Montreal carries it 10.4 per cent more miles than the Canadian Pacific, and in moving a ton from St. John to Montreal carries it 53.2 per cent more miles.

The effect produced on the comparative average rates per mile of the Intercolonial and the Canadian Pacific is obvious. The Intercolonial cannot charge a higher absolute rate between any two points than the Canadian Pacific. But when a shipment moves over it, the absolute rate must be divided by a larger mileage to ascertain the average per mile. Therefore, while the actual rates of the two roads between competitive points are the same, the average per mile received by the Intercolonial on through business is smaller than that re-

[1]Railway Statistics, 1914, p. xxiv.
[2]Ibid., p. 46. [3]Ibid., p. xxvi. [4]Ibid., p. 48.
[5]Statistics of Railways in the United States, Interstate Com. Commission.
[6]See act of confederation.
[7]Encyclopedia Britannica, 11th ed., article "Canada" (Railways).
[8]Official Railway Guide.

ceived by the Canadian Pacific. This causes the average rates per mile of the Intercolonial to give the impression that its actual rates are lower in comparison with those of the other railways of Eastern Canada than they are.

These considerations show why it is hard to make a fair comparison between the average rates of the Grand Trunk, the eastern lines of the Canadian Pacific, and the Intercolonial. But a detailed comparison of their actual rates would be out of the question; and if the various points mentioned be given due weight, a comparison of their average rates may be instructive. Table II gives their average rates for the two years ending on June 30, 1914, and June 30, 1915.[1]

TABLE II.

	1914			1915		
	Intercolonial	C.P.R. Eastern Lines	Grand Trunk	Intercolonial	C.P.R. Eastern Lines	Grand Trunk
Avg. rec'pts. per pas. per mile, cents	1.669	1.808	1.778	1.82	1.894	1.753
Avg. rec'pts. per ton per mile, cents	0.600	0.716	0.687	0.52	0.719	.687

The through rates of the Intercolonial are necessarily the same as those of competing lines. Considering all the conditions, the statistics indivate that its local rates are somewhat lower than those of other lines in corresponding territory; and one of its higher officers expressed to the writer the opinion that they are about 10 per cent lower.

If this is correct, the losses of the Intercolonial are due partly to the lowness of its rates, but more largely to other causes. Its total earnings per mile in 1914 were $8,625. In order to have paid its operating expenses and 4 per cent on its cost of construction as officially reported, it would have had to earn $11,541, or 34 per cent more than it did, and its rates would have had to be at least 34 per cent higher. This would have made both its average passenger rate and its average freight rate considerably higher than those of the Canadian Pacific or Grand Trunk.

Not more than one-third of the losses of the Intercolonial can be attributed to its rates. Even this one-third cannot be defended. Like its other losses, this part is defrayed from taxes. The people of the whole country are thus obliged to pay for a large part of the transportation furnished to those who travel and ship over the Intercolonial. If the government charged these travelers and shippers higher rates and voted them an equivalent subsidy, the results to all concerned would be the same, while the public would clearly perceive the true character and significance of the policy followed.

(The concluding part of this article will be published next week.)

[1]Railway Statistics of the Dominion of Canada for years named, and official information as to Canadian Pacific eastern lines.

THE FRIENDSHIP CORNERS OF FRENCH RAILWAY STATIONS

By Walter S. Hiatt

Our Special European Correspondent

In war time old things are often done in new and better ways. Before the war there was in each of the larger French railway stations a poste de secours or emergency room for taking care of persons injured or taken ill about the station. After the war began many hundreds of these postes de secours were taken in charge by charitable women's organizations and made over into comfortable resting quarters for the soldiers.

Soldiers, of course, are not always at the front. They must travel as well as fight. Not only are they sometimes sent to the rear when they are wounded or out of condition, but every few months also they are given leave to go home to visit the family and to rest up. If they have no home or if their families have been scattered, they are given leave just the same; they take it, trusting to Providence to find friends behind the lines.

The establishment of these friendship corners, these station hospitals for both the body and the heart, these restaurants and reading and sleeping rooms, all in one, was not accomplished in a day. First, in the early days of the war the railroads themselves enlarged their postes de secours to provide temporary shelter for homeless French and Belgian refugees in the early days of the war. Gradually they added hospital facilities for the wounded soldiers rolling in from the front, and some of the railways, indeed, turned over whole floors of their larger stations for this purpose, this being done, for example, at the Paris terminal of the Orleans railway and the Paris general offices of the Paris-Lyon-Mediterranee. Gradually the improvement of the hospital train service and the enlargement of the military hospitals made these station hospitals less necessary.

During their brief existence, however, these hospitals had shown the need of caring for the temporary wants of the traveling soldier, often a stranger in his own land, shunted from pillar to post, without money to buy a cup of hot coffee, without the courage to look for the smile or cheering word



Free Restaurant and Hospital for Soldiers in French Railway Stations

that sent him into battle with the feeling that he was truly fighting for dear hearts behind the lines.

It was not long before little bands of women, mothers, wives and sweethearts, had volunteered in each city and town to assist the railroads to care for the traveling soldier, and finally, at the instance of a certain railroad director, all of the French stations were organized for this purpose by different societies, normally formed for other work, such as the Croix Rouge, the Croix Verte, the Union des Femmes de France, the Association des Dames Francaises, the Societe de Secours aux Blesses, the English Women's Emergency Corps Canteen. These good women rapidly enlarged the scope of the work. Instead of being a place where an English, Belgian or French soldier might have his wound rebandaged, the poste de secours became a place where meals were served without charge, where a soldier could pass the night in a clean bed, or spend the few hours of waiting for his train. In short, these rooms became living centers of love.

This final and beautiful touch has been given by the presence of the girls and young women who, save for the supervision of the chief nurse and manager, are now practically in charge of all the rooms. The chief nurse is usually an older married woman. At the Gare St. Lazare, in Paris, Madame de Berckem, wife of the general of that name, oversees the operation of the poste de secours. The younger women, too young to leave home entirely or to serve as field or hospital

nurses, and for the most part members of exclusive society circles, have found here the most natural means of satisfying their desire to lend a helping hand in the war. There are probably some 5,000 young women now helping in this work.

Of all the places on the earth, railway stations are the centers of the truest, most unsimulated sentiment; and in war times the meetings and partings there intensify the sentimental atmosphere about these buildings, too often so forbidding in aspect.

It may have been for this reason that these young women, in ordinary times not permitted to leave their homes alone, have been attracted to this work of cheering the soldiers that come and go by the hundreds and the thousands day in and day out. At any rate, these young ladies who at home have their maids, are now eager to leave their homes before daybreak in the cold of winter and to go to the railway stations to take their turn in the relays that search the trains and platforms for stray soldiers to lead to the canteen, or to wait on them humbly, kindly and smilingly.

This job is practical as well as sentimental. At the Gare de Montparnasse, in Paris, at Bordeaux, at Toulouse in the south, at all the stations, this work goes on as work rather than as a charity function. At the end of each watch the white dresses are soiled, stained and spotted, the feet are weary with tramping, the hands raw and cold. An astonishing amount of work is done each day by these young women, particularly on those days when the hospital trains arrive with their wounded and when these wounded must be helped or carried to waiting ambulances. At the Gare St. Lazare, the vast Paris terminal of the State Railways, there is a reading room, a restaurant, a sleeping room, and a hospital, the entrances of which are but a few dozen feet from the trains that come and go hour in and hour out. Each minute brings a new soldier. No less than 100,000 meals have been served there since February 10, 1915, no less than 6,000 wounds have been dressed and no less than 300,000 soldiers have passed by. In short, enough soldiers to make five army corps have been smiled upon, waited upon, sent on their journeys by the dozen mademoiselles on duty there.

Their task is not an easy one. While the soldiers are always quiet, kind, and on their best good behaviour, they are poor and often literally penniless. Money must be secured to pay the expenses of keeping open the restaurant and hospital, of slipping a few sous unawares into the capacious pockets of the friendless soldier.

Therefore, these young women, assisted by their most pleasing smile, and dressed in their spotless white uniforms, troop through the arriving and departing trains, collection box in hand, begging for the soldiers of France, for their soldiers. Not an easy part of the work, that, for it is easier to give than to ask. Yet the public is as generous as it can well be. The money comes in, by pennies in the third class, by franc pieces in the second and first class compartments, not too quickly, not more than ten dollars a day, yet enough to pay for the food. When private charity fails to respond the railroad companies, who are already running special fast trains to and from the front so soldiers on leave may lose no time, furnishing heat and light in the canteens and rendering many little services necessary to the orderly maintenance of the friendship corners, are visited by the young women, and they do not come away empty-handed.

Just now the most war-like, the most picturesque of the big railway stations of France, other than possibly that at Havre, is that of the Northern Railway at Paris. Here one can see daily thousands of refugees leaving the war zone or trying to get back to their old homes on the border of the invaded districts of the north; here come and go for the most part the soldiers of the great front, arriving on leave, say, with their uniforms soiled by months in the trenches, so soiled that their sky-blue color has become that of clay, the once white skins of their faces tanned and bronzed, burned and bearded so that they are a fright to all but the little mothers of the canteens. English and Belgian soldiers likewise crowd in at this station from their front to have a peep at Paris.

At this station, therefore, there are two resting places for the soldiers, one established by French women, a second by English women. At the latter the English soldiers get their tea, toast, bread and butter, jam or marmalade, their bacon and eggs, their fish, and such home cooking unknown to the French table. Here, too, are welcomed the English transport workers employed about Paris. On Sunday afternoons, in particular, these and other English soldiers gather here for tea and a smoke and hold little concerts, singing the songs they like best. All is as free as the air; not a penny is charged. When they go on their way, on one of those journeys from which so few hope to return, they are given boxes of food, filled with more bread and marmalade, ham sandwiches, and tobacco for their everlasting pipes. This canteen, such being its formal name, is international in its scope and service. Taking its register for a recent week, I found that meals had been served to 337 British soldiers, 609 Belgians, 17 French, 10 Africans of la legion Etrangere, and 102 Indians.

Just before Christmas a public concert was given in the French canteen, known as the Cantine Militaire et Poste de Secours de la Gare du Nord, to celebrate the 110,000th meal that had been served up to that time in this canteen. "Does this celebration mean that you have had one hundred and ten thousand soldier visitors?" I asked one of the mademoiselles. "My no," she said. "We have had whole armies here for a cup of coffee and a bite of bread. We must have had at one time or another half the soldiers of France."

At the end of the concert one of the young women told some of her experiences with her traveling soldiers. She told how one homeless and penniless holdier on leave for six days in lonely Paris had found lodging in the station, and during all that time insisted on sleeping on the hard floor. "The beds are too clean for me," he had explained. "Keep them for the wounded." She told how another hero of the trenches, duly decorated with the Medaille Militaire, with one of his hands shot to pieces, due to "a hunting accident," so he said, had spent not only his nights, but his days of leave at the canteen. "I'm afraid of Paris," he had told the mademoiselles.

All of the canteens keep registers, for purposes of accounting, and to allow visitors to sign their names. Sometimes the soldiers write out a line of thanks. One poor fellow from the country scrawled: "I was received just as in a hotel where you have to pay to eat." This from a homeless soldier: "May you be blessed by all true soldiers for the way you have reminded us of our absent families."

Thus these kind mademoiselles and their canteens keep on through the long months of the war making friends for themselves, their country, and its railways, and piling up pleasant and enduring memories around the noisy, dingy stations.

One enthusiastic station master said to me: "I wish we could manage to keep them on as steady employees after the war is over!"

The Cessation of Inventions.—Someone poring over the old files in the United States Patent Office at Washington the other day, found a letter written in 1833 that illustrates the limitations of the human imagination. It was from an old employee of the Patent Office, offering his resignation to the head of the department. His reason was that as everything inventable had been invented, the Patent Office would soon be discontinued and there would be no further need of his services or the services of any of his fellow-clerks. He therefore decided to leave before the blow fell.—*From Scientific American.*

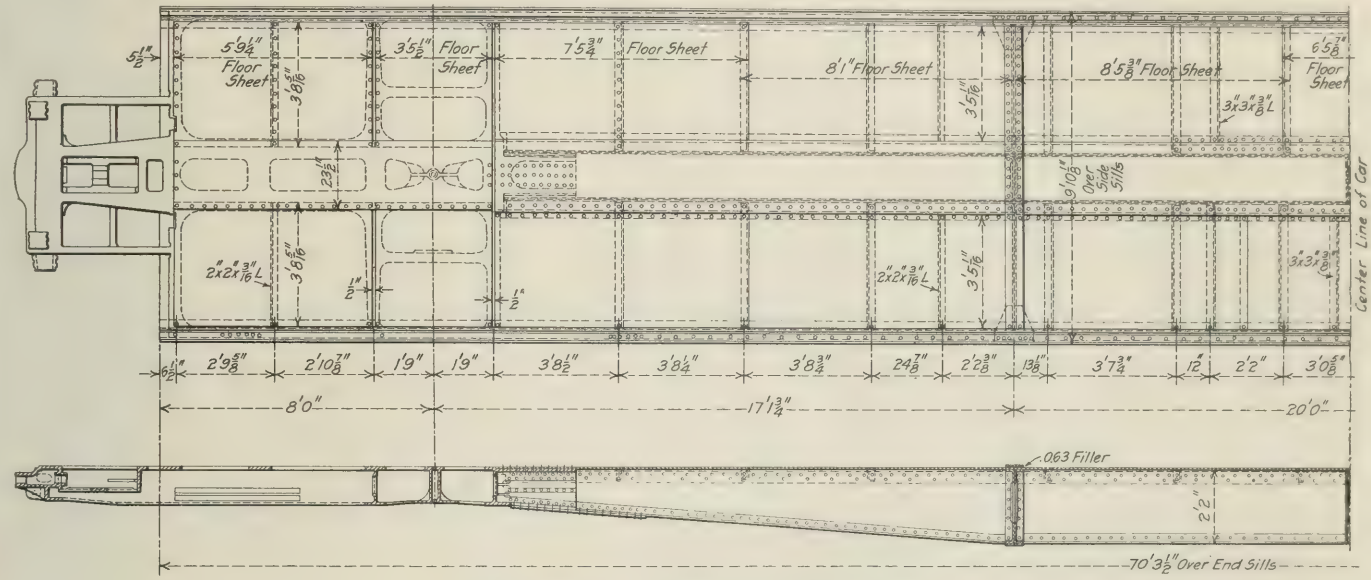
First Steel Coaches for the Boston & Maine

Seating Capacity Is 88 and Weight 118,500 lb., Weight Per Passenger Being 1,346 lb.; 4-Wheel Trucks Used

THE Boston & Maine recently received from the Pullman Company six steel coaches and two steel smoking cars which are the first passenger cars of this type of construction that this railroad has placed in service. The cars will be used in through service between New York and Portland, Maine, and will be followed by six 60-ft. baggage cars and two 70-ft combination baggage and mail cars.

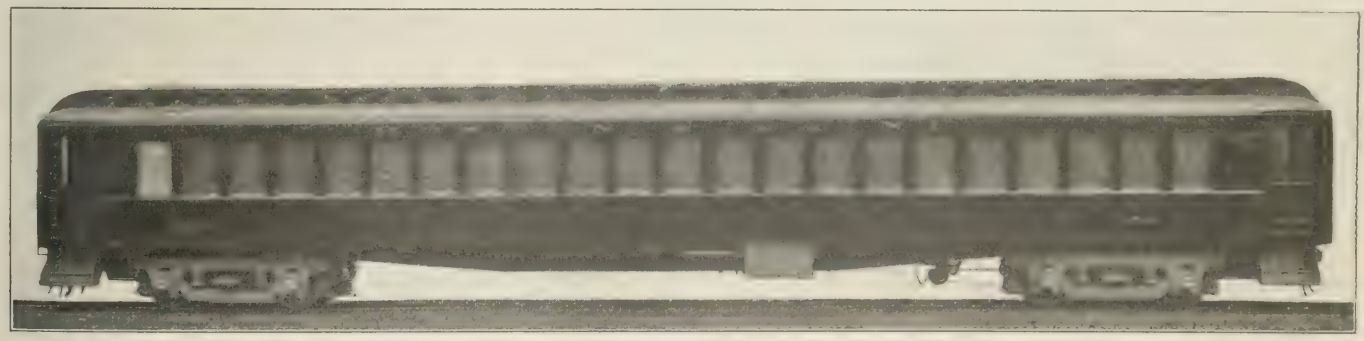
The new passenger cars are 70 ft. 3½ in. long over end sills, 80 ft. 3¾ in. long over buffer face plates and are mounted on four-wheel trucks with 8-ft. wheelbase and spaced 54 ft. 3½ in. between center plates. Commonwealth cast steel platforms and double body bolsters are used with center sills of the fishbelly type. The center sills are built up of 5/16-in. web plates with 5-in. by 3½-in. by ⅜-in. angles outside at the top and 3-in. by 3-in. by ⅜-in. angles inside and outside at the bottom. The sills are 26 in. deep at the deepest part and are spaced 16 in. apart and there is a 30-in. by ⅜-in. top cover plate extending between the bolsters. The side sills are made up of 5-in., 11.6-lb. Z-bars riveted to 4-in. by 3-in. by 5/16-in. angles and extending the full distance between the bolsters. The floor beams are 3/16-in. pressed diaphragms, 5 in. deep, and there are two cross-bearers placed 10 ft. on either side of the center of the car and built up of 5/16-in. pressed diaphragms with 6-in. by ⅜-in. top cover plates extending across the car at the top and under the center sills at the bottom.

There is an anti-telescoping device which consists of two 6-in. 23.9-lb. I-beams at each end forming a part of the vestibule door post construction. In addition there are used in the body and construction a 3½-in. by 3-in. by 5/16-in. angle at the corner riveted to a 4-in., 8.25-lb. Z-bar, while there are two Z-bars of the same weight forming end posts between the door and corner posts. The door posts are 6-in., 23.9-lb. I-beams and the end plate is a 7-in., 12.25-lb. channel. The side frame construction includes a dropper-bar belt rail, with 4-in. by ⅛-in. pressed channel side posts, two per pier.

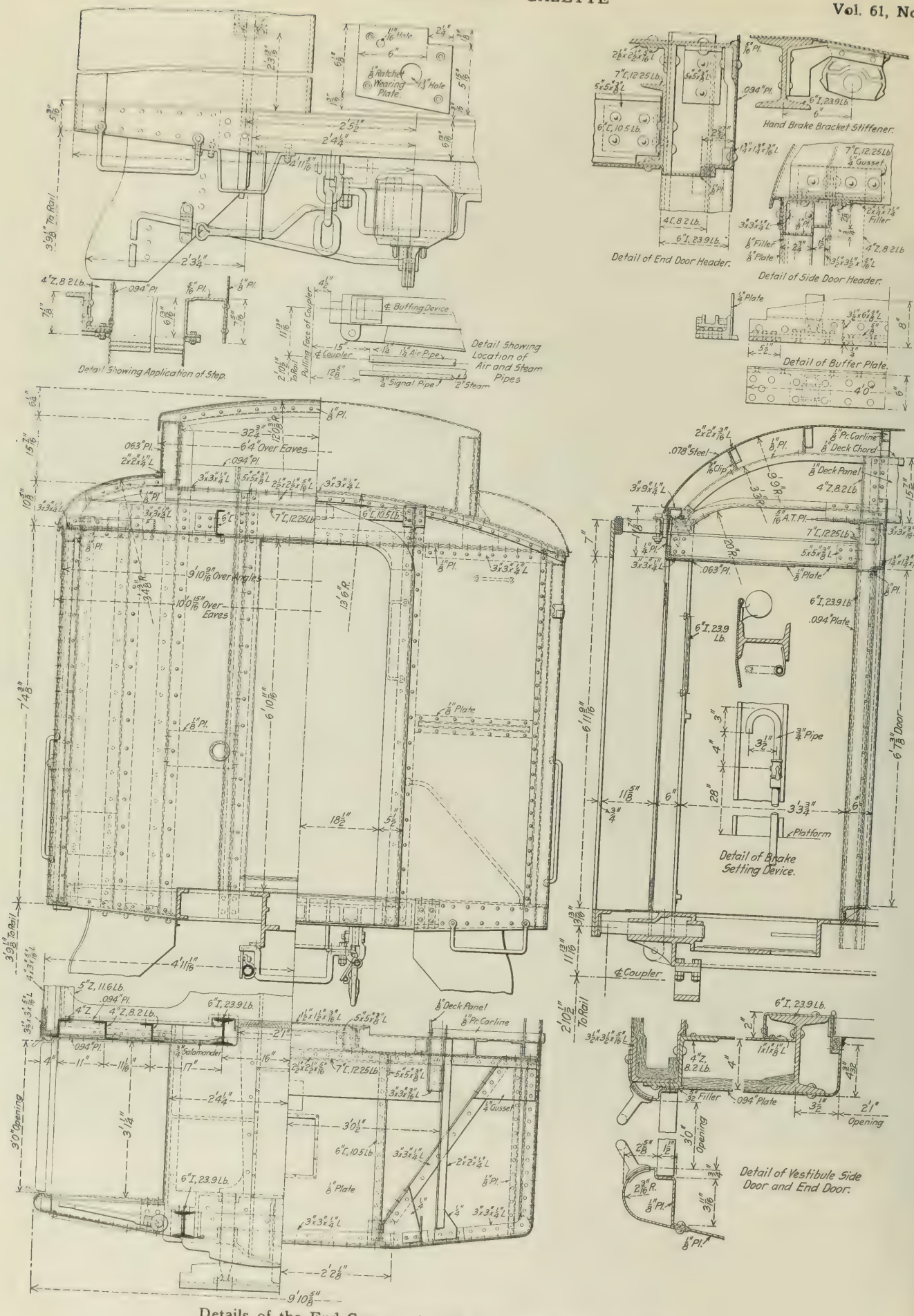


Underframe of the Boston & Maine Coach

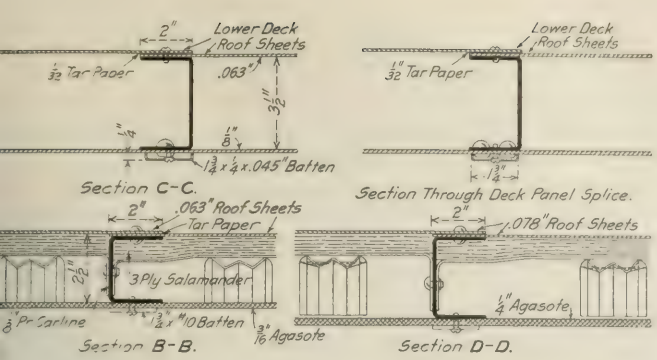
The coaches weigh complete 118,500 lb., which gives a dead weight per passenger of 1,346 lb. The smoking cars weigh 118,000 lb., the dead weight per passenger being 1,282 lb. The seating capacity of the coaches is 88 and that of the smoking car is 92; the latter has one saloon. The dead weight per passenger compares favorably with that of the composite underframe cars now in service on the Boston & Maine, this weight in the latter cars being 1,262 lb. The

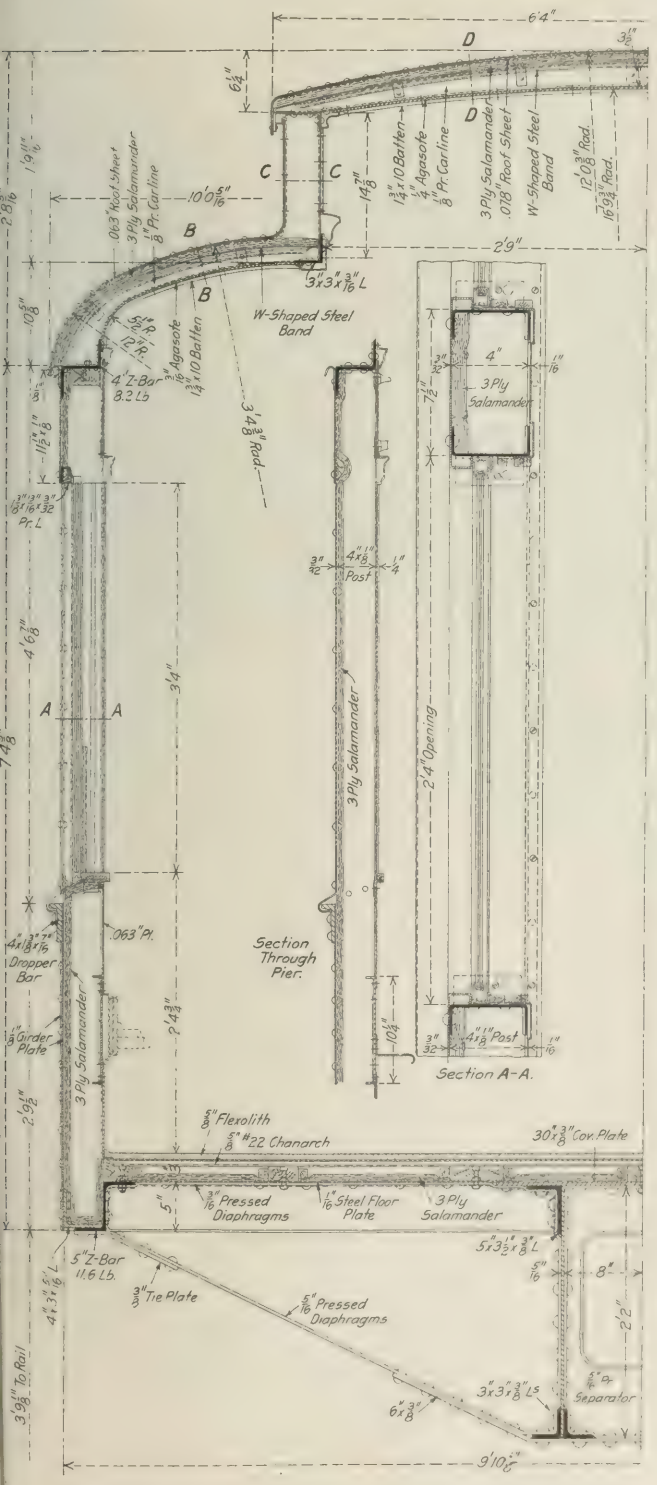


Boston & Maine Steel Day Coach



Details of the End Construction of the Boston & Maine Coach



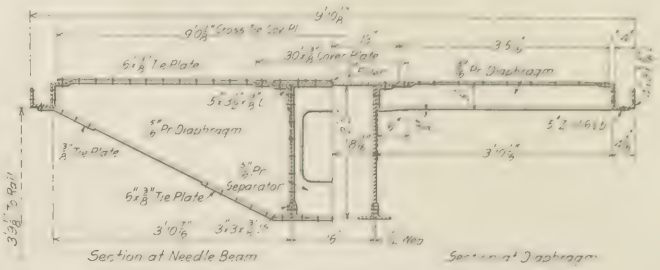


Cross Sections of the Boston & Maine Coach

table shows a comparison between these cars and a number of other steel coaches:

	Total weight, lb.	Seating capacity	Weight per passenger, lb.	Length over end sills	Type of truck
Boston & Maine.....	120,000	88	1,346	70 ft. 3½ in.	4-wheel
Pennsylvania	120,000	88	1,364	70 ft.	4-wheel
New Jersey Central..	115,800	78	1,480	63 ft.	4-wheel
New Haven	131,000	88	1,488	70 ft. 6 in.	6-wheel
New York Central..	142,000	84	1,690	70 ft.	6-wheel

The trucks under the Boston & Maine cars are of the four-wheel Commonwealth cast steel type, equipped with 5½-in.



Cross Sections of the Underframe

by 10-in. journals and solid steel wheels. They are fitted with clasp brakes.

The electric lighting is of the axle generator body suspension type, one-half of the new equipment having the Safety Car Heating & Lighting Company's "Underframe" system and the other half the Gould system. The lighting equipment includes 16-cell, 300-ampere-hour batteries. The lighting distribution to passengers is effected by drop lamps, all located on the center line of the car. The customary upper deck sash is omitted, the only openings being those required for the automatic ventilators. To insure more than the usual



Interior of the Boston & Maine Coach

natural light, the window sash is brass, of the narrow Forsyth type, giving a larger glass area than is possible with the wider style of wood sash. The seats are of the reversible type made to insure the greatest comfort to passengers together with simplicity of design. They were manufactured by Heywood Brothers & Wakefield Company, Wakefield, Mass. The seat covering consists of Chase's figured green frieze in the coaches, and in the smoking cars Chase's Gibraltar leather is used. All other construction details are the same for both coaches and smoking cars. The interior color scheme is cream white for the headlining and lower deck, dull cherry for the walls above the belt rail and dirt gray below. The floor-

ing is of Flexolith cement, with color to match the lower side walls. Three-ply Salamander insulation is used in the walls and roof, with Agasote headlining.

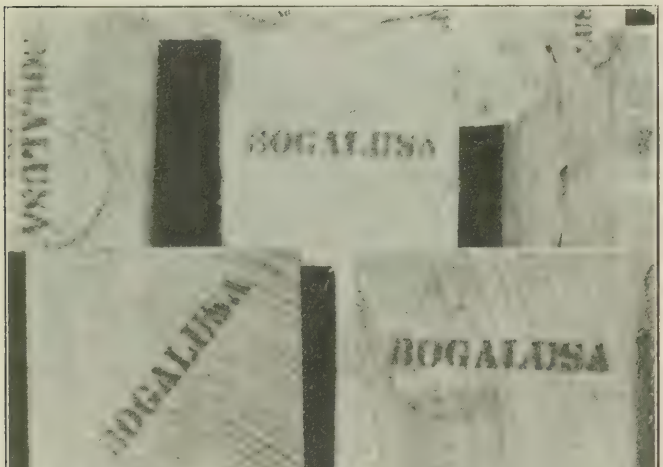
Westinghouse PC brake equipment is used with 16-in. service cylinders and 14-in. emergency cylinders. The draft gear is Miner friction type A-3-P with Pitt couplers, and the buffers are Miner friction type B-10.

BRANDING LUMBER AT THE MILL

After a number of years, a growing sentiment on the part of the lumber manufacturers in favor of the trade-marking of lumber has crystallized into definite action. The Southern Cypress Manufacturers' Association has adopted this practice and other lumber associations are either formulating plans for carrying it into effect or have the matter under serious consideration. In addition to this a few manufacturers have commenced to mark lumber as individuals and it is expected that others will follow their example.

The trade-marking of lumber is one method that will be used by the lumber manufacturers in their campaign to secure the proper recognition of their product for those purposes for which it is best suited and to establish a reputation for fair dealing and standardized products. As carried out by the Cypress Manufacturers' Association each piece will bear the name of the association and a number designating the mill where the stick originated. By bringing the name of the association or individual manufacturer to the notice of the user a closer relation between them is brought about which will encourage the user to bring to the manufacturer's notice any irregularities from which he has suffered.

In the case of the association mark, each mill is identified and any objectionable practice by the mill or by the jobber can be quickly run down. A strict compliance with the association regulations will soon create a reputation for the trade-marked lumber which will mean a return to the manufacturers far in excess of the expense entailed in marking.



The Bogalusa Brand of the Great Southern Lumber Co.

One advantage of this system lies in the fact that it will mean as much to the small producer as to the largest. Any mill which will conform to the regulations of the association can share in the reputation which the marked lumber will enjoy. A few of the larger manufacturers have recently begun the practice of branding their product with individual trade-marks, thus establishing reputations for the individual manufacturers rather than the associations. Trade-marks of this kind are shown in the photographs.

There have been cases in the past where the producer and user have suffered alike from irregular practices on the part of the middleman, who has sold lumber as belonging to a higher grade than it classified according to the manufacturers' grading rules. It is apparent from this that the marking of the grade of the lumber would be a desirable addition to the brand. It has, however, been found impossible thus far to work out any practicable scheme for doing this. The rules for grading are not uniform in all localities and much lumber is used for purposes requiring special gradings or selections. Another objection arises from the possibility of some change in the grading of individual sticks after they have been graded at the mill because of the disappearance of some defects and the appearance of new ones, through changes of temperature, humidity or other causes while the material is en route.



The "Newman" Brand on the Sides of Sticks

However, with the trade-mark clearly shown on the stick the purchaser can readily trace down any irregularities in the grading. It is also entirely possible that select structural material classed as dense southern yellow pine, according to the recently adopted classification, will be placed on the market branded as to grade.

The accompanying photographs show two schemes for branding the lumber: one on the side and the other on the end. The latter is the favored practice and is executed automatically by a machine as the lumber leaves the trimmer table, the marks being a combination of an impression in the fibres and an ink mark. When the prices are branded on both ends the ink is commonly used on one end only. Marking the sticks on both ends simplifies the process and has the advantages that when the lumber is piled the marks will always be visible on the ends of all the sticks exposed on any side, and the piece is still identified after one end has been cut off. The minimum size which it has been found practicable to mark is 1 in. by 3 in.

The trade-marking of lumber will work to the advantage of the reputable dealers and to the disadvantage of the unscrupulous. With this impetus to fair dealing the gain to the purchaser should be great, particularly to a large purchaser such as a railroad.

JOSEPH RAMSEY, JR.

Joseph Ramsey, Jr., president of the Wabash during the exciting period when the Wabash gained an entrance into Pittsburgh, died suddenly of apoplexy on July 7 at his home in East Orange, N. J. Although the scheme of using the Wheeling & Lake Erie and building the Wabash-Pittsburgh Terminal to give the Wabash and thus the Gould system an entrance to Pittsburgh and to connect the Wheeling & Lake Erie and the Western Maryland to give the system an Atlantic coast port is usually credited to George Gould, the Wabash-Pittsburgh Terminal, part of the scheme at least, originated with Joseph Ramsey, Jr. The plans had to be carried out against the bitter opposition of both the Pennsylvania and New York Central lines and were bold in the extreme. It was Mr. Ramsey who secured the contract with the Carnegie Steel Company for a volume of traffic, which if the Wabash-Pittsburgh Terminal had ever been able to handle it, might conceivably have made it a fairly successful road instead of the monumental failure which it proved to be.

In September, 1905, after the stock transfer books of the Wabash had been closed, Mr. Ramsey who had been president since 1901, advertised over his own signature as president, an appeal to the debenture and stock holders asking for proxies for use at the annual meeting on October 10. He said that he represented no financial interests but that this action was taken solely by the desire to save the company which he had been president of from the results which he thought would follow from further control by the Goulds. The Wabash had long been a Gould road and it was thought that George Gould and the Gould estate could control at least 40 per cent of the proxies. When the annual meeting took place, Mr. Ramsey was not able to elect even one director. The failure of his attempt to wrest control from George Gould appeared absurdly flat. The fact is not generally known and has probably never been published before that the late Russell Sage, who held large blocks of the Wabash debentures as well as considerable amounts of stock, had told Mr. Ramsey that he could count on him for his proxies—the debentures had voting rights as well as the stock. At the last minute Russell Sage changed his mind and decided to give his proxies to the Gould estate. Mr. Ramsey, embittered, turned his fight for proxies into a bitter attack on the treatment which he had received from the Goulds.



Joseph Ramsey, Jr.

While the Gould-Ramsey attempts to get into Pittsburgh and get an Atlantic coast outlet for the Gould system proved to be a disastrous failure, it is not entirely fair to judge the conception of Mr. Ramsey by the results. George Gould at that time was even less inclined to give others authority than he has been in more recent years, nor would he, it is generally believed, take time himself to study and properly conduct the affairs of his companies. It may be that Ramsey's Wabash-Pittsburgh Terminal plans were inherently impossible of successful fruition, but whether or not this is so, their failure was assured by the clash of Ramsey and Gould in the carrying out of these plans.

Joseph Ramsey, Jr., was born on April 17, 1850, at Pittsburgh, Pa., and was educated at Western University and began railway work in 1869, in an engineering corps of the Pittsburgh, Cincinnati, Chicago & St. Louis. He later served as engineer on construction and then as assistant engineer of the Cincinnati & Muskingum Valley. From May to October, 1871, he was chief engineer on location of the Bell's Gap Railroad, then assistant engineer on the Pennsylvania Railroad; from April, 1872, to 1873 he was engineer and then to 1879 chief engineer and superintendent of the Bell's Gap Railroad. He was then chief engineer and superintendent of the New Castle & Lake Erie. From November, 1879, to April, 1882, he was chief engineer and superintendent of the Pittsburgh Southern, after which he served as chief engineer and general manager on various roads until August, 1883, when he became engineer on the Cincinnati, Hamilton & Dayton; and from 1886 to 1890 he was chief engineer of that road. He was then assistant to president of the Cleveland, Cincinnati, Chicago & St. Louis until June, 1891. Mr. Ramsey also served on different roads including the following: March, 1890, to March, 1895, president of the Peoria & Pekin Union; June, 1891, to April, 1893, general manager of the Cleveland, Cincinnati, Chicago & St. Louis; and from April, 1893, to December, 1895, general manager of the Terminal Railroad Association of St. Louis. From December, 1895, to June, 1901, he was vice-president and general manager of the Wabash, then to October, 1905, was president. While at the head of the Wabash, he also served as president of the Wabash-Pittsburgh Terminal, the Wheeling & Lake Erie, the Western Maryland and the Ann Arbor. His service with the Wabash terminated in 1905, and in 1906 he was chosen president of the New York, Pittsburgh & Chicago, a projected line designed to compete with the Pennsylvania. In 1910 he became also president of the Ashland & Western and the Lorain, Ashland & Southern. From 1910 to 1912 he again served on the Ann Arbor, and in 1912 also was president of the Wheeling & Lake Erie. At the time of his death he was president of the Lorain, Ashland & Southern.

WOMEN RAILWAY WORKERS IN RUSSIA.—Following the satisfactory results of the employment of female labor during the war on the railways, and having in view the shortage of men, the Minister of Ways of Communication has proposed to the southwestern railways to put women in place of the assistant station masters in fourth class stations and sidings. The necessary conditions of such employment are that the women should be properly trained in a railway traffic school and be not under 25 years of age.

THE AUTOMATIC MEASUREMENT OF STRESSES

By Rudolph Welcker

The attention of the writer was called two years ago to the methods pursued by the railroad inspection service of Holland to determine the effect of increased loading or speeds on structures and track. All structures, if exposed to new conditions of loading, are subjected to field tests which are made by a party especially trained for this purpose. The instrument used is shown in the photograph and has passed through a regular stage of development. The results have been so important from an economic point of view that some of the railroads have followed suit and make their own tests to extend the knowledge of their structures. The material collected at that time seemed so valuable and the matter itself so susceptible of future development that the writer decided to investigate the applicability of these methods for the requirements in the United States.

In the course of these experiments it became obvious that the taking of these stresses should be made automatic. The instruments as used in Holland are operated by hand and require an operator for every four units on track work and one for each instrument in bridge work. By improving the mechanical means of moving the paper tape on which the records are made and by resorting to a winder with a special electrical escapement, it became possible to control an unlimited number of extensographs from one central point. This contrivance makes the instruments self-recording and automatic. The method is also to be preferred from the standpoint of safety and simplicity.

It would be impossible to describe in detail in this space the principles and construction of the instruments involved and all the results obtained thereby. As an example of the results some diagrams are shown in the accompanying drawing. Series A was taken in Holland in 1914 and series B in the United States in the following year. Both diagrams show stresses in rails during the actual operation of fast trains. As an additional improvement the American diagram shows a number of tally points which represent time marks spaced 0.6 sec. apart. By means of these points it is possible to compute the speed of the train accurately. This complete diagram therefore shows the load, the speed of the load and the stress caused by their combined influence.

Since the record can be controlled from any place and distance from the track it is possible to get a check on the train speed by this means. This factor in itself is of great importance in cases where the train speed is restricted.

By way of results a few general conclusions are given. It has become evident in so far as the examination of American rails is concerned that the stresses do not prove to be greater than those which are caused by European train loads under the same conditions. This is contrary to the general impression and deserves further investigation. The experiments have been made in both cases with the same set of instruments.

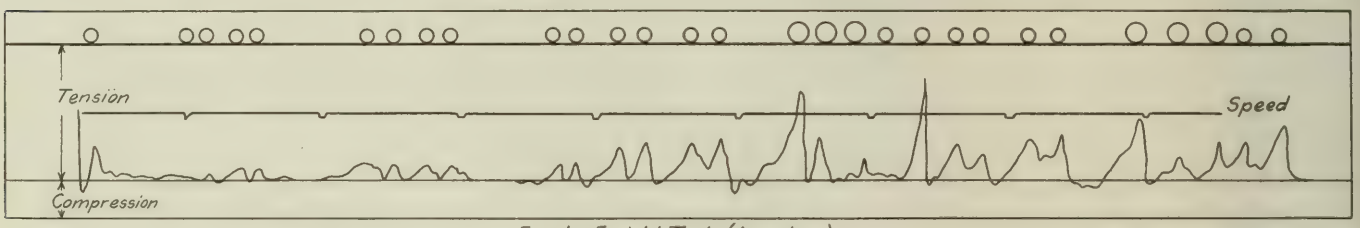
In the case of freight trains hauled by two engines greater stresses were observed under the driving wheels of the second engine. The high speed of the trains is more conducive to high stresses than an increase in axle load, especially on curves which are not properly lined.



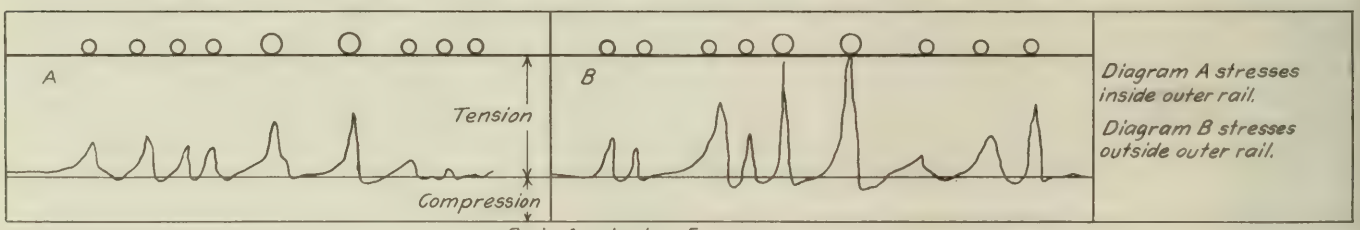
The Recording Instrument

The examinations of bridges also have been most interesting. The instruments, for instance, indicate plainly whether cracks in the material of a beam or girder are of importance from the standpoint of safety. It does not need explanation that in such experiments it is absolutely essential to have the instruments under central control.

They have also been used to examine stone and concrete bridges. In such cases, however, it is necessary to increase the gage length of the standard instrument to register the much smaller displacements. These instruments offer an unlimited field of investigation and the time will come when their extended use will result in a more accurate knowledge of engineering structures.



Empty Freight Train (American)



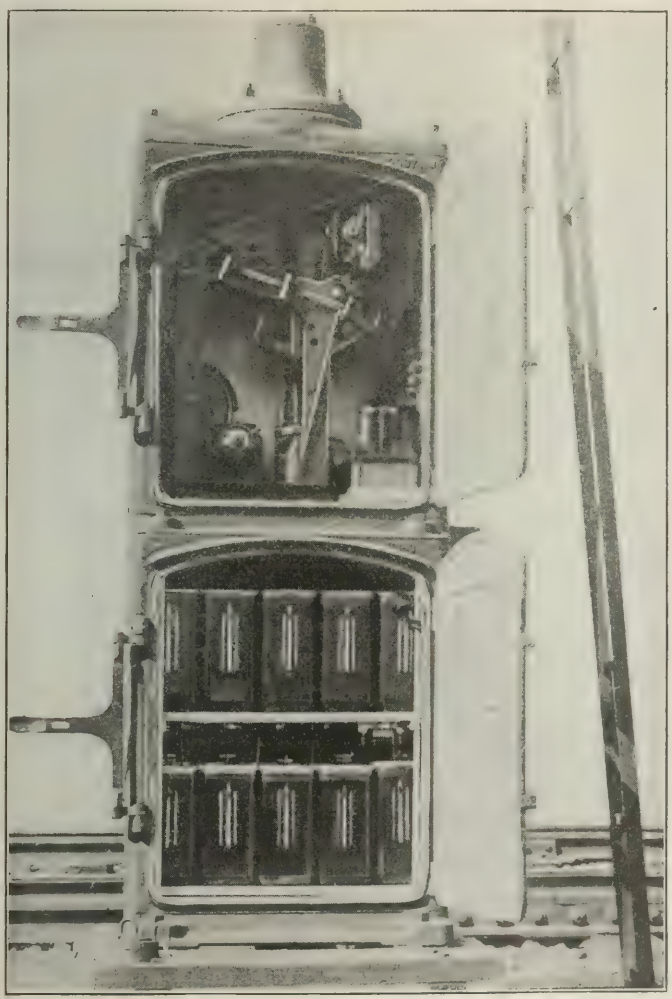
Paris-Amsterdam Express.

Typical Stress Diagrams

LARGE BRITISH STEEL OUTPUT IN 1915.—The British output of steel ingots for 1915, according to statistics just published by the Iron, Steel and Allied Trade Federation, was 8,350,944 gross tons. This is the largest output in the last six years.—*Iron Age.*

NEW AUTOMATIC BLOCK SIGNALS ON THE ATLANTIC COAST LINE

The Atlantic Coast Line has recently placed in service automatic block signals on its double-track line from Selma, N. C., southward to Parkton, N. C., 62 miles. Selma is 160 miles south of Richmond. Parkton is at the end of double-track and is the junction of the main line and the Bennettsville branch. This installation completes the automatic signal system between Richmond and Parkton, 222 miles. The line was formerly operated by the manual block system and the installation of automatic signals has made it possible to discontinue the service of many operators. On a similar 40-mile section of the road a reduction in payrolls was made at the time automatic signals were put in service which was sufficient to pay for the maintenance and depreciation of the



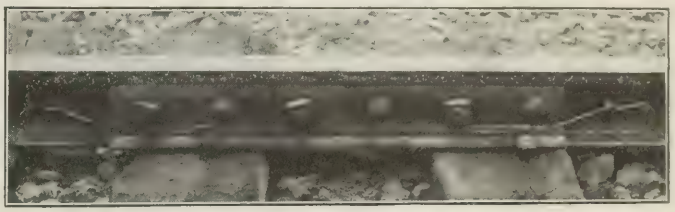
Double Mechanism Case; Primary Battery in Lower Part

signals and show a clear profit of $7,000 a year; and beyond this was the increased capacity of the road by reason of the shorter block sections and the increased safety and efficiency of operation. The saving in train detention in one month as compared with the same month the year previous amounted to approximately 21 hours.

The signal system adopted for this section is the Union Switch & Signal Company's standard "wireless" control, the blocks averaging about 5,400 ft. in length, without cut sections. The signals are of the U. S. &. S. style S, operating in three positions in the upper right-hand quadrant. Night indications are red for stop, green for caution, and white for clear.

There are two features of this installation of particular interest—the method developed for housing the signal and track circuit battery in a lower mechanism case, and the exclusive use of duplex channel pins for bonding. Primary battery of the "BSCO" caustic soda type is used to operate both the signals and the track circuits, fifteen 500-a. h. cells being used on the signal circuits and five on the track circuits. Rectangular jars were used to economize space, the arrangement of cells being shown in the accompanying illustration. It would also be possible to arrange these cells lengthwise in three rows of 4 cells each on both shelves, making the total capacity of a case 24 cells. This arrangement would expose to view the flat surface of the plates, insuring the best opportunity to see the indications of approaching exhaustion.

The housing of battery in the mechanism case has a number of advantages. In the first place, it is an inexpensive installation, as it eliminates the cost of concrete wells or other underground housing, reduces the amount of wire required for the installation and eliminates all trunking and other conduit. There is also a saving in the length of signal posts and connecting rods. Trouble from broken wires through accident or corrosion because of exposure in trunking is eliminated and the shortening of the wire between the battery and the motor eliminates most of the drop in potential at this point. The possibility of a battery being flooded is practically eliminated and with the battery so conveniently located there is less excuse for inattention on the part of inspectors and maintainers. Since the signal cases afford little protection from the cold, it is necessary in latitudes subject to



Standard Bond Wires with Duplex Channel Pins

low temperatures to compensate for the increased internal resistance and consequent loss of voltage to which the batteries are subject during cold weather by providing additional cells. The number required on this account depends of course upon the degree of cold to be provided for, but the manufacturer's tests indicate that it is not likely in any case that more than 20 cells per signal would be required to replace 16 cells located in a well.

In the track bonding on this installation ⅜-in. duplex channel pins were used. These have been found to be most economical and advantageous. On previous work, soft-drawn E. B. B. galvanized bond wires 46 in. long had been used, but in this case 44-in. No. 6 B. & S. gage copper-clad bond wires were used, the adoption of the shorter length being made possible by the ability to bend the copper-clad wires to a smaller radius than iron. With the use of the duplex pins, only two are required for each joint, instead of four as in single bonding. The breakage of the ⅜-in. drills is much less than the 9/32-in. used with single pins, and the cost of drilling and bonding is less. All bond wires were bent to a template and the holes were drilled at the joints exactly the same distance from the ends, thus making all the bonding uniform.

In order to determine exactly how good a connection resulted from the use of duplex pins several were driven through with a punch, and in each case it was found that the wires had been somewhat flattened where they came in contact with the rail web and the pins had gripped so tightly as to give them the appearance of having been welded or brazed. It is the standard practice on this road, within track circuit limits, to turn the lip of the joint spike toward the

center of the track, the object being to save wires from being worn off, cut in two, or interfered with by the section forces.

This work was installed under the direction of C. J. Kelloway, signal engineer, to whom we are indebted for the above information.

STEEL ORE CAR FOR THE DULUTH, MISSABE & NORTHERN

The illustration shows one of a number of steel ore cars recently built by the Ralston Steel Car Company, Columbus, Ohio, under its own patents, for the Duluth, Missabe & Northern.

The features of special interest in the design are the door operating mechanism and the ability to quickly dump the load. A test was made recently with one of these cars loaded with 52 tons of ore, to ascertain the length of time required to dump the load, one man doing the work. From the time the operator applied the wrench to the operating shaft, including dumping the load and closing the doors, the car was made ready for the return trip to the mines in 35 seconds.



Steel Ore Car with Quick Operating Doors

The door operating mechanism consists of links suspended from brackets secured to the draft sills at the ends of the lower portion of the hopper. The links at the two ends of the hopper bottom are connected by shafts disposed under the doors, and on these shafts rollers are mounted running in a trackway on the doors. Near the end of the hopper body, short shafts are mounted in bearings, having applied thereto armed crossheads with curved links attached to the arms and the door shafts.

A worm segment is mounted on each short shaft and the hub of the segment is made with a clutch member having a lug on it. Another clutch member is secured to each shaft and made to co-operate with the lugs on the other clutch members. The lugs in the two clutch members are so proportioned as to permit of relative movements of the segment and shaft. Worms are mounted between the draft sills near the ends of the hopper body and are disposed over and enmesh with worm segments. A transverse shaft passes through the worms for rotating them, and this shaft is mounted near its ends in bearings secured to the side sills. The ends of the shaft project beyond the side sills for the application of a device for manually operating it.

Sprocket wheels are secured to the cross shafts and these sprockets are connected by a chain so that when one or the other of the shafts is rotated, motion will be imparted to both worms for turning the worm gears. When the doors are closed they are kept so by the worm gearing, without the necessity for the use of pawl or ratchet devices. When the sub-shaft has been rotated sufficiently to overcome the dead centers of the link mechanism, the weight of the load in the hopper body forces the doors fully open.

The side sills of the car are composed of channels having their flanges turned inwardly to provide a flush surface for the application of channel side stakes. The end sills are connected to end sill side sills, to which the corner posts are attached. The upper ends of the corner posts are connected to top end angles, to which the upper ends of the front and rear inclined hopper sheets are secured. The draft sills extend forward beyond the end sills and back to the inclined sheets, to which they are secured.

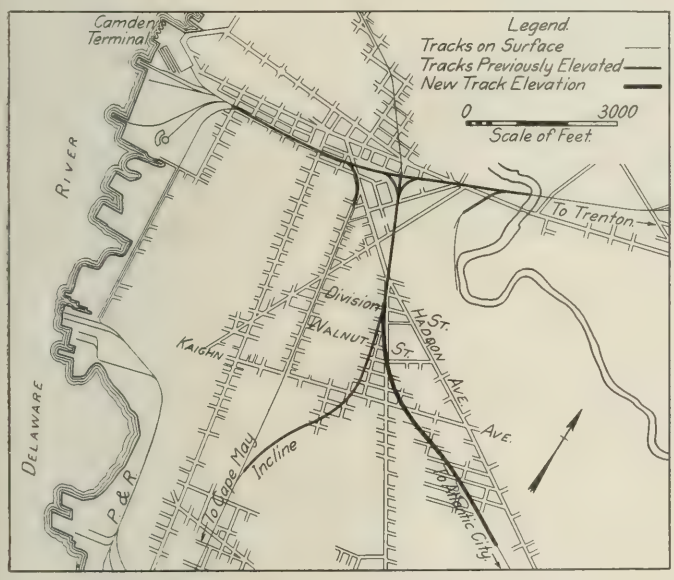
The bolsters are composed of diaphragms connected to the side and center sills and bottom cover plate. The upper edges of the diaphragms are riveted to a floor plate which covers the entire portion of the frame from the hopper sheet to striking plate. This floor cover plate is riveted to the end sill angles, draft sills, and side sills, and has a flange at its rear end which is connected to the hopper slope sheet, forming a girder which permits of the buffing stresses being equally distributed over all parts of the underframe.

Secured to and extending from one bolster to the other are longitudinal or sub-sills spaced a short distance from the side sills. These serve to increase the strength and rigidity of the underframe, and also provide a connection for the door bracket hinges and sloping side floor sheets. This sub-sill is connected to the side sill proper.

Grade Crossing Elimination in Camden, N. J.

The Pennsylvania Railroad Is Elevating the Atlantic City Line Tracks, Using Several Types of Street Subways

THE Pennsylvania Railroad is completing the elevation of tracks on the Atlantic City line of the West Jersey & Seashore in Camden, N. J., involving the construction of 12 under-crossings for city streets. The project forms one step of a plan for a somewhat complete elimination of grade crossings in that city, and is unique in several ways. No two subways are exactly alike. Four different varieties of steel bridge floors have been used, and, unlike most other



Map Showing Progress of Track Elevation

track elevation projects, the filling material has been obtained within one-quarter mile of one end of the track elevation limits, and was handled with narrow gage equipment.

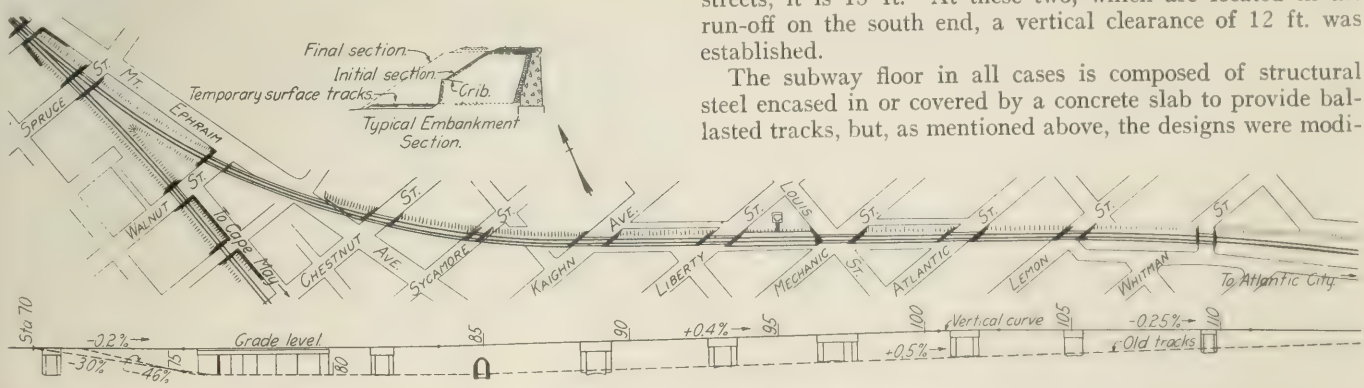
In 1905 the Pennsylvania Railroad entered into a contract with the city of Camden for the elimination of grade crossings in that city, and by the end of 1913, the progress on this work was marked by the elevation of the Trenton division tracks from the Camden terminal to the Cooper river, and on the Cape May line of the West Jersey & Seashore as far as Van Hook street. The Atlantic City line, which connects with the Cape May line at Division street, reached the elevation by an incline commencing at Walnut street. This required a grade of 3 per cent for northbound trains and one of 4.6 per cent for southbound (down grade) trains. The present work involves the elevation of the Atlantic City line south from this junction for a distance of 1¼ miles. This portion of the line crosses all the streets on a skew with the result that there is only one square subway, that at Whitman street, where the street was relocated to obtain a right angle crossing. At the north end of the work, where the line crosses Mt. Ephraim avenue on a very flat skew, it was found desirable to provide a steel viaduct about 500 ft. long crossing also Mt. Vernon and Walnut streets, which intersect Mt. Ephraim avenue under or near the structure.

As seen on the accompanying profile, the original grade line had an ascending grade of 0.5 per cent southward, beginning at Sycamore street. This made it possible to make the descent from the south end of the track elevation with a 0.25 per cent grade, commencing at Atlantic street. This is the critical point in the new grade line, as governed by the head-room requirements for the subway at this street. The material depression in the natural ground surface and the old grade line, north from this point as far as the Mt. Ephraim avenue viaduct, resulted in a large variation in the severity of the head-room conditions at the various subways within those limits and advantage was taken, in the more favorable cases, to use more economical designs of subway floors than were permissible where the head-room requirements were more difficult to fulfill.

The Subways

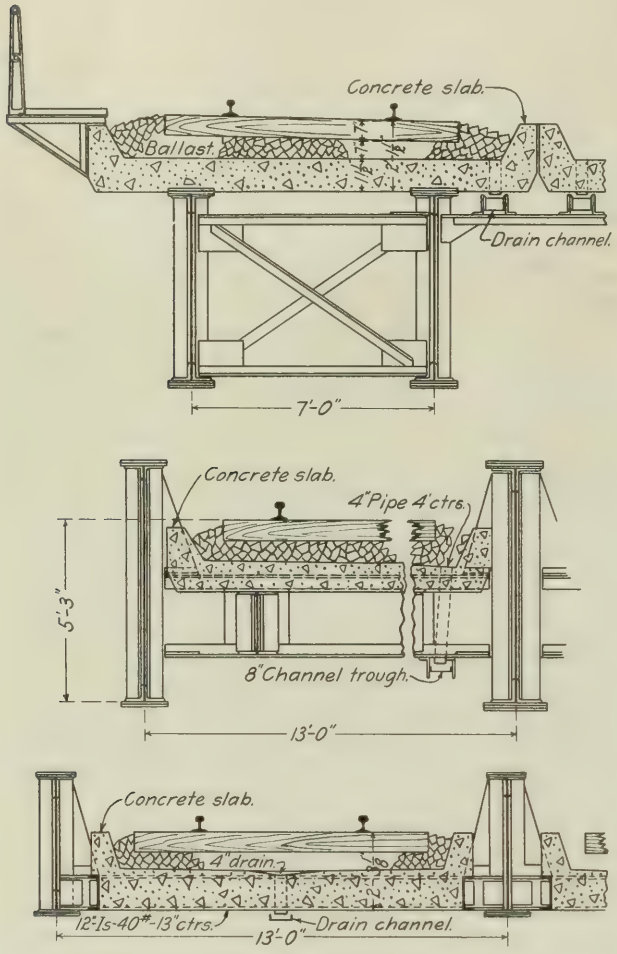
The subways are all steel girder bridges with the exception of the one at Sycamore street, which is a 20 ft. skew arch, and with this exception all of them embrace the full width of the streets. At Whitman street the superstructure makes a clear span from abutment to abutment. At all of the other steel subways, intermediate supports are provided at the curb lines and in the Mt. Ephraim avenue viaduct, a third row of columns is placed in the center of the roadway. The vertical head-room was made 14 ft. at Kaighn avenue and Mt. Ephraim avenue to provide for the existing car line on the former and afford provision for a future line on the latter. On all of the other streets, except Lemon and Whitman streets, it is 13 ft. At these two, which are located in the run-off on the south end, a vertical clearance of 12 ft. was established.

The subway floor in all cases is composed of structural steel encased in or covered by a concrete slab to provide ballasted tracks, but, as mentioned above, the designs were modified as the clearance conditions permitted. At Whitman street the floor consists of steel troughs, spanning transversely between the girders with a floor thickness of 3 ft. from base of rail to under clearance. At Lemon and Atlantic streets 12-in., 40-lb. I-beams encased in concrete were used with a floor thickness of 2 ft. 10½ in. At the subway for the intersection of Louis street and Mechanic street and the one at Liberty street, sufficient head-room was available to permit



Map and Profile of the Work

the use of through girders with a floor beam and stringer type of floor, the concrete slab resting on the top flanges of the stringers, and giving floor depths of 5 ft. 3 in. and 4 ft. 2½ in., respectively. At Kaighn avenue and Chestnut street, deck girders with concrete deck slabs were used, with a total depth from base of rail to clear of 7 ft. 10⅝ in. and 6 ft.



Types of Floors Used for the Subways

5⅜ in., respectively. In the Mt. Ephraim avenue viaduct, the same type of floor was used as at Lemon and Atlantic streets, except that 15-in. I-beams were used which were raised materially above the lowest possible position, thereby giving a total floor depth of 4 ft. 5⅛ in.

These structures embody a number of interesting details.



Subway at Intersection of Lewis and Mechanic Streets

All floors were waterproofed with pitch and five-ply felt paper protected by a course of brick, laid on a sand cushion, except at Lemon street, where tile one inch thick were used to give a smaller floor thickness. In all cases where the floor consisted of slabs supported on top of the steel work, drainage was afforded by pipes passing through the slabs to steel troughs underneath and draining to down spouts at the columns. Where these slabs rest on the back walls of the abutments, expansion was provided by a lead bearing plate, which consists of sheets of lead soldered together. Where the floor



Looking North Toward Spruce Street Junction. Atlantic City Line Incline on the Right, Mt. Ephraim Avenue Viaduct on the Left

consisted of I-beams encased in concrete, steel aprons were provided which curve downward over the back walls.

The Mt. Ephraim avenue viaduct is supported on 2 abutments, 18 columns and 1 concrete pier. The latter is located on the south side of Walnut street and serves as the fixed point, expansion bearings being provided at each abutment with the columns acting as rockers.

In only three cases was any change made in the existing



A Section of the Heavy Timber Crib Retaining Wall

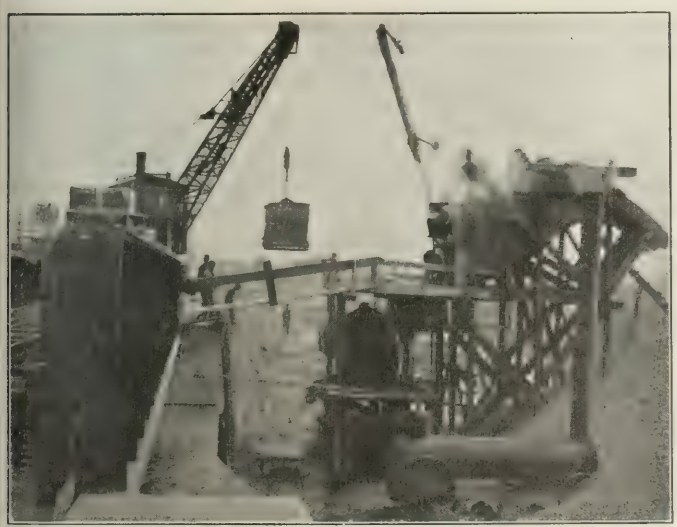
grade of the street. Lemon street and Whitman street were materially depressed to obtain the desired head-room. At Kaighn avenue it was necessary to lower the street grade by the amount which it had been originally elevated to cross the tracks which had been located somewhat above the natural ground surface at that point.

Construction Program

The traffic on the Atlantic City line is largely passenger, and is much heavier in summer time than in winter. The

winter schedule provides for 40 trains daily, while the summer schedule, plus an average of about 16 extra trains daily, amounts to about 76 trains on Monday to Friday, inclusive, and approximately 88 trains on Saturday. The old line on the surface consisted of two main tracks, and the right of way permits of a maximum development of four tracks, although the present authority is for the elevation of only two tracks. The need of avoiding interference with traffic during construction and the anticipated addition of more tracks in the future, resulted in a plan providing for the location of the two elevated tracks adjacent to the west right of way line. Owing to the restricted right of way this required a full height retaining wall along the west property line for practically the entire distance and with the operated tracks on the surface thrown as far toward the east side of the right of way as possible, and a temporary timber crib wall alongside the near track, it was possible to provide a full embankment for only one track on the elevation, until surface operation was discontinued. This crib wall was built of 12 in. by 12 in. and 12 in. by 14 in. second-hand timbers, as shown in one of the photographs.

It was the original plan to transfer the southbound traffic to the upper level as soon as the embankment was completed for one track and then build a second timber crib adjacent to the northbound track on the surface and complete the embankment for the northbound track. It was found that this plan would prove expensive, particularly because of the cost of the second timber crib, which at some points would need to be as much as 10 or 11 ft. high. Consequently, it was decided to transfer both northbound and southbound trains to the upper level as soon as the embankment was completed for one track, by the use of gauntlet tracks, and with operation removed entirely from the surface it would be possible to



The Concrete Plant. Locomotive Crane Raising the Concrete Bucket

complete the embankment without the use of a second crib retaining wall.

Construction Methods

This project involves 100,000 cu. yd. of embankment, 25,000 cu. yd. of concrete and 1,830 tons of structural steel. The total cost is about $700,000, all of which is borne by the Pennsylvania Railroad, except $13,000, or one-half of the cost of the bridges at Sycamore street and Whitman street, which were required to be built by the city of Camden after the passage of the original ordinance, under the terms of which additional bridges, when required, were to be paid for jointly by the railroad company and the city. The James McGraw Company, Philadelphia, has a contract for all the work except the steel erection, which is being done by the Pittsburg Construction Company. The concrete work was started in May, 1914, and all footings were completed by July of that year, and the neatwork of all structures by April, 1915. All concrete was provided from a plant located at Lemon street west of the tracks. As shown in one of the photographs, the mixer was located under an elevated bin which was filled by a stiff-leg derrick and a clam-shell bucket. The concrete was delivered to the work in a hopper bottom box mounted on a narrow gage car handled by a Brown-hoist locomotive crane, which also served to transfer the concrete from the mixer to the hopper car by means of a



South End of Track Elevation Looking North. Surface Tracks on the Right

bottom dump bucket. For the concreting of footings, the car was transported on a track laid on the surface. When the neatwork of the walls and abutments was being concreted the car was moved over a light trestle on a level with the tops of the abutments and which was also used for transporting the filling material. The retaining walls and abutments are of mass concrete and are damp-proofed on the back.

Work was commenced on the placing of the embankment in February, 1915, after a sufficient amount of the retaining walls and abutments had been completed so that the work of filling would not interfere. The filling material was all obtained from a borrow pit located west of the tracks at the end of the south runoff. The material was loaded with a 70-ton Marion steam shovel and handled in narrow gage side-dump cars by dinky locomotives operating over the light trestle previously mentioned in connection with the concrete work. The embankment was entirely completed for one track by April, 1915, after less than two months' work.

The erection of the structural steel work was not commenced until the embankment had been finished for the one track. This work was started at the south end and continued progressively northward, using standard gage equipment running on a track, laid on the embankment and the bridges as the work progressed. This track was provided with a third rail to permit the operation of the narrow gage equipment for the transporting of concrete for the deck slabs and for additional filling, etc.

The southbound track was placed in service on the upper level early in January, 1916. The gauntlet track installed extends from the south end of the Mt. Ephraim avenue viaduct to a point half way between the Lemon street and the Whitman street bridges. This gave the minimum length of gauntlet tracks and avoided complications with the junction at Spruce street. Operation of the northbound trains over this gauntlet track was commenced on March 21 and work was then resumed on the embankment to complete a sufficient width for two tracks. This work was practically completed about June 1, when the summer passenger schedule with greatly increased service became effective.

The design and construction of this work were under the general direction of A. C. Shand, chief engineer of the Penn-

sylvania Railroad. The design of the subways was under the immediate direction of H. R. Leonard, engineer of bridges and buildings, and C. W. Thorn, assistant engineer, is in direct charge of construction.

THE RAILWAY WAGE CONTROVERSY

In addition to those mentioned in previous issues many railroads have issued circulars to their train employees regarding the wage controversy, asking them to consider the situation carefully before voting for a strike.

Buffalo, Rochester & Pittsburgh

A circular by T. F. Brennan, general manager of the Buffalo, Rochester & Pittsburgh, is addressed especially to the older men in the company's employ. Mr. Brennan says:

"I hope that before casting your vote you will give careful consideration to the position of this company which is striving to justly compensate all of its employees for their service and at the same time fairly compensate investors for the use of their money. Your welfare, as well as that of the company, depends on the company's ability to do this.

"The vote of a stockholder in a corporation counts in proportion to the capital he has invested. The vote of a company in the larger railroad associations, when taken on matters of importance, counts in proportion to its mileage. The matter regarding which you are about to cast your vote is of vital importance to you, especially to those of you who have been many years in the service of this company. Your experience and years of service constitute your capital and you are concerned in the result of this vote in proportion thereto; but as the vote of an older employee will count for no more than that of a younger man, who has comparatively little at stake, I most earnestly urge the older men, who because of their longer experience have a better understanding of conditions, to advise the younger men with a view of bringing about an impartial adjustment of the present controversy."

Santa Fe

A. G. Wells, general manager of the Atchison, Topeka & Santa Fe Coast Lines, has issued a circular saying in part:

"Some of you have never been through a strike. Take my word for it; such have much to be thankful for, especially those who have wives, mothers, sisters or children dependent upon them for support.

"Here on the coast lines we have by intelligent effort and hearty co-operation built up a transportation organization that is second to none in the world. Do not let us disrupt it.

"Yours are preferred jobs, and in the event of a strike men will flock in from all parts of the country to take your places, because it is known you have good conditions, good pay and good treatment. This is what happened in 1894, and history always repeats itself.

"There has never yet been a big railway strike that the men won. Furthermore, the Santa Fe has never been forced to engage in a strike it did not win.

"The present demands are unjust and impossible. Your insurance against sacrificing the seniority which by years of toil you have built up is to see that your ballot on the impending issue bears the legend 'No.' I appeal to you in the name of that great Santa Fe family of which we are all members, of which we are all so proud, and which your industry and intelligence have helped to create: in your own self-interest and that of those dear to you, and as a man who has your welfare very much at heart, to vote 'No' on the impending issue."

Burlington

In a circular issued to the employees of the Chicago, Burlington & Quincy, Vice-President H. E. Byram says:

"The present road schedules, based entirely on the 10-mile-an-hour basis, are the outgrowth of many years of amicable negotiations and arbitrations between the company and your representatives.

"It is not the desire of this company, as a participant in the movement, to deprive you of any of the privileges either in compensation or working conditions that are accorded to you by the existing agreements, but any attempt to apply all the existing rates and favorable rules that produce additional compensation and which have been based on a 10-mile-an-hour basis, to a 12½-mile-an-hour basis in road service, and 8-hour basis in yard service at the 10-hour rates, would have the result of destroying the very foundation of our present basis of payment and produce a result that would be entirely unfair to the company. It is the desire of this company to continue the agreements that are now in force on the 10-mile-an-hour basis as they are at present.

"In the interest of the harmony and fair dealing that has heretofore prevailed in the handling of such matters between the Burlington company and your representatives, I feel it my duty to call your attention to these facts and to ask you to consider them in making up your minds whether to vote in favor of extreme measures which might disrupt and destroy the harmonious conditions that prevail on the Burlington railroad at this time."

Gulf, Colorado & Santa Fe

F. G. Pettibone, vice-president and general manager of the Gulf, Colorado & Santa Fe, has issued a circular to the public, explaining the demands of the brotherhoods and of the railways' proposals for arbitration. The circular is in a series of 14, giving a comparison of the earnings of a train crew on various local runs, under the present basis of wages and the proposed basis. In conclusion the circular says: "We address this communication to you, our patrons who travel and ship over our line, for the reason that it is you who must ultimately pay the bill. Regardless of whether the railways or the men are right in this thing, is it not proper that you, the third party, should have a voice in the proceedings? It is fair to both men and railways that an impartial tribunal should sit in judgment upon the case in its entirety and it is your right that this should be done. Is it not, therefore, your duty to exert your influence to bring this about?"

Colorado & Southern

E. S. Koller, vice-president and general manager of the Colorado & Southern, has issued the following circular to the employees:

"We note that the statement accompanying the ballots on which the engineers, firemen, conductors and trainmen are voting, contain the following statement:

"'It (the answer of the railroads) also abolished the "first-in, first-out" rule and "automatic release," and allowed crews to be run through terminals and around other crews.'

"This statement is misleading, and to avoid misunderstanding we submit for your information the following: Conferences with the committee representing the men developed the fact that there are many different rules and practices calling for release of crews, etc. It was not the intention of the National Conference Committee of the Railways to disturb these rules and practices as they now exist on individual roads, except to the extent necessary to conform to the following principles, without interfering with existing seniority rules:

"First: To permit short turn-around runs with definite limitations as to miles and hours.

"Second: To permit at the beginning of the day, the combination of a short trip with a straightaway or long trip.

"This proposed limited operation of crews through terminals or turning at terminals, does not justify the broad assertion that 'first-in, first out' rules and 'automatic release' where they now exist are to be abolished."

Nashville, Chattanooga & St. Louis

John Howe Peyton, president and general manager of the Nashville, Chattanooga & St. Louis, issued a circular to officers and employees, giving actual amounts of payrolls on that road for the month of May.

Dividing all employees into three classes: (1) train and yard service employees, (2) general officers (president, vice-president, general counsel, treasurer, division superintendents, etc.), and their assistants and clerks, and (3) all other employees not included in the other two classes, and analyzing the payroll, it is found that the actual compensation paid these three classes for the month of May, 1916, was as follows:

	Total compensation	Total hours	Average per hour	Total days	Average per day of 10 hrs.
Class 1—					
Enginemen	$46,839	79,447	59 cts.	7,944	$5.90
Firemen	26,874	76,758	35 cts.	7,676	3.50
Conductors	23,138	45,139	51 cts.	4,514	5.10
Other trainmen	66,180	190,384	35 cts.	19,038	3.50
Total (Class 1) trainmen	$163,032	391,728	42 cts.	39,172	$4.20
Class 2—					
General officers, assistants and clerks	$94,421	296,245	32 cts.	29,624	$3.20
Class 3—					
All other employees	$314,039	1,760,880	18 cts.	176,088	$1.80
Total (Classes 2 and 3)	$408,460	2,057,125	20 cts.	205,712	$2.00

"It will be seen that during the month of May, the equivalent of 39,172 ten-hour days at $4.20 per day was worked by the train and yard employees. It is evident that if a strike be effected by about 1,600 of these employees because their demands for greatly increased compensation are not granted, trains must cease to run, and about *seven thousand other employees* who, during the same month, worked the equivalent of 176,088 ten-hour days at an average pay of $1.80 per day, must, sooner or later, be thrown out of work.

"This company confidently expects, if a strike is called by those dissatisfied with their present working conditions and who are now paid more than twice the average wages of all other employees, that its employees from all departments will volunteer to fill vacancies in order to prevent the discontinuance of trains, which would result in inconvenience to the public, privation among employees and their families, and serious loss to the company.

"If the emergency arises, *There will be a call for volunteers. Are you prepared to serve?*"

The Association of Western Railways has compiled for distribution a collection of newspaper editorials commenting on the proposal of the railways that the wage issue be submitted to the Interstate Commerce Commission or to arbitration.

The Brotherhoods

At the recent convention of the Brotherhood of Locomotive Firemen and Enginemen at Denver, Colo., the general secretary and treasurer was directed to send a communication to Washington protesting against any interference by Congress in the wage controversy. The protective committee also reported a resolution, which was adopted, declaring that the work of the locomotive firemen is "skilled labor." Another resolution was adopted urging the employment of white men exclusively as train service employees.

The brotherhoods are conducting an extensive advertising campaign by the use of large posters, giving their arguments in support of their demands, which are tacked on fences and trees, and displayed in stores, barber shops, etc. One of these posters states that an "eight-hour day" for train employees is favored by the governors of 10 states, as follows: Woodbridge N. Ferris, of Michigan; Frank M. Byrne, of South Dakota; William C. McDonald, of New Mexico; M. Alexander, of Idaho; James E. Ferguson, of Texas; Frank B. Willis, of Ohio; Samuel V. Stewart, of Montana; Locke Craig, of North Carolina; George W. P. Hunt, of Arizona; G. W. Clarke, of Iowa.

They have also furnished slides containing arguments for an "eight-hour day" to a large number of moving picture houses throughout the country.

THE REGULATION OF RAILROAD PURCHASES

By W. L. Stoddard

Washington, July 11.

This week marks the last date for the filing of briefs on the tentative draft of rules prepared by the Interstate Commerce Commission for the enforcement of section 10 of the Clayton Anti-Trust act. This law requires that in specified cases purchases of railroad supplies shall be made and dealings shall be had "with the bidder whose bid is the most favorable to such common carrier, to be ascertained by competitive bidding under regulations to be prescribed by rule or otherwise by the Interstate Commerce Commission." The section under discussion goes into operation October 15, and representatives of railroads and of railroad supply manufacturers appeared before the commission last month to present their views.

The act provides that common carriers shall make or have no contracts for construction or maintenance at any time to the amount of more than $50,000 a year with any firm when the carrier has upon its board of directors or as an agent any person who is at the same time an officer of the company from which supplies are bought, or who has "any substantial interest" in such a company. Within thirty days after making any purchase every common carrier must file a statement with the Interstate Commerce Commission setting forth fully the transaction, naming the bidders; and must describe the manner of the competitive bidding. The commission is empowered to investigate such transactions, and when it has reason to believe that the law has been violated, it must turn over its papers and findings to the attorney general. Besides providing heavy fines for violations of this law, the statute prescribes that bids shall be advertised in newspapers and trade papers setting forth in detail the conditions of the purchase.

Among those who appeared at the hearings before the Commission were J. Kruttschnitt, Alfred P. Thom, Henry B. Spencer, W. A. Worthington, George A. Post, and other representatives of corporations and railroads involved. Mr. Thom presented an elaborate analysis of the proposed rules.

Mr. Thom urged the commission first to define the field in which the proposed regulations should operate. Dealings between a company and its subsidiaries ought not to be considered as coming within the law. He argued that section 80 of the Clayton law did not prohibit interlocking directorates in common carriers, and therefore section 10, to be consistent with section 80, must have the same purpose. He read a letter from the treasurer of the Pennsylvania Railroad who said, in part, "Under the Clayton act it would appear that we would have to restrict transactions to less than $50,000 per annum; any amount over $50,000 must be subject to competitive bidding. This would require us to offer outside bidders opportunity to purchase stock in subsidiaries where we now own entire capital stock, and thereby work a great hardship upon us."

Such corporations, declared Mr. Thom, referring to the supply companies owned by the railroads, are merely, "the alter ego of the same corporation. It seems to me that there is not a purchaser, on the one hand, actuated by an unfair or dishonest interest toward the seller, on the other; because, in effect, the purchaser is buying from itself."

The speaker also asked the Commission to define the phrase, "substantial interest" and to make clear the meaning of the word "the most favorable bid" so that in case a bid not the lowest were accepted, the carrier would not be

prosecuted. The question of advertising specifications was discussed at length; also the question of emergency purchase by permission of the commission, and the delays arising from the necessity of publishing detailed specifications.

Representing the railway business association, George A. Post summed up the situation when he said, after endorsing the principle of the bill, that "All that I would ask of the commission is that it shall carefully abstain from any interference with the orderly course of business or put unnecessary burdens upon those who are called upon to bid under the circumstances of the interlocking status. . . . All that the rules should require would be that after the bids are in, the railroad officer whose function it is, upon a review of the case, to decide which is the most favorable bid, all things considered, should award the contract." Some such procedure, Mr. Post declared, would assure the integrity of the buyer and would do away with the "shoestring buyer," a class denounced by Mr. Thom as "the harpies which will seek to fasten their fangs upon the railroads," so that "honest roads and honest business men will hereafter be confronted, by virtue of this system," with a horde of competitors whose activity would force up the price of railroad supplies.

TRIPLEX ARTICULATED LOCOMOTIVES FOR THE ERIE

In 1914 the Baldwin Locomotive Works built for the Erie Railroad a Triplex articulated compound locomotive,* designed in accordance with patents granted to George R. Henderson. This locomotive attracted wide attention because of the novelty of its design and its great hauling capacity. It develops a tractive force, working compound, of 160,000 lb., and in this respect is still unsurpassed, as far as is known, by any other steam locomotive.

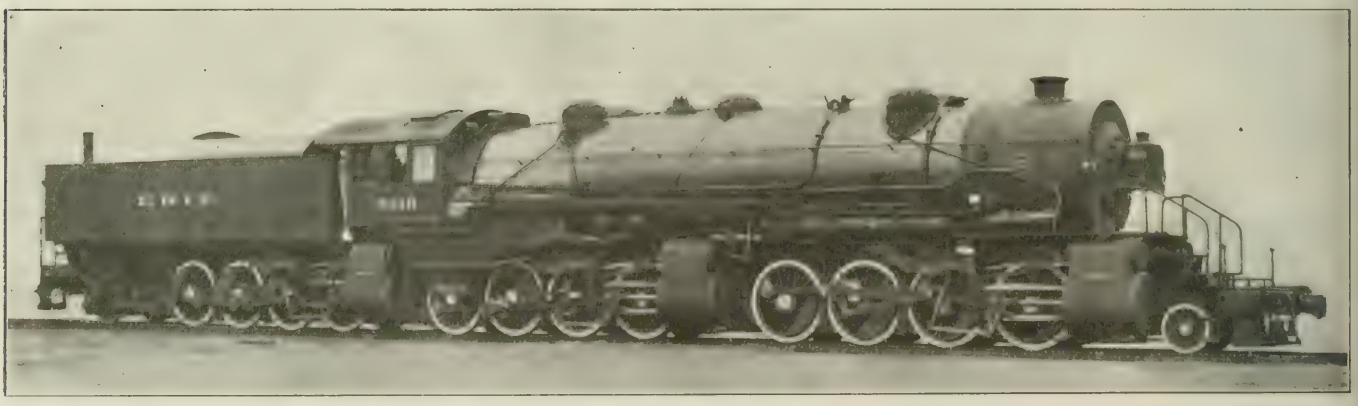
This locomotive has been used in pushing service on the Susquehanna Hill, where the grade is 1.5 per cent, and where three helper locomotives were formerly required in handling a full tonnage train. The results obtained have been so satisfactory that two additional locomotives of the same hauling capacity as the first one have recently been completed. In general design these locomotives closely follow their predecessor, and the majority of the machinery and structural details are interchangeable in all of them. Based on experience with the first engine, a number of changes have been made, but these in no way affect the general principles on which the locomotive is designed and operated.

Experience with the first engine indicated the desirability of securing additional grate area. Accordingly in the new locomotives, the Gaines bridge wall is omitted, and the grates extend the full length of the furnace, 13 ft. 6 in., the grate area being 121.5 sq. ft. This is probably the largest grate ever used in a locomotive. The grate bars are divided by longitudinal bearers into three groups, and each group is arranged to rock in two sections. The grates are shaken by power, two operating cylinders being placed low down on the back head. These rotate a transverse steel shaft of 2¼ in. square section on which are mounted suitable arms having square fits and therefore rotating with it. The grate-shaking levers are mounted on bushings which are slipped over the shaft. They may be latched to the fixed levers so that the different sections of the grate may be rocked independently as desired. There are two drop-plates, located right and left in the back of the firebox, and they can also be operated by the power shakers.

The firebox is built with a combustion chamber 54 in. long which extends forward into the boiler barrel. All seams in the firebox and combustion chamber are welded, as are also the seams in the two fire-door openings; and the inside and outside shells are welded to the mud-ring at the corners. The arch tubes extend from the bottom of the combustion chamber to the back sheet of the firebox. A vertical wall is built across the throat of the combustion chamber, and the foot of the arch abuts against the top of this wall.

As the firebox is located above three pairs of driving wheels, the space available for the ash-pan is necessarily limited. A large pan of the Talmage type, however, has been applied. This pan has four hoppers, and provides an air opening amounting to 16.6 per cent of the grate area.

The machinery, running gear, cylinders and steam piping of these locomotives are practically duplicates of those used on the first engine. The rear truck has been moved back one foot, thus lengthening the total wheel base from 90 ft. to 91 ft.; and the capacity of the tank has been increased from 10,000 to 11,600 gallons. The feed water heater under the tank is retained, and the water drawn from the heater is forced into the boiler by a centrifugal pump which is placed under the running board on the right hand side. The pump and injector checks are placed well forward on the top center line of the boiler. The front sand boxes are placed right and left on top of the boiler, instead of in the forward cylinder saddle as in the previous design.



Erie Triplex Locomotive

This type of locomotive has proved its efficiency for heavy pushing service. As far as its machinery, articulated frame connections and steam piping are concerned, the details are so similar to those of Mallet locomotives that any organization trained to handle Mallets should have no difficulty in caring for the Triplex locomotive. On the Susquehanna Hill grade conditions and tonnage rating are particularly favorable to the use of these locomotives, the three pushers formerly required per train being replaced by one Triplex. Where similar conditions prevail on other lines, the Triplex locomotive is worthy of consideration as a means of reducing the expense of heavy grade operation.

*For a description of this locomotive see May 8, 1914, issue of the *Railway Age Gazette*, page 1057.

The principal dimensions and data are as follows:

General Data

Gage	4 ft. 8½ in.
Service	Pusher
Fuel	Bituminous Coal
Tractive effort	160,000 lb.
Weight on drivers	766,300 lb.
Weight on leading truck	32,050 lb.
Weight on trailing truck	62,000 lb.
Weight of engine and tender in working order	860,350 lb.
Wheel base, driving	71 ft. 6 in.
Wheel base, rigid	16 ft. 6 in.
Wheel base, total	91 ft.

Ratios

Weight on drivers ÷ tractive effort	4.8
Total weight ÷ tractive effort	5.4
Tractive effort × diam. drivers ÷ equivalent heating surface*	1,092.5
Equivalent heating surface* ÷ grate area	75.9
Firebox heating surface ÷ equivalent heating surface,* per cent	4.7
Weight on drivers ÷ equivalent heating surface*	83.1
Total weight ÷ equivalent heating surface*	93.2
Volume equivalent simple cylinders	51.32 cu. ft.
Equivalent heating surface* ÷ vol. equiv. simple cylinders	179.8
Grate area ÷ vol. equiv. simple cylinders	2.4

Cylinders

Kind	Compound
Diameter and stroke (2 H. P. and 4 L P.)	36 in. by 32 in.

Valves

Kind	Piston
Diameter	16 in.
Type of valve gear	Baker

Wheels

Driving, diameter over tires	63 in.
Driving, thickness of tires	3½ in.
Driving journals, main, diameter and length	11 in. by 13 1/16 in.
Driving journals, others, diameter and length	11 in. by 13 1/16 in.
Engine truck wheels, diameter	33 in.
Engine truck, journals	6 in. by 12 in.
Trailing truck wheels, diameter	42 in.
Trailing truck, journals	9 in. by 12 in.

Boiler

Style	Conical
Working pressure	210 lb. per sq. in.
Outside diameter of first ring	94 in.
Firebox, length and width	162 in. by 108 in.
Firebox, plates, thickness	tube, 5/16 in.; others, 3/8 in.
Firebox, water space	front, 6 in.; back and side, 5 in.
Tubes, number and outside diameter	326—2¼ in.
Flues, number and outside diameter	53—5½ in.
Tubes and flues, length	24 ft.
Heating surface, tubes and flues	6,418 sq. ft.
Heating surface, firebox†	433 sq. ft.
Heating surface, total	6,851 sq. ft.
Superheater, heating surface	1,584 sq. ft.
Equivalent heating surface*	9,227 sq. ft.
Grate area	121.5 sq. ft.

Tender

Water capacity	11,600 gal.
Coal capacity	16 tons

*Equivalent heating surface = total evaporative heating surface + 1.5 times the superheating surface.

†Includes 108 sq. ft. combustion chambers, and 74 sq. ft. arch tube heating surface.

CANADIAN RAILWAY COMMISSION APPROVES ADVANCES IN EASTERN FREIGHT RATES

The Railway Commission of Canada on July 6 issued its decision on the application of the railways in eastern Canada for general increases in freight rates, allowing advances in the class rates of from 1 to 6 cents per 100 pounds and a large number of increases in commodity rates. The advances allowed are in many cases less than those proposed by the railways. The advances are approved on the ground that they are necessitated by increases in operating expenses, including wages, and in the cost of fuel and supplies. The commission has issued an official summary of the decision. Regarding the reasons for an increase it says:

"Operating expenses have increased generally. While from 1899 to 1914 train mile earnings increased 89 per cent, the cost of service per train mile increased 112 per cent, notwithstanding economies attributable to increased locomotive power, lower grades, better loading and increased traffic. In the period 1910 to 1914 earnings increased 10.6 per cent; expenses, 17.7 per cent. In 1915 earnings increased 5.3 per cent; expenses, 12.4 per cent.

"Railway ties cost 38 per cent more in 1914 than in 1907; in 1915 they were 45 per cent higher.

"The cost of fuel to operate 100 miles was 30 per cent higher in 1914 and 1915 than in 1907. The average cost of fuel increased 21.8 per cent in the period 1909 to 1914.

"Salaries and wages represent three-fifths of the total railway expenses. This item has increased rapidly. The wage bill of the Grand Trunk alone increased in the period 1909 to 1914 by 52 per cent, and for 1915 the increase was 50 per cent.

"The increase in labor cost is mainly due to increases in wages, as there have been economies in the number of men employed per 100 miles of track. Decreases in wages are not a feasible means of economizing. The wages on the Grand Trunk have increased by 4.3 per cent since the hearing.

"The Canadian Pacific divisions in eastern Canada are the Atlantic, Eastern, Ontario and Lake Superior. The Atlantic division is operated at a loss. There is but little local traffic on the Lake Superior division. The Canadian Pacific and the Grand Trunk are both engaged in business in the Eastern and Ontario divisions, and here the freight business of the Canadian Pacific gives only 20 per cent of its total freight revenue, and represents only three-fifths of the business done by the Grand Trunk.

"The Grand Trunk was built to meet the needs of eastern Canada. It runs into all the large producing centers; it has a well established and well worked up business. In eastern Canada it does the largest business and obtains the greatest earnings. It is fair to accept for primary consideration the actual results of the Grand Trunk's earnings as a basis of rates. The rates cannot be based on the total capital cost of the Grand Trunk as carried on the company's books, which would represent a cost of $131,000 per mile.

The new lines of the Canadian Pacific from Glentay to Agincourt and from Toronto Sudbury, cost respectively $71,000 and $56,000 per mile. This includes nothing for terminals. The Intercolonial cost, including equipment and terminals, $75,000 per mile.

"The Hydro-Electric Company has recently made an estimate that 138 miles between Toronto and London would cost $100,000 per mile, including terminals and equipment.

"The net earnings per mile of line of the Grand Trunk at their highest in 1913 amounted to $3,500 per mile. In 1914 they were $3,059 and in 1915 $2,477.

"The financial relations of the Grand Trunk to the Grand Trunk Pacific, as well as to its United States lines, are analyzed, and it is ruled that outside investments cannot be considered as bearing on the reasonableness of freight rates.

"Economical financing of the Grand Trunk has been rendered extremely difficult, if not impossible. Appropriations of all kinds have been cut and repairs have been postponed. On December 31, 1915, over 4,000 cars were held for repairs, notwithstanding the lighter traffic of the year.

"In order to keep the equipment in proper shape, it will be necessary to obtain 1,249 new freight cars at an expenditure of $2,238,000. Normal track renewals would require 431 miles; for the period 1913 to 1915, inclusive, the track renewals were only 45 per cent of this standard; and for the year 1915 the renewals fell to 67 miles. The renewal work on bridges and culverts during the year 1915 is $20,000 below the average yearly expenditure of the period of 1906 to 1915.

"The economies so made cannot continue indefinitely without great loss and inconvenience to the public.

"In the Western rate case, the government expert computed that six per cent should be allowed so as to provide four per cent for interest charges and two per cent for surplus.

"Money is now more expensive. Taking the cost of the Glen Tay-Agincourt line and adding $10,000 per mile for equipment, the net earnings would have to be $4,800. If the Toronto-Sudbury line is taken as a basis, net earnings per mile would have to be $4,001; while if the Intercolonial is taken they would have to be $4,500.

"Aside entirely from the terminal expenses, the Grand

Trunk net earnings in the best year are far short of these figures.

"The western rates case points out the difference in conditions between eastern and western Canada and, notwithstanding material reductions, the general schedule in the west is higher. The Railway Act requires and the general public interest of the country demands that if practicable eastern rates should be advanced so that the different schedules may more nearly approach a parity.

"The effect of new competing lines, the Canadian Northern, recently constructed, is not considered in striking a reasonable basis. The increases made are justifiable entirely on the mere fact of the increases in Grand Trunk expenses, and having regard to traffic of normal years."

The increases in rates allowed are described as follows:

"Besides the class tariffs of general application, the application of the railway companies comprises over 150 exceptional or special single rates and more or less comparative schedules of exceptional rates, lower than the class rates, applicable to various commodities.

"To quote the judgment—'No flat increase of 5, 10 or other percentage could be applied simply to augment railway revenue. Each rate of notice has to be considered having regard to its reasonableness for the service performed.'

"As each of these items has thus been separately dealt with on its merits it is impossible within the limits of a press notice to give any clear synopsis of the board's conclusions. The application with respect to some of the commodity items has been declined and in numerous instances less has been granted than asked for by the railway companies.

"The findings regarding the class tariffs may, however, briefly be summarized. In the territory bounded on the west by, but not including, Port Arthur, and by the Georgian Bay, Lake Huron and Detroit river, and on the east by Quebec and Megantic, also between C. P. R. stations in New Brunswick, the class rates, provided they are now lower than the standard or maximum mileage tariff, may be increased by two cents in the first and one cent in the fifth classes, the rates for the other classes to be properly proportioned in accordance with the standardized scale. An exception is made of the lines of the Canadian Pacific and Canadian Northern between Parry Sound and Sudbury, otherwise no increases are allowed.

"Because of the comparatively lower level of the rates to the Maritime Provinces great increases are permitted. Between points in the provinces of New Brunswick and Nova Scotia and points west of Quebec, Levis and Megantic as far as Montreal and Valleyfield and north of the Ottawa river the first class will be advanced four cents and the fifth class two cents. The other classes in proportion.

"Between the same maritime sections and points west of Montreal the carriers are authorized to increase their rates by six cents for the first class and three cents for the fifth, the remaining rates fitting in from the standardized scale.

"Here, again, an exception is made of the line of the C. P. R. in the St. John River Valley, where the rates, instead of being advanced, will be lowered by the company so as not to exceed the St. John rates, this relief being due to the opening of the National Transcontinental south of Edmundston, N. B.

"As the government railways are not subject to the jurisdiction of the board, the Intercolonial and National Transcontinental management is, of course, free to fix its own rates. Nevertheless, the judgment provides that the through rates of the Grand Trunk, Canadian Pacific and other independent companies in Quebec and Ontario, to Intercolonial points east of St. John, to Halifax and Sydney are to preserve the same differences, if any, over the St. John rates as at present."

Commodity rates have been increased on iron and steel articles by one-half cent per 100 pounds on all rates not over 15 cents per 100 pounds, one cent on rates between 15 and 25 cents, and 1½ cents on rates over 25 cents. Pig iron, billets, wire rods, rails and crop ends bear a rate increase of about five per cent. Cement increases one-half cent per hundred pounds on all rates under 15 cents, and one cent on all rates over 15 cents. On crushed stone, sand and gravel there is a general increase of about five cents per ton. On lumber there is one-half cent of an advance on all rates under 15 cents and one cent on all rates over 15 cents for distances over 60 miles, with an exception covering districts affected by the Ottawa rate.

On paper there is an advance of one to two cents on less than carload movements. On carload shipments the commodity rates advance three-fifths of a cent to districts west of Quebec, Levis and Megantic, and three cents per 100 pounds to districts in New Brunswick, Nova Scotia and Quebec east of Levis.

Hay reverts from the commodity to the tariff rates. Increases on the rates on cattle, sheep and hogs are approximately one cent for distances from 31 to 40 miles, 1½ cents for 46 to 50 miles, and two cents for distances over 50 miles.

There is a 10 per cent increase in coal rates, with a maximum of 10 cents per ton, subject to certain exceptions, which reduce some rates. An advance of five and 10 cents per ton has been allowed on coke.

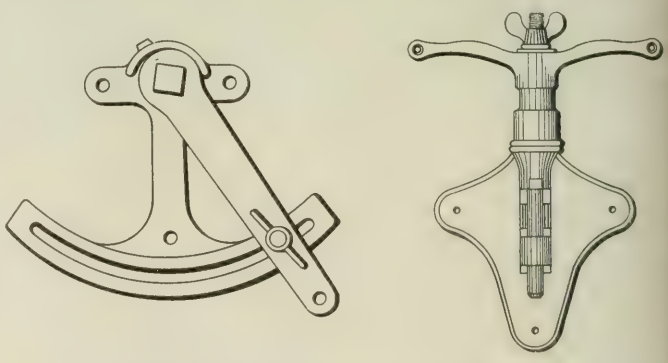
Commodity rates have been abolished on leather so as to restore it to the fourth and fifth class rates.

On canned goods there is a uniform increase of 1½ cents to Quebec points and one to four cents to St. John. On cheese there is an advance of two cents per hundred pounds to Montreal.

The proposed increases on fruits are postponed until they can be considered along with proposed increases in icing and salt for refrigeration, which are now under suspension.

VENTILATION ACCESSORIES

Two devices for use on the dampers of ventilating ducts have recently received extensive introduction. One is a damper quadrant with which a damper may be secured in any position. It consists entirely of malleable iron parts. The axle of the damper is attached to a short lever which rotates in contact with a frame containing a quadrant slot which is secured to the side of the duct. A wing nut in the end of the lever makes it possible to lock the lever at any



The Damper Quadrant and Damper Clip

point in the length of the quadrant slot, thus insuring a fixed position for the damper.

In the case of dampers which require frequent adjustment where a positive lock would be a source of inconvenience, a damper clip has been provided known as the "Sure Lock Clip." This is provided with one or two handles to which chains may be attached for hand operation and has a special adjustment in the barrel whereby the

damper is securely held in any position in which it is set.

Ventilating ducts and other sheet metal work require accessories especially adapted to the purpose; thus a special form of screw has been designed to cover the special requirements. The threads of these screws extend the entire length so that the metal may be drawn up flush with the head. The edges of the threads are sharp, causing them to cut into the metal in the manner of a tap. Another feature is that the screw is tapered only at the point, the sides of the screw being parallel for the larger portion of the length. These accessories are manufactured by the Parker Supply Company, New York.

QUARTERLY ACCIDENT BULLETIN No. 57

The Interstate Commerce Commission has issued Accident Bulletin No. 57 containing the record of railway accidents in the United States during July, August, and September, 1915. The number of persons killed in train accidents was 127 and of injured 1,837. The total number of casualities of all classes reported was 46,049; or 2,531 killed and 43,518 injured. With this bulletin the commission begins its new classification of casualties, announced last year. In the principal totals there is no important change. The injuries to trainmen, fatal and non-fatal, are divided, in table 1B, into 14 classes. A new class, "non-train accidents," includes the cases formerly classed as "industrial." The condensed summary, Table 1, is as follows:

TABLE NO. 1—CASUALTIES TO PERSONS—STEAM RAILWAYS

Class	Passengers and persons carried under contract		Employees (including employees not on duty)		Other persons (trespassers and non-trespassers)		Total persons	
	Killed	Inj'd	Killed	Inj'd	Killed	Inj'd	Killed	Inj'd
Train accidents.								
Collisions	9	514	31	314	4	13	44	841
Derailments	13	481	40	324	21	36	74	841
Miscellaneous, including boiler explosions	..	11	8	139	1	5	9	155
Total	22	1,006	79	777	26	54	127	1,837
Train-service accidents	40	1,431	434	8,589	1,812	2,915	2,286	12,935
Total	62	2,437	513	9,366	1,838	2,969	2,413	14,772
Nontrain accidents	..	...	100	28,337	18	409	118	28,746
Grand total	62	2,437	613	37,703	1,856	3,378	2,531	43,518

Table No. 1A presents figures of the current bulletin, the bulletin next preceding, and that covering the corresponding quarter of the previous fiscal year, as follows:

TABLE NO. 1A—CONDENSED SUMMARY OF FATALITIES

No.	Item	Bulletin No. 57 (July, Aug., and Sept., 1915)	Bulletin No. 56 (Apr., May, and June, 1915)	Bulletin No. 53 (July, Aug., and Sept., 1914)
1	Passengers killed in train accidents	22	2	73
2	Passengers killed, all causes	62	26	117
3	Employees on duty killed in train accidents	78	46	73
4	Employees on duty killed in coupling	30	22	27
5	Employees on duty killed, total	438	329	463
6	Total passengers and employees (items 2 and 5, above)	500	355	580
7	Other persons killed, incl. tresp., nontresp., and employees not on duty, all causes	1,936	1,609	2,069
8	Employees killed in industrial accidents	95	94	99
	Grand total (items 6, 7, and 8)	2,531	2,058	2,748

The non-train accidents—mostly accidents to employees at work (not on or around trains)—are divided, Table 1BA, into 13 classes of accidents and 5 classes of employees; but the number of hours worked, and the "man-hours," reported by the roads, do not appear in the bulletin. The total number of collisions and derailments reported was 2,853 (974 collisions and 1,879 derailments). These are classified as follows

TABLE NO. 2—COLLISIONS AND DERAILMENTS

Classes	Number	Number of persons—Killed	Number of persons—Inj'd	Damage to road and equipment
Collisions:				
Rear	92	13	212	$91,600
Butting	77	12	323	118,700
Broken train	97	...	9	41,600
Miscellaneous	708	19	297	335,900
Total	974	44	841	$587,800
Derailments due to:				
Defects of roadway	380	8	206	$222,600
Defects of equipment	964	21	114	805,700
Negligence of trainmen, signalmen, etc.	163	5	79	105,200
Unforeseen obstructions of track, etc.	75	25	222	166,000
Malicious obstruction of track, etc.	27	3	32	41,300
Miscellaneous causes	270	12	188	332,000
Total	1,879	74	841	$1,672,800
Total collisions and derailments	2,853	118	1,682	$2,260,600
Total for same quarter of—				
1914	3,085	172	2,329	$2,342,511
1913	3,913	208	3,760	3,239,159
1912	3,935	276	4,100	3,366,401

The bulletin gives the usual tables classifying certain kinds of accidents in detail, all shown (for employees) under the 14 heads above mentioned.

Twenty-one accidents occurring during this quarter were investigated by the inspectors of the commission and the reports of these investigations fill 40 pages of the bulletin. The accidents occurred as follows:

Spokane & Inland Empire and Idaho & Wash. No.—McGuires, Idaho	July	1	Side collision
Chic., Mil. & St. Paul—Rainier, Wash.	"	3	Derailment
Denver, Boulder & West.—Salina, Colo.	"	5	Derailment
Minneapolis & St. Louis—Haydenville, Minn.	"	7	Derailment
Norfolk & Western—Roanoke, Va.	"	22	Butting collision
Chic., Rock Island & Pac.—Mickles, Ark.	"	29	Rear collision
Missouri, Kan. & Tex.—Lockhart, Tex.	"	30	Derailment
Chic., Rock Island & Pac.—Waveland, Ark.	Aug.	1	Butting collision
N. Y., N. H. & H.—Atlantic, Mass.	"	4	Side collision
Norfolk & Western—Swords Creek, Va.	"	5	Derailment
Pitts., Cinn., Chic. & St. L.-Cumberland, Ind.	"	9	Derailment
Balt. & Ohio So. West.—Orient, Ohio	"	12	Rear collision
Ches. & Ohio—Altman, W. Va.	"	17	Derailment
Southern Pacific—Riverdale, Ore.	"	20	Butting collision
Colorado Midland—Idlewild, Colo.	"	27	Butting collision
Norfolk & Western—Welch, W. Va.	"	28	Butting collision
Missouri, Kan. & Tex.—Smithville, Tex.	Sept.	1	Butting collision
Denver & Rio Grande—Deen, Colo.	"	8	Butting collision
Memphis, Dallas & Gulf—Bingen, Ark.	"	9	Butting collision
Kansas City, Mex. & Orient—Mertzon, Tex.	"	9	Derailment
Missouri Pacific—Plattsmouth, Nebr.	"	24	Butting collision

Electric Railways reporting to the commission (not included in the foregoing statistics) had 150 persons killed during the quarter and 1,303 injured; and there were 30 collisions and 18 derailments. Train accidents are charged with 5 fatalities. The total number of passengers killed from all causes was 9; and of employees 14 (5 non-train accidents). The number of trespassers struck or run over by cars was 63; 46 killed and 17 injured.

THE AUTOMOBILE INDUSTRY.—During the year, 1914 to June, 1915, about 600,000 automobiles were built in the United States, as compared with 445,000 during the preceding year. It is believed that the total production for 1916 will be about 900,000.

THE MURMAN RAILWAY OF RUSSIA.—More than 15,000 men are working on the Murman Railway, which will be completed in August or September. The terminus of the Murman Railway is an ice-free port on the Arctic Ocean, 700 miles north of Petrograd.

DISCHARGED PRUSSIAN SOLDIERS AS TICKET COLLECTORS.—It is stated that in future as many armless and one-armed men discharged from the army as possible will be employed on the Prussian State railways as ticket collectors. A ticket-punching apparatus worked by the feet has been adopted.

General News Department

A fire at the shops of the Seaboard Air Line, at Portsmouth, Va., July 6, destroyed the coach shed and ten passenger cars; estimated loss, $100,000.

The Southern Pacific has announced an increase of wages of 25 cents a day for all section laborers, except Mexicans and Chinese, employed on its lines in California, Nevada, New Mexico and Arizona.

The United States Civil Service Commission announces examinations August 28 and 29 for the positions of inspector of safety appliances and inspector of hours of service under the Interstate Commerce Commission; salary, $1,800 a year. Applicants must be between 25 and 50 years of age. Persons who desire to take the examinations should apply to a civil service board for form 1933.

Herbert Deeming, for 13 years secretary of the Chicago General Managers' Association and the Association of Western Railways, has become associated with D. C. Buell in the management of the Railway Education Bureau at Omaha, Neb. His headquarters will be in Chicago temporarily, but later at Omaha. Mr. Deeming was formerly chief clerk to the president and general manager of the Chicago & Western Indiana railroad and the Belt Railway of Chicago.

The employees of the Pullman Car Works, Pullman, Ill., have organized a baseball league to consist of 10 competing teams. J. S. Runnells, president of the Pullman Company, has offered a permanent cup for the winning team and a set of medals for the individual members. The company will furnish uniforms and all necessary incidental equipment. LeRoy Kramer, vice-president of the Pullman Company, has been made honorary president of the league; R. Thompson is president, C. Swingle, vice-president; E. A. Backlin, secretary-treasurer.

The board of directors of the Pennsylvania Railroad at its meeting on June 12 authorized an appropriation not to exceed $100,000, to be expended under the direction of the proper executive officers for the relief of the families and dependents of employees who have been enlisted in the army or navy of the United States through membership in the national guard or otherwise, and who have been called into active service. Each case will be dealt with on its own merits, so that the relief will in every case be directed into channels where there is an established necessity for its application.

Anderson Pace, manager of the Bureau of Railway Publicity of Illinois, has sent out a circular and also has published an advertisement in Chicago newspapers announcing the organization of the bureau by the railway companies operating within the state of Illinois, for the purpose of promoting "a better acquaintance between the public and the railways of Illinois, a better understanding by the railways of what the public wants and thinks, a better understanding by the public of railway needs and problems, and increased co-operation between the railways and those whom they serve."

Violent Storm in the Gulf States

Railroads throughout large sections of the states of Florida, Mississippi, Louisiana and Alabama sustained great damage from a tropical hurricane moving inland from the Gulf of Mexico on July 5. After striking the vicinity of Pensacola, Fla., and Mobile, Ala., it moved through southern Mississippi as a violent rainstorm which caused washouts all through that section and much damage to bridges. At Bond, Miss., on the Gulf & Ship Island, an engineman and a fireman were killed in a derailment caused by a washout. Near Pensacola, a Louisville & Nashville bridge, three miles long, over the Escambia Bay, was washed out, necessitating a long detour for eastern traffic. Several days elapsed before conditions were generally restored to anything approaching normal.

Georgia's State Railroad

In accordance with recommendations contained in the report of the Western & Atlantic releasing commission of the state of Georgia, a bill has been introduced into the legislature, which is now in session, amending the releasing act by providing that the next lessee, with the written consent of the governor, may sublet trackage rights. This was previously prohibited. Another bill would give the commission complete authority to handle all matters pertaining to encroachments on the right of way. The commission, in its report, states that it is investigating the ownership of property by the state at St. Mary's, in connection with the proposed construction of deep-water terminals at that port. The commission has not yet reached any conclusions as to the extension to the sea. The report contains an appreciation of the aid extended by John Howe Peyton, president, and Hunter McDonald, chief engineer of the Nashville, Chattanooga & St. Louis, present lessee.

Slow Orders and Hand Signals*

Inspectors spoke of the necessity of men being very careful when working at a bridge where there is a slow order, not to wave at engineer on passing trains and not to make any signal with the hands, as the engineer is liable to mistake it for a "high ball" and not slacken speed across the bridge. Cases were cited in the past where the engineer approaching with his train to where men were working waved with his hand at the foreman in charge, who returned the salute by waving his hand; and the engineer thought, or pretended he thought, it was the go ahead signal, and did not slacken speed; an accident resulted and the foreman received the blame.

It was decided that if the engineer waves or signals to the foreman, and foreman feels that he must acknowledge the courtesy, then the best thing to do is to nod the head; but in any case keep the hands down so that nothing can be construed as a signal to continue at regular speed. In case of an accident where slow orders have been disregarded, if the foreman has waved or signaled in any way to the engineer, then the engineer can easily lay all blame on the foreman.

American Shipbuilding During the Year Ended June 30, 1916

The Bureau of Navigation, Department of Commerce, reports that 1,030 vessels of 347,847 gross tons were built in the United States and officially numbered during the fiscal year ended June 30, 1916, compared with 1,266 vessels of 215,711 gross tons during the fiscal year ended June 30, 1915. The seaboard yards have built 35 large steel merchant steamers aggregating 191,859 gross tons, the largest merchant steel output in their history. Of these, 21 steamers are each over 5,000 gross tons, the largest being the H. H. Rogers of 10,050 gross tons; and 14 are between 3,000 and 5,000 gross tons each. The Newport News Shipbuilding and Dry Dock Company built 6 of 40,329 gross, Maryland Steel Company, Sparrows Point, Md., 8 of 35,665 gross, Union Iron Works, San Francisco, Cal., 5 of 32,665 gross, New York Shipbuilding Company, Camden, New Jersey, 7 of 32,164 gross, and Fore River Shipbuilding Company, Quincy, Mass., 4 of 24,932 gross. The Newport News, Camden and Quincy yards were also engaged in naval construction. Of these steel ocean steamers 24 of 138,858 gross tons have been registered for foreign trade, 8 of 34,386 gross tons enrolled for the coasting trade, one, of 6,034 gross tons, was sold to Norwegians and up to June 30 the two remaining had not been documented. Of the relatively small output of the Great Lakes, 8 vessels of 14,775 gross tons are each under 2,500 tons, built for the ocean trade of which 4 are for foreign trade and one has been sold to Norwegians.

*From the Minutes of a Frisco Staff Meeting.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MAY, 1916

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Alabama & Vicksburg	143	$98,347	$38,322	$149,423	$14,811	$30,330	$3,721	$48,059	$2,121	$5,448	$104,344	$45,078	$8,535	$36,543	$23,011
Alabama Great Southern	309	406,504	106,467	551,228	48,304	108,993	13,795	141,601	3,142	9,394	325,229	225,999	16,433	209,544	118,959
Atchison, Topeka & Santa Fe	8,626	7,375,183	2,044,423	10,238,456	1,418,229	1,404,204	174,032	2,646,442	.....	192,464	5,830,536	4,407,920	465,317	3,938,088	1,291,788
Atlanta & West Point	93	60,650	37,445	113,477	14,308	21,183	6,677	33,238	2,018	5,021	82,395	31,082	6,564	23,888	9,011
Bessemer & Lake Erie	205	1,099,037	29,467	1,145,220	131,801	195,997	10,539	252,902	.....	12,844	591,024	554,196	22,002	532,191	—5,810
Boston & Maine	2,302	3,016,688	1,250,856	4,775,110	476,575	585,852	35,782	1,894,086	20,971	101,091	3,114,355	1,660,754	171,881	1,488,873	733,905
Buffalo, Rochester & Pittsburgh	586	943,347	98,103	1,094,247	141,385	267,553	13,204	334,899	1,693	22,444	781,179	313,068	30,000	283,063	65,259
Chicago, Burlington & Quincy	9,369	6,127,408	1,605,979	8,596,915	1,474,349	1,395,924	131,966	2,440,487	106,289	178,187	5,727,203	2,869,712	369,343	2,500,370	1,191,858
Chicago Great Western	1,496	830,050	243,808	1,185,814	205,366	207,844	48,835	432,560	8,612	38,356	939,832	245,983	45,744	198,660	37,568
Chicago Junction	13	.....	.....	206,507	18,949	19,110	1,176	115,950	.....	5,063	160,247	46,260	2,273	43,986	15,647
Chicago, Milwaukee & St. Paul	10,210	6,699,481	1,492,250	9,110,463	1,440,355	1,595,079	181,774	3,087,107	57,709	162,320	6,424,679	2,685,784	387,638	2,291,495	601,863
Chicago, Rock Island & Pacific	7,559	4,140,169	1,386,663	5,975,044	803,674	1,605,226	130,307	2,116,228	39,333	150,531	4,230,850	1,744,194	297,392	1,444,338	646,710
Chicago, St. Paul, Minneapolis & Omaha	1,753	1,026,599	393,556	1,551,333	243,416	217,961	28,922	562,667	16,151	40,515	1,108,205	443,127	83,462	359,384	100,530
Cincinnati, New Orleans & Texas Pacific	337	819,800	140,571	1,028,091	93,773	247,665	28,473	271,925	6,644	26,786	676,121	351,970	32,000	319,558	70,694
Cleveland, Cincinnati, Chic. & St. Louis	2,385	4,693,113	776,003	3,827,134	407,920	711,699	89,350	1,265,207	22,680	67,815	2,561,668	1,265,466	135,000	1,130,123	521,462
Cumberland Valley	164	223,046	54,658	293,209	54,935	27,723	5,091	82,068	1,165	8,853	178,541	114,668	5,960	108,672	44,836
Delaware & Hudson Co.—R. R. Dept.	857	1,904,695	212,895	2,253,968	180,872	368,862	28,422	778,150	20,134	83,068	1,459,508	794,460	58,650	735,810	92,729
Delaware, Lackawanna & Western	955	3,292,963	713,006	4,463,151	504,161	596,944	75,935	1,362,290	31,782	74,429	2,642,495	1,820,656	202,500	1,618,061	374,188
Denver & Rio Grande	2,577	1,570,310	318,537	2,044,628	203,136	348,243	46,256	486,667	23,062	48,460	1,155,824	888,805	90,000	798,755	205,921
El Paso & Southwestern Co.	1,027	852,345	133,799	1,032,731	94,878	124,798	18,437	239,991	6,221	27,783	512,108	520,623	37,329	483,293	248,147
Elgin, Joliet & Eastern	748	1,197,737	6	1,276,882	136,729	256,956	7,702	354,407	.....	21,324	776,419	500,463	38,529	461,934	180,272
Florida East Coast	745	463,655	141,710	718,507	76,508	75,186	7,251	183,313	5,009	18,409	364,744	353,763	33,613	320,097	7,803
Gulf & Ship Island	308	135,237	30,561	175,912	12,951	26,943	3,247	38,595	286	7,259	89,281	86,632	5,929	80,702	51,368
Hocking Valley	350	611,804	68,918	750,599	68,375	181,090	8,125	204,925	.....	15,303	477,718	272,881	43,200	229,661	65,922
Houston, East & West Texas	191	89,367	29,709	127,556	3,907	16,976	2,123	41,310	764	3,342	68,103	59,452	5,108	54,341	22,269
Illinois Central	4,767	4,455,225	1,082,909	5,985,472	836,217	1,477,905	100,371	1,811,303	31,644	149,843	4,397,117	1,588,355	296,400	1,288,733	608,177
International & Great Northern	1,159	622,195	153,934	834,715	113,830	119,113	24,136	338,225	4,433	29,099	609,190	225,526	30,000	195,487	106,437
Kansas City Southern	836	727,342	129,525	940,772	81,995	124,885	27,406	282,133	.....	33,446	545,575	395,196	48,376	346,571	80,381
Lake Erie & Western	900	529,176	56,823	616,126	74,260	107,465	14,557	198,406	.....	12,065	406,753	209,374	25,000	184,088	110,511
Lehigh & New England	296	174,628	1,354	191,603	38,653	30,891	1,936	59,039	.....	5,749	136,242	55,361	8,820	46,387	—66,574
Louisiana & Arkansas	278	114,943	16,084	134,561	24,454	19,983	3,619	35,228	.....	4,242	87,526	47,035	7,941	39,095	—14,671
Louisiana Ry. & Navigation Co.	351	127,308	27,247	165,683	24,553	26,575	6,596	55,985	.....	6,466	120,175	45,508	9,500	36,008	2,666
Maine Central	1,220	707,130	263,226	1,043,125	147,507	161,339	12,425	367,874	2,352	29,546	720,974	322,151	49,665	272,536	100,543
Michigan Central	1,803	2,545,236	838,205	3,839,535	472,330	515,796	66,412	1,311,517	50,271	69,351	2,485,678	1,353,857	140,000	1,213,175	565,364
Midland Valley	380	116,210	37,021	160,894	28,467	32,059	2,665	39,678	.....	6,534	108,762	52,133	7,549	44,567	38,899
Missouri & North Arkansas	365	65,199	32,345	104,144	26,810	17,379	3,475	37,630	.....	5,792	91,086	13,058	5,800	7,136	31,070
Missouri Pacific	3,931	2,129,412	395,708	2,739,646	487,503	794,313	78,995	974,827	6,862	64,206	2,400,773	338,873	99,640	238,906	66,269
Monongahela	108	162,734	9,023	174,550	26,008	16,441	922	37,546	.....	3,974	84,892	89,658	4,000	85,658	.....
Morgan's La. & Texas R. R. & S. S. Co.	404	268,692	82,704	376,567	56,041	63,721	12,285	130,176	2,233	11,505	275,874	100,743	22,667	77,945	41,751
Nashville, Chattanooga & St. Louis	1,231	798,327	224,627	1,107,351	151,711	182,375	56,003	372,302	9,129	36,394	806,809	300,542	27,000	273,430	128,960
Nevada Northern	165	167,376	12,551	184,784	18,061	11,476	532	29,055	27	3,824	62,976	121,809	6,185	115,624	35,940
New Orleans & North Eastern	204	248,995	49,642	332,384	30,757	42,283	10,528	97,884	5,343	12,048	198,805	133,579	16,500	117,079	56,752
New Orleans, Mobile & Chicago	402	157,795	24,621	190,224	28,703	26,117	4,308	58,095	127	7,400	124,752	65,471	6,500	58,956	29,608
New Orleans, Texas & Mexico	386	100,849	26,298	134,893	34,656	23,410	5,268	44,829	.....	9,729	117,891	17,002	1,561	15,427	20,110
New York Central Railroad	6,093	12,406,871	4,029,197	19,143,693	1,901,593	3,262,388	260,080	6,237,911	236,154	383,448	12,281,576	6,862,118	673,020	6,188,873	2,079,184
New York, Chicago & St. Louis	570	1,166,351	101,286	1,318,337	109,937	203,824	44,975	460,174	4,485	21,374	844,768	473,569	45,000	428,515	305,963
St. Louis & San Francisco	4,750	3,019,787	948,303	4,213,240	616,948	854,686	71,771	1,224,934	.....	101,546	2,830,083	1,383,157	173,591	1,207,697	300,988
St. Louis, Brownsville & Mexico	548	138,228	63,096	217,383	30,584	20,207	7,222	71,216	.....	10,197	135,864	81,519	8,000	73,347	11,138
St. Louis, Iron Mountain & Southern	3,555	2,342,654	491,165	2,930,572	573,708	802,298	76,739	799,213	11,536	65,868	2,314,413	616,158	129,833	485,526	11,596
St. Louis Southwestern	943	527,008	105,054	674,090	73,570	113,960	31,185	171,281	2,803	25,011	417,455	256,635	46,831	209,697	52,808
San Antonio & Aransas Pass	724	177,880	67,929	265,648	55,922	47,433	7,180	144,702	.....	12,863	267,997	2,348	11,000	—13,550	7,815
San Pedro, Los Angeles & Salt Lake	1,184	693,789	244,266	1,025,543	97,784	126,832	31,793	271,400	17,131	18,439	563,116	462,427	49,228	413,050	118,791
Seaboard	3,449	1,515,123	362,390	2,085,324	255,907	302,855	72,931	697,709	10,317	68,840	1,408,412	676,912	101,281	575,137	.....
Southern	7,047	4,457,848	1,423,869	6,261,274	706,826	1,053,915	154,119	1,857,378	40,910	173,905	3,969,965	2,291,309	260,946	2,031,843	684,388
Tennessee Central	294	112,332	33,819	154,128	23,001	20,110	6,296	50,539	.....	7,140	107,086	47,042	4,683	42,309	20,333
Texas & Pacific	1,944	989,678	333,209	1,433,073	123,413	282,211	41,935	619,169	.....	51,719	1,126,686	306,387	72,000	233,955	157,361
Toledo & Ohio Central	436	399,295	48,669	485,718	79,932	114,776	7,162	177,513	1,601	10,363	391,347	94,371	23,539	70,831	33,137
Toledo, Peoria & Western	248	58,301	33,754	98,595	16,458	24,389	2,428	37,018	.....	3,743	84,037	14,558	6,500	8,058	6,871
Toledo, St. Louis & Western	451	264,469	30,912	323,874	62,591	69,631	16,750	156,064	.....	8,012	312,970	10,904	20,600	190,073	181,064
Union R. R. of Pennsylvania	31	.....	.....	524,039	55,395	106,024	117	199,436	.....	4,072	364,798	159,241	7,000	152,241	7,706
Vicksburg, Shreveport & Pacific	171	79,112	40,355	134,446	12,148	25,521	3,646	40,352	2,202	5,784	89,497	44,949	13,650	33,919	8,741
Virginian	303	567,351	34,979	647,345	64,921	105,499	5,659	148,340	14,556	16,944	355,813	291,053	6,000	285,176	108,744
Western Maryland	689	847,356	77,607	1,000,930	109,185	157,577	21,383	289,802	12,574	20,686	610,884	390,046	31,500	358,586	97,305
Western Ry. of Alabama	133	69,519	33,121	114,307	10,870	22,403	6,189	30,507	1,870	5,370	86,273	28,033	5,341	23,110	11,817

Transportation of the National Guard

Following a meeting of the military committee of the passenger traffic officers of the western railroads at Chicago on July 7, E. L. Bevington, chairman of the Transcontinental Passenger Association, gave out a statement as a reply to some of the newspaper criticisms regarding the transportation of the National Guard. He said in part:

"Some of the published criticisms of the railroads and of the government regarding the method of transporting the National Guard to the Mexican border fail to take into consideration the conditions under which the movement had to be handled.

"The principal objection seems to be the fact that it was necessary to transport some of the troops for a part of the way in day coaches, instead of in sleeping cars. The regulations of the war department for this traffic do not provide for the use of standard sleeping cars, except for officers.

"If all of the tourist sleeping cars in the United States could have been placed at the disposal of the war department and assembled at the mobilization camps at once it would have taken nearly six weeks to transport the entire 120,000 men to the border, if they all required sleeping car equipment.

"Cars were placed at the disposal of the government as rapidly as possible, but it must be remembered that they were scattered all over the country and that it took time to move them. Neither the railroads nor the Pullman Company had any advance notice of the emergency, although by prior arrangement with the war department routes had been arranged in advance for the movement of troops from every military post in the United States, so planned as to distribute the traffic among the railroads, to avoid congestion on any one line, to secure the most direct route and to enable cars and engines to be brought into service in the shortest possible time.

"However, as compared with the experience during the Spanish war in 1898, the movement has been handled with remarkable precision. Great credit is due to Col. Chauncey B. Baker, deputy quartermaster-general at Washington, for the foresight he displayed in co-operating with the railroads long in advance, in planning the routings and as many of the arrangements as could be planned in advance, without which provision delays and congestion must inevitably have occurred."

Representative Charles Bennett Smith, of Buffalo, has offered a resolution in the National House of Representatives calling upon the Committee on Interstate and Foreign Commerce to "conduct an inquiry for the purpose of determining the cause and fixing the responsibility for the failure of the railroads to provide adequate and proper accommodations to transport the National Guard of New York to the Mexican border," and asking that "the committee recommend to Congress such remedies as may be deemed fit to prevent a recurrence of the conditions described, and a punishment of the person or persons responsible for them."

The resolution says: "The railroad facilities provided for transporting the National Guard of the State of New York to the Mexican border are said to have been indescribably bad, three men being compelled in many instances to occupy one seat, and no sleeping accommodations of any kind having been furnished, except for the officers of the regiments.

"Great suffering has resulted from the failure of the railroads to provide suitable and necessary equipment to meet the requirements of the situation.

"Sufficient time was given the railroads to provide an adequate number of cars, and to supply at least the ordinary comforts of travel to the members of the New York National Guard on their way to the border to protect American lives and property."

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, date of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Railroad Superintendents.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Annual meeting, August 16-18, 1916, Memphis, Tenn.

American Electric Railway Association.—E. B. Burritt, 8 W. 40th street, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Electric Railway Manufacturers' Association.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Railway Tool Foremen's Association.—Owen D. Kinsey, Illinois Central, Chicago. Annual meeting, August 24-26, 1916, Hotel Sherman, Chicago.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

Association of Manufacturers of Chilled Car Wheels. George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

International Railroad Master Blacksmiths' Association.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next meeting, August 15-17, 1916, Hotel Sherman, Chicago.

International Railway General Foremen's Association.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, August 29 to September 1, Hotel Sherman, Chicago.

Master Car and Locomotive Painters' Association of the United States and Canada.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 12-14, 1916, "The Breakers," Atlantic City, N. J.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

Railway Fire Protection Association.—Frank C. Irvine, 1125 Pennsylvania Station, Fittsburgh, Pa. Annual meeting, October 10, 1916, Chicago.

Railway Signal Association.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 12-14, 1916, Grand Hotel, Mackinac Island, Mich.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

Roadmasters' and Maintenance of Way Association.—L. C. Ryan, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Salt Lake Transportation Club.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

Signal Appliance Association.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of Newark.—Roy S. Bushy, Firemen's Bldg., Newark, N. J. Regular meetings, 1st Monday, in month, except July and August, The Washington, 559 Broad St., Newark.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August. Waldorf-Astoria Hotel, New York.

Traffic Club of Pittsburgh.—D. L. Wells, Gen'l Agent, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

Traffic Club of St. Louis.—W. S. Crilly, 620 South 7th St., St. Louis, Mo. Annual meeting, December 5, 1916. Noonday meetings, October to May.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next meeting, September 5-8, 1916, Hotel Sherman, Chicago.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

T. C. Tipton, hitherto freight agent of the Fort Smith & Western, at Atlanta, has been chosen traffic manager of the Jacksonville Traffic Bureau, Jacksonville, Fla., and will take up his duties July 15. The Jacksonville Traffic Bureau is an incorporated concern, succeeding the traffic department of the Jacksonville Chamber of Commerce. Its president is John Ball.

The American International Terminal Company has been organized under the laws of Delaware, with a capital of $100,000, to study the problems of railway, steamship, and industrial terminals, apparently at New York City, with the purpose of providing better facilities for the extension of export trade. This concern seems to be a combination of interests connected with the National City Bank, of New York, and Stone & Webster. W. H. Lyford, general counsel of the Chicago & Eastern Illinois, has been retained as consulting expert by the new company.

The New York, New Haven & Hartford had to extend its temporary embargo on traffic moving via the Harlem river and Maybrook gateways to July 12, the congestion having continued to increase. The accumulation of freight was caused in part by the holiday interval; by the New England troop movement to the Mexican border, and the heavy summer and Independence Day travel. A large number of freight engines had to be used in passenger service, necessitating some curtailment in freight service. On June 3 there were 1,758 cars being held under demurrage; on July 1 this had decreased, through better assistance of consignees, to 994 cars. The company calls for the continued co-operation of consignees and asks them not to order in excess of actual requirements.

Ticket Frauds on the New York Central

The Interstate Commerce Commission has suspended a paragraph in a tariff of the West Shore division of the New York Central, giving notice that commutation tickets will not be sold to passengers who have misused such tickets; and public hearings have been held in New York City on the question of the reasonableness of such a provision. The paragraph in question, which has been in force several months on other divisions of the New York Central, in connection with tariffs which name intrastate rates only, is as follows:

> In consideration of the reduced rate at which monthly commutation tickets are sold. their limitations must be strictly observed, and no commutation ticket will be sold to any person who, having previously purchased such a ticket, shall have used it, or permitted it to be used, in violation of the provisions therein contained.

Officers of the road think that their traffic has suffered many thousands of dollars annually by the misuse of commutation tickets. Merchants and others buy tickets and sell coupons, to persons not entitled to ride on them, at rates much below the single-ticket fares. For example, the monthly commutation rate from Poughkeepsie to New York, 73 miles, is but 28 cents a trip, while the regular one-way fare is $1.58, and the single round-trip fare is $2.80, leaving a margin of $1.30 on a single ride and $2.24 on a round-trip.

It is said that some of these scalpers have made such large profits that the lifting of a book by a conductor, when wrongfully used, has not deterred them; they have bought more books.

Railway Extension in Argentina.—The Buenos Aires Western Railway was authorized by a decree of February 7, 1916, to build a branch line extending westward for 100 miles from Colonia Alvear (Mendoza).

New Locomotives for the South African Railway.—The South African Railway has recently received five large locomotives, built by the North British Locomotive Company, according to the designs and specifications of the railway's chief mechanical engineer. These engines, which are of the Mallet compound type, are said to be the largest in the world to run on the 3-ft. 6-in. gage. It is probable that these locomotives will be assigned to the Witbank Line, in the Transvaal, where the coal traffic is heavy.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

A complaint on behalf of Newark, Jersey City, Hoboken and Elizabeth has been filed with the commission asking: That rates to and from New Jersey cities on traffic shipped to or from trunk line territory and beyond, via the trunk line railroads, with terminals at Jersey City, Hoboken and Weehawken, N. J., be established lower than those charged by the same lines on traffic to and from New York and Brooklyn, to and from the same territory, to the extent of the difference of the cost of service. That reciprocal switching arrangements and reasonable joint rates be established for the interchange of freight between the railroads having their terminals at Jersey City, Hoboken and Weehawken at a reasonable distance from these terminals; that all freight originating at and delivered to the defendant railroads at Jersey City, Hoboken or Weehawken be required to be given the same handling and dispatch as New York tonnage, and that all freight consigned to New Jersey towns be allowed the same period of free storage as New York and Brooklyn.

Rates on Salt

Swift & Co. v. Union Pacific et al.:

A rate of 27½ cents per 100 lb. on bulk salt in carloads from Kansas producing points to Fort Worth and North Fort Worth, Tex., is found unreasonable and maximum rates are prescribed for the future. (39 I. C. C., 665.)

Livestock Switching at Nashville, Tenn.

Nashville Abattoir, Hide & Melting Association et al. v. Louisville & Nashville et al. Opinion by Commissioner Clark:

Defendant's refusal to deliver and receive carload shipments of live stock at complainant's private siding in Nashville, Tenn., found not to be unreasonable or discriminatory. (40 I. C. C., 134.)

Lumber from Louisiana Points

Opinion by Commissioner Meyer:

A proposed cancellation of joint through rates on yellow-pine lumber from producing points on the Louisiana Western, the Lake Charles & Northern and Morgan's Louisiana & Texas to points on the Santa Fe system in Texas is found not justified. (39 I. C. C., 688.)

Grain to Arkansas Points

Opinion by the Commission:

A proposed cancellation of joint rates on grain in carloads from points in Kansas and Missouri on the St. Louis & San Francisco by way of Bridge Junction, Ark., to points in Arkansas on the Rock Island is found justified in part. Schedules under suspension are ordered cancelled, but without prejudice to respondents' right to file a new tariff conforming to the findings herein. (40 I. C. C., 49.)

Lumber from Helen, Ga.

Byrd-Matthews Lumber Company et al. v. Gainesville & Northwestern et al. Opinion by Commissioner Clements:

The present adjustment of rates on lumber to Cincinnati, Ohio, and other Ohio river crossings from Helen, Ga., and from Murphy, N. C., and certain other points in North Carolina on the lines of the Southern Railway is found prejudicial to Helen, and a reasonable relationship is prescribed. (40 I. C. C., 116.)

Rates from New Orleans, La., to Tulsa, Okla.

Opinion by Commissioner Hall:

The commission finds that the class rates from New Orleans, La., to Tulsa, Okla., are not unreasonable. Rates on certain commodities from New Orleans, and Galveston, Tex., are also not found unreasonable but a readjustment of rates to certain

Oklahoma points is suggested. Applications of defendants for relief from the long-and-short-haul provision of the fourth section with respect to lower class and commodity rates from New Orleans to Joplin and Neosho, Mo., than to Tulsa, Okla., are granted. (40 I. C. C., 9.)

Illinois Grain to Chicago

In the matter of rates applicable on grain from points in Illinois, via Chicago, to interstate destinations. Opinion by Commissioner Clark:

The principal question involved in this controversy is whether the interstate or the intrastate rates should be charged to Chicago, Ill., on grain originating at points in Illinois, billed to Chicago, and there stored in, or transferred through, elevators and ultimately moved therefrom on local rates to destinations beyond the limits of the state. In nearly every instance the interstate rate on grain from Illinois points to Chicago is higher than the intrastate rate.

The commission finds as follows:

Grain originating in Illinois, shipped locally intrastate to Chicago, there sold, and subsequently shipped all rail under local rates, or via lake, to interstate destinations, is subject to the local intrastate rates from points of origin to Chicago.

Grain originating in Illinois, moving interstate to Chicago via the Elgin, Joliet & Eastern, unloaded into elevators at Chicago, and subsequently shipped via lake under independent water line rates or charges, is subject to the local interstate rates from points of origin to Chicago. (40 I. C. C., 124.)

Hardwood Lumber Reshipped from Nashville

Nashville Lumbermen's Club v. Louisville & Nashville et al. Opinion by Commissioner Harlan:

The rates and regulations applying on hardwood lumber shipped to Nashville, Tenn., and subsequently reshipped to points north of the Potomac and Ohio rivers are not found unreasonable or discriminatory.

Discrimination was alleged because a lumber dealer at any of the Ohio river crossings may bring hardwood lumber from mills in Tennessee, Louisiana, Mississippi, Alabama, Florida and Georgia into his lumber yards and there assort, grade, dry and dress it and, after storing it for an indefinite period, may finally ship it out to the markets in official classification territory, paying through charges from the mills to the ultimate destination based on the rates to and from the crossing. Nashville is not a rate-breaking point, as are the Ohio river crossings; and lumber originating at stations on the Nashville, Chattanooga & St. Louis or on the Tennessee Central takes the local rate into Nashville and, when reshipped, the established local charge from Nashville to the ultimate destination is exacted, making through charges from the mills that, as a rule, exceed the combination of rates on the Ohio river crossings by from 0.1 cent to 5 cents per 100 lb. (40 I. C. C., 59.)

Cement to Texas Points

Opinion by Commissioner Daniels:

The Kansas City, Mexico & Orient of Texas, in connection with the St. Louis & San Francisco, participated in an 18½-cent rate on Portland cement from Ada, Okla., to the first three points on its line in Texas. It also participated in a 22½-cent rate to the same points from Harry's and Eagle Ford, Tex., in connection with the Texas & Pacific and Fort Worth & Denver City, the distance from the latter points being slightly less than from Ada. Moved by an attack threatened upon its intrastate rates unless the interstate rates from Ada were increased, and failing to obtain the assent of the St. Louis & San Francisco to such increases, the Kansas City, Mexico & Orient of Texas directed the cancellation of rates on cement from Ada to all points on its line in Texas. Upon inquiry into the reasonableness of the proposed cancellation and of certain substitute rates suggested at the hearing, the commission holds that no evidence has been introduced tending to show that the proposed cancellation or the suggested substitute rates would be just or reasonable, and that respondent's apprehension of reductions in its intrastate rates constitutes no justification for canceling or increasing interstate rates when the propriety of the resulting increased rates is not established. (40 I. C. C., 94.)

Coal and Coke from Bon Air, Tenn.

Opinion by Commissioner Clements:

Over the protest of the Southern Railway but acting under its concurrence, the Nashville, Chattanooga & St. Louis reduced rates on bituminous coal from its Tennessee mines to Southern Railway stations in Georgia and changed the relationship between these mines and the Southern's Tennessee mines. The Southern withdrew its concurrence in such rates, necessitating their cancellation. The resulting combination rates are held by the commission not to have been justified, but the Southern is found to have justified increased rates in the amounts of those in effect prior to the reduction referred to. (40 I. C. C., 180.)

Express Rates from Sioux City, Iowa

Traffic Bureau of the Sioux City Commercial Club v. American Express Company et al. Opinion by Commissioner Meyer:

The commission finds that the express rates between Sioux City, Iowa, and points in South Dakota are not unreasonable.

The present relation of rates for transportation by express between Sioux City, Iowa, and points in South Dakota, and between the same South Dakota points and Sioux Falls, Mitchell, Aberdeen, Watertown and Yankton, S. D., is held, however, to give an undue preference to Sioux Falls, Mitchell, Aberdeen, Watertown and Yankton, and to result in prejudice and disadvantage to Sioux City. The defendants are ordered to remove this discrimination. (39 I. C. C., 703.)

STATE COMMISSIONS

At the request of the Georgia Shippers' Association, the hearing on the proposed adjustment of freight rates by Georgia roads has been postponed by the State Railroad Commission to August 17, which is the day after the close of the legislative session. Attorneys for the railroads were ready but acceded to the request. The commission has announced a program of hearings for eleven divisions of tariffs. The date set for the final hearing is September 2. The statement, which has been widely published in connection with this investigation of proposed increases, that freight rates are already higher in Georgia than in other Southern States, has been answered by the railroads in a long letter, sent to the principal newspapers, showing the incompleteness and unfairness of the comparison on which the statement was based. It is declared that on the great bulk of the freight the rates in Georgia are in reality lower. The comparison, based on the numbered classes alone, covers a comparatively small volume of merchandise.

COURT NEWS

Relief Associations

The Indiana Appellate Court holds that an action for benefits against a railroad employees' relief association cannot be maintained where the establishment of such relief association is void under the Indiana statute of 1907, prohibiting railroads from maintaining any relief association the rules of which require an employee to waive personal injury claims on becoming a member. —B. & O. S. W. v. Duncan (Ind.), 112 N. E., 898.

Limitation of Liability for Loss by Freezing

A shipper, not wishing to wait for a refrigerator car, accepted a box car in which to ship potatoes from Kaleva to Chicago, expressly assuming by indorsement on the shipping order the risk of freezing. From a directed verdict for the plaintiff in an action for damages, the potatoes being frozen on the ground of unreasonable delay at Kaleva, the railroad appealed. It was not shown that the potatoes did not freeze before the delay at Kaleva had become unreasonable. The Michigan Supreme Court held that the plaintiff could not recover notwithstanding Michigan Uniform Bills of Lading Act, permitting the carrier to insert in the bill of lading only such conditions as do not impair his obligation to exercise the "degree of care in the transportation and safe-keeping of the goods intrusted to him which a reasonably careful man would exercise in regard to similar goods of his own." This could not be intended to require the carrier to take precautions with goods which the owner himself deemed it

unnecessary or undesirable to take. The owners were equally aware of the danger of freezing, anticipated it, yet relied upon chance by their failure to put a stove in the car.—Lardie & Son v. Manistee & North Eastern (Mich.), 158 N. W., 31.

Proper Notice of Claim for Damages

In a suit for negligent delay in a shipment of live stock the defense was set up that no notice of claim for damages was given as required by the shipping contract. The Kansas City Court of Appeals held that a letter from the railroad's superintendent of freight loss and damage claims, which was on its face an admission that a claim was filed with the road concerning the shipment, but which did not show when it was received, the letter treating the matter as though notice had been given in proper time, was sufficient evidence that notice was given within the required time. This, the court said, was not treating the letter as showing any waiver of notice, but holding that the evidence showed notice was given and inferably, from the facts and conduct of the parties, within the required time.—McFall v. St. Louis & San Francisco (Mo.), 185 S. W., 1,157.

Crossing Accident—Standing on Track

Where a person at a crossing stood on one track in broad daylight, waiting for a train to pass on another track, the Michigan Supreme Court holds that the engineer of an approaching freight train on the track on which the person stood had a right to assume that the latter would seasonably step aside, and until it became apparent that he would not do so there could be no negligence of the engineer "after discovery of the plaintiff's negligence," and the railroad was entitled to a directed verdict.—Bonner v. Grand Trunk Western (Mich.), 158 N. W., 3.

Delivery of Goods

A bill of lading of hay to the order of the consignor was delivered by the bank to the buyer that he might exercise the right of inspection, which the shipping contract allowed him to do. The hay was promptly returned after inspection, and the buyer refused to receive it because it was not in good condition. The station agent by mistake marked the bill canceled by delivery. After a delay of more than a month, during which the consignor insisted on treating the transaction as a delivery, the hay was returned to and sold by him. He then sued the railroad and the bank for the difference between the price realized and the contract price. The Kansas City Court of Appeals held that the station agent's mistake did not entitle the plaintiff to treat the hay as delivered, so as to render the railroad liable for wrongful cancellation. The mistake was corrected immediately, and, of course, before any injury could have resulted. The damage was the result of the plaintiff's own fault.—St. Joseph Hay & Feed Co. v. Missouri Pacific (Mo.), 185 S. W., 1162.

Routing Shipments—Different Rates Between Two Points

The Pittsburgh Coal Company and the Zenith Furnace Company delivered 14 carloads of coal to the Northern Pacific at Duluth, Minn., to be carried to Hitterdal, Minn., for delivery to the consignee, the plaintiff in an action to recover excess freight rates. The Northern Pacific owned and operated two lines out of Duluth, over either of which it could have carried the coal to Hitterdal. One line, 228.1 miles long, was wholly within Minnesota, and the legal rate for such shipments over that line, as fixed by the state statute of 1907, was $1.28 per ton. The other line, 234.7 miles long, ran through Wisconsin for 11.7 miles, and the legal rate for such shipments over this line, as fixed by tariffs filed with the Interstate Commerce Commission, was $2 per ton. The railroad, having received no instructions as to the line over which the coal should be shipped, transported it over the interstate line, and collected from plaintiff $2 per ton. The railroad's only defense was that the shipment was subject to the interstate rate.

The Minnesota Supreme Court holds that where a railroad operates two lines between the same points and the freight rate over one line is less than over the other, if other conditions are reasonably equal, it is the duty of the company to transport shipments between those points over the line which will give the shipper the benefit of the cheaper rate; or to show that shipper selected the other line, or that a proper regard for his interests required the shipment to be made over it. The rates prescribed by the state statute were held to be the lawful rates for transporting intrastate shipments from the time that act declared such rates to be in effect, notwithstanding the fact that the enforcement thereof had been enjoined for a time. The railroad was not relieved from its duty by the fact that the validity of the lower rate was in litigation, and until the judgment of the United States Supreme Court established its validity and annulled the injunction. The fact that owing to easier grades it was more economical to transport the shipments over the interstate line did not justify disregard of the plaintiff's right.—Solum v. Northern Pacific (Minn.), 157 N. W., 906.

Sufficiency of Bridge Tell-Tales

In an action against a railroad for the death of a brakeman, killed by striking a low bridge while on top of a train, it was shown that there was a telltale within 247 feet of the bridge, and that the train was moving 25 miles an hour. The New York Appellate Division held that it was a question for the jury whether the telltale was too near the bridge. While the evidence showed that the brakeman had been employed by the railroad as a fireman and brakeman for a year, it also showed that he had made only from 7 to 10 trips on this branch of the road, and that the time of the accident was the first time he had ever been on the top of the train when it passed under the bridge. Did he know, or should he have known, the distance of the telltale from the bridge? It was held that this was a question for the jury.

Was the engineer of the train negligent in not signalling with the engine whistle as the train neared the bridge? There was no rule of the company requiring such signals. Was it imputable negligence on the part of the engineer not to give them of his own volition? The engineer testified that he sometimes whistled as the engine neared a low bridge if he thought the brakemen might be unaware. Perhaps he might not have occasion to do this twice in a year, and then only when he thought that he noticed that the brakeman was unconscious at the moment of the situation. It was held that it was error to submit to the jury any question of negligence on the part of the engineer. The court distinguished the case from Curren v. Lake Champlain & M., 211 N. Y. 60, 105 N. E. 105, where the practice of signaling relied on was uniform. Judgment for the plaintiff was reversed and a new trial granted.—Marus v. Central of New Jersey (N. Y.), 155 N. Y. Supp., 586.

The Right to Work Is Property

The Supreme Judicial Court of Massachusetts holds that the state statute of 1914, declaring that the right to work shall no longer be a property right and prohibiting injunction in violation of employment contract cases where no irreparable damage is about to be committed on property, was beyond the power of the legislature to enact, since it deprived the laborer of property without due process of law. The right to work is property of which one cannot be deprived by simple mandate of the legislature, but is protected by the 14th amendment to the Constitution of the United States, and by numerous guaranties of the state constitution. The mere fact that it is also a part of the liberty of the citizen does not affect its character as property. A further effect of the statute was to deprive laborers of the equal protection of the laws. It provides in substance that the property right to labor of any individual or number of individuals associated together shall not be recognized in equity as property when assailed by a labor combination, unless irreparable damage is about to be committed, and no relief by injunction shall be granted save in like cases where there is no relief at law.

"If a laborer must stand helpless in a court while others there receive protection respecting the same general subject which is denied to him, he is not being afforded his constitutional right of the equal protection of the laws. The right to make contracts to earn money by labor is at least as essential to the laborer as is any property right to other members of society. If as much protection is not given by the laws to this property, which often may be the owner's only substantial asset, as is given other kinds of property, the laborer stands on a plane inferior to that of other property owners. Absolute equality before the law is a fundamental principle of the Constitution. The courts must be open to all upon the same terms. Doubtless the legislature may

make many classifications in laws which regulate conduct and to some extent restrict freedom. So long as these have some rational connection with what may be thought to be the public health, safety, or morals, or in a restricted sense, so as not to include everything that might be enacted on grounds of mere expediency, they offend no constitutional provision. Weekly payment laws, employers' liability acts, workmen's compensation acts, inspection laws based on number of employees, and numerous statutes similar in principle have been upheld. But these are all quite different from that in question."

The action in which the question arose was one in which a labor union was alleged to be conspiring to deprive the complainants of their employment if they did not desert their own and join the defendant organization, by using unlawful pressure on employers by threats of sympathetic strikes and otherwise.—Bogni v. Perotti (Mass.), 112 N. E., 853.

Crossing Accident—Contributory Negligence

Action was brought by a chauffeur for personal injuries sustained in attempting to cross the Lehigh Valley tracks near Valois, N. Y. The automobile was struck by a train and two of its occupants were killed. In the Federal District Court the plaintiff secured a judgment, from which the railroad appealed. It did not dispute the negligence of the engineer in failing to give warning by bell or whistle, or the amount of the verdict, and the only question in the case was whether the plaintiff exercised the care which the law required of him. "What the plaintiff did or did not do before he got upon the track," the Circuit Court of Appeals for the Second Circuit said, in affirming the lower court's judgment, "is of the greatest importance. . . . The plaintiff knew for a distance of half a mile south of the crossing that he was approaching it. When he was about 825 feet from it he shut off the power and let his automobile coast to a point 146 ft. short of the crossing, where he brought his car to a stop. He then looked both ways along the tracks, and, seeing no sign of a train, started towards the crossing, and continued to look as well as he could, both ways, until he got on the crossing and saw the engine approaching him from about 200 feet away. He heard no sound of the engine before he saw it. At that time his seat in the automobile was right over the first track. He then put on power, all he dared to, in an effort to get across ahead of the train, because, he said, he knew he couldn't stop to clear it. The locomotive hit the rear end of the automobile and threw it from the track, smashing it pretty well to pieces." The plaintiff testified that before he stopped to look and listen an orchard and cattle guards obstructed his view. It was held that whether the plaintiff told the truth and whether he exercised sufficient care were questions for the jury. Mr. Ward, Circuit Judge, dissented, on the ground that the plaintiff was guilty of contributory negligence as a matter of law, saying: "He employed an engineer to take measurements on the ground, who testified that at a point 146 ft. south of the track on which the train was approaching there is an unobstructed view of the curve, that is, about 3,498 ft. from the crossing, and at a point 100 ft. south an unobstructed view for 3,380 ft. Such obstructions as were spoken of, as for instance, fences, cattle guards, telegraph poles, interfered no more with the plaintiff's vision than would a balloon or a bird flying in the air. Giving the train 60 miles and the car 8 miles an hour, which are the highest speeds testified to, the train would move 88 ft. and the car nearly 12 ft. a second; in other words, at a point 146 ft. south of the place of collision, one could see the train approaching about 1,520 ft. away, and one who started from that point, as the plaintiff says he did, would at 8 miles an hour arrive at it in 15 seconds, with the train in full view all the time. The plaintiff testified he stopped at the 146-ft. point, looked and did not see the train, and then started up and looked and did not see it until the train was within 200 ft. This testimony cannot be believed. If he had looked he must have seen it in time to avoid the collision, because he said he could stop his car in 6 ft."—Lehigh Valley v. Kilmer, C. C. A., 231 Fed., 628.

In an action arising out of the same facts by the executor of a female passenger who was killed while riding in the back seat of the automobile, it was held that the decision in the Kilmer case ruled this, and the question whether the deceased was guilty of contributory negligence in not doing something to stop the chauffeur from driving in front of the train was a question for the jury.—Lehigh Valley v. Emens, C. C. A., 231 Fed., 636.

Railway Officers

Executive, Financial, Legal and Accounting

George R. Allen has been appointed assistant general solicitor of the Pennsylvania Railroad, with office at Philadelphia, Pa., succeeding Henry W. Bikle, promoted. Effective August 1.

Henry Wolf Bikle, whose appointment as assistant general counsel of the Pennsylvania Railroad, with office at Philadelphia, Pa., has already been announced in these columns, was born on October 20, 1877, at Gettysburg, Pa. He prepared for college at Steven's Hall, in Gettysburg, and later took a course at Pennsylvania College, graduating in 1897 with degree of A.B. Mr. Bikle studied law at Gettysburg until the fall of 1898, and then entered the law department of the University of Pennsylvania, graduating from this institution in 1901. In June of the same year he was admitted to the bar, and since 1904 he has been first a lecturer and later assistant professor in the law department of the University of Pennsylvania. He was appointed assistant general solicitor of the Pennsylvania Railroad on December 1, 1907, which position he held at the time of his recent appointment as assistant general counsel of the same road as above noted.



H. W. Bikle

A. W. Thompson, whose appointment as vice-president in charge of traffic and commercial development of the Baltimore & Ohio system, with headquarters at Baltimore, Md., has already been announced in these columns, was born on May 8, 1875, at Erie, Pa., and was graduated from Allegheny College, Meadville, in 1897, as a civil engineer. The following year he began railway work in the engineering department of the Pittsburgh & Lake Erie, and in 1899 was appointed assistant engineer of surveys on the Pittsburgh division of the Baltimore & Ohio. He was made assistant engineer of the Pittsburgh division in 1900, and the following year was appointed engineer of the Cumberland division. In 1902 he returned to Pittsburgh as division engineer, and the following year went back to the Cumberland division as superintendent. He was transferred to Wheeling, W. Va., in 1904, as superintendent of the Wheeling division, and from 1907 to April, 1910, he was chief engineer of maintenance of way. In April, 1910, he was promoted to chief engineer of the Baltimore & Ohio system, including the Baltimore & Ohio Southwestern, and remained in this position until December, 1910, when he was made general manager of the same roads at Baltimore, Md. On April 11, 1912, he was elected third vice-president of the same roads and



A. W. Thompson

the Cincinnati, Hamilton & Dayton, with office at Baltimore, and now becomes vice-president in charge of traffic and commercial development of the Baltimore & Ohio system, as above noted.

C. S. Sikes, auditor for the receivers for the Pere Marquette, has been appointed general auditor for the receivers, the position of auditor having been abolished. J. O. Talbott, assistant auditor, has been appointed assistant general auditor; A. J. Anderson, auditor of traffic accounts, has been appointed auditor of freight traffic, and F. W. Niemann has been appointed auditor of passenger traffic. The positions of assistant auditor, auditor of traffic accounts and assistant auditor of traffic accounts have been abolished, effective July 1.

Operating

The headquarters of the dining car and hotel department of the Union Pacific system have been transferred from Omaha, Neb., to Ogden, Utah.

R. E. Orr, acting trainmaster of the Grand Trunk at Lindsay, Ont., has been appointed trainmaster of the eighth, ninth and tenth districts, with headquarters at Lindsay.

J. H. Carlisle, assistant to general superintendent of transportation of the Chesapeake & Ohio and the Chesapeake & Ohio of Indiana, at Richmond, Va., has been appointed assistant to the general manager, with headquarters at Richmond.

T. B. Burgess, trainmaster of the Baltimore & Ohio at Garrett, Ind., has been appointed assistant superintendent with office at Cleveland, Ohio. Lyman H. Campbell has been promoted from a position in the operating department at Baltimore, Md., to trainmaster of the Chicago division, with office at Garrett, succeeding Mr. Burgess.

Carl A. Mitchell, trainmaster of the New York, New Haven & Hartford at Hartford, Conn., has been appointed superintendent of the Hartford division, succeeding A. W. Honywill, assigned to other duties, and Charles H. Motsett has been appointed superintendent of the New London division, with headquarters at New London, vice P. T. Litchfield, assigned to other duties.

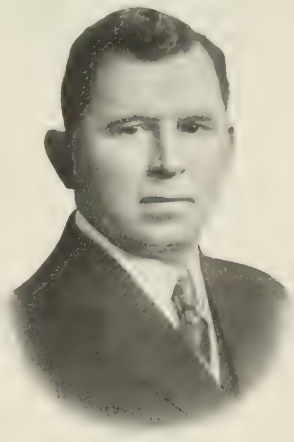
J. G. Bloom, division engineer of the Chicago, Rock Island & Pacific, at Little Rock, Ark., has been appointed superintendent of the Amarillo division, with headquarters at Amarillo, Tex., vice H. J. Sewell, transferred to the Louisiana division with office at Eldorado, Ark. D. Van Hecke, superintendent of the Louisiana division, has been transferred to the Indian Territory division with headquarters at Haileyville, Okla., vice H. F. Reddig, transferred to the Oklahoma division, with headquarters at El Reno, Okla. C. L. Ruppert, superintendent of the Oklahoma division, has been transferred to the Missouri division, with headquarters at Trenton, Mo., vice F. W. Rosser, resigned.

James Paul Stevens, whose appointment as general manager of the Chesapeake & Ohio and Chesapeake & Ohio of Indiana, with headquarters at Richmond, Va., has already been announced, was born on December 28, 1885, at Peru, Ind., and was educated in the common schools. He began railway work in January, 1901, on the Chesapeake & Ohio and served to 1904 consecutively as clerk, telegraph operator and despatcher, at Hinton, W. Va., and at Richmond, Va. In January, 1904, he was appointed chief despatcher on the Cincinnati division at Covington, Ky., remaining in that position until February, 1907, when he was promoted to assistant superintendent of the same division. In January of the following year he was appointed superintendent of the same division. On May 1, 1910, he was appointed general superintendent, and since that time has served in this capacity on all three general divisions of the same road until his appointment on July 1, as general manager of the Chesapeake & Ohio and the Chesapeake & Ohio of Indiana, as above noted.

B. B. Greer, whose appointment as assistant to the vice-president in charge of operation of the Chicago, Burlington & Quincy has been announced, was born in Chicago in 1877. He was educated at Armour Institute and Dartmouth College and began railway work in 1899 with the Great Northern. He remained with that company until 1908, filling various positions, including roadmaster's clerk, chief clerk to the superintendent, roadmaster and assistant superintendent. Mr. Greer then entered the service of the Burlington as transportation inspector on the general manager's staff, and has since been consecutively superintendent of terminals at St. Louis, Mo., division superintendent at Hannibal, Mo., and St. Joseph, and assistant to the general manager of the lines east of the Missouri river, with headquarters at Chicago. On January 1, 1915, he was promoted to assistant general manager of the lines east, with office at Chicago, and on March 1, of the same year, was transferred to Omaha, Neb., as assistant general manager of the lines west. As assistant to the vice-president he has headquarters at Chicago.

Thomas B. Coppage, whose appointment as general superintendent of the first district of the St. Louis & San Francisco has been announced, was born on June 23, 1864, at Danville, Ky. He entered railway service in 1879, as an employee of the Louisville & Nashville, and from 1880 to 1890 was successively operator, despatcher and trainmaster of the Cincinnati Southern and its successor, the Cincinnati, New Orleans & Texas Pacific. From 1890 to 1892 he was assistant superintendent of the Louisville, New Orleans & Texas, at Greenville, Miss. He was despatcher and chief despatcher of the Atchison, Topeka & Santa Fe, at Marceline, Mo., until 1894, when he entered the employ of the St. Louis, Iron Mountain & Southern, at Van Buren, Ark., as chief despatcher. He was later trainmaster of the same road at Van Buren, and, in 1902, became trainmaster of the Gulf, Colorado & Santa Fe at Temple, Tex. He was later division superintendent, with office at Temple, Tex., and, in 1907, entered the service of the St. Louis & San Francisco as superintendent of the Northern division at Ft. Scott, Kan. On March 1, 1914, he was appointed superintendent of transportation, with headquarters at Springfield, Mo., and on July 1, 1916, was promoted to general superintendent of the first district, with headquarters at the same city.

J. H. Dyer, whose appointment as assistant general manager of the northern district of the Southern Pacific, with headquarters at Portland, Ore., has already been announced in these columns, was born in Colfax, Cal., in 1872. He began work with the Southern Pacific as a track laborer in 1888, on the Sacramento division. In the following year he entered train service as a brakeman, and subsequently was a conductor, yardmaster and trainmaster on the same division. He was appointed superintendent of the Shasta division in 1908, and superintendent of the Tucson division in 1911. He was transferred to the Sacramento division as superintendent in 1914, and continued in that position until July 1, 1916, when his appointment as assistant general manager was effective.



J. H. Dyer

Traffic

J. W. Ellingson has been appointed traffic manager of the Salt Lake & Ogden, with headquarters at Ogden, Utah.

Willard G. Wilson has been appointed commercial agent of the Southern Pacific, with headquarters at Ogden, Utah, vice M. D. Shortz, resigned.

W. H. Gardner has been appointed assistant general livestock agent of the Gulf, Colorado & Santa Fe, with headquarters at Ft. Worth, Tex., vice K. D. McKenzie, resigned.

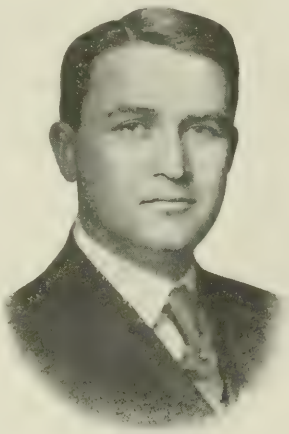
T. H. Simmons, commercial agent of the Chicago, Rock Island & Pacific at Cedar Rapids, Iowa, having retired, W. B. Metcalf has been appointed commercial agent, with headquarters at Cedar Rapids.

J. R. Morrow, traveling passenger agent of the New Orleans & Northeastern, the Alabama & Vicksburg, and the Vicksburg,

Shreveport & Pacific at Dallas, Tex., has been appointed western passenger agent, with headquarters at Dallas, vice C. F. Woods, promoted.

G. S. Rains, whose appointment as freight traffic manager of the Seaboard Air Line, with office at Norfolk, Va., has already been announced in these columns, was born on February 16, 1879, at Gainesville, Fla., and was educated at the grammar schools. He entered railway service on December 1, 1893, as office boy in the general freight office of the Florida Central & Peninsular at Jacksonville, Fla. When that company became part of the Seaboard Air Line in July, 1900, he was transferred to the general freight office of the Seaboard Line, at Portsmouth, Va., and was consecutively chief rate clerk, assistant chief clerk and chief clerk of rate department. In July, 1909, he was appointed assistant general freight agent of the Seaboard Air Line at Norfolk; in November, 1912, he was promoted to general freight agent and now becomes freight traffic manager of the same road, as above noted.

Eugene Fox, recently appointed general traffic manager of the El Paso & Southwestern System, the Morenci Southern and the Nacozari, with headquarters at El Paso, Tex., was born at Winterset, Iowa, on January 18, 1877, and was educated in the public schools of Stuart, Iowa, and Hutchinson, Kan. He began railway work as a bill clerk for the Chicago, Rock Island & Pacific at Hutchinson, in January, 1898. He was subsequently weighmaster, ticket clerk, bill clerk and cashier in the freight department until September, 1899, when he was appointed traveling freight agent, with headquarters at Salt Lake City, Utah. In October, 1901, he was transferred to St. Louis, Mo., in the same capacity, and in 1902 was made traveling freight agent, with headquarters at El Paso, Tex. In June, 1905, he left the Rock Island to become general agent of the El Paso & Southwestern system at Los Angeles, Cal. He was transferred to Chicago, Ill., as general agent, in November, 1906, and in June, 1909, was made assistant general freight agent at El Paso. From 1910 to 1913 he was general freight and passenger agent at El Paso, and from the latter date until July 1, 1916, was assistant general traffic manager at Chicago. As general traffic manager Mr. Fox will have his headquarters at El Paso, Tex.



Eugene Fox

Engineering and Rolling Stock

The office of the mechanical superintendent of the Texas & Pacific has been transferred from Marshall, Tex., to Dallas. The jurisdiction of the mechanical superintendent has been extended over the fuel bureau.

D. C. Cunningham, superintendent of shops of the Denver & Rio Grande at Salt Lake City, Utah, has been appointed superintendent of motive power of the Denver & Salt Lake, with headquarters at Denver, Colo.

Robert Farnham, Jr., assistant to the engineer of bridges and buildings of the Pennsylvania Railroad at Philadelphia, Pa., has been appointed assistant engineer of bridges and buildings, and the position of assistant to the engineer of bridges and buildings has beeen abolished.

C. B. Woticky has been appointed electrical engineer of the Lehigh Valley, and D. J. Cartwright, electrical engineer at South Bethlehem, Pa., has been appointed assistant electrical engineer, both with offices at South Bethlehem.

C. F. Hinchman, assistant engineer maintenance of way of the Cleveland, Cincinnati, Chicago & St. Louis, at Mount Carmel, Ill., has been appointed engineer maintenance of way of the Indianapolis terminal division, with headquarters at Indianapolis, Ind.

Arthur Engh, whose appointment as assistant bridge engineer, Chicago, Burlington & Quincy, lines east of the Missouri river, has been announced, was born at Chicago, Ill., on June 9, 1885. Prior to entering railway service he was employed by Ralph Modjeski and the American Bridge Company. From August, 1905, to 1913, he did detailing and designing work in the bridge department of the Burlington. He was then made office engineer in charge of the office of the bridge engineer, being relieved of these duties in 1914, to become office engineer of the Paducah & Illinois, in charge of the design of the Metropolis (Ill.) bridge. In 1915 and 1916, he was again office engineer of the Burlington in charge of the design and plans for the double-track bridge across the Missouri river at Kansas City. As assistant bridge engineer he will have headquarters, as heretofore, at Chicago, Ill.

Arthur E. Owen, whose appointment as chief engineer of the Central of New Jersey, with headquarters at New York, has already been announced in these columns, was born on January 19, 1876, at Montclair, N. J., and was educated in the Montclair high school and later attended Rutgers College, New Brunswick, N. J. In 1898 he began railway work as a draftsman in the tax agent's office of the Central of New Jersey at New York and has been in the continuous service of that road ever since. In August, 1899, he was transferred to the chief engineer's office as a rodman, and the following November was appointed assistant engineer, at Mauch Chunk, Pa. He was transferred in the same capacity to Jersey City in 1901, remaining in that position until January, 1907, when he was appointed principal assistant engineer; and he now becomes chief engineer of the same road as above noted.



A. E. Owen

Purchasing

William G. O'Fallon has been appointed purchasing agent of the Terminal Railroad Association of St. Louis, vice J. E. Williams, Jr., assigned to other duties.

G. T. Ingold has been appointed storekeeper of the Baltimore & Ohio lines at New Castle Junction, Pa. He was formerly connected with the storekeeper's department at Pittsburgh.

OBITUARY

Robert B. Thomson, treasurer of the Chicago Junction and the Union Stock Yards & Transit Company, died at his home in Morgan Park, Ill., on July 9.

A. J. Cota, division master mechanic of the Chicago, Burlington & Quincy, lines east of the Missouri river, with office at Chicago, died at his home in La Grange, Ill., on July 9.

J. L. Brass, assistant to the general manager of the Oregon-Washington Railroad & Navigation Company, with headquarters at Seattle, Wash., died at that city on June 30, after an illness of several weeks.

John Norment Powell, general counsel of the Carolina, Clinchfield & Ohio, at Johnson City, Tenn., died on July 8, at Wytheville, Va. Mr. Powell was born on September 15, 1877, at Columbia, Va. He studied law privately and was admittted to the bar in 1899. In September, 1901, he was appointed general counsel of the South & Western Railroad, and since 1908 had been general counsel of the Carolina, Clinchfield & Ohio, which absorbed the South & Western.

Equipment and Supplies

LOCOMOTIVES

The Rhodesia Railways, Ltd., have ordered 6 Mountain type locomotives from the American Locomotive Company. These locomotives will have 23 by 24-in. cylinders, and a total weight of 172,000 lb.

The Union Minere de Haut Katanga has ordered 5 six-wheel switching locomotives from the American Locomotive Company. These locomotives will have 10 by 16-in. cylinders, and a total weight of 45,000 lb.

The Pennsylvania Equipment Company, 1438 S. Penn Square, Philadelphia, Pa., is in the market for one 50-ton Heisler locomotive, one 30-ton Climax geared locomotive, and one 42-ton Shay geared locomotive.

The Central of Brazil, reported in the *Railway Age Gazette* of June 30 as being in the market for 7 Pacific and 12 ten-wheel locomotives, has ordered 2 Pacific and 12 ten-wheel locomotives from the American Locomotive Company. The Pacific type locomotives will have 21½ by 28-in. cylinders, and a total weight of 207,000 lb. The ten-wheel locomotives will have 21½ by 28-in. cylinders, and a total weight of 175,000 lb.

FREIGHT CARS

The Lehigh Valley is inquiring for 1,500 box car bodies.

The Chicago, Burlington & Quincy is inquiring for one steel four-wheel coal car.

The Chicago & North Western is inquiring for 200 narrow gage mine cars.

The Chicago, Milwaukee & St. Paul will soon build 1,100 42-ft., 40-ton box cars at its Milwaukee shops.

The Duluth, Winnipeg & Pacific has ordered 750 box cars from the Haskell & Barker Car Company.

The Havana Central has ordered 50 30-ton flat, 150 30-ton box and 10 30-ton caboose cars from the Standard Steel Car Company. These cars are for the Cuban Central. The Havana Central was also reported in the *Railway Age Gazette* of June 30 as having placed orders for 940 other freight cars.

The Pennsylvania Equipment Company, Philadelphia, Pa., is in the market for 15 to 20 second-hand standard gage tank cars, with wood or steel underframes, and with a capacity of 5,000 to 7,000 gallons of molasses, weighing 12 lb. to the gallon. The Pennsylvania Equipment Company is also in the market for 15 to 20 second-hand, 100,000 lb. capacity steel hopper cars, 25 to 30 No. 2 Russell log cars and several log loaders.

PASSENGER CARS

The Philadelphia & Reading is in the market for 2 to 6 dining cars.

The Delaware & Hudson has ordered one private car from the Pullman Company.

The Chicago, St. Paul, Minneapolis & Omaha is inquiring for 2 lounging and cafe cars.

The Boston Elevated has ordered 42 all steel elevated car bodies from the Pressed Steel Car Company.

IRON AND STEEL

The Russian Government has placed orders with American companies for approximately 425,000 tons of rails, divided about as follows: United States Steel Corporation, 150,000 tons; Cambria Steel Company, 150,000 tons; Lackawanna Steel Company, 75,000 tons, and Bethlehem Steel Company, 50,000 tons. In 1915 the Russian Government ordered 400,000 tons of rails in the United States.

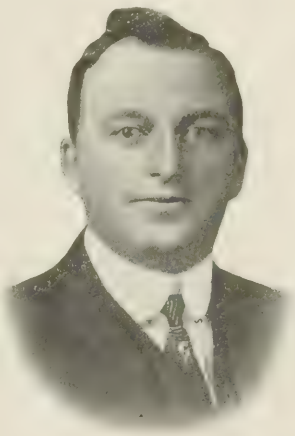
Supply Trade News

D. E. Garrison, president of the Corrugated Bar Company, of St. Louis and Buffalo, died on July 4 at his home in St. Louis, Mo., at the age of 77.

R. L. Brown, who has been associated with the M. C. B. Company, Chicago, has been appointed special representative of the Curtain Supply Company, Chicago.

Atkinson & Utech, Inc., 111 Broadway, New York, have been appointed Eastern sales agents for J. R. Johnson & Co., Richmond, Va., manufacturers of open hearth steel car axles.

Henry Fischer, sales agent at Chicago for the Verona Tool Works, of Pittsburgh, Pa., has been appointed general sales manager of the company, with headquarters at Pittsburgh, Pa. Mr. Fischer was born on June 4, 1880, in Brooklyn, N. Y. He was employed by the Shutt Improvement Company, railroad contractors, at St. Louis, Mo., from 1901 to 1903. From 1904 to 1911 he was in the engineering department of the Cleveland, Cincinnati, Chicago & St. Louis, at Cincinnati, Ohio, during the last three years of which time he was chief clerk to the chief engineer. From 1911 until July 1, 1916, he was sales agent of the Verona Tool Works at Chicago, as above noted.



H. Fischer

George R. Boyce, railroad representative of A. M. Castle & Co., Chicago, Ill., has been appointed assistant general manager of sales and in that capacity will retain supervision of the railroad sales for the company.

Aaron Dean, formerly resident manager of the New York office of the Union Switch & Signal Company, has been appointed special representative, with headquarters in New York. W. P. Allen has been appointed resident manager.

The Franklin Railway Supply Company has granted leave of absence to its employees already active in the National Guard or those who may join later. Married or single men with dependents will receive full pay and their positions will be reserved for their return.

Harry S. Whitehair, formerly with the railway department of the Chicago Varnish Company in the New York office, has been appointed Eastern representative of the Kay & Ess Company, Dayton, Ohio. Mr. Whitehair was with McCord & Company, Chicago, for two years before his connection with the Chicago Varnish Company.

J. M. Buick, vice-president of the American Car & Foundry Company, has been appointed general manager also. William M. Hager, formerly secretary of the company, has been elected assistant to the president, and has been succeeded as secretary by H. C. Wick, formerly assistant to the secretary and also secretary to F. H. Eaton, the late president of the company. F. W. Tuttle has been appointed assistant secretary.

At the recent commencement exercises of the Rensselaer Polytechnic Institute, the degree of Doctor of Engineering was conferred upon Robert W. Hunt, who has been a trustee of the institute since 1886, and has done much to further the interests of the school. At the same time a portrait of Mr. Hunt by

Lewis Betts was presented to the institute. Mr. Hunt has contributed largely to the erection of some of the institute's new dormitories.

A. E. Crockett, vice-president of the Standard Chain Company, Pittsburgh, Pa., has been appointed assistant general sales manager of the chain department of the Jones & Laughlin Steel Company. F. D. Grunder, assistant general sales manager of the National Tube Company, has been appointed assistant general manager of sales of the new tube department of the Jones & Laughlin Steel Company, with headquarters at Pittsburgh. S. E. Hackett, assistant to the president of Joseph T. Ryerson & Sons, has been made manager of the Chicago branch of the Jones & Laughlin Steel Company, vice David N. Barker, resigned.

The net earnings of the American Car & Foundry Company for the fiscal year ended April 30, were $2,816,017.55, after deducting $1,779,341.07 for renewals, replacements, repairs, etc. Dividends of $2,700,000 were paid at the rate of 7 per cent on preferred capital stock and 2 per cent on common stock, leaving $116,017.55 surplus earnings for the year. In his remarks, President Woodin stated that about $7,300,000 worth of munitions contracts had been undertaken by the company, and added that the company's export department had obtained a fair share of the foreign orders for equipment, which assumed considerable proportions during the past year. Additions to the Chicago (Ill.) and Berwick (Pa.) plants and the improvement of the facilities in the Milton plant for the more economical production of tank cars, called for an expenditure of $474,774.55.

Bethlehem Steel Company

Official announcement has been made of the acquisition of the Pennsylvania and Maryland steel companies by the Bethlehem Steel Company, and also of the future policy of the companies. The announcement states:

"All of the properties and businesses as going concerns of the Pennsylvania Steel Company and Maryland Steel Company have been acquired by Penn-Mary Steel Company, a subsidiary of Bethlehem Steel Company, and such properties and businesses will hereafter be operated under lease by Bethlehem Steel Company, which has taken over all contracts, has acquired all current accounts, and is prepared to meet all outstanding obligations of such companies when due.

"All unfinished contracts of these companies will be carried out and performed by the Bethlehem Steel Company without interruption. The books of account will be kept at, and all payments will be made from, South Bethlehem, Pa., and checks for accounts due to the Pennsylvania Steel Company or Maryland Steel Company should be drawn to the order of Bethlehem Steel Company, and mailed to South Bethlehem, Pa. The executive, treasury, accounting, sales and purchasing departments will have their headquarters at South Bethlehem, Pa., to which letters intended for their attention should be addressed.

"Bethlehem Steel Company, by E. G. Grace, president.

"Pennsylvania Steel Company, by E. C. Felton, president."

L. W. Adams has been appointed superintendent of the Saucon plant, vice R. F Randolph, general superintendent, resigned. R. M. Bird has been appointed superintendent of the rolling mills of the Lehigh plant, succeeding Mr. Adams, and William Bangster will succeed Mr. Bird as superintendent of the treatment department of the Lehigh plant.

The following changes have been made in the sales department: The general sales offices of the Pennsylvania Steel Company, the Maryland Steel Company and the Titusville Forge Company have been consolidated with the general sales office of the Bethlehem Steel Company. R. W. Gillispie, general manager of sales for the Pennsylvania and Maryland Steel Companies at Philadelphia, and Paul Mackall, sales agent for the Bethlehem Steel Company in the district of Pittsburgh and west, have been appointed assistant general sales agents at So. Bethlehem, Pa. Edward S. Knisely is general sales agent. R. E. Belknap, district sales manager Pennsylvania Steel at New York, will become sales agent at Chicago, and J. M. Price, sales agent of the Chicago district, has been transferred to St. Louis as sales agent.

The sales agents of the various branch offices will be as follows: H. A. Jackson, Oliver building, Boston; J. M. Ellis, 111 Broadway, New York; W. B. Kennedy, Morris building, Philadelphia; Jesse A. Davis, Continental building, Baltimore; H. W. Eisenhart, First National Bank building, Pittsburgh; J. N. Clarke, 1266 Ontario street, Cleveland; J. S. Hegeman, Majestic building, Detroit; R. E. Belknap, People's Gas building, Chicago; J. M. Price, Chemical building, St. Louis; E. S. Illig, Crocker building, San Francisco.

Charles M. Schwab, chairman of the company, has announced that improvements will be made in the Steelton, Pa., plant costing $15,000,000. It is understood that expenditures totaling $20,000,000 will be made on the Sparrows Point, Md., plant, and that $1,000,000 will be spent for the Saucon plant.

Kansas City Bolt & Nut Company

In the *Railway Age Gazette* of June 23 announcement was made that on June 15 the stock of the Kansas City Bolt & Nut Company was purchased by Kansas City interests from the J. H. Sternbergh estate of Reading, Pa., and that coincident with the transfer of the property the following officers were elected: George T. Cook, president; Solomon Stoddard, vice-president and general manager; H. R. Warren, secretary and treasurer.



G. T. Cook

George T. Cook, the new president of the company, was born in Kansas City, Mo., October 14, 1871. He was educated in the public schools of Kansas City and graduated from the University of Kansas. He was in the purchasing department of the Kansas City, Fort Scott & Memphis for several years, and moved to St. Louis at the time the Kansas City, Fort Scott & Memphis was absorbed by the St. Louis & San Francisco. He remained in St. Louis about a year and left to go with the Kansas City Bolt & Nut Company as general sales manager in June, 1902. He resigned from the Kansas City Bolt & Nut Company in 1910, however, but continued in the railway supply business in Kansas City. On June 15, 1916, he was elected president of the Kansas City Bolt & Nut Company, as above noted.



S. Stoddard

Solomon Stoddard, vice-president and general manager, was born in Boston, Mass., and educated in Trinity College, Stratford, Conn. He entered the service of the Kansas City Bolt & Nut Company in a minor position in February, 1900, and has worked up to the position of vice-president and general manager.

Steel Corporation's Unfilled Orders Decrease

The United States Steel Corporation reported 9,640,450 tons of unfilled orders on hand June 30. This is a decrease of 297,340 tons, as compared with the orders on hand at the beginning of the month, when the record total of 9,937,798 tons had accumulated. The June 30 figures are also below those of April 30, when orders amounted to 9,829,551 tons. They are, however,

more than double the 4,678,196 tons on the books June 30, 1915. The decrease in tonnage is the first reported since August, 1915.

TRADE PUBLICATIONS

FOUNDRY EQUIPMENT.—The Whiting Foundry Equipment Company, Harvey, Ill., has recently issued catalog No. 120, dealing with tumblers and dust arresters; catalog No. 121, dealing with coke oven equipment, including ovens, racks, cars, trucks and coke-over doors, and catalog No. 122, dealing with ladles. All three bulletins are well illustrated.

THE LOGIC OF THE DEAN.—This is the title of a booklet which has recently been issued by the William B. Pierce Company, Buffalo, N. Y. The booklet deals with the Dean boiler tube cleaner made by the company. It shows how scale is formed and asserts that the formation of scale cannot be prevented absolutely by boiler compounds. It then takes up the problem of scale removal and describes the Dean tube cleaner and its operation. A list of users is also given.

VARNISHES, ENAMELS AND JAPANS.—The Moller & Schumann Company, Brooklyn, N. Y., has recently issued Bulletin No. 1, dealing with the company's Hilo black enamels and japans. The bulletin describes the range of blacks available for wood, steel, cast iron, tin, brass or other materials. It contains lustre standards whereby one may readily obtain a clear idea of the meaning of the terms, gloss, semi-gloss, rubber, dull rubber or flat, and be enabled to pick out the finish best suited to his needs. Each article is described in a manner to indicate its use. The bulletin also gives the necessary reduction for applying; the various methods of brushing, spraying, dipping and tumbling, and it also indicates the heat and time of baking.

SOUTHERN PACIFIC.—"Across America" is a new folder published by the Southern Pacific for distribution in Australasia and the Orient. Besides two maps, it contains over 60 half-tone illustrations of the attractions of California and the Pacific Coast in addition to characteristic views of Chicago, New York, Washington and other Eastern cities. The text describes, in an interesting manner, the four routes across America of which the tourist arriving in San Francisco has the choice when traveling over the Southern Pacific. Most valuable to over-sea travelers is the "Landing and Customs" information, which states clearly the requirements of the law as to declaration and entry of personal baggage, besides the rates of duty on some of the principal classes of merchandise usually brought in by passengers in their baggage.

CAR WHEELS.—The American Steel Foundries have issued an attractive catalogue descriptive of the Davis steel wheels made by the company. The booklet names the advantages of the Davis one-wear steel wheel asserting that, "It retains the advantages of the cast iron wheel—a hardened tread and flange, a softer plate and hub, and a one-wear construction" and in addition is stronger, is of less weight, has absolute rotundity because of its ground treads and has a lower maintenance cost on account of fewer removals for common wheel defects. The booklet is well illustrated, there being given sections, pictures of the wheels, and a number of views, some in colors, showing the manufacture. One section deals with wheels for electric railway service and another gives comparative data of Davis and other wheels in tests and actual service.

STANDARD SAFETY DEVICES.—The "Conference Board on Safety and Sanitation," 928 Western Avenue, West Lynn, Mass., has issued an eight-page leaflet describing the "N. A. S. O." safety devices, with illustrations and prices. These devices have been approved by the Conference Board, which represents the National Affiliated Safety Organizations, namely, the National Founders' Association, the National Association of Manufacturers, and the National Metal Trades Association; and all of the articles are made under the supervision of the board. The aim is to sell these articles at cost, or nearly so; but any profits derived from sales are utilized for further research in connection with the promotion of safety in industrial establishments. Among the things described are goggles; leggins for foundrymen; respirators; the N. A. S. O. Sanitary Stretcher; Safety Feet for Ladders, and a Metal Danger Sign. The N. A. S. O. Standard First Aid Jar was described in the *Railway Age Gazette* of January 8, 1915, page 64.

Railway Construction

ALABAMA & MISSISSIPPI.—Work has been completed, it is said, on the extension of the Pascagoula-Moss Point Northern from a point near Leakesville, Miss., south to Lucedale, 20 miles, and a train was recently run from the northern terminus at Vinegar Bend., Ala., south to Pascagoula, Miss., on the Gulf Coast. (May 12, p. 1059.)

ANTHONY & NORTHERN.—This road has been extended from Fellsburg, Kan., north to Gibson, 13 miles.

CANADIAN NORTHERN.—A new branch has been opened for business from Camrose, Alta., south to Alliance, 59.8 miles. The Victoria Beach subdivision of the Central division has been extended from Grand Marais, Man., north to Victoria Beach, about 13.8 miles.

CANADIAN PACIFIC.—This company will extend its Expanse south line, seven miles beyond Vantage, Sask., and connect it with the line west of Weyburn, at Assiniboia. It will also extend the branch running from Stirling, Alta., to Foremost, ten miles east. Grading contracts have not yet been let. Track laying and all other work will be completed by the company's own forces.

CENTRAL FLORIDA INTERURBAN.—This company with $100,000 capital and headquarters at St. Cloud, Fla., plans to build an interurban railway, it is said, from St. Cloud north to Sanford, about 40 miles, thence to a point on the Atlantic seacoast. C. E. Carlson, president, W. Hall, secretary and treasurer.

CROSBYTON-SOUTH PLAINS.—This company, a subsidiary of the Atchison, Topeka & Santa Fe, has asked for a charter for a line from Lubbock, Tex., 65 miles southwest, through Brownfield to Seminole. Locating will be started soon.

DENTON-KRUM LINE.—The city of Dallas, Tex., is making an effort to interest some company in the construction of a steam railroad between Denton and Krum, a distance of eight miles. This road would connect the Gulf, Colorado & Santa Fe at Krum, with the Missouri, Kansas & Texas at Denton. The city of Dallas agrees to take $50,000 worth of first mortgage bonds on this road, should it be built.

ELECTRIC STANDARD RAILWAYS COMPANY.—A charter has been granted by the state of Delaware to this company with $1,000,000 capital, it is said, to build and operate railways. G. L. Campbell, H. R. Noll and H. W. Lukens, Williamsport, Pa., are said to be interested.

GREAT NORTHERN.—This company has given a contract to Morris, Shepard & Dougherty, St. Paul, Minn., for building an extension from Wildrose, N. D., to Grenora, 36 miles at an estimated cost of $675,000. About 5 per cent of the work has been completed.

MARTINEZ & CONCORD INTERURBAN.—This company will build a line from Martinez, Cal., via Avon to connect with the Oakland, Antioch & Eastern at Government Ranch, a distance of 6.5 miles. A contract for the grading will be let in about 60 days. About 15,000 cu. yd. of material per mile will be handled. The maximum curvature is about 4 deg. and the maximum grade about 2 per cent. About 900 lineal ft. of open deck pile trestle will be constructed. Clifford McClellan, president, and J. B. Rogers, chief engineer, San Francisco, Cal.

MCCONNELLSBURG & FORT LOUDON.—A contract for the construction and equipment of the line building from McConnellsburg, Pa., to Fort Loudon, 11 miles, has been let to Clyde E. Coon and a sub-contract for construction work has been let to Walter F. Patterson, Sr., & Son, Pittsburgh, Pa. (June 16, p. 1353.)

NORTHERN OHIO TRACTION & LIGHT CO. (ELECTRIC).—This company proposes an expenditure of about $2,000,000 for improvements. The work will be extended over a long period of time, and will include double tracking on the Akron, Bedford and Cleveland division, $387,000; improvements from Bedford, Ohio.

to Newburg, $160,000; double track from Canton, Ohio, to Massillon, $200,000; double tracking the Canton-Akron line between Blue Point, Ohio, and Springfield Lake, $175,000; double track from the Akron (Ohio) terminal over private right of way to Gorge, $340,000; the completion of a high tension line to Canton, $280,000, and the purchase of an Akron terminal station site, $355,000.

Northern Pacific.—The construction of a branch line from Dixon, Mont., to Polson, 33.75 miles in length, has been authorized, but construction work has not yet been started nor have bids been asked for. The work will involve about 23,000 cu. yd. of material per mile, and the construction of a few small timber bridges. The maximum grade is 1 per cent.

Oregon Short Line.—This company will complete an extension from Marshfield, Idaho, to Idahome, a distance of 19 miles. Grading of this line was completed in 1911. Track laying will be done by company forces.

Pascagoula-Moss Point Northern.—See Alabama & Mississippi.

Southern Railway.—The Tennessee & Carolina Southern has been extended from Chilhowee, Tenn., south to Alcoa, 6 miles. A contract has been let by this company to the Brooks-Galloway Company, Atlanta, Ga., for building double track from Duluth, Ga., to Suwanee, 5.50 miles, and from Spartanburg, S. C., to Lawsons Fork, 1.50 miles.

Tennessee & Carolina Southern.—See Southern Railway.

Winston-Salem Southbound.—A new branch has been opened for business between Whitney, N. C., and Badin, 5 miles.

Yazoo & Mississippi Valley.—This company is preparing to raise the grade of its tracks, from three to six feet, for about 12 miles between Vicksburg, Miss., and the Yazoo river. The work will be done by company forces and will involve handling about 250,000 cu. yd. of material. The company is also raising its grade for a distance of about 17 miles south of Vicksburg, 14 miles of which will be entirely new line, including a new crossing over the Big Black river. The work involves about 500,000 cu. yd. of material. The contract for the grading has been let to the H. W. Nelson Company, Chicago, Ill.

RAILWAY STRUCTURES

Brewster, Ohio.—The Wheeling & Lake Erie has awarded a contract to W. C. Handshy & Son, Zanesville, Ohio, for constructing the Y. M. C. A. building at Brewster mentioned June 9, page 1246.

Houston, Texas.—The Missouri, Kansas & Texas has awarded a contract to the American Construction Company of this city, for the erection of a reinforced concrete cotton platform at an estimated cost of $50,000.

Mattoon, Ill.—The Cleveland, Cincinnati, Chicago & St. Louis will open bids in about three weeks for a brick and concrete station and office building to be 40 ft. by 150 ft. and two stories in height to be built at Mattoon.

Menominee, Mich.—The Chicago & North Western has awarded a contract to Leyden & Ortseifen, Chicago, Ill., for the construction of a brick depot to cost about $14,000.

North Regina, Sask.—The Canadian Northern is constructing a frame store building, 25 ft. by 58 ft., and 18 ft. in height, to cost about $3,900. It is also rebuilding a portion of its machine shop recently destroyed by fire at a cost of about $3,000. George McLeod, Winnipeg, Man., has the contract.

Rock Island, Ill.—The Tri-City Railway will receive bids soon for a brick and reinforced concrete shop building, 160 ft. by 300 ft., to be built at Rock Island. The building will be part one story and part two stories high, and the cost will be about $80,000.

San Francisco, Cal.—The Southern Pacific is preparing plans for a 10-story office building to be constructed at the corner of Market and Spear streets.

Railway Financial News

Boston & Maine.—The directors' meeting was held July 11 after a joint meeting of a committee representing directors of the Boston & Maine and some lessor companies. On this committee were, President Hustis and Henry Day, representing the Boston & Maine; Gordon Abbott, representing the Fitchburg; Phillip Dexter, representing the Boston & Lowell; W. H. McClintock, Richard Olney and Charles E. Gross, representing the Connecticut River, and Benjamin A. Kimball and Walter M. Parker, representing the Concord & Montreal. At the directors' meeting of the Boston & Maine which followed the joint conference it was decided to ask holders of the $13,300,000 six per cent notes maturing July 17 to extend these notes to August 31, and it was announced that this action was the result of the joint conference mentioned above. The Boston & Maine directors also asked the directors of the Vermont Valley and the Connecticut River to arrange for the renewal of the notes of these companies which amount to $2,300,000 for the Vermont Valley and $2,450,000 for the Connecticut River, to August 31. These notes mature July 17.

Denver & Rio Grande.—A conference was held on July 11 between various interests in the Gould estate to consider a proposal that the estate surrender its interest in the Texas & Pacific and the International & Great Northern and receive In return the Missouri Pacific's interest in the Denver & Rio Grande. While no statement as to the decision is given out, it is believed that the proposal was looked on favorably and it is also believed that the bankers—Kuhn, Loeb & Company—financing the Missouri Pacific, are favorable to this plan. Should the plan go through, it is quite possible that one system would be made of the Missouri Pacific, Texas & Pacific and International & Great Northern.

Great Northern.—This company has bought the Watertown & Sioux Falls Railroad from C. O. Kalman for a price said to be $1,250,000. The road runs from Watertown, S. D., to Sioux Falls, S. D., 103 miles. It was formerly called the South Dakota Central.

International & Great Northern.—See Denver & Rio Grande.

Missouri Pacific.—See Denver & Rio Grande.

New York, Chicago & St. Louis.—A group of Cleveland capitalists have bought from the New York Central Railroad that company's majority holdings of the stock of the New York, Chicago & St. Louis. The price paid for this stock was $8,500,000. The par value of the stock held by the New York Central on December 31, 1915, was $15,018,000, the total stock outstanding of the New York, Chicago & St. Louis being $30,000,000. The New York Central carried this majority stock of the Nickel Plate on its book at a valuation of $8,447,747. It will be seen, therefore, that the sale price was approximately the same as the book value. It is announced that the new directors of the New York, Chicago & St. Louis are as follows: O. P. Van Sweringen, M. J. Van Sweringen, Warren S. Hayden, J. R. Nutt, M. B. Johnston, Charles L. Bradley, E. W. Moore, F. E. Myers, E. R. Tinker, G. M. Murphy and G. W. Davidson. Chauncey M. Depew for the time being remains chairman of the board and William H. Canniff, president, also remains on the board of directors. The Nickel Plate operates 523 miles of road, of which 495 miles are owned and has outstanding beside the $30,000,000 stock $28,569,000 bonds. In 1915 its gross earnings were $12,536,380. It is earning at the rate of very considerably more than that in the present calendar year.

Pennsylvania Railroad.—This company has sold to Kuhn, Loeb & Company, New York, $20,000,000 nine months' notes bearing interest at 3⅞ per cent annually. The notes have been placed privately by the bankers.

Texas & Pacific.—See Denver & Rio Grande.

Wheeling & Lake Erie.—For the twelfth time the sale of this road under foreclosure has been postponed. A press dispatch from Cleveland making this announcement says it is rumored that the Erie might bid for the Wheeling & Lake Erie.

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Nickel Plate Now Independent

The New York Central Railroad has sold its stock—a majority of the total outstanding—of the New York, Chicago & St. Louis to a syndicate of Cleveland bankers. The stock of the "Nickel Plate" was carried on the books of the New York Central at approximately $8,500,000, and this is the amount which the syndicate has agreed to pay for the stock. The "Nickel Plate" runs from Buffalo to the Illinois state line and leases a line from its western terminus to Grand Crossing, Illinois, from which point it has trackage rights over the New York Central into Chicago. It was built parallel to the Lake Shore not because there was any economic need for an additional railroad between Buffalo and Chicago, but to force the Vanderbilts to buy it through the practice of cut-throat competition. The total amount of dividends which the New York Central has received from the "Nickel Plate" has been, roughly, $6,200,000, which is for a period of 23 years, so that if the book value of $8,500,000, at which the stock was carried, represents approximately its net cost, the New York Central has received a little over $260,000 a year, or not much over 3 per cent per annum on its investment. Obviously this was not a profitable investment, except in the negative sense of having prevented disastrous competition. The sale of the stock now indicates that cut-throat competition is no longer a thing to be greatly feared. The reasons for the sale, therefore are easily understood, but there still remains the question of why anyone should want to buy a controlling block of stock which has averaged for the past 23 years only about 3 per cent on the purchase price. Apparently it indicates a belief on the part of the Cleveland capitalists that as an independent and intensively managed road, the "Nickel Plate" can be made to earn considerably more than it did as a part of the New York Central system. This is a reasonable belief. Some of the most conspicuous successes in very recent years in successful and profitable railroad management have been the intensive development of comparatively short lines. At the present time the company is making a fine showing, but the present volume of traffic cannot be expected to continue. The road lacks terminals both at Buffalo and at Chicago.

Average Wage of Railway Employees

The statistics of the Interstate Commerce Commission for the fiscal year ended on June 30, 1915, show that railways operating 224,859 miles of line reported that they employed an average of 1,409,342 persons during the year and paid them in salaries and wages a total of $1,164,844,430. This makes an average per employee of $826.52. This figure is especially interesting because of the fact that it is the largest average compensation figure which ever could be calculated from the statistics of the Interstate Commerce Commission. It is interesting for another reason. Until 1915 the commission gave the number of persons employed by the railways on June 30 of each year and the total compensation paid to them during the year. It has always been contended that the average annual compensation figure arrived at by dividing the number of employees in June into the total compensation paid during the year was misleading. As already indicated, the statistics for 1915 give the average number of men employed throughout the year. The average wages per year for the five years 1910-14, as arrived at by the old method, were as follows: 1910, $673; 1911, $724; 1912, $732; 1913, $756; 1914, $810. The average for 1915, arrived at by using the average number of persons employed during the year, is just two per cent greater than the average for 1914, arrived at by the old method and 9 per cent greater than that for 1913. In view of the loud complaints made by professional statisticians, especially those in the pay of organized labor, regarding the old method of calculation, the similarity of the results obtained by the old and the new methods is somewhat amusing. The old method was not strictly scientific; but it gave approximately correct results; and the average figure arrived at by the new method shows the same thing as those arrived at by the old, viz., that railway employees are, on the average, the best paid classes of workers in the United States.

A car inspector must not only be thoroughly familiar with the details of car construction and operation, but must understand the application of the rules of interchange, which are growing more and more complicated each year; must know the safety appliance requirements in detail; ofttimes is required to pass upon the loading of long materials, which is regulated by an extensive set of rules, and must understand the regulations for the loading and handling of explosives. The car inspector may also prove a most important factor in reducing the claims for loss and damage to freight. To understand the construction of cars, he must have served for some time in the capacity of a car repairer. The number of inspectors is so large that great difficulty is found in getting a sufficient number of capable men for this purpose and this difficulty is not improved by the low salaries which are paid to these men. A live, modern apprenticeship system for car department employees would pay handsome returns even if it did no more than help satisfactorily to select and train men for this position; on the other hand, changes in car construction and the necessity for greater care in the maintenance and upkeep of cars requires a large force of car repairmen, and these men to be really efficient must possess considerable skill. Car department officers freely admit that some system of developing and training these men should be adopted, and yet most of them hold up their hands and say it is impossible. It is possible, and it is possible to do it right. It requires hard work and painstaking effort, but the results are well worth while. Of the 974 apprentices on the Santa Fe on May 31, 1916, 148 were freight car carpenter apprentices and 25 were car builder and coach carpenter apprentices. What the Santa Fe is doing other roads ought to be able to do.

A Vital Need of the Car Department

As the amount of business handled through a less-than-carload freight house increases, additional track capacity can be secured either by increasing the length of the house and the platforms or by adding more tracks. Beyond a certain point, each of these measures has serious limitations. As the house is lengthened the freight trucking distances increase. E. H. Lee ascertained in a study some two years ago that the freight haul increases 27.8 feet for each additional 100 ft. in the length of the house. As additional tracks are added the difficulty of reaching cars on those farthest removed from the house increases rapidly. As a result five or six tracks are generally considered a practical maximum. The common practice in reaching the outside cars is to truck through the doorways of the intervening cars. This requires that the runways be kept open and prevents the stacking of freight in the doorways. In an inbound freight house this practice requires the removal of all freight from the doors before the outside cars can be reached, resulting in an additional handling of a considerable tonnage, with increased liability of damage and a confusion of shipments. The practice of trucking through cars also results in interference between truckers, even under the most careful routing. To avoid this difficulty at some stations the cars have been divided at intervals of perhaps 200 ft. and temporary cross platforms have been constructed which can be removed readily whenever switching is to be done. This is an improvement over the trucking through the cars but the placing and removing of these runways require attention and labor. To simplify this, the Santa Fe has installed platforms at its freight house at Los Angeles which are lifted mechanically as described elsewhere in this issue. This system has obvious merit, and will probably meet with adoption at other stations. A further possibility is the raising of these transfer bridges vertically to clear cars rather than from one end as is done at Los Angeles.

Lift Platforms at Freight Houses

THE MECHANICAL DEPARTMENT AND LOCOMOTIVE DEVELOPMENT

EIGHT or ten years ago there was a widespread belief that the end of a comparatively short period would see the steam locomotive largely replaced by electric power. Today the steam locomotive in America has reached a point of development which even the greatest visionary would not have attempted to predict fifteen years ago. Moreover, the highest point in this development has not yet been reached; there is no question that the steam locomotive will gain much in both sustained power and economy within the next few years.

In introducing refinements in the American locomotive it was natural that designers should follow, more or less closely, lines laid down in European practice. European railway engineers had forced on them the necessity for more refined design long before this was considered necessary in America. Many of the most meritorious examples of European locomotive work are results of the engineering practice of the railways' own mechanical engineering officers. There was a time in the history of American railroads when a similar statement would have been true; allowing for a few brilliant exceptions, such a statement cannot be made today. The present high point which has been attained in the development of the locomotive in this country has been reached mainly because of the energy and resourcefulness of manufacturers of locomotives and locomotive equipment.

It is a sad commentary on the mechanical department, but it is nevertheless true, that there is very little real mechanical engineering being done in the average American railroad drawing office, and this is said without any reflection on the ability of very many of our mechanical department officers. How many railroad executives have encouraged the mechanical department in the production of original work in locomotive and car design? How many have been willing to provide the necessary funds to carry out such work intelligently and effectively, even if they were in favor of it? Very few. The mechanical department of the average American railroad has been treated as a necessary evil for years; it has been permitted a ridiculously inadequate and underpaid staff which has been forced to do its work with inefficient and very frequently antiquated equipment. There has been no provision made, in any but a very few cases, to build up a staff of officers and men for the future and thus encourage the best work of employees from year to year, looking toward a continual improvement and expansion of the road's mechanical practice. The result has been haphazard, hand-to-mouth work.

Fortunately, some few railway men and manufacturers of railway equipment were big enough and broad enough to see the possibilities in the development of the locomotive and it is to them that the railways owe in large measure their present ability to move traffic in such large trainloads and at such low costs. Railway officers in general, and the higher executive officers in particular, may not like the idea of going outside their own organizations for advice and assistance on the improvement of their motive power and its operation, but the manufacturers are today and have been for some years providing a service to American railroads, the value of which is beyond stating in dollars and cents. It has been the manufacturers who have developed and perfected the economy- and capacity-producing features of the present-day American locomotive and it will have to be generally admitted that they have done and still are doing their work exceedingly well.

Much of the recent development might have been carried out by the railways themselves. The executives have themselves to thank that it was not so carried out; but there is still enormous possibility for the railroad mechanical department to improve the steam locomotive in the future, both by closer co-operation with the manufacturers and by closer and

more comprehensive attention to mechanical engineering matters by the roads themselves. It remains with the executive officers as to whether at least part of the credit for future developments shall rest with the mechanical departments of our railways or whether all of it, like the credit for the great majority of the improvements of the past ten years, shall go to the manufacturers.

THE INVESTIGATION OF REGULATION

BOTH houses finally have passed the resolution providing for an investigation by a joint committee of Congress of the entire subject of regulation of railways. This investigation will be, or at least should be, the most important affecting transportation ever conducted in the United States. There can be no doubt as to the question to which it will principally relate. It will undoubtedly be directed chiefly toward ascertaining the desirability of substituting exclusive federal regulation for the present system of both federal and state regulation, or at least of completely subordinating state to federal control.

The more enlightened class of public men and the better informed part of the public already appreciate the fact that the present policy of regulation has many shortcomings, and that most of them grow out of the duplications and conflicts of federal and state control. On the other hand, there are public men who believe that regulation should be made more rather than less drastic; who are aware that state regulation usually has been more drastic than federal; and who are therefore opposed to any interference by the federal government with state regulation. No man in public life has been so uniformly successful in getting on the wrong side of public questions as William J. Bryan. Naturally, therefore, we find him rushing to the defense of state regulation and denouncing in a recent issue of the Commoner as "Another Railroad Plot" the movement for making federal regulation paramount. It must be admitted that a majority of railway managers have become convinced that it is desirable from the standpoint of the transportation companies for federal regulation to be made not only paramount but, if practicable, actually exclusive. Men like Mr. Bryan, Senator La Follette and Clifford Thorne, who act always on the enlightened principle that whatever may be good for the railways must be bad for the public, have no difficulty, therefore, in deciding where they will take their stand. If the railway managers favored exclusive state regulation they would advocate federal regulation. Since the railway managers favor exclusive federal regulation they leap to the defense of "states' rights." But experience has shown, contrary to the political and economic philosophy of the Bryan-LaFollette-Thorne school of statesmen, that what is bad for the railways is not necessarily good for the public, and that what is good for the public is not necessarily bad for the railways. It is certainly true as to the subordination of state to federal control that it is even more to the interest of the public than of the railways that the proposed change should be made.

The reasons why the public suffers from the present system of regulations were eloquently and forcibly pointed out by Frank Trumbull, chairman of the Chesapeake & Ohio, and also chairman of the Railway Executives Advisory Committee, in a recent address to the National Hay Association, which is published elsewhere in this issue of the *Railway Age Gazette*. The duplication of federal and state regulation causes a very large amount of unnecessary expense to the national and state governments—in other words, directly to the public itself. It also causes a large amount of needless expense to the railways. For example, as a result of this duplication the carriers have to make nearly 2,000,000 reports of multifarious kinds to public bodies annually. The cost of making these reports goes into railway operating expenses and ultimately is paid by the public in the form of freight and passenger rates. The policies followed by the federal and state regulating authorities often are grossly inconsistent. For example, some states burden the railways with laws requiring extra men in train crews and fix the maximum passenger fare at two cents a mile. The Interstate Commerce Commission, in its regulation of interstate commerce, does not require extra men in train crews, and allows a rate higher than two cents to be charged. Now, it cannot be reasonable, right or expedient for the Interstate Commerce Commission to regulate the interstate rates and operation of the railways in Ohio, for example, in one way, and for the state authorities of Ohio to regulate state traffic in Ohio in an entirely different way. Either the federal or the state regulation is unreasonable and unfair.

Since federal and state regulation obviously result in unnecessary waste of public money, and since wherever they differ one or the other must be unreasonable and unfair, it necessarily follows that one or the other ought to be either completely subordinated or abolished. Mr. Bryan and those who think as he does defend state regulation and say it ought not to be abolished. Perhaps the joint committee of Congress appointed to make the investigation, and subsequently Congress itself, will agree with Mr. Bryan. In that case let them be consistent. Let the joint committee recommend the complete abolition of federal regulation and Congress pass a law relegating regulation entirely to the states. On the other hand, the joint committee and Congress may differ from Mr. Bryan and those who think as he does, and believe that federal regulation is more desirable than state. If so, let them be consistent and recommend and enact the measures necessary to either subordinate or abolish state regulation. Both the railways and the public would be better off under either system than under both.

Mr. Bryan quotes the plank of the Democratic national platform of 1908, which asserted "the right of Congress to exercise complete control over interstate commerce and the right of each state to exercise like control over commerce within its borders." This, he says, states the correct principle. It will be recalled that Mr. Bryan some years before he wrote this plank, which he now so highly approves, made a speech at Madison Square Garden in New York, in which he advocated government ownership of railways in the United States, and proposed that the federal government should own and manage the main lines and the states the branch lines. Everybody except Mr. Bryan saw at once that this proposal was the product of a mind constitutionally incapable of thinking straight. The principle of regulation which he upholds is equally impracticable. Experience has demonstrated that it is not possible for Congress "to exercise complete control over interstate commerce" and at the same time for "each state to exercise like control over commerce within its borders." Experience has shown and is showing at this moment, that when the states exercise complete control over commerce within their borders they interfere with similar regulation of interstate commerce by the national government, and vice versa. Commerce and transportation within the states and among the states are one and inseparable. Regulation which ignores this fact is based upon unsound principles and is bound to have bad results.

The concentration of regulation in the national government and the increase of federal regulation so that it would cover in a reasonable manner all the phases of rate-making, operation and finance which the public interest may require would benefit the railways, but at the same time it would benefit the public still more. Fortunately, whether the Republican or the Democratic candidate for President is elected the nation will have at its head during the next five years a man whose mind is influenced not by the considerations that appeal to demagogues but by those that appeal to statesmen;

and with such a man at the head of affairs both the railways and the public can rest assured that the question of federal vs. state regulation ultimately will be determined not by the fear that some good may be done to the railways, but by the desire to do the greatest practicable good for the public.

STATE AND PRIVATE RAILWAY DEFICITS IN CANADA

THE subject of government ownership of railways in Canada is one of peculiar interest at this time. The increase in railway mileage in that country within recent years has been greater in proportion than ever took place in any other country, except in the years from 1860 to 1880 in the United States. In 1905 Canada had only 20,487 miles of railway. In 1910 it had 24,731 miles, and in 1915, 35,582 miles. The increase in the 10 years from 1905 to 1915 was 73 per cent, and in the 5 years from 1910 to 1915, 44 per cent. Part of this mileage was built by the government and a larger part by private companies, but the construction of most of the private mileage was subsidized by the government in various ways. There recently has been a crisis in railway affairs in that country. The two private companies which have built the most new mileage, the Grand Trunk Pacific and the Canadian Northern, have failed to earn their fixed charges and have had to appeal to the government to pay the interest it has guaranteed for them. The principal reasons why they have not earned their fixed charges are obvious. These are, that they are new lines in undeveloped territory, that, in respect of railways, the country is temporarily overbuilt; and that these lines were opened for traffic when the nation was involved in a great war. Most of the private mileage of Canada has become able in due time to earn a return on its investment. It is fair to assume that in the course of a few years these new railways, if also left in private hands, will become able to do so.

Nevertheless, the fact that the public has had to pay some of the interest that it guaranteed for them, is being used as an argument for the government taking them over and operating them. The Minister of Finance in discussing the matter in parliament on May 15, said: "This situation must be faced; there must be an end to this annual coming to the government by these two railway companies for relief." Comparison of this statement with the facts regarding the way in which the affairs of the railways now owned by the Canadian government have been handled affords a delicious example of governmental inconsistency. The Intercolonial has been owned and managed by the Dominion since 1867. Never in a single year during that time has it earned both its operating expenses and interest on the investment in it. In other words, in every single year it has had an actual deficit, and has had to draw upon the public treasury at the expense of the taxpayers. The total loss it has inflicted on the taxpayers cannot be exactly stated because the accounts have been so kept that the amount of interest which the government has had to pay on the investment in it cannot be ascertained. But, as shown in an article published in this paper last week, the total loss it has incurred is approximately $250,000,000. In another article published elsewhere in the present issue of the *Railway Age Gazette* the reasons why the government railways have been a financial failure are set forth. Nobody in Canada seems to suggest that the Intercolonial, which government management has had 50 years of opportunity to make a paying property, shall be put on a self-supporting basis. It seems to be taken as a matter of course that it must annually for all time come to the public crib for relief. But when two new railways opened by private companies fail, in a period when conditions are altogether unfavorable, to earn interest which the government has guaranteed, the finance minister announces that "there must be an end to this annual coming to the government by these two railway companies for relief." And yet the results for the government and the taxpayers of paying the deficit of a railway owned by the government are exactly the same as those of paying the deficits of railways owned by private companies.

What remedy does the finance minister propose to apply if these private railways continue to have deficits which must be paid by the public? The temporary relief the government has given "enables these roads," the finance minister says, "to continue until such time as, upon the best advice that we can get, we shall be able to suggest some permanent solution, which I believe will probably involve the taking over by this government of one or more of the existing railway systems, and which, as I stated, may involve later on the nationalization of all the railway systems of Canada." Oh, wise finance minister! The government railways of Canada never up to the present moment have earned even their operating expenses; and yet, according to the finance minister, the proper remedy to apply to the deficits now being incurred by certain private railways is government ownership! If past experience in Canada may be taken as indicating future developments, the government, by adopting the finance minister's remedy, would abolish the temporary deficits of the private railways by the device of converting them into much larger permanent deficits of state railways. What a happy prospect for the Canadian taxpayer!

But let us not be too severe on the minister of finance. Not only he, but most of the people, and most of the public men of Canada spare themselves the inconvenience which would be caused by the feeling that something must be done to remedy the deplorable and costly situation of the government railways by the simple expedient of ignoring that situation or of actually keeping themselves in ignorance about it. On the other hand, they cannot avoid knowing what the situation is with respect to the private railways whose interest the government has guaranteed. If these roads fail to earn their fixed charges the government must pay what it has agreed to, and this requires specific legislation appropriating specific amounts from the public treasury. The contributions from the public treasury in payment of the deficits of the state railways are just as real, but not so unmistakable and specific. The difference between them recalls the story of the diminutive Hebrew commercial traveler who, after his employer had chided him for putting a suit of clothes in his expense account, revised it, but made it amount to the same total as before. His employer expressing satisfaction with the revised edition, but inquiring how it happened to come to just the same total as the original one, the little Hebrew replied, "Vell, the difference is, the suit of clothes is still in there, only you can't see it."

The suggestion that Canada, which has paid a deficit resulting from government ownership of railways in every year since it has owned railways, shall acquire certain private railways in order to avoid paying railway deficits, might be accepted as one of the humors of the silly season were it not so striking an illustration of the grotesque inconsistency and ignorance so often manifested by the officials of democratic government in dealing with business problems.

NEW BOOKS

Corrosion of Iron.—By L. C. Wilson. Bound in cloth. 169 pages, 4¾ in. by 7¼ in. Published by The Engineering Magazine Company, 140 Nassau street, New York. Price $2.

This book is a revision of a series of articles recently published in The Engineering Magazine. The author's purpose has been to assemble and condense the most interesting and important studies and facts connected with the corrosion of iron and its protection therefrom. Considerable practical information is included concerning materials available for the preservation of iron and steel.

Letters to the Editor

STATION FACILITIES

Ann Arbor, Mich.

To the Editor of the Railway Age Gazette:

May I venture a suggestion with respect to the facilities offered in the more pretentious passenger stations of our larger cities?

I have had occasion to visit several of the very fine stations built during the past few years. The interior is finished in expensive stone, the ceiling is decorated with mosaic, the furniture is mahogany, or something equally expensive. So when a mother travels with a live brood of three or four restless youngsters, she and the matron and the janitor are busy keeping these hustling innocents from using the settees as a runway and otherwise defacing the expensive finish. In addition to saving the mother the worry of having others correct her offspring, wouldn't it be as cheap to have a room plainly finished, somewhere adjoining the main waiting room, furnished with a few ordinary rocking chairs, a sand box, a teeter, and a few things like that,—as many department stores do? J. E. Baker.

A SUGGESTION FOR RAILWAY PUBLICITY

Jamestown, Cal.

To the Editor of the Railway Age Gazette:

In the edition of June 16 I note a very readable article on the subject of "Where German Efficiency Falls Down," and what occurred to me particularly was the comparison of charges for passenger and freight service and cost of same.

It occurs to me that is would be a very good idea for the railroads to get a set of moving pictures, showing the various types of passenger and freight cars in the European countries, and the interior of coaches as well as the exterior and along side of these the views of the American coaches. It would also be a good idea to show how these cars look when they are in motion with the crowded coaches and people standing up.

A set of slides showing the comparisons of fares and charges for goods should also be shown and these latter, I would suggest, should be shown on the screen from a different machine so that they could be there permanently, at least for a long enough time for the people to read and digest them.

These pictures could then be sent around to the different moving picture places. The larger railroads could send exhibits to various places individually. I believe that they would work up a very good feeling for the roads in this country.

S. H. Smith,
Traffic Manager, Sierra Railway.

RAILWAY EQUIPMENT HIRE

Chicago, Ill.

To the Editor of the Railway Age Gazette:

I quote below from an article published in the Wall Street Journal of April 21. It is evident that the author, like 95 per cent of the public, is not familiar with M. C. B. Rules, which govern all car repairs, when he states:

> "The using road is supposed to repair any damage to the cars, sustained while they are in its custody, or pay the owner for such repairs."

While it should be this way, it is, in fact, quite the contrary. For nearly every repair that is made to a car by the borrowing road, a charge is made to the owner of the car. Not only this, but all wheels, axles, brasses, brake shoes and wearing parts on the car are charged to the owner of the car by the using road, which items are just as much an operating expense as coal, lubricants or any other expenses incurred in operation. In most cases the average cost of maintaining these items runs as high as $7 or $8 per month per car, and if a borrowing road is relieved of this expense, certainly, in their reports this item of operating expense should be credited to car hire balance and charged to the road's operating expense. For the above reason, and the fact that on the road's own cars no interest, depreciation or banker's commissions on the cost of cars are charged to operating expense, many receivers, to make a favorable showing, urge the issuance of receiver's certificates to build cars, when it would have been far cheaper to have hired or used foreign cars instead of incurring obligations which must be taken care of before reorganization is possible. This often works great harm to the stockholders and seriously delays reorganization, particularly in view of the fact that it is a question, under present M. C. B. rules, if it is not cheaper for a road to use foreign cars than to build cars for its own use. An Investor.

THE DIVERSITY OF RAIL SPECIFICATIONS

New York, N. Y.

To the Editor of the Railway Age Gazette:

At the recent American Iron and Steel Institute meeting two representatives of the Steel Corporation mentioned the desirability from a manufacturing standpoint of a common specification for rails. The inference was that the difference in existing specifications is not so great but that a common standard could be easily attained. The statements and intimations suggest the inquiry as to who is responsible for this not having been done long ago.

Disregarding minor differences in chemical composition and sundry details as to manufacture, rail specifications differ now mostly with respect to physical testing and rejection conditions. Thus there are five principal specifications:

1. Manufacturers standard—No tests and no rejections for piping and segregation.
2. A. R. E. A.—Three tests from each heat for piping and segregation and rejection of rails accordingly.
3. A. S. T. M.—Practically the same as the A. R. E. A., but rails found piped and segregated are accepted as "special rails."
4. Nick and break test.—Piece of the top rails of each ingot are nicked and broken and the rail represented rejected if piped or segregated.
5. Pennsylvania—Similar to the A. R. E. A. with special chemical tests required.

It has been stated repeatedly that piping and segregation form the curse of the rail situation, failures attributed to such causes being estimated at from 40 to 60 per cent of the total. No good reason exists for inflicting the railroads with so large a quantity of obviously defective steel, yet for those specifications above which permit of detecting and rejecting unsound rails, viz.: numbers 2, 4 and 5, the manufacturers charge a premium above the stipulated price of rails and evidently take pains to make this enough in the case of the nick and break test specification and the Pennsylvania specification to render them practically prohibitive of general adoption.

A few years ago the railroads yielded to the rail manufacturers' demand for improved balanced sections. This was an item of great expense for the roads to bear as any change of standards must be. Later the railroads were more or less forced to take open hearth steel in lieu of Bessemer at a cost of $2 per ton more, although there is little doubt but that the change was beneficial. Then came a horizontal increased price for rails amounting to $5 per ton, and now the distant cry is for heavier sections with corresponding increased costs. Thus it would seem that continually the railroads bear the burden while the manufacturers sit complacently, controlling in many respects not only the situation, but the policy as well by foisting certain specifications on the railroads against others admittedly superior and more protective. Surely the

manufacturers should be the last to complain of the lack of a common specification. The railroads individually and through the rail committee of the American Railway Engineering Association, have tried, and the responsibility for lack of success is well recognized. A. B. C.

THE LATELY REVISED STANDARD CODE

HAILEYVILLE, Okla.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

With the lately revised standard code we fully expected a very substantial reduction in the length of some of the forms of train orders; but it appears that there is yet ample space for improvement. No one knows this better than the train despatcher, who rehearses the different forms every day. If he asks his superintendent why it is necessary to use such and such forms when one a great deal shorter would answer the purpose, about the only satisfaction he gets is that it is "standard."

Form "E," for wait orders, still provides for the word "until" before each time shown. Such a repetition certainly seems unnecessary. The omission of the word would not have any effect on the understanding of the order.

Form K is lengthened by the addition of three words, when, as a matter of fact, it could be shortened three words (the last three, A to Z). Why is it necessary to put in the words "due to leave"? Simply saying "No. 1 of February 29th is annulled" will convey all the information necessary. Employees will understand it. No. 1's schedule is over a certain piece of track, and that only, and when a man gets an order that No. 1 of such a date is annulled he understands just exactly where No. 1 is annulled. In annulling a schedule part way over the division, it is, of course, necessary to give the details.

Form G could be eliminated. When it is necessary to run an engine extra all the requirements could be embodied in the clearance card handed out at the terminal, with the exception of meeting points with opposing trains. The clearance card is issued on the authority of the despatcher and it would specify that this particular engine would use the track between certain points as an extra train. This procedure would also answer for sections of trains, Form F.

It is good to see the elimination of Example 3, Form G, which did not amount to much, any way. It was a burden to the despatchers to put it out and to the operators to copy it.

There is an agitation now on the part of some to make time-table meeting points between trains of same class positive. It is claimed that this will reduce the number of train orders. But the proposed plan would have its drawbacks as well as its good qualities. However, with a little more censoring there could be a great reduction in the length of the orders now used, thus relieving the despatchers and operators of a good deal of work.

The subject of efficiency tests should receive attention in connection with the despatching rules. How many of the inspectors undertake to find out if the last paragraph of Rule 210 is lived up to? It says, "Enginemen must show train orders to firemen and when practicable must show trainmen. Conductors must show train orders when practicable to trainmen." The phrase "when practicable" pretty nearly nullifies the rule, for it leaves a loop-hole for the conductor to omit the duty unless he feels like it. Nothing is more important than that the conductor know that all members of his crew, at all times, understand the train orders in effect. He is not able at any time to foresee what will happen in the future, and should an accident befall him, and his brakemen not know what was going on, a serious accident might result. I have been told by both brakemen and firemen that they have gone over their entire division without knowing anything about the train orders that had been received on the trip. Firemen and brakemen should be required to report to the superintendent when such a condition exists, and action should be taken with the negligent conductor or engineman. The trainmaster, the traveling engineer and the inspector of train service should make this matter one of the most important, when on the road, and see that the intent of the rule is carried out. I have traveled considerably both by freight and passenger and have never known a time during any trip that it was not practicable for the conductor to show his train orders to the rear brakeman and usually to all the men of the crew.

It would be a good plan, and it was in effect on one line where I worked, for the operator in copying orders to make an additional copy. This was handed to the flagman or rear brakemen. J. L. Coss.

FREIGHT RATES IN GEORGIA

ATLANTA, GA.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Considerably more than two-thirds of the freight transported in Georgia moves under the rates confined to particular commodities, and the question whether the rates are high or low therefore is not illuminated by the comparison that has been made by the Georgia Shippers' Association, which comparison has to do only with the six higher classes. This point should be stated as a supplementary fact in connection with the news item printed, in your issue of July 14, page 82, relative to the hearing which is to be had before the Georgia Railroad Commission beginning August 17. The rates in Georgia, on hundreds of the most important commodities and those moving in the heaviest volume, are lower than in the states north of Georgia, so that as a whole the freight tariffs in Georgia are substantially lower than those in any other southern state.

In a general complaint brought by the Atlanta Freight Bureau against the railroads of the state a number of years ago, the commission formally found that the rates promulgated by it were as a whole lower than the rates established by the commissions of other southern states. And the situation in Georgia today is more favorable to the shipper than in past years because of the smaller number of exceptions to the southern classification which are now in effect in the other southern states.

There are other details in which the comparisons between Georgia and other states need explanation. For example, in the other states, the rate for 25 miles applies to any distance over 20 miles, whereas in Georgia the 20-mile rate applies up to 22 miles.

As the result of the efforts of shippers of each state to secure rates lower than the rates paid by shippers of neighboring states, and by interstate shippers, Georgia now has no two systems of rates alike, and, as a consequence, there are numerous discriminations and inequalities, which the railroads are seeking to remove, with the coöperation of the various state regulatory bodies.

It is for the purpose of perfecting a rate adjustment for the entire southeast, which would eliminate such discriminations and discrepancies between intrastate rates in the different states, and between intrastate rates and interstate rates, that the railroads have proposed the readjustment in Georgia which they are now asking the railroad commission to approve. They are submitting similar petitions to the commissions of other southern states. There is no doubt that the readjustment proposed would give a reasonable system of rates under which every shipper would pay like charges for similar services; but such a readjustment cannot be made without increasing rates between points where they are now relatively low, and on commodities which do not pay their just share of the cost of transportation. No fair adjustment can be reached without increasing some rates, for to make an adjustment by reducing every rate to the level of the lowest now in effect in any state in the southeast would bankrupt the carriers. C. G. A.

The Reconstruction of the Keokuk Bridge



New Spans Across Mississippi River Replace Old Ones Built in 1871. Original Piers Carry the New Structure

The Bridge with One Old Span Remaining

THE erection of a new superstructure for the Keokuk and Hamilton bridge over the Mississippi River at Keokuk, Iowa, has just been completed, thereby replacing 11 old spans of cast and wrought iron which had carried rail and highway traffic across the river for more than 45 years. Considerable interest is attached to the details of the old structure and the excellent condition of the material after its long period of service. The bridge carries a miscellaneous traffic consisting of trains of the Keokuk branch of the Wabash, of the Toledo, Peoria & Western, and of an interurban line, as well as highway traffic. The steam road traffic consists of six trains each way daily and the interurban business of a car each way every hour.

The bridge is located about one-half mile south of the dam and power plant of the Mississippi River Power Company, and the Government lock. The bridge, exclusive of approaches, is 2,194 ft. long and consists of 10 fixed spans and a draw span. Commencing at the east abutment there are eight spans varying from 148 to 162 ft. in length, followed by two spans of 254½ ft. with a draw span adjacent to the west abutment, having a total length of 380 ft. The piers and abutments are all founded on rock at a maximum depth of 50 ft. below the base of rail. All of the piers are on a slight skew to the northeast.

Interesting Old Spans

The old structure, built in 1869 and 1870, and placed in service early in 1871, presented many features of interest. The old spans were all Whipple trusses, having parallel chords with the exception of the draw span, the top chords of which were slightly bowed. The end and intermediate posts were made up of Carnegie octagonal columns, the top chords of two I-beams, two channels and a cover plate, the bottom chords of eye-bars, the diagonals and all laterals of loop bars, and the top lateral struts of tubular sections of cast iron. Cast iron joints were provided at the panel points to facilitate the connection of the members. There was almost a total absence of splice plates or other means of affording a positive connection of the compression members, the dead load stresses being relied upon to hold the structure together.

The bridge was a through structure carrying all traffic on one deck, the trusses being placed 21 ft. 6 in. center to center to afford an adequate driveway, with a single railroad track in the center; a sidewalk was carried outside the trusses on either side. The track and driveway floor was carried on timber cross ties, supported on two wooden stringers under each rail, with a jack stringer next to each truss. The floor beams, of unusual design for this day, consisted of two 10-in. channels, trussed by means of eye-bars and cast iron posts. The old structure was built and owned by the Keokuk & Hamilton Bridge Company and was a toll bridge, an arbitrary being imposed on the steam road and interurban traffic. The new bridge is being financed by the same interests and the existing traffic arrangements will continue.

The New Bridge

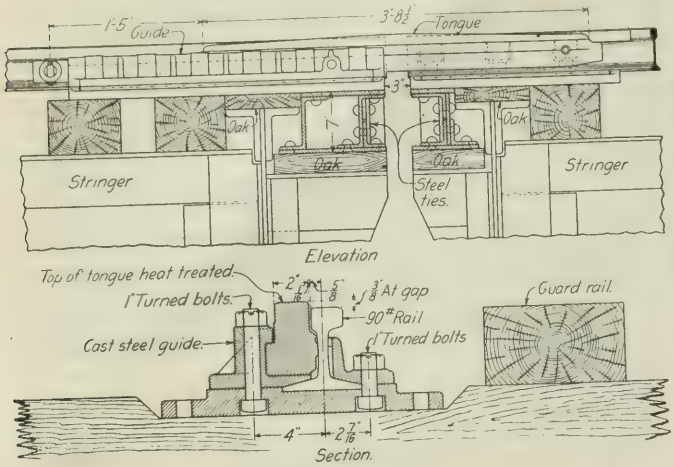
The new superstructure for the eight shorter spans at the east end of the bridge consists of parallel chord riveted Pratt trusses. The two 254½-ft. spans are curved chord Pratt trusses with riveted top chords and eye-bar bottom chords. The swing span consists of two riveted spans, made partially continuous by eye-bar connections to the tower over the pivot pier.

As most of the old substructure was in good condition, the new superstructure has been placed on the old piers, with the exception of one which was partially rebuilt. On account of a difference in the floor depth the old piers have had to be cut down and capped with concrete. The old center pier is hollow, consisting of a circular wall under the drum with a central column under the center casting. In preparing this for the new superstructure the circular wall and central column were covered with a reinforced concrete slab.

An improvement has been obtained in the new structure through the separation of the highway traffic from the rail traffic by placing the former on an upper deck. This has necessitated a viaduct 600 ft. long on the west side of the river and one of 360 ft. on the east side. Owing to the fact that the business district of Keokuk is at a considerable elevation above the railroad tracks, the approach viaduct on the city side is a convenience rather than a detriment. On the east side of the river an incline on a 6 per cent. grade is necessary. The removal of the highway traffic from the

lower deck has permitted a reduction of the distance between trusses to 16 ft. 7 in. for the eight short spans and 20 ft. 6 in. for the others and the use of the ordinary floor beam and stringer floor system, with an open timber deck.

The upper deck has a creosoted wood block roadway for the team traffic and a sidewalk 4 ft. 6 in. wide, cantilevered out on the south side. The floor is carried on wooden stringers having from 7 to 10 ft. spans, supported on 15-in. 42-lb. I-beams, spanning from truss to truss. On the eight short spans the highway deck is carried on top of the top chords of the trusses. In the draw span and the two curved chord spans the deck is carried between the trusses, longitudinal



The Rail Lock

girders being provided just inside of each truss to carry the floor system, these girders being supported at each post by connections to the cross frames.

The Swing Span

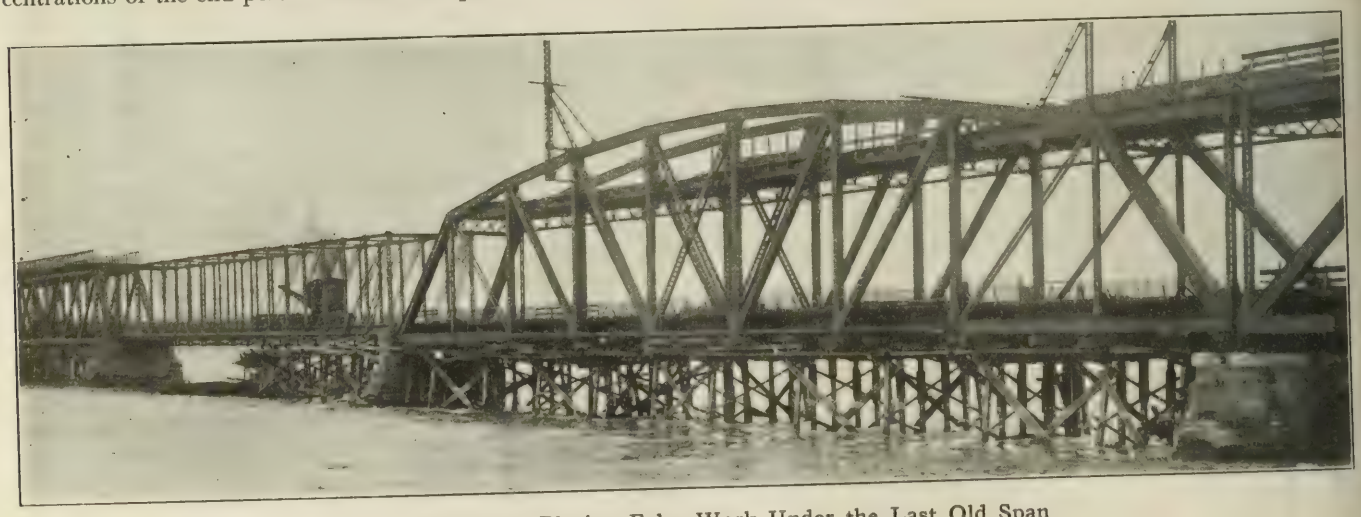
The center of the swing span is of the rim bearing type and has a four-support loading arrangement. The bottom chords of the trusses pass directly over the drum and the concentrations of the end posts and the tower posts are transmitted directly through the bottom chords to the drum, there being no intermediate loading girders. The rollers are secured between two concentric rings; a stiff structural ring on the inside and a lighter flexible ring on the outside, the inside ring being rigidly connected to the center by a system of stiff radial struts. With this arrangement the roller shafts are simply short axles connecting the rollers to the two rings.

Two sources of power are provided for operating the bridge machinery, a 37-hp. motor operating on a 25-cycle, 440-volt circuit, and a 14-hp. 2-cycle Fairbanks-Morse marine gas engine, operating at 800 r. p. m. The machinery is arranged so that it may be operated by either, the single unit performing all functions in either case. The motor will be used ordinarily, the gas engine serving merely as an alternative source of power in case of a failure of the current. The motor is connected to the machinery by a hand-operated clutch which may be thrown into gear either with the swing machinery or the longitudinal shafting connecting to the machinery at each end of the span.



The Pivot Pier and Tower

These longitudinal shafts are connected by two clutches to the end lifts and the rail locks, but through a peculiar trip arrangement these clutches are alternately operative and inoperative, thereby automatically effecting the alternate operation of the end lift and the rail lock in the proper sequence. Thus in opening the bridge the end machinery first withdraws the rail lock and with the completion of this function, the clutches are shifted automatically, putting the end lift machinery in motion to lower the end of the bridge. The



Locomotive Crane Placing False Work Under the Last Old Span

operator, observing the completion of this operation on a mechanical indicator, shifts his hand clutch and the bridge commences to swing. When the bridge is being closed all of the operations are reversed.

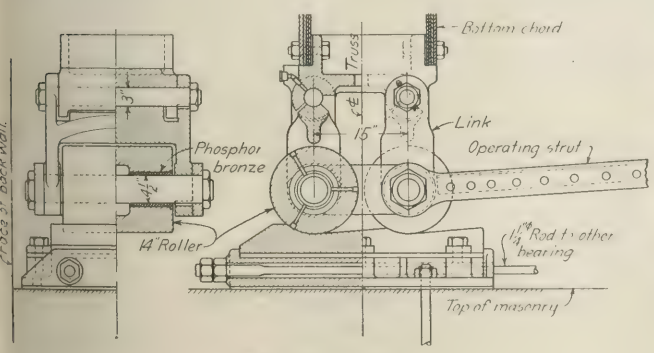
As shown in one of the accompanying drawings the end lifts are of a type which serves to center the bridge automatically and will readily overcome the warping effect resulting from the unequal expansion of the two sides of the structure. The ends of the spans are raised by forcing the



Highway Deck of One of the Two 154½ ft. Spans

toggles from an inclined to a vertical position, the rollers at the lower ends of the toggles being in contact with the inclined bearing surfaces. As the toggles are raised, the rollers roll down the inclines to the lowest position, after which any further movement of the toggles serves to center the ends of the span.

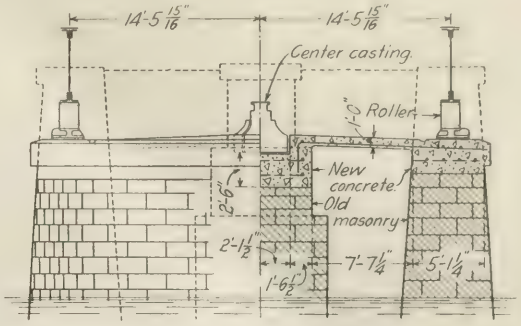
The rail locks are of the sliding tongue type as shown. A



The End Lift

new development in this case is the use of steel ties under the ends of the rails, a measure adopted because of the rapid crushing of wooden ties as a consequence of the impact obtaining when the wheels pass over the gap in the rails. The tongues of the rail locks are of uniform section throughout except for the bevels on the top surface. Instead of being provided with a removable head which may be replaced when worn out, they are cast in a single piece and the top surface is treated by the "Stroh" hardening process. The rail traffic being relatively light and with moderate loading, it is not expected that the wear of the rail locks will be severe.

The operator's house is a three-story frame structure carried outside the truss on the south side of the bridge. The room on the top floor is for the accommodation of a watchman who must close the gates on the highway deck before the bridge is turned. The room on the second floor contains the controllers, switchboard, clutch levers and mechanical indicators for the end lifts and will be used for operating the



Reconstruction of the Top of the Pivot Pier

bridge with electrical power. The first floor contains the gas tank, the water tank, a hot water heating plant and the gas engine. No interlocking plant is provided.

Because the channel of the river is bare rock it was considered unsafe to transmit the electrical power by means of a marine cable. The current is carried by wire to a pole mounted over the top of the tower and which carries the cross-



The New Draw Span with the Old Highway Floor Still in Place

arm which supports telephone and telegraph wires carried across the bridge. This pole consists of two pipes, an 8-in. extra heavy pipe on the outside which is held in a fixed position by the cross-arm and the wires and a 2½-in. pipe on the inside which turns with the bridge. A drum at the top of the pole contains collector rings for transferring the current to the swing span.

Falsework and Erection

Owing to the fact that the river has a rock bottom, piles could not be driven and the falsework consisted of frame

bents of six posts each, arranged in pairs to form towers, the longitudinal and transverse bracings being carried as low as the water level permitted. For falsework stringers, temporary use was made of floor beams from the old spans and stringers from the new spans, the stringers for the 254½-ft. spans being used in the erection of the 8 shorter spans.

Because the new highway deck could not be placed in service until all the new spans were erected, it was necessary to maintain the highway on the lower deck until the new bridge was entirely completed. The plans for the erection were therefore perfected with this in mind. The old trusses were dismantled, leaving the old floor system in place, the oxy-acetylene torch being used extensively in removing the old material. Because of the loose-jointed nature of the old trusses it was necessary to guy them thoroughly as soon as they were placed on falsework and any members were removed. After the old trusses were out of the way, the old floor was replaced by the new floor, panel by panel, and the old floor beams and stringers were taken out, depending upon the continuity of the old track rails to carry the highway deck until the panel of the new floor system was put in place. Owing to a difference in length in the old and new panels, the old stringers were cut off each time and blocked as required to fit up against the last new floor beam set.

The erection was started in July, 1915, beginning with enough falsework to carry the two spans at the east end of the bridge the falsework was used over and over as the work progressed, about 75 per cent. of additional falsework material being provided later. The short spans were completed by January 7, 1916. The erection of the draw span was started on November 22, 1915, and completed about March 1, 1916.

Owing to a delay in the delivery of the drum the trusses were erected except for the towers before the drum arrived. The bottom chords were jacked ½-in. above the final position and the threads, rollers and the drum in four sections were slipped under the trusses. The four tower posts were not erected until after the drum was in place to provide room for swinging out the boom of the derrick car while the drum sections were being erected. After the drum and its radial braces were completely assembled, the drum was rotated on the rollers until the holes in the top flanges of the drum registered with those in the bottom chord of the trusses, thus permitting the connection of the drum to the trusses.

The erection of the westerly 254½-ft. span, followed that of the draw span, but when the falsework for the easterly 254½-ft. span was to be placed high water made it necessary to stop the work on January 25. The stage of the river continued high and work could not be resumed until May 31.

The new bridge was designed by Ralph Modjeski, consulting engineer, Chicago, who was represented at the bridge by G. C. Hinckley, resident engineer. The Strobel Steel Construction Company, Chicago, had the contract for the entire new bridge including alterations to the substructure.

JOHN J. BERNET

John J. Bernet, vice-president in charge of operation of the Michigan Central, and resident vice-president at Chicago of the New York Central, has been elected president of the New York, Chicago & St. Louis, with office at Cleveland, succeeding W. H. Canniff, resigned. Mr. Bernet has been connected with the lines now included in the New York Central continuously since 1889, when he started with the Lake Shore & Michigan Southern as a telegraph operator. His entire career has been spent in the operating department, and he has made steady and consistent progress through the various grades in that department, serving consecutively as train despatcher, trainmaster, assistant superintendent, superintendent, assistant general superintendent, general superintendent, assistant vice-president and vice-president. Mr. Bernet belongs to the class of men whose progress is not spectacular, but who achieve success by great thoroughness and efficiency in every task which they are called upon to perform. Before engaging in railroad service he was for a time a blacksmith, and as one of his associates remarks, he learned early the importance of "striking while the iron is hot."



John J. Bernet

He is a rather quiet man of a retiring disposition, who by steady and painstaking application has come to be regarded as an unusually efficient operating officer. One of his striking characteristics is his ability to get to the heart of each problem that is presented to him, and to reach a prompt decision as to the necessary action. In this way he always has been able to keep up with his office work and spend a great deal of time on the road. He has never been a man to spare himself as far as hard work is concerned, and his subordinates have appreciated his willingness to consider the important details of various propositions submitted to him.

Mr. Bernet was born on February 9, 1868, at Brant, Erie county, New York. He was educated in the public schools at Buffalo, N. Y. He entered railway service in 1889 as a telegraph operator for the Lake Shore & Michigan Southern, and on March 12, 1895, was appointed train despatcher, which position he held until April 2, 1901. From April 2, 1901, to March 6, 1903, he was trainmaster of the Eastern division. On March 6, 1903, he was appointed assistant superintendent of the same division; on February 1, 1905, superintendent of the same division. On November 22 of the same year he was appointed assistant general superintendent of the same road at Cleveland, Ohio, which position he held until October 1, 1906, when he was appointed general superintendent. He was general superintendent until June 1, 1911, when he was appointed assistant to vice-president of the New York Central Lines West of Buffalo, with headquarters at Chicago. On April 15, 1912, his title was changed to assistant vice-president. On April 1, 1913, he was appointed vice-president in charge of operation, and on January 1, 1915, at the time

of the reorganization of the New York Central & Hudson River and the Lake Shore & Michigan Southern, and their consolidation into the New York Central Railroad, he was appointed resident vice-president at Chicago for the New York Central, acting as the general representative of the company in that territory. He also retained the vice-presidency in charge of operation of the Michigan Central.

Mr. Bernet has an extensive grape farm at Moorhead, Pa., and is an enthusiastic golfer.

MR. ACWORTH'S LATEST REVIEW OF THE AMERICAN SITUATION*

This is my tenth visit to the United States, of whose railway affairs I have been for about thirty years a diligent student. Every time I am brought into contact with American railways, the overpowering impression produced on my mind is of the marvelous results which the efficiency of the railroad men produces with the minimum expenditure, both of capital and income. It is not very far from accurate to say that the average mile of English railroad has cost as many pounds as the American mile has cost dollars. It is true that for our expenditure we have mostly double-track roads, while your typical road is only single tracked, but per mile of line you probably carry—we have no ton-mile and passenger-mile statistics in England—more tons of freight and nearly as many passengers as we do, and thanks to your concentration of load into wholesale units both of carload and trainload, your single track is normally capable of taking care of the traffic offered.

The Problem of Terminals

But I do not think it is so with your terminals. Fifteen tons of package freight in one thirty-ton car take much less room on the road than the same weight distributed over five of our little ten-ton cars, or "trucks" as we call them, but when fifteen tons come to be handled at the terminals and carted away by teams, they need just as much space in America as in England. In other words, you will have to spend vast sums of money to enlarge and improve your terminal accommodation, and the land required for the purpose you will have to buy and adapt at modern prices. One does not need to go outside of New York with the new Pennsylvania and Grand Central stations to see what new terminals cost in a great city.

Double Tracks and Other Improvements

But there is more than this. Even assuming that you can carry your present traffic along the road, statistics show that your traffic doubles every twelve years and, therefore, before long you will have to do a great deal of double tracking, and double tracking very often means practically rebuilding the railroad. Again, as the country gets more settled, traffic becomes more diversified; express and fast freight become more important. There will be more passenger trains, both through and local, not only due to closer settlement, but also to more exacting demands in matter of service. Now, express and fast freight trains not only carry less, but run at higher speeds than slow freight, and passenger expresses run at higher speeds still, so you will have both more trains on the line for the same amount of traffic and greater varieties in speed, and all this means, as every railway man knows, a great reduction in the carrying capacity of the line as measured in tonnage.

Public demands for abolition of grade crossings, for steel coaches with their enormous weight per passenger carried—three times that usual in England—for block signalling, for monumental stations, etc—all these things will imply immensity of expenditure. Mr. Hill estimated ten years ago that the railroads ought to spend a billion dollars a year to keep abreast of the public requirements. They have not spent it, not because the expenditure was unnecessary, but because the money was not forthcoming; and somehow you will have to catch up the arrears and take care of the future on an even more generous scale, or the development of the country will be brought to a standstill.

New Capital Requirements

Can the railroads get all the money they need? The question is a very serious one, and I will not attempt to answer it. That in the past they have not been able to get out all the long-term bonds they would have liked to sell is sufficiently proved by the volume of short-term notes issued and frequently renewed at maturity. Why should an investor buy railroad bonds? Primarily, he wants security. The fact that over forty thousand miles of railroad are today in the hands of a receiver is sufficient proof that he does not always get it, and if railroads cannot sell bonds, still less can they issue common stock. Even the Pennsylvania Railroad, after seventy years of honest and intelligent work in developing the resources of what is perhaps the richest traffic territory in the world, earned in 1914 hardly more net income than sufficed to pay its modest six per cent dividend.

Why should the public invest in railroads, if the returns are less than on other investments and the security of the capital seems to lessen rather than increase? And if the American public refuses to invest, there is certainly no other source for new capital nowadays. The European market will have enough to do to take care of its own requirements for many a year to come.

For all that, the prospects for the future look to me far more bright than I could have imagined when I was last here, less than three years ago. I see from the replies to a circular sent out to its clients by a New York banking house that 1,310 correspondents report that hostility to the railroads is abating, while only 185 say that it still persists; and the same correspondents, by a majority of almost two to one, report that a five per cent advance in rates would not be seriously opposed. And a general five per cent increase, all of it net income be it observed, would put a very different aspect on the whole situation.

Hopeful Signs

The railroads need not merely cessation of hostilities, but active support and help from the public authorities. They cannot complain that in the past the legislatures have neglected them. On the contrary, the excess in quantity of railway legislation has been almost as conspicuous as the deficiency in its quality. But there are many signs that things are changing. Recent decisions of the Interstate Commerce Commission have shown that this most important body appreciates the situation, and is ready to help the railroads to reach a sounder financial position. The fact that one of your great political parties has put forward in its platform the unification of control under the single authority of the Federal Government is a most hopeful sign. The mere avoidance of waste owing to the necessity of complying with innumerable varying requirements as to methods of operation will be a great thing.

I question whether the public has any conception of the amount of time and money wasted owing to the multiplication of inquiries, rate schedules, accounts, reports, etc. I have seen an estimate that the railroads, taken all together, have to furnish about two million reports yearly to the various state and Federal authorities. Unification of control will put an end to such patent absurdities as the fact that, while the Interstate Commerce Commission recognizes that 2½ cents a mile is a reasonable fare, say, from Roches-

*An article by W. M. Acworth in the July Circular of the National City Bank, New York City.

ter to Cleveland, if a passenger on the same train gets out at Buffalo, New York decides that he cannot reasonably be asked to pay more than 2 cents a mile!

Then your Federal valuation law of 1913 must soon begin to bear fruit. From what I have seen and heard of what has already been done, I am persuaded that any fair valuation, such as is now being carried out by engineers appointed by the government, will prove conclusively what I have always myself firmly believed, that the railroads of the United States are worth today far more than the sum at which they are capitalized.

I am quite sure that the American public mean to be fair, but they can hardly be expected to keep abreast of the railway situation, as it changes from year to year. They have been thinking too much hitherto of "old forgotten far-off things and battles long ago." They seem now, as proved by the proposal that a Congressional committee shall inquire into the whole situation, to be inclined to have done with the past and to turn their minds to the future. An exhaustive inquiry into the situation as it exists today can only be in the interest of the railroads and railroad investors. It will show, I am firmly convinced, that the railroads deserve well of the country; that per dollar of capital invested they do more work than any railroads in the world; that the rates they charge, having regard to the service rendered, are far lower than anywhere else in the world; but that the rates, as a whole, are not adequate to afford a steady and reasonable return, year in and year out, on the present investment, and to induce capitalists to make the great further investment which the public interest requires.

Once the knowledge of these basic facts, as I believe them to be, has been got into the public mind, I have no doubt that the railroads will be given such fair treatment as will produce the investment of all the capital required. It is to be hoped, however, that the public education will be speedily completed. For the expenditure of new capital on a generous scale must not be much longer postponed if the trade of the country is to continue to expand in the years ahead.

CONGRESSIONAL INVESTIGATION ASSURED

WASHINGTON, July 19.

Last Saturday the House of Representatives amended and passed the long pending Newlands resolution creating a joint House and Senate subcommittee to investigate railroad legislation, transportation, and government ownership. On Monday the Senate, without debate, agreed to the resolution as it came from the House; and this long delayed measure now goes to the President.

The principal amendment calls for a report to Congress January 8, 1917. Wireless and cable companies are added to the list of public utilities which the committee is to investigate. The investigating committee will consist of five senators and five representatives from the respective commerce committees.

In the course of the debate in the House a rather interesting disclosure was made. Chairman Adamson, in charge of the bill, was asked if the eight-hour day movement was included in the scope of the proposed investigation. To this Mr. Adamson replied in the negative; and in response to a question as to whether his committee had before it any resolution "in relation to the dispute between the railroads and the employees on that matter," Mr. Adamson answered:

"Four months ago when the clouds gathered above the horizon the Republican leader [Mr. Mann] and I investigated to see whether there would be any strike. I will not say where we went, but we were assured by the representatives of the employees that there would be no walkout, and they did not mean to stop the wheels. The Interstate Commerce Commission did not favor any investigation, and I concluded that no action was necessary, and dropped the subject."

The bill to amend the Cummins amendment (as to declaring value of baggage, etc.,) has been reported favorably to the House (Bill S. 3069 Report No. 944).

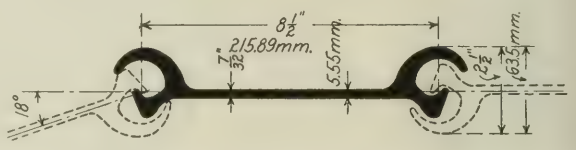
H. R. 16681, the clearance bill, has been reported to the House from the Interstate and Foreign Commerce Committee (Report No. 970).

An agreement has been reached by the conferees on the postoffice appropriation bill by which the Senate amendment, modified in some respects, but retaining only the substantial features of the Senate amendment relating to railway mail pay, will be retained in the bill. The agreement contemplates a reference to the Interstate Commerce Commission of any question relating to compensation for the railroads for carrying the mail. This is a substantial victory for the railroads. It seems likely that the provision allowing the Postoffice department to send second class matter, under certain conditions, by freight train will be retained in the law, but with a clause allowing aggrieved publishers to appeal to a federal court.

A NEW SHEET PILING SECTION

The new Lackawanna 8½-in. section, of which the illustration and table of properties appear below, was designed to give a wider range of selection to users of Lackawanna steel sheet piling. It is of the standard Lackawanna straight-web type with interlock consisting of similar hooks and guards on both edges, and is for use where a comparatively light section is required with high transverse strength and minimum weight in medium trench and cofferdam work.

The interlocked joint formed between adjacent piles is flexible through an arc of 18 deg. on each side of the center



Weight.		Section Modulus.			
Lb. Per sq. ft.	Lb. Per Lin. ft.	Per Single Section.	Per inch of Width.	Per Horizontal Foot of Wall interlocked in place.	Least Radius of Gyration.
20.75	14.633	1.100 in³	0.1294 in³	1.553 in³	0.509 in.

Section and Table of Properties

plane of the piling section. The hooks of adjacent sections engage to offer resistance to longitudinal displacement while the guards overlap and engage the outer surface of the hooks on the adjacent sections, thus preventing lateral displacement and co-operating to prevent longitudinal displacement. The joint can be disengaged only by withdrawing one pile.

In the development of this new section, special attention was given to secure high tensional and transverse strength, and at the same time to produce a pile which would have comparatively low weight per sq. foot. This steel sheet piling is made by the Lackawanna Steel Company, Lackawanna, N. Y.

THE ENGLISH CHANNEL TUNNEL.—A resolution in favor of the Channel Tunnel will shortly come before the house of commons. The annual report of the Northern Railway of France expresses regret that the scheme has not yet materialized, and intimates that it has fulfilled all its obligations, preserved its rights, and is ready to profit by the unexpected facilities which the application of electricity would give both to the piercing of the tunnel and to the operation of the submarine railway.

Failure of Government Ownership in Canada

Influence of Unfortunate Location, Uneconomical Management and Politics Reflected in Intercolonial History

By Samuel O. Dunn

PART II

THE conclusion that at least two-thirds of the losses incurred by the Intercolonial are not due to its rates suggests that they must be due to uneconomical management. In this connection stress must be laid on the fact that the cost of providing railway service necessarily includes capital expenses, as well as operating expenses. A further fact which often is overlooked is that there is a very close relationship between capital expenses and operating expenses. Under either private or public ownership the public must ultimately pay all of both of these classes of expenses; and the amount of operating expenses will under either policy depend largely on the amount of the capital expenses efficiently incurred. To reduce the grades of a railway involves an increase of investment and fixed charges—in other words, of capital expenses; but if the investment is wisely and efficiently made, it will cause a still greater diminution of operating expenses. The total expenses will thereby be diminished. Likewise, if needed capital expenditures are not made, there will be needless increases of operating expenses; if capital expenditures are unwisely or inefficiently made, there will be needless increases of fixed charges; and in either case the total expenses will become needlessly large. This close relation between capital expenses and operating expenses illustrates the folly, so strikingly exemplified in Canada, of the common practice of keeping the accounts of government railways so as not to show the exact amount of interest paid on the investment, and of calling all their net earnings "profits." It would be equally rational to ignore the operating expenses also, and to call the total earnings "profits."

Bearing in mind these facts and principles, let us investigate the total expenses of the Intercolonial. Its cost to the public to June 30, 1914, including its losses, was $219,000 per mile. Interest on this at 4 per cent is $8,760 per annum, which, added to its operating expenses, $8,718 per mile, makes a total expense to the Canadian public for the service of the road of $17,478 per mile of line, without allowing anything for the taxes lost to the public because it is not privately owned.

To pay this total from its earnings the Intercolonial's rates would have to be raised 102 per cent. The Canadian Pacific in its eastern lines charges rates slightly higher than those of the Intercolonial; it handled in 1914 a traffic slightly smaller; it collected only $10,045 per mile of line in rates from the public; and yet it paid taxes, interest on its bonds, and 10 per cent dividends on its stock, 7 per cent of these being from earnings; and it had a surplus averaging $256 for each mile of line.

It may be contended by some that the inclusion of all the losses the Intercolonial has sustained in getting a basis for ascertaining its actual present expenses is not fair. The writer believes that this is the only method which discloses the amount which government ownership and management have cost and are costing the people of Canada. But, to avoid this objection, let us disregard the losses sustained prior to 1914. In 1914, the cost of construction of the Intercolonial was officially reported as $70,815 a mile. Interest on this at 4 per cent is $2,833. Added to operating expenses, $8,718, this makes a total expense per mile, as already indicated, of $11,541. Taxes on the same basis as those the Canadian Pacific paid would increase this to $11,671. The Canadian Pacific eastern lines, for each mile of line operated, collected 15 per cent less than this from the public, while handling only 6.5 per cent less traffic per mile; they paid taxes, and they earned $1,573 net operating income per mile; and the Canadian Pacific system, as already indicated, not only paid interest and dividends, but had a surplus. To have paid 4 per cent interest, and paid taxes and put aside surplus in the same proportion, the Intercolonial would have had to collect from the public $11,900 for each mile of its line, or 18 per cent more per mile than the Canadian Pacific eastern lines did. The data on which these comparisons are based are given in Table III.

TABLE III.

COMPARATIVE STATISTICS OF THE INTERCOLONIAL AND CANADIAN PACIFIC EASTERN LINES FOR THE YEARS 1914 AND 1915.

	Year Ended June 30, 1914.		Year Ended June 30, 1915.	
	Intercolonial.	Canadian Pacific Eastern Lines.	Intercolonial.	Canadian Pacific Eastern Lines.
Mileage	1,457	4,596.2	1,459	4,786.9
Average cost (or capitalization) per mile	$70,815	$51,021*	$75,066	$47,863*
Passengers carried one mile per mile of road	137,390	172,790	115,105	126,208
Passenger-train miles per mile of road	2,096	2,499.5	1,939	2,170.1
Average passengers per train	51	69	46	58
Average rate per passenger per mile, cents	1.67	1.808	1.81	1.894
Average total earnings per passenger-train mile	$0.978	$1.599	$0.966	$1.409
Total passenger-train earnings per mile of line	$2,839.90	$3,895.94	$2,705.80	$3,057.07
Ton miles per mile of road	923,541	823,064	793,315	695,000
Revenue freight-train miles per mile of road	3,466.13	2,655.2	3,101.64	1,999.4
Average tons per train	264.74	309.98	260.54	347.56
Average rate per ton per mile, cents	0.60	0.716	0.52	0.719
Average earnings per revenue freight-train mile	$1.61	$2.219	$1.58	$2.50
Total freight revenue per mile of line	$5,568.54	$5,891.69	$4,887.64	$4,998.51
Operating revenue per mile of road	$8,625.13	$10,044.86	$7,745.15	$8,314.54
Total train miles per mile of road	5,562.25	4,987.4	5,033.9	3,987.1
Operating revenue per train mile	$1.55	$2.01	$1.54	$2.09
Operating expenses per mile of road	$8,717.87	$8,341.34	$7,775.89	$6,199.94
Operating expenses per train mile	$1.57	$1.67	$1.545	$1.56
Net earnings per mile of road	—$92.74	$1,703.52	—$30.74	$2,114.60
Taxes per mile of road	None	$130.30*	None	$123.90*
Operating income per mile of road	.....	$1,573.22	.....	$1,990.70

*Average for entire system. All computations furnished from official sources.

It is clear that the service of the Canadian Pacific, while profitable to its owners, costs the public much less in proportion than that rendered by the Intercolonial. And the expense of it is more equitably distributed. It is all paid by those who receive the service, while only from one-half to three-fourths of the total expenses incurred by the Intercolonial are borne by those who receive its service. The rest is borne by the taxpayers.

The question naturally arises why the total expenses of the Intercolonial are so great. Its "cost of construction"—the investment in it—as officially reported, amounting in 1914 to

*Part I of this article was published in the *Railway Age Gazette* of July 14, 1916. Reprinted by permission from The Journal of Political Economy, University of Chicago, July, 1916

$70,815 a mile, is excessive according to the standards of Canada and the United States. The average capitalization of the railways of the United States in 1914 was only $66,661; and an average mile of their line was a much better piece of property and handled substantially more traffic than the average mile of the Intercolonial. The average capitalization of the private railways of Canada, excluding duplications, was $53,619.[1] The average capitalization of the Canadian Pacific system was $51,021. Most of the privately owned railways of Canada, and conspicuously the Canadian Pacific, have received subsidies from the government. The receipts of the Canadian Pacific from its land grants amount to about $6,000 for each mile of its line. But the government aid it has received is far from adequate to account for the difference of over $17,000 a mile between its average capitalization and the Intercolonial's "cost of construction." The explanation of the Intercolonial's large cost of construction must be that expenditures on it have been made wastefully, or that its accounts have not always distinguished accurately between expenditures for construction and expenditures for operation.

That there long was scandalous waste in the construction of the Intercolonial is beyond question. Many years ago Sir Alexander Galt moved in Parliament that "the present system under which the road is being built as a public work of the Dominion is expensive and unsatisfactory; . . . and that in the opinion of this house the construction and future operation of the line should be committeed to private hands." Walter Shanly, the most eminent Canadian engineer of his day, who built the Hoosac tunnel, alleged that the Intercolonial "had already involved a vast waste of money and done much to contaminate public life." Sir John MacDonald, when prime minister, said that he was "tired of the disclosures about frauds and shortages, bankrupt contractors, and contractors who had made a fortune with suspicious ease, and was disposed after construction was completed to turn over the operation of the line to the Grand Trunk or some other company." Before the Civil Service Commission of 1892, Collingwood Schreiber, a distinguished engineer, then deputy minister of railways, and for some years general manager of the line, testified that he had taken some sand from a gravel-pit in the woods near Gloucester Junction for which he offered $5 as ample compensation. The owner, backed by local politicians, demanded $70,000, and in the end obtained $16,000. "The public's mind," said Mr. Schreiber, "is pervaded with the idea that one has a right to get all one can from the public treasury." The original estimate for an extension from Hadlow, near Quebec, to St. Charles Junction, fourteen miles long, was $600,000. Property owners whose land and buildings were condemned appealed with such success to local politicians for assistance, "and swore one for another as to values" so ably, that the line finally cost $2,200,000.[2] It seems to have been a common practice to let contracts for new construction and improvements to concerns and individuals because they were supporters of the party in power.

The only structures or facilities of the road whose character tends to explain its relatively high cost are certain of its passenger stations, which are very large and pretentious-looking for the towns in which they are situated. One is told in Canada that these are due to the influence of local members of Parliament. Appropriations for passenger stations on the Intercolonial sometimes are part of the "pork barrel" in Canada, as appropriations for postoffice buildings are in the United States.

Let us turn now from the road's capital expenses to its operating expenses. During most of the last ten years it has handled more traffic per mile, both freight and passenger, than the eastern lines of the Canadian Pacific. Within recent years the Canadian Pacific has had a heavier passenger business; but the Intercolonial still has a denser freight traffic. This was true in 1914; and in that year it ran 5,562 trains over each mile of line, as compared with 4,987 run by the Canadian Pacific eastern lines. Bearing these facts in mind, it is interesting to study the analysis of operating expenses given in Table IV:

TABLE IV.

OPERATING EXPENSES, 1914.

	Intercolonial.		Canadian Pacific Railway Eastern Lines.	
	Total Operating Expenses per Mile.	Per Cent of Total Operating Expenses.	Total Operating Expenses per Mile.	Per Cent of Total Operating Expenses.
Maintenance of way and structures	$1,454.00	16.66	$1,744.00	21.87
Maintenance of equipment.	1,916.00	22.06	1,621.00	20.33
Conducting transportation.	4,936.00	56.56	4,247.00	53.27
Traffic expenses	199.00	2.22	171.00	2.15
General expenses	245.00	2.55	188.00	2.37

A question arises: Why are the Intercolonial's expenditures for maintenance of way and structures smaller than those of the Canadian Pacific, when the amount of traffic it handles and the number of trains it runs are larger? It may be answered that it is because the Intercolonial is more economically operated. This explanation can hardly be accepted, because while its total traffic, passenger and freight, per mile is only about 6.5 per cent heavier than that of the Canadian Pacific eastern lines, its cost of maintenance of equipment per mile is 11.5 per cent greater, its cost of conducting transportation per mile 13.5 per cent greater, its traffic expenses per mile 16.5 per cent greater, and its general expenses per mile 30 per cent greater. The advocates of government ownership claim that it would save money by doing away with the "princely" salaries paid to the higher officials of railways. The salaries of general officers are included in "general expenses." These, as just noted, are 30 per cent higher per mile on the Intercolonial than on the Canadian Pacific eastern lines; and the expenses of the railway department of the government are not included in this calculation. The Intercolonial's small expenditures for maintenance of way and structures are partly due to the fact that, on the whole, its roadway and track are not kept in as good condition as those of the Canadian Pacific. A further explanation may be that expenditures which really should be charged to maintenance of way are charged to construction. The line between maintenance of way, and additions and betterments, is hard to draw accurately; and where a management is confronted with chronic deficits, as on the Intercolonial, it is under a constant temptation to make as good a showing as possible regarding operating expenses, by charging everything it can to capital account.

The small expenditures of the Intercolonial for maintenance of way are not new. In the five years ending with June 30, 1914, it spent on this account an average of only $1,317 per mile of line, while the Canadian Pacific system, handling a smaller traffic per mile, spent an average of $1,497. The fact that the capital—or "cost of construction"—account of the Intercolonial is rapidly growing larger without causing reductions, absolutely or relatively, in transportation expenses, supports the theory that its low figures for maintenance of way expenses are largely fictitious.

There is nothing fictitious, however, about its relatively large expenditures for other accounts. One of the surest indications of uneconomical and inefficient management is that a road is spending a relatively small part of its earnings for maintenance and a relatively large part for conducting transportation and for general and traffic purposes. What is spent for maintenance goes into the physical property and helps to keep up or improve the service, while what is spent for conducting transportation and for general and traffic purposes adds nothing to the physical property, but is gone forever. Relatively large expenditures for maintenance of way

[1] "Operating Results of Canadian Railways in 1914," by J. L. Payne, controller of statistics of Canadian railway department, in *Railway Age Gazette*, March 26, 1915.

[2] Montreal Gazette, October 21, 1915.

are more important than those for maintenance of equipment; for the latter may be due to a system of management which provides and uses an unnecessarily large amount of equipment. It is especially important to keep down the cost of conducting transportation, not only because the outlay made for it is gone forever, but because it is much the largest item of railway expenses.

The main reason for the Intercolonial's relatively high cost of conducting transportation is obvious. The most effective means for restricting this part of expenses is to handle traffic in the largest possible carloads and trainloads. Now, the Intercolonial has a long average haul per ton, 265 miles; it has a denser freight traffic than the Canadian Pacific eastern lines; and yet in 1914 it carried only 265 tons per train, as compared with 310 tons for the Canadian Pacific eastern lines. In consequence it ran 30 per cent more freight trains over each mile of line to handle 12 per cent more freight traffic. Similarly it ran 84 per cent as many passenger trains over each mile of line to handle 74 per cent as much passenger traffic. The comparatively small trainloads of the Intercolonial help to explain not only its high transportation expenses, but also its high maintenance of equipment expenses. The more trains run to handle a given business, the more equipment there must be provided and maintained and the larger, other things being equal, will be the expenditures for maintenance of equipment.

The road's relatively large expenditures for conducting transportation and maintenance of equipment are no more a new thing than its relatively low expenditures for maintenance of way. During the five years ending with 1914, while its maintenance of way expenses per mile were less than those of the Canadian Pacific system, its maintenance of equipment expenses averaged $1,746 per mile, or 33 per cent more, and its conducting transportation expenses $4,075 per mile, or 19 per cent more.

In the United States 20 per cent of the operating expenses of the railways are incurred for maintenance of way, while on the Intercolonial less than 17 per cent are incurred for that purpose. In this country maintenance of equipment expenses are 23.8 per cent of total operating expenses, while on the Intercolonial they are 22 per cent. On the railways of the United States less than 51 per cent of operating expenditures are made for conducting transportation; on the Intercolonial, almost 57 per cent. The Intercolonial makes 39 per cent of its operating outlay for both classes of maintenance and 61 per cent for other purposes. The railways of the United States make 44 per cent of theirs for maintenance and only 56 per cent for other purposes. The railways of the United States, with a capitalization smaller than the Intercolonial's cost of construction, handle 5 per cent more passenger traffic and 27 per cent more freight traffic per mile, with only 2.6 per cent greater operating expenses. One need not be expert in the analysis of railway statistics to see that those of the Intercolonial indicate a management which is extremely uneconomical as compared with that of the average railway in Canada or the United States.

Little of the blame for this poor showing can apparently be placed on the present minister of railways, Hon. Frank Cochrane, or the present general manager, F. P. Gutelius. When Mr. Cochrane came into office a few years ago he evidently realized that the road had long been wretchedly mismanaged; for he put Mr. Gutelius, an experienced and able railway man, a former officer of the Canadian Pacific, in charge, with large authority. Mr. Gutelius went energetically to work to increase earnings and reduce expenses. He received the loyal support of most of the officers; and he has continued, up to the present time, his efforts to improve the results secured.

The general confusion and reduction of railway earnings caused by the war have made it difficult to measure the effects of his exertions. And unfortunately the Canadian public, especially that part living in the provinces in which the Intercolonial operates, and the representatives of this part in Parliament, have grown accustomed to having, and, indeed, insist upon having, the Intercolonial managed in ways which mainly account for its high expenses. Almost every increase of rates or reduction in expenses which the present management has attempted to make has encountered opposition which soon has been supplemented by or converted into political pressure. When it tried to reduce the excessive local freight and passenger service being given, the communities affected appealed to their deputies, and they to the minister of railways. When efforts have been made to dispense with needless employees, deputies have interposed in defense of their partisans. The fiscal year ending on June 30, 1915, was a period of acute business distress in Canada. There was a heavy decline in railway traffic. How much more freely and energetically the management of a private railway company can act in such an emergency than the management of a state railway subject to political pressure is indicated by the fact that while the Intercolonial suffered a loss of total earnings per mile of 12 per cent and reduced its operating expenses 11 per cent, the Canadian Pacific eastern lines, with a loss of earnings of 20 per cent per mile, reduced their operating expenses 25.7 per cent. The management of the Intercolonial could not have done so well as it did if it had not been saved the trouble of laying off numerous employees by having them voluntarily enlist in the army. It did not discharge these; it simply did not replace them.

When a railway produces such results over a long period they may be immediately attributable to a number of causes, but these minor causes usually are themselves the effect of a few major causes. One of the major causes in this case has been that the officers in direct charge of the property have had little incentive to manage it well. The public and Parliament have not demanded this as the stockholders and directors of a railway company do. Consequently, there has been a feeling of comparative indifference regarding results on the part of the officers. Another of the major causes has been the influence of politics. This has been *the* major cause. The part which politics formerly played is freely admitted by the officers of the road, although they say that conditions are somewhat different now. The prevailing low rates have been made as a sop to the people, and especially to the French population, of the eastern provinces. "Almost every abuse known to railroading took root and flourished, such as underbilling—that is, permitting a favored shipper to load the cars with a larger quantity of goods than he paid for, while his competitors on the other side of politics were restricted to a standard load and mulcted for any excess; the granting of secret rebates; the maintenance of an excessive number of stations and employees in order to swell the political influence of the road at election times; absurd classifications; unjust tariffs; the acquisition of more or less useless branch lines to serve partisan ends, and so on."[1]

It was customary for the party in power to buy railway supplies only from its supporters; and the story is told of a dentist who engaged in the manufacture of a certain device expressly to market it on the Intercolonial by means of his political affiliations. It was common practice largely to increase the number of employees some weeks before election, and every officer of the road frequently had the experience of coming to his office and finding among his subordinates the faces of men he had never seen before, and who had been put on his payroll at the instance of politicians. If an influential politician wanted a man given a job on the railway he did not bother to take up the matter with the general manager or even with the division superintendent. He wrote a letter to the trainmaster or the roadmaster and ordered his friend and supporter employed. If an employee was discharged for incompetency or other good cause, he could

[1]Montreal Gazette, October 21, 1915.

usually get reinstated if he had political pull. When business fell off, politics made it impossible to reduce the number of employees and operating expenses proportionately. Political influence was used not only to secure excessively large and expensive passenger stations, but also unnecessary and unprofitable passenger and freight service. For example, when the present management came in it found that numerous passenger trains were being run into and out of St. John, Halifax, Sydney, and Newcastle, to enable leading citizens of these small cities to live in the "suburbs." Most of these trains were earning only fifteen to fifty cents per mile, but when the management tried to reduce the service it encountered a storm of opposition which soon became largely political.

As already indicated, the present management is trying to eliminate political influences and to put the operation of the road on a business basis. But the effects of the old régime are still apparent, and, as has been shown, opposition instead of assistance is offered by the part of the public served by the Intercolonial, while very little help is received from the rest of the people of Canada.

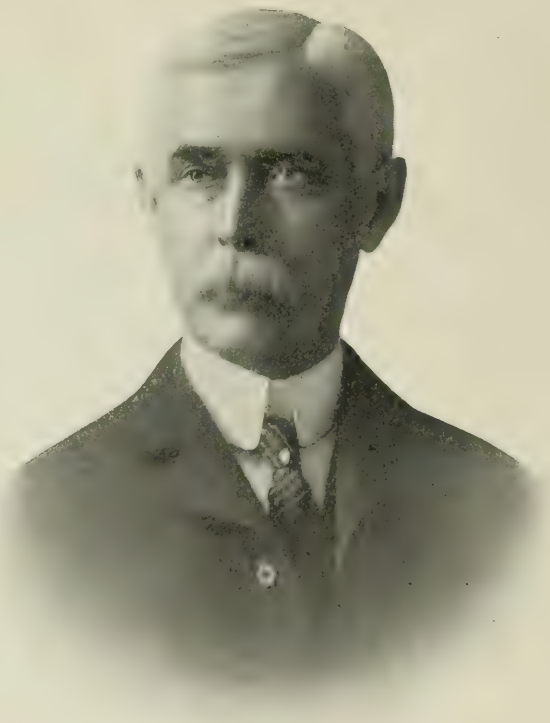
One of the arguments always advanced for government ownership is that the managements of state railways will and should strive rather to promote the welfare of the people than to earn profits; and it may be contended that to show that the Intercolonial's management has been dominated by politics, that its rates have been made too low, and that there has been waste in its construction and operation, proves nothing regarding the desirability of government ownership and management, because it takes no account of the influence which has been exerted on the development and prosperity of the territory which the road serves.

The question as to the amount and character of the influence which the Intercolonial has exerted on the development and prosperity of the maritime provinces is a somewhat difficult one to answer. It is easily demonstrable by official data regarding the changes in the population, the agriculture, and the industry of these provinces and of other parts of Canada and the United States, that progress in the territory served by the Intercolonial has been relatively small and slow. In fact, it probably has been as small and slow as in any other equally large territory in Canada or the United States which has any considerable natural resources. Doubtless, however, this is due to a combination of circumstances. The natural resources of the maritime provinces from either an agricultural or a manufacturing standpoint are not great, and their population is to a large extent naturally quite conservative. One thing may be said, however, with certainty. This is that the material progress made in the territory served by the Intercolonial has not been such as to support the argument that government management of railways will tend more strongly to promote the material well-being of the public than private management.

W. H. CANNIFF

William Henry Canniff has resigned as president of the New York, Chicago & St. Louis, with office at Cleveland, Ohio, after having held that office for 18 years and after a consecutive railroad experience of 53 years. Mr. Canniff began as a night watchman, later became a station agent, and until 1898, when he was elected president of the Nickel Plate, his official positions had been entirely in the operating department on lines which later became parts of the Lake Shore & Michigan Southern. He was general manager of the latter road when he was elected president of the Nickel Plate.

As a railroad president he has been distinguished for his close application to his work, for his unusual familiarity with the details of all departments, for his fairness to employees, the public and his competitors, and his all-around ability as an executive. He has been an unremitting student of all phases of railroad work and has enjoyed remarkably intimate relations with his employees, with whom he was very popular. His administration of the Nickel Plate property has been a highly successful one.



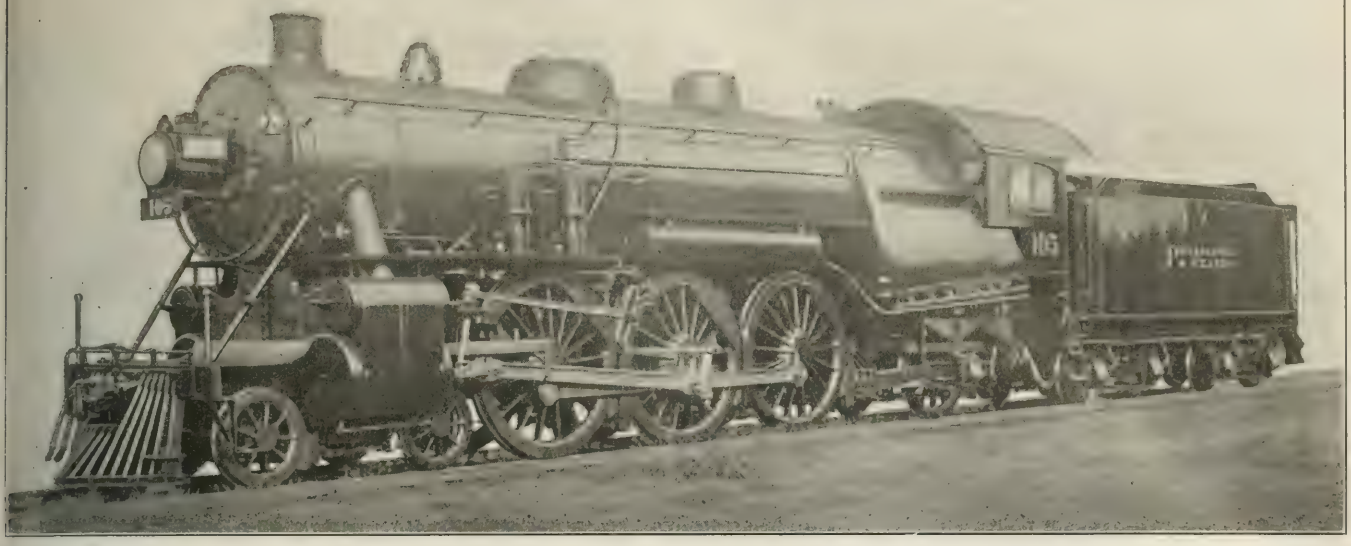
W. H. Canniff.

Mr. Canniff was born on October 22, 1847, at Litchfield, Mich. He began his railway service in 1863 as night watchman on the Michigan Southern & Northern Indiana at Osseo, Mich. After two years he was promoted to agent of the same road at Trenton, Mich., where he remained for three years. From August, 1868, to August, 1872, he was joint agent for the Michigan Southern & Northern Indiana and the Louisville, New Albany & Chicago at Salem Crossing. In 1872, he was made traffic master of the Kendallville division of the Lake Shore & Michigan Southern. He was later transferred to the Chicago division and in November, 1880, he was appointed supervisor of the Lansing division of the same road, including the Detroit, Hillsdale & Southwestern, and the Fort Wayne & Jackson railroads. After nine years in this capacity he was appointed on November 1, 1889, assistant general superintendent of the Lake Shore, on January 1, 1892, he was appointed general superintendent and from March, 1896, to May, 1898, he was general manager of the same road. On the latter date he was elected president of the New York, Chicago & St. Louis.

RAILWAYS ASSIST MILITARY IN EAST AFRICA.—A despatch on the operations in German East Africa, says: "The rapidity of the advance and the distance to which it was carried must almost inevitably have caused a breakdown in the transport but for the unremitting exertions of the railway engineers who carried forward the railway from the Njoro Drift, east of Salaita, to Taveta and the Latema Nek, at an average rate of a mile a day, including surveying, heavy bush cutting and the bridging of the Lumi river."

Pacific Type Locomotives for the Reading

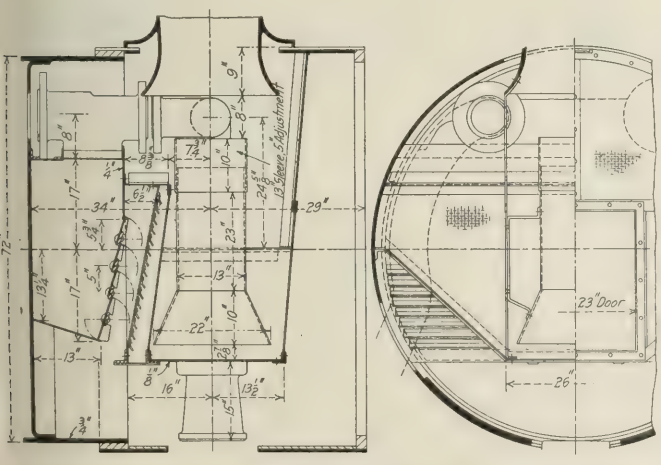
These Are the First Engines with This Wheel Arrangement Built for This Road; Light Reciprocating Parts



Philadelphia & Reading Pacific Type Locomotive.

THE Philadelphia & Reading has recently placed in service five locomotives of the Pacific type, which are the first of that type to be used on this road. These locomotives were designed to haul heavy passenger trains in very fast service, with a limit of 60,000-lb. load on each pair of driving wheels. The locomotives weigh, in working order, 273,600 lb., of which 176,900 lb. is on the drivers, 38,000 lb. is on the leading truck and 58,700 lb. on the trailer. The loaded weight of the tender is 160,000 lb.

With 25 in. by 28 in. cylinders, 200 lb. boiler working pressure and driving wheels 80 in. in diameter, the maximum tractive effort is 37,200 lb., giving a factor of adhesion



Front End Arrangement of the Reading Locomotive

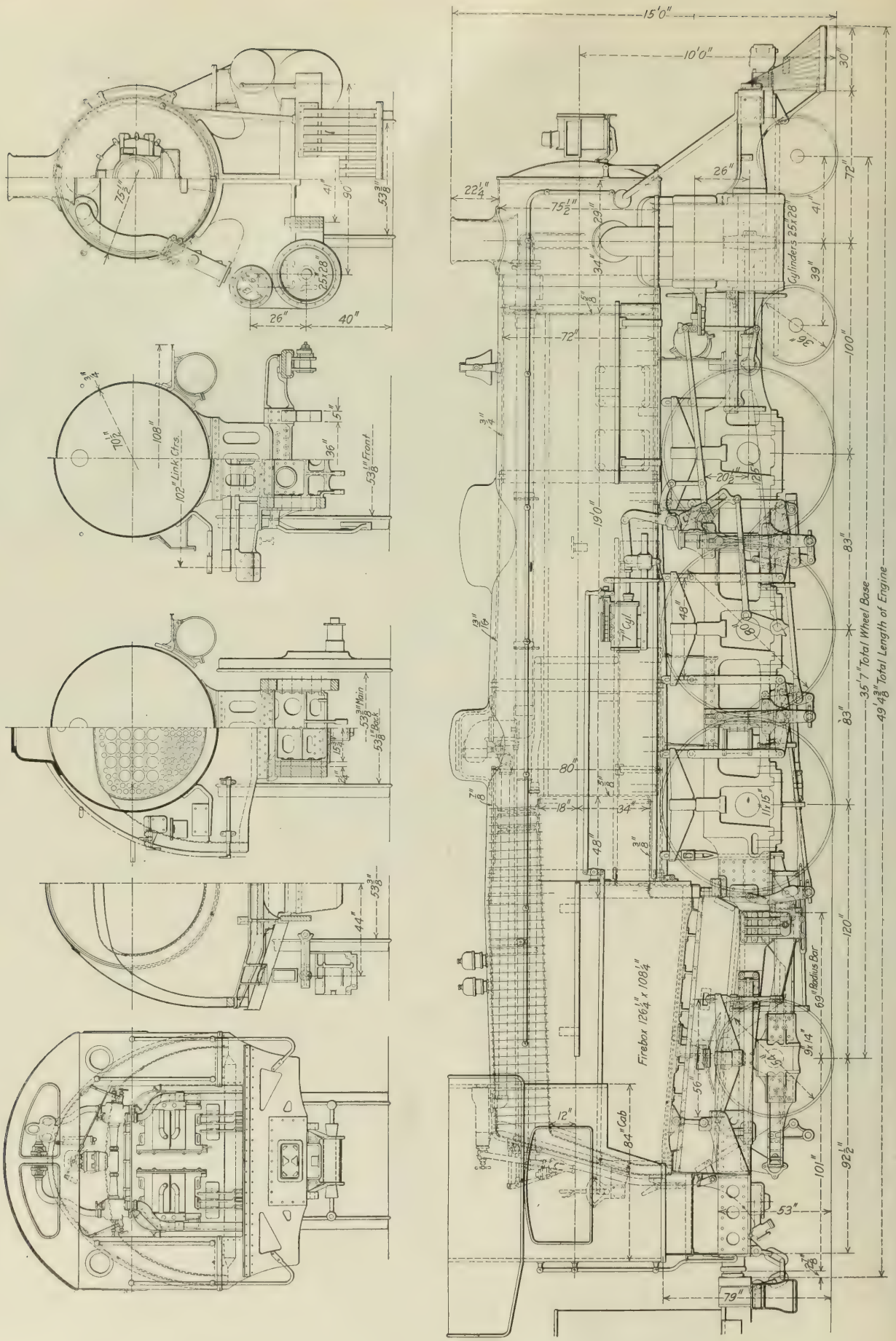
of 4.76. The valves are of the piston type, 13 in. in diameter, with 7 in. maximum travel, 1⅜ steam lap, 5/16 in. lead and ¼ in. exhaust clearance. They are driven by Walschaert valve gear, which, together with the reciprocating parts, has been made as light as possible to reduce the ill effects from the counterbalancing. The total weight of the reciprocating parts for one side is 1,237 lb., which, with 98,000 lb. piston load, the full boiler pressure being considered as acting on the piston for this purpose, gives a piston load of 79 lb. per pound weight of reciprocating parts. This compares with a corresponding figure of 83 lb. in the case of the Pennsylvania Railroad Atlantic type engines, class E6S, and 87 lb. for that road's K4S Pacific type engines. In the Reading engine 65 per cent of the reciprocating parts is balanced, the dynamic augment at a speed of 80 miles per hour being 41.5 per cent of the static weight on the drivers.

The boiler is of the Wootten type, with 200 lb. working pressure, the diameter at the front end being 72 in. and the greatest diameter 80 in. It has a firebox 10 ft. 6 in. long by 9 ft. wide, giving a grate area of 94.5 sq. ft. There is a 48 in. combustion chamber which provides a length of 19 ft. for the 163 2¼-in. tubes and 30 5½-in. flues. The heating surface of the tubes and flues is 2,644 sq. ft., and that of the firebox is 282 sq. ft., giving a total evaporative heating surface of 2,926 sq. ft. The superheating surface is 652 sq. ft. The fuel used is anthracite coal.

The extreme height of the locomotive is 15 ft. and the center line of the boiler is 10 ft. above the rail. The leading truck wheels are 36 in. in diameter; the trailing truck wheels, 54 in. The total engine wheel base is 35 ft. 7 in., while the total wheel base of the locomotive and tender is 67 ft. 11⅜ in.

An interesting feature of these locomotives is the front end arrangement which is intended especially to prevent the throwing of fire from the stack. The officers of the Reading state that this arrangement is giving every satisfaction. The smokestack proper has an inside extension of only 9 in., there being a petticoat pipe with an adjustable sleeve, the top of this pipe being 8 in. below the stack extension and the bottom 2⅞ in. above the top of the exhaust nozzle, which is 15 in. high. There is a netting placed almost vertically both in front of and behind the petticoat pipe and a series of deflectors is placed between the superheater dampers and the back netting, these deflectors having a tendency to throw the cinders downward and prevent the cutting out of the netting, as well as helping to break up the large cinders. The superheater damper arrangement is unusual; as will be seen from the drawing, it is made in four sections.

The tender has a water capacity of 8,000 gal. and a coal



Elevations and Sections of the Philadelphia & Reading Pacific Type Locomotive

pacity of 12.85 tons; it has a wheel base of 19 ft. 9 in. and fitted with a water scoop. The locomotive is provided with vo 9½-in. Westinghouse air pumps and the special equipent includes Ragonnet reverse gear, Cole trailer truck and ranklin fire door. The following table gives the principal mensions and data:

General Data

ge	4 ft. 8½ in.
rvice	Passenger
el	Anth. Coal
ractive effort	37,200 lb.
eight in working order	273,600 lb.
eight on drivers	176,900 lb.
eight on leading truck	38,000 lb.
eight on trailing truck	58,700 lb.
eight of engine and tender in working order	433,600 lb.
heel base, driving	13 ft. 10 in.
heel base, total engine	35 ft. 7 in.
heel base, engine and tender	67 ft. 11⅜ in.

Ratios

eight on drivers ÷ tractive effort	4.76
tal weight ÷ tractive effort	7.35
ractive effort × diam. drivers ÷ equivalent heating surface*	763
uivalent heating surface* ÷ grate area	41.4
rebox heating surface ÷ equivalent heating surface,* per cent	7.2
eight on drivers ÷ equivalent heating surface*	45.3
tal weight ÷ equivalent heating surface*	70.1
olume both cylinders	15.9 cu. ft.
uivalent heating surface* ÷ vol. cylinders	245
ate area ÷ vol. cylinders	5.95

Cylinders

nd	Simple
ameter and stroke	25 in. by 28 in.

Valves.

nd	Piston
ameter	13 in.
eatest travel	7 in.
tside lap	1⅜ in.
side clearance	¼ in.
ad in full gear	5/16 in.

Wheels.

iving, diameter over tires	80 in.
iving journals, main, diameter and length	11 in. by 15 in.
iving journals, others, diameter and length	11 in. by 15 in.
gine truck wheels, diameter	36 in.
ailing truck wheels, diameter	54 in.
ailing truck, journals	9 in. by 14 in.

Boiler

pe	Wootten
orking pressure	200 lb. per sq. in.
tside diameter of first ring	72 in.
rebox, length and width	10 ft. 6 in. by 9 ft.
bes, number and outside diameter	163—2¼ in.
es, number and outside diameter	30—5½ in.
bes and flues, length	19 ft.
eating surface, tubes and flues	2,644 sq. ft.
eating surface, firebox	282 sq. ft.
eating surface, total	2,926 sq. ft.
perheater heating surface	652 sq. ft.
uivalent heating surface*	3,904 sq. ft.
ate area	94.5 sq. ft.
okestack, height above rail	15 ft.
nter of boiler above rail	10 ft.

Tender

eight, loaded	160,000 lb.
heels, diameter	36 in.
rnals, diameter and length	6 in. by 11 in.
ter capacity	8,000 gal.
al capacity	12.85 tons

*Equivalent heating surface = total evaporative heating surface + 1.5 es the superheating surface.

AN AMERICAN RAILROAD IN URUGUAY.—The Republic of ruguay, with an area of 72,172 square miles, had, in 1913, 539 miles of railroad. By the various lines composing is system the interior of the country has been opened up d communication has been well developed with the prinpal seaport, Montevideo, in the extreme south. Toward e west and northwest, connection is effected with the ports the Uruguay River and the western part of south Brazil. ward the north the Brazilian frontier is touched and there now direct service into southern Brazil, eastward to Rio rande and Porto Alegre, and directly northward to São aulo and Rio de Janeiro. Toward the east and northst, although projected lines to the Brazilian frontier have t been constructed, the railroad has advanced considerly within the last few years. These railroads all center Montevideo, and good service is offered through the interior ached by them. There has been, however, need of other es which will serve as feeders to the main lines already nstructed or, acting independently, accomplish a similar rpose.

ONE SYSTEM OF CHECKING L. C. L. FREIGHT*

By W. F. Northrup

Agent, New York Transfer Station, Delaware, Lackawanna & Western, Secaucus, N. J.

The most important detail in the handling of l. c. l. freight is the correct checking of the shipments. Failure on the part of the check clerk to properly tally and forward the shipments to the proper cars is costing the railroads a sufficient amount of money on account of losses to make this feature paramount in any investigation leading toward improved efficiency. There are so many different methods in use to cover this particular feature that time and space will not permit a discussion of the advantages and disadvantages of the different systems.

After considerable investigation during which numerous methods of checking were experimented with, we have adopted on the Lackawanna what is known as the "Carbon Ticket System." This is really nothing more or less than a combination of other methods of tallying freight and is the result of a study of the causes of improper loading. While this system has not eliminated loading errors it has reduced them sufficiently to demonstrate the effectiveness of the method. The carbon tickets do not differ materially from the various other forms of the so-called vericheck ticket, which are generally in use, except that they are bound in pads and each alternate ticket bears a carbon back. This arrangement results in the issuance of each ticket in duplicate. The information shown on these tickets is as follows:

First—Spot number;
Second—Shipment number;
Third—Number of pieces on truck;
Fourth—Truckman's number;
Fifth—Check clerk's number.

In operating this system each shipment passing through the transfer station is assigned an individual number. When the ticket is issued the original is turned over to the trucker who takes it with the freight to the outbound car, where it is deposited in a box hanging inside the car. The tickets in these boxes are inspected at frequent intervals by a verifier, whose duty it is to see that all of the spot numbers in the first space on the ticket agree with the number of the spot in which the car is standing.

In case of an error steps can be taken immediately to remove the freight and place it in the proper car. In this manner errors made by the truckman are immediately noted and can be corrected without delay. Investigation however has proved that no small number of errors are due, not to the truckman, but to the check clerk; hence the idea of the carbon ticket. The duplicate copy of the original ticket is retained by the check clerk until he completes the out-turn of the car

Month	Packages retransferred to proper car	Packages found in improper car too late to transfer. Traced by wire	Total
Trucker's Errors			
January, 1915	60	2	62
February	90	3	93
March	178	1	179
April	200	2	202
May	146	5	151
June	169	7	176
	843	20	863
Checker's Errors			
January, 1915	31	25	56
February	36	14	50
March	38	56	94
April	88	44	132
May	53	29	82
June	118	63	181
	364	231	595
Grand total	1,207	251	1,458

*Received in the contest on The Handling of L. C. L. Freight.

in which he is working, after which the duplicate tickets with the way-bills are turned over to another verifier who immediately checks each ticket back against the original way-bills. Any discrepancy in the out-turn of the car is detected immediately.

To demonstrate the effectiveness of this system and to give an idea of just how many pieces of freight were loaded at this station in error, such error being detected and the freight reloaded to the proper cars I give below a statement for the first six months of 1915 which is self-explanatory.

Aside from the actual errors corrected as demonstrated in the above statement, the moral effect on each trucker and checker has avoided errors, the number of which cannot be estimated. This system is not infallible. Loading errors are still made which are not in every case detected, but they are few and far between. Following are a few of the important advantages which have been noted as a result of this system:

1. Errors made by each truckman and check clerk are known within 24 hours, and by maintaining a daily record the agent is in a position to detrmine just which of his employees are delinquent and can deal with them accordingly.

2. It has reduced over and short reports 60 per cent;

3. It is invaluable as a record in handling O. S. & D. and claim papers.

In connection with the carbon ticket system we maintain an individual record of each of the men employed at the station; and each error noted either by means of tracers, correspondence, O. S. & D. reports or claims has been charged against the man responsible for it. When any man's record indicates that he is not capable of performing the duties assigned to him he is suspended from service for either 10, 15, 20 or 30 days, according to the seriousness of his offense. Continued errors result in dismissal.

To stimulate interest in our check force we have installed a bonus system for the checkers, the cost of which is $10 monthly. This money is distributed in three prizes, consisting of a first prize of $5, a second prize of $3 and a third prize of $2 monthly. These awards are based on a demerit system and are given to the three check clerks who receive the fewest number of demerits per ton handled during the month. This method of awarding the prizes necessitates not only accuracy on the part of the check clerk but also his doing a reasonable amount of work to be considered for the award. The demerits charged against the check clerks include two demerits for each piece of freight loaded to the improper car; two demerits for each day's absence from duty; one demerit for each error in issuing a ticket, whether or not an actual error in loading is involved, and one demerit for each failure to comply with station rules and regulations, of which each checker has a copy.

This bonus system has worked very satisfactorily and has developed several men who can check an average of 70 to 80 tons of freight daily with loading errors not averaging over 5 to 10 pieces per month. A corresponding improvement is noted in the entire force, and the interest displayed in striving for the money has caused a very satisfactory decrease in improper loading with the resulting claims. Below I give the tonnage handled at this station for the first 5 months of 1915, showing the approximate number of pieces of freight handled and the number of pieces improperly loaded each month:

Month.	Tonnage.	Number of pieces of freight handled. (Estimated)	Number of pieces of freight improperly loaded
January	17,624	.....	114
February	17,894	.....	98
March	21,484	.....	122
April	21,952	.....	451
May	21,196	.....	260
	100,150	3,120,000	1,045

We have also effected a material reduction in the number of claims handled through the station at New York transfer by the use of the carbon ticket system. Below I give figures showing to just what this reduction amounted as regards claims handled during the first six months of 1915 as compared with the first six months of 1913, the carbon ticket not being in use at this station during the earlier period. These figures include all freight claims and freight claim letters on which we were requested to supply a record. The amount of money involved cannot be shown, however, as the claim papers did not in all instances show it.

Month	Claims handled in 1913	Claims handled in 1915	Decrease
January	423	302	121
February	445	283	162
March	426	313	113
April	474	265	209
May	502	225	277
June	383	260	123
	2,653	1,648	1,005

TRAIN ACCIDENTS IN MAY[1]

The following is a list of the most notable train accidents that occurred on railways of the United States in the month of May, 1916:

Collisions

Date	Road	Place	Kind of Accident	Kind of Train	Kil'd	Inj'd
4.	Central Ga.	Mogul.	bc	P. & F.	0	3

Derailments

Date	Road	Place	Cause of Derailm't	Kind of Train	Kil'd	Inj'd
1.	Norfolk & W.	Solitude	b. rail	P.	0	30
2.	Denver & Rio G.	Farnham.	unx	P.	0	0
9.	Norfolk & W.	Mineral Sp'gs.	d. truck	P.	0	32
11.	Seaboard A. L.	Manson.	acc. obst.	P.	2	1
16.	Missouri, K. & T.	Clinton.	b. rail	P.	0	7
16.	G. H. & S. A.	Nulo, Tex.	b. rail	P.	0	7
17.	Norfolk & W.	Pembroke.	slide	F.	0	3
18.	N. Y. N. H. & H.	Braintree.	unx	P.	0	3
20.	N. Y. N. H. & H.	Waterbury.	unx	F.	1	0
30.	Denver & Rio G.	Grand Valley	unx	P.	0	9

The trains in collision near Mogul, Ga., on the 4th were eastbound passenger No. 18 and westbound freight No. 37. Both trains had been brought nearly to a stop, and the damage to the engines was not great. Three persons were injured. The signalman at Mogul had admitted the freight to the block section occupied by the passenger train.

The train derailed on the Norfolk & Western near Solitude, Va., on the evening of the 1st was northbound passenger No. 2, and four passenger cars fell down a bank. About 25 passengers and 5 employees were slightly injured. The cause of the derailment was a broken rail.

The train derailed at Farnham, Utah, on the morning of the 2d was eastbound passenger No. 16, and the engine and first five cars were ditched. No persons were seriously injured. The cause of the derailment was not determined. The tender was the first vehicle to run off the rails.

The train derailed near Mineral Springs, Ohio, on the 9th was an eastbound local passenger. The injuries to persons are reported as all having been slight. The tender and four coaches fell down a bank. The derailment is believed to have been due to the failure of a safety hanger of the spring plank of a truck of the mail car.

The train derailed at Manson, N. C., on the 11th was southbound passenger No. 7. The train was drawn by two engines and when running at about 45 miles an hour was thrown off the track at a switch, the tender of the leading engine being the first vehicle to leave the rails. The switch was slightly open, having been displaced by a short iron rod 1⅞ in. in diameter, the presence of which rod has not been explained. One fireman and one trainman (who was off duty and riding on the train without authority) were killed, and one engineman was injured.

[1]Abbreviations and marks used in Accident List:

rc, Rear collision——bc, Butting collision——xc, Other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc. ——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

The train derailed near Clinton, Mo., on the 16th was the southbound Texas special express. Five passenger cars fell down a bank. Three passengers and four trainmen were injured. The cause of the derailment was a broken rail.

The train derailed near Nulo, Tex., on the 16th was No. 10, eastbound, the Sunset Limited Express. Three passenger cars, a mail car and an express car were partly overturned. Five passengers and two trainmen were slightly injured. The cause of the derailment was a broken rail. The rail was of 80 lb. section laid in 1904, and broke because of an internal transverse fissure.

The train derailed near Pembroke, Va., on the 17th was a westbound freight. The locomotive, a new Mallet, was overturned and fell down a bank. The engineman, fireman, and a brakeman were injured. The engine struck a rock about the size of a small barrel, which had in some way become dislodged from the mountain side and rolled to the track at a place where the view along the track was very short.

The train derailed at Braintree, Mass., on the 18th was a northbound local passenger. It was moving at low speed on a sharp curve and the rear car was overturned. Three passengers were injured. The cause of the derailment was not discovered.

The train derailed near Waterbury, Conn., on the 20th was an eastbound freight. One brakeman was fatally injured. The cause of the derailment was the loosening of a driving wheel tire.

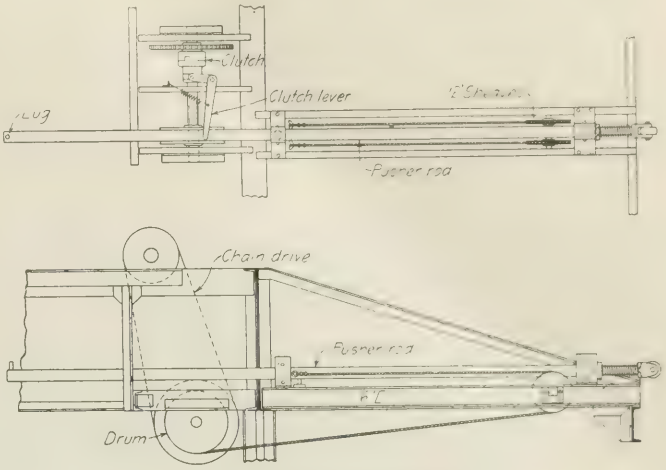
The train derailed on the Denver & Rio Grande near Grand Valley, Colo., on the 30th was eastbound passenger No. 2. Fve cars ran off, and three employees and six passengers were injured. The cause of the derailment is reported as undetermined.

LIFT BRIDGES AT A FREIGHT PLATFORM

The local freight terminal of the Atchison, Topeka & Santa Fe at Los Angeles consists of two buildings about 1,000 ft. long, separated by seven house tracks, interspaced with two transfer platforms of approximately the same length as the houses. As a means of greatly reducing the trucking distances, three power-operated transfer bridges have been installed to afford intermediate cross trucking movements which are made movable to permit the switching of cars on the house tracks. These bridges present an interesting departure in freight house operation and several ingenious engineering details have been worked out in their design.

The older of the two freight houses was built in 1907 and is 1,080 ft. long. One portion of it is 40 ft. wide and was used until recently as an outbound freight house. The other part is 60 ft. wide and was designed for an inbound house. The newer house was finished recently to serve as an outbound freight house, the entire old building being assigned to the inbound freight service. The new house is 800 ft. 9 in. long by 59 ft. 8 in. wide, with an automobile platform at the outer end of the same width and 149 ft. long.

The seven tracks between the out-freight house and the in-freight house are divided into three groups by two platforms, each 16 ft. wide, there being three tracks adjacent to the new house, two between the two platforms and two adjacent to the old freight house. The house tracks come to a stub end on a line with the inner end of the freight houses and a cross platform connects the two longitudinal platforms and the two freight houses at this point.



The Pusher Mechanism

Owing to the great length of the layout, electric tractors and trailers were particularly applicable and have been installed, but in order to afford a material reduction in the trucking distances, bridges were installed at two points in the length of the station to permit cross movements of the trucks. These bridges were removed by hand each time it was necessary to switch the cars, a cut being made in the string of cars opposite each bridge when the cars were placed to allow room for the bridge.

The operation of these primitive bridges proved expensive and it was found that power-operated bridges could be installed at a considerable saving over the cost of operating the old ones. Two bridges have been installed as shown in the accompanying photograph to provide movable spans over the three groups of tracks at two intermediate points in the



Interior of New Outbound Freight House

length of the station. A third bridge has been provided over a single track in the throat of the yard. As shown, the larger structures each consist of a gallows frame of structural steel, spanning the center pair of tracks, and supporting the operating machinery from which the three drawbridges are raised or lowered.

The draw bridges are simple in design, consisting of structural steel beams carrying a plank flooring. The bridge over the three tracks next to the out-freight house has a length of 43 ft. 4 in. The other two bridges are 28 ft. 10 in. and 29 ft. 4 in. in length, respectively. However, a very simple device has been used to afford short span lengths, thus making it unnecessary to provide bridges of sufficient stiffness to span the full distances. Heavy sills have been placed on the center lines between tracks directly under these bridges to serve as bearings for swinging legs attached to the spans. When the bridges are down these legs serve as intermediate supports, thus cutting the spans to approximately 13 ft. When the bridges are raised the legs fold back against the under sides of the bridges and outside of the clearance lines.

The spans are raised and lowered by means of cables winding up on drums operated by 7½-hp. 3-phase, 60-cycle alternating current motors. Worm drives are used, thus avoiding the need of any system of brakes. One 7½-hp. motor operates the 3-track bridge; another motor of the same size operates the two smaller bridges simultaneously. Controllers are installed on one of the posts of the gallows frame at the platform level for the operation of the motors and automatic cut-offs are provided to stop the motors when the bridges are fully opened.

Unlike the usual bascule span, these bridges come to a true vertical position when open. Therefore the weight of the bridge is in no way effective to start it downward when it is desired to close the bridge. This becomes quite a formidable difficulty when a wind is blowing against the bridge in a direction opposite to that of the closing movement. On account of this difficulty, pushers were provided to push the bridges out a sufficient distance to make the weight of the bridge effective in carrying it downward and also to serve as buffers when the bridges are opened. The pushers for the two smaller bridges are operated by means of counter weights, both pushers and counter weights being clearly visible in one of the accompanying photographs. In the case of the larger bridge a motor-operated pusher was required.

This pusher is shown in the accompanying drawing, and its operation is simple. When the bridge is to be closed a drum in clutch with the motor operating the bridge winds up a cable and the pusher is forced outward. When the full reach of the pusher has been obtained a small lug on the end of the pusher rod comes in contact with the clutch lever and throws the drum out of clutch with the motor. Thus the pusher remains stationary during the remaining travel of the bridge. The operation is reversed when the bridge is raised.

The new freight house has a steel frame, consisting of bents 20 ft. center to center made up of two columns and a clear span truss, supporting steel purlins which carry the wooden roof. The freight doors occupy the full spaces between columns on both sides of the house and steel sash windows occupy most of the space above the doors, the small amount of wall space consisting of reinforced concrete curtain walls. Rolling doors are installed on the track side and cross folding doors on the team side. The doors fold outward rather than inward, thus saving space inside of the house and affording a canopy over the doors on the outside. At the inner end of the house there is a basement for a length of 200 ft. for storage purposes, this basement being of reinforced concrete construction. The house is equipped with twenty-six three-ton scales and four six-ton scales placed adjacent to the team side doors. Each scale is provided with a Fairbanks automatic dial, graduated to the full capacity of the scales. The automobile platform is provided with a six-ton scale with a 7¾-ft. by 16-ft. platform.

The bridges were installed under the general direction of G. W. Harris, chief engineer of the Santa Fe coast lines. The design of the freight station was under the direction of E. A. Harrison, and the design of the bridges under the direction of A. F. Robinson, architect and bridge engineer of the Santa Fe system, respectively. A contract was let to C. H. Norwood, Chicago, who furnished all the structural steel and electrical equipment, and also designed the operating machinery.



The Lift Bridges Open

Railway Regulation Causes Locomotor Ataxia*

Lack of Co-ordination and Fairness in Present System Does Great Harm—National Control the Remedy

By Frank Trumbull
Chairman, Chesapeake & Ohio Railway

I SHALL not weary you with figures or with platitudes about what you do for the railroads or what they do for you. The fact that you have invited a representative of the railroads to address you, evidences sufficiently the mutual welfare and regard of shippers and carriers. Neither shall I apologize for the railroads. There has been a great deal of critical comment about exceptional instances of railway administration, but if you will put it all together you will find it relates to less than 10 per cent of the mileage of the country, and that it has very much exceeded in volume and sound the praise bestowed upon the other 90 per cent. Railway administration of today in this country is as honest as any other business. Notwithstanding this, railway directors and officials accept the principle of regulation because railway companies are public service corporations. Discriminations and unreasonable practices by such corporations are and ought to be forbidden by law. Discriminations by individual states against the commerce of other states and unreasonable requirements ought also to be done away with by some better method than tedious litigation. Obviously, any adequate scheme of regulation ought to deal not with 10 per cent of the roads or with 90 per cent, but with all of them, and no regulation can be adequate that is not unified and consistent.

I might entertain you with a long history of various attempts at regulation, commencing with the so-called "Granger laws," followed later by the Interstate Commerce law, enacted 29 years ago, and both in turn followed by hundreds upon hundreds of statutes enacted by federal and state governments. But it is sufficient for this occasion to say that these endeavors, due to a variety of motives, have, after establishing general principles, all been of a piecemeal and patchwork character; court plasters, not blood remedies. Railway legislation has been more conspicuous for quantity than for quality, and "legislation" and "regulation" are not synonymous terms.

It is true that much progress has been made. For example, in the so-called Eastern Rate Case the Interstate Commerce Commission made, in December, 1914, the following declarations of principle:

> That there is in this country a fundamental need of adequate transportation facilities.
>
> That such facilities during the continuance of present economic conditions can only be had by means of private capital, combined with private enterprise.
>
> That private capital can only be obtained by the hope and realization of fair and reasonable return.
>
> That to produce such return, freight rates may be raised, when it is shown that existing rates as a whole, considered regionally in this case) yield inadequate revenue, and that the higher rates proposed would be reasonable.
>
> That such reasonable passenger fares may be charged as will yield a fair return on the property devoted to passenger use, and, further, that in general each class of service, including the mail and express, should contribute its just proportion to the total economic cost of operation.
>
> That in determining reasonable rates, interest upon railway debt is not a factor and will be discarded.

This last has mightily clarified a thing about which there has been much confusion of thought and even more confusion of tongues. The fact is that bonds and stocks indicate only the ownership of property, and are not the property itself which is used by the public. This is simply a corollary to the long established principle that if railway companies take private property for public use, they must pay its reasonable value, regardless of how the previous owner acquired it or paid for it.

However, almost immediately after this decision was handed down, one state made an order reducing rates which, if sustained by the courts, would take away several million dollars per annum of the benefits derived at Washington.

Various state rates and practices could not be changed to conform to the recommendations of the commission; payments by the postoffice department were still outside the commission's jurisdiction; all the states were at liberty to make requirements which in one way or another changed the net revenue of the roads. All of which illustrates the real helplessness of the Interstate Commerce Commission actually to "regulate." Clearly, something was still lacking.

Let us get down to fundamentals; back to the intent and real meaning of things. If you will look at Webster, you will find these definitions of the word *"regulate"*:

> "To adjust by rule or method."
>
> "To put in good order."
>
> "To adjust or maintain with respect to a desired condition."
>
> "To regulate a watch or clock, to adjust its rate of running so that it will keep approximately standard time."

The carriers and the public have suffered because they have not really obtained *regulation* according to the intent and meaning of that much-used word. Don't take my statement for it, but let me read to you an extract from a recent report of the House Committee on Interstate and Foreign Commerce upon a resolution providing a joint committee of inquiry into the whole problem of transportation—similar to the Aldrich Monetary Commission—a resolution which has already passed the Senate and is expected soon to pass the House:

> "Since the approval of the act to regulate commerce in 1887, the system has had a gradual and irregular growth by various and sometimes sporadic amendments, some of them making decided, if not radical, changes in the original plans and policies, and some of them adding new and important activities. So that the entire law to regulate commerce now in force is not a uniform, compact, symmetrical structure easily understood, but is an incoherent growth, sometimes inconsistent, in some parts hardly reconcilable, and, to say the least of it, the diversities and incongruities should be carefully considered and wherever possible unified and improved, to the end that the federal regulation of carriers may be successfully carried on with the best possible service to the public. . . . It is the earnest hope of every member of your committee that the investigation, if ordered, shall be directed to the detection of defects in the system, the establishment of truth as to the best way to remedy these defects, and the perfection of the system for the increased convenience and prosperity of the people in every way that human legislative wisdom can accomplish perfection in anything."

In addressing Congress on December 8, 1915, President

*An address delivered before the National Hay Association at Cedar Point, Ohio, on July 12, 1916.

Wilson, in recommending such a committee, said among other things about transportation:

> "It is obviously a problem that lies at the very foundation of our efficiency as a people; it is the one common interest of our industrial life."
>
> "The question is whether there is anything else we can do that would supply us with effective means, in the very process of regulation, for bettering the conditions under which the railroads are operated and for making them more useful servants of the country as a whole."

You will perceive that I am not giving you my own views, but those of great leaders of thought in this country. Senator Underwood, of Alabama, said in an address at Chicago, on February 4, 1916:

> "We must recognize that the man who is willing to invest his money at a moderate rate of interest in railroad securities is not exploiting the public, but is a public benefactor."
>
> "We must solve the problem along lines of private ownership and Government regulation. We must consider the wisdom of substituting one master for the forty-nine masters that regulate our commerce today."

Colonel Roosevelt and Mr. Taft have made almost identical statements in clear and unmistakable terms, and Mr. Hughes said immediately after his nomination:

> "We must rescue our instrumentalities of interstate and foreign commerce, our transportation facilities, from uncertainty and confusion. We must show that we know how to protect the public without destroying or crippling our productive energies."

The "Locomotive Engineers' Journal," official organ of the 75,000 railroad engineers, said not long ago:

> "The railroads are almost wholly interstate in character, and it requires little thought to realize how unsatisfactory and unbusinesslike it makes the conditions for the railroads with a commission in every state demanding all sorts of conditions from the roads.
>
> "The great thoroughfares should have one boss, instead of forty-nine, and the rate making should be done by one factor of the Government, so that a survey of the whole territory may be before them, when all the varied conditions can be readily seen, and rates made that are just, both to the shipper and the railroads.
>
> "No other kind of business could live under such unknown and unfixed conditions."

The Massachusetts Public Service Commission, in reporting not long ago on the New Haven road, after an exhaustive inquiry, made this statement:

> "The whole legal question is so difficult, so entangled and confused by conflicting claims and rights, that it raises serious doubts as to the wisdom of the system from which it arose. No man can serve two masters. Is there public advantage in compelling a corporation to serve three or more? A system under which a single undivided corporation is at the same time three separate corporations is wholly illogical and seems contrary to good order and reason."

Formerly, wages and rate matters were dealt with in a rather lawless way by shippers, employees and individual roads, but in the last few years there has been an evolution; both wages and rates have been considered regionally, and now, for the first time, the train service employees are insisting that their wages shall be considered on a nation-wide basis. Industrial and commercial bodies all over the country, recognizing the great need for unified and more efficient regulation of transportation, have passed significant resolutions during the present year calling upon Congress for investigation and relief. The Merchants' Association of New York, the Chamber of Commerce of Philadelphia, the National Manufacturers' Association, the National Lumber Dealers' Association, the Southern Pine Association, National Leather Association, American Hardware Manufacturers' Association and many similar organizations of wide influence in the business world have expressed themselves vigorously to this effect.

So under our very eyes this thing has come to pass. Men of all classes and of all shades of political opinion are declaring that the transportation question is a national problem —not a local issue.

Now, if you and other shippers, and the people who travel in passenger trains, or who receive mail and parcels post carried by the railroads, and railway directors and officials, are all agreed that the propriety of regulation is no longer in dispute, surely all of us together ought to be able to search our hearts, ascertain our paramount duty, get down to business and discuss the whole question from the standpoint of the public interest.

We may, therefore, ask ourselves:

Is it in the public interest that the railroads of this country are required to make over two million reports per annum to various federal and state tribunals?

Is it in the public interest that passenger rates are only two cents a mile in some states and higher in more populous states? And in considering this question will not the most obvious thing to the public be the cost and comfort of the passenger equipment of today as compared with twenty years ago?

Is it in the public interest that wagon-loads of testimony are submitted to various state tribunals to prove that rates ought to be higher, resulting in refusals, after a corresponding laborious inquiry by the Interstate Commerce Commission, the result of which was a finding that interstate charges ought to be increased and that passenger traffic is not paying its share?

Is it in the public interest that some states pass extra-crew laws while other states are refusing to pass them?

Is it in the public interest that one shipper—the postoffice department—determines compensation to the railroads without submission to the Interstate Commerce Commission when other shippers are deprived of such a privilege?

Is it in the public interest that public service corporations are required by divided authority to violate the spirit, if not the letter, of Section Two of Article Four of the Constitution of the United States, which declares that "The citizens of each state shall be entitled to all privileges and immunities of citizens in the several states."

Is it in the public interest that public tribunals have said in some cases that rates by one line may be higher than another because the cost of operation is higher, thereby penalizing superior location and construction? If so, what incentive is there to build better roads, or improve existing roads?

Is it just that wages of steel workers, coal miners and others are voluntarily increased by employers and these increases then passed along to the consumer, including the railroads, unless similar flexibility be accorded to railroad investors and nearly two million employees? If not, what is the alternative?

Besides innumerable things like those mentioned are confusing anti-trust laws of various states as well as the federal government, which seem to most students of railway economics to be superfluous, when superimposed upon minute regulation and to interfere with that very desirable thing—low cost of production. Then, too, think of the time of shippers and railway officials devoted to attendance upon various tribunals. In consequence of all these wasteful things, millions upon millions of dollars which ought to be saved for *somebody,* are going over the dam every year, and warrant the query whether there is any more wisdom in disembarking railroad corporations at state lines than there would be in disembarking passengers and freight or changing wages at state lines. Who, for example, would think of advocating a postoffice department for each state in the union? Is it not your duty and mine to cut out waste wherever we can, no matter how prosperous we may be?

The net results of conditions such as I have enumerated, is that individual states are actually regulating interstate commerce and are shifting to other states burdens of railway credit which the latter ought not to assume, and in reality are requiring railway corporations to do what the federal law prohibits them from doing—that is, to discriminate between persons and places.

The fact is, we haven't had "regulation" at all. It is locomotor ataxia. If you will look again at the dictionary,

you will see locomotor ataxia described as "A disease of the spinal cord characterized by peculiar disturbances of gait, and difficulty in co-ordinating voluntary movements."

Surely Webster must have had the railroads in mind when he wrote that! The federal government may be likened to the spinal cord of our political system. Congress can, and should—without any constitutional amendment—act in these matters in behalf of all the states and "co-ordinate" the railroads. The small number of people who would be thrown out of political employment are as nothing in the balance to the millions who would be benefited. In fact, state public service commissions would still have quite enough to do in supervising street car lines, lighting companies, water companies, etc. Any fear of too much centralization could be easily overcome by regional commissions. If we can mobilize the strength of the banks regionally, why not also the railroads? The *people* of the states would be better served and better protected. The *people* care nothing for state lines on the map, or for theoretical state rights, when they want to do business.

Not long ago I heard an after-dinner speaker say: "The railroads must be taken out of the field of speculation." I do not know just how this is to be accomplished, unless by government guarantees, but certainly the business ought to be relieved of the speculative risks of conflicting treatment by public authorities.

Railway investors are quite willing to take their chances with the other people of this country. They do not have any problems, except so-called regulation, that you have not. You have your puzzles about wages, about fluctuations of crops, of demand and supply and many other things. The railroad investor takes "pot-luck" with you, but is timid, even in prosperous seasons, about the one thing with which he has to contend and with which you do not; that is, artificial and uncertain limitations on profits. He is quite willing to have supervision of railway securities, but, naturally, thinks that the machinery should be simple and prompt and the federal government should act in behalf of all the states in regulating the instrumentalities of commerce. At present nineteen states are trying to regulate the issuance of securities, and no two of the regulations are alike. If you were a banker, how long would you, with present opportunities for making money, tie up your funds or your customers' funds, waiting for "consents" of various tribunals, some of which impose a heavy special tax on this "privilege" of devoting money to public use, although the proceeds of the securities may be largely spent in other states?

No railway regulation can really put the machine "in order" that does not comprehend the question of railway credit. Facilities must, of course, precede service, and credit must precede facilities. Our railroads should always be ahead of, not behind, the growth of the nation. In this connection, may I bring to your attention just one graphic statement? The debt of the railways of this country is now, roughly speaking, about eleven billion dollars. The stock amounts to about seven billion dollars. Now, how long would your bankers do business with you if you were attempting to permanently borrow eleven dollars for every seven you put in the business yourself? Millions of people are as dependent upon weak roads as other people are upon the strong ones. For example, take the southwest. A large part of its railroads are in bankruptcy. Surely that is not all due to bad management. How much of it is due to unwise regulation, how much to unsound laws about financing, and how much to other things? Could any congressional action be of greater service than to do whatever is necessary to safeguard and strengthen railway credit?

Railway returns for the fiscal year just ended were equivalent to about 5½ per cent on the property used by the public—surely not exorbitant. Is there any prosperous private business in the world that yields so small a return? In 1913 the return was about 5 per cent, in 1914 about 4 per cent, in 1915 about 4 per cent. I am speaking of the railroads as a whole; not even a unified regulation can be successful if it is not to make weak roads healthier and more serviceable, nor can it be successful if based on returns of prosperous years only.

In no business is it conservative to draw out every year all of the profits. How long would your bankers be cordial if you were to withdraw every year all of your gains, instead of building up reserves or adding to the real value of your assets? I have said that I am not here to apologize for the railroads, neither am I here to boast, but perhaps I may give you one illustration: The average passenger train in this country earns for carrying passengers, mail, express and parcels post about $1.40 per mile. The average equipment of locomotive and cars provided for this probably weighs about 500 tons per train and is projected through space at a speed varying from 20 to 60 miles per hour. That is to say, a five hundred ton train is projected twelve miles at high speed for the price of a ton of hay. Do you happen to know of any equivalent service for less money? Let me also quote from a recent statement of W. M. Acworth, a distinguished English writer on railway economics. He said:

> "This is my tenth visit to the United States, of whose railway affairs I have been for about thirty years a diligent student. Every time I am brought into contact with American railways, the overpowering impression produced on my mind is of the marvelous results which the efficiency of the railroad men produces with the minimum expenditure both of capital and income."

A very helpful American writer has said:

> "A nation is made great not by its fruitful acres, but by the men who cultivate them; not by its great forests, but by the men who use them; not by its mines, but by the men who work in them; not by its railways, but by the men who run them. America was a great land when Columbus discovered it; Americans have made of it a great nation."

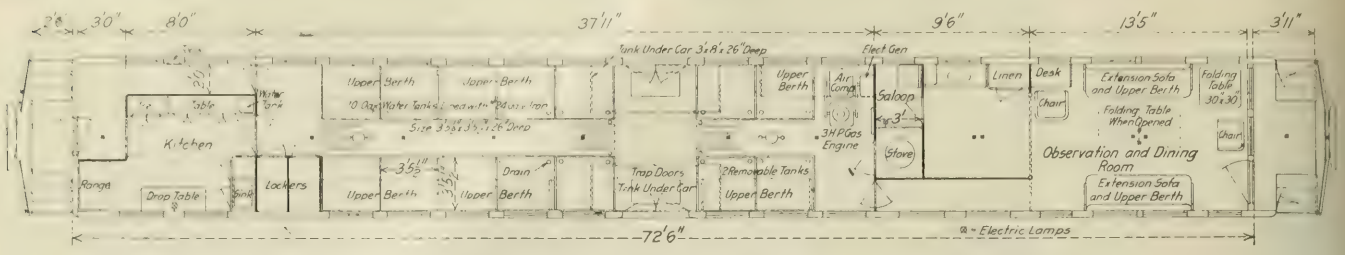
We are a great nation, not a federation of tribes. Never before has there been such a national consciousness. We should be as proud of prosperous railroads as of prosperous banks; we must have both if we are to keep pace with the great expansion ahead of us, to say nothing of our normal growth. The opportunity of this generation—your opportunity and mine—is to serve our country by promoting national unity. The paramount "state right" is to be part of the union. Nothing will promote national unity more than unified and consistent regulation of transportation, which, as President Wilson has said, is "*the* one common interest of our industrial life." It is a fascinating task, and it is most gratifying that all the multiplying signs of mutual friendliness and appreciation are so propitious for its accomplishment.

British Locomotive Exports.—The value of the engines shipped in March was only $350,000, as compared with $1,200,000 in March, 1915, and $1,250,000 in March, 1914. The value of the exports to March 31, this year, amounted to $1,650,000, as compared with $3,800,000 in the first quarter of 1915, and $6,000,000 in the first quarter of 1914.

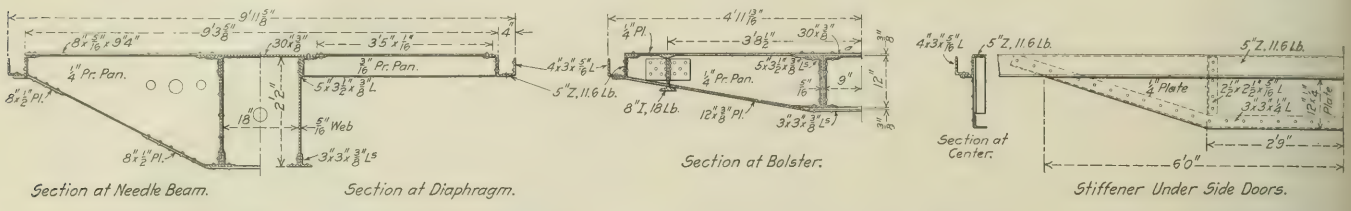
Utilizing Spoiled Munitions.—At the outbreak of the present war, many manufacturers went into the munitions business without definite ideas as to the requirements of this work. Consequently a large amount of material was spoiled or made in such a way that it would not pass inspection. One concern lost over 5,000 18-lb. British cartridge cases, but a novel use was made of these cases. They were placed in a punch press and smashed down so as to form a shallow cup. Soldered on the edges of this cup were two small curved holders which converted the cartridge case into a very satisfactory and attractive cigar and ash holder. The result was that the spoiled cartridge cases sold for a higher price in this form than they would have if sold for munition purposes.—*Machinery.*

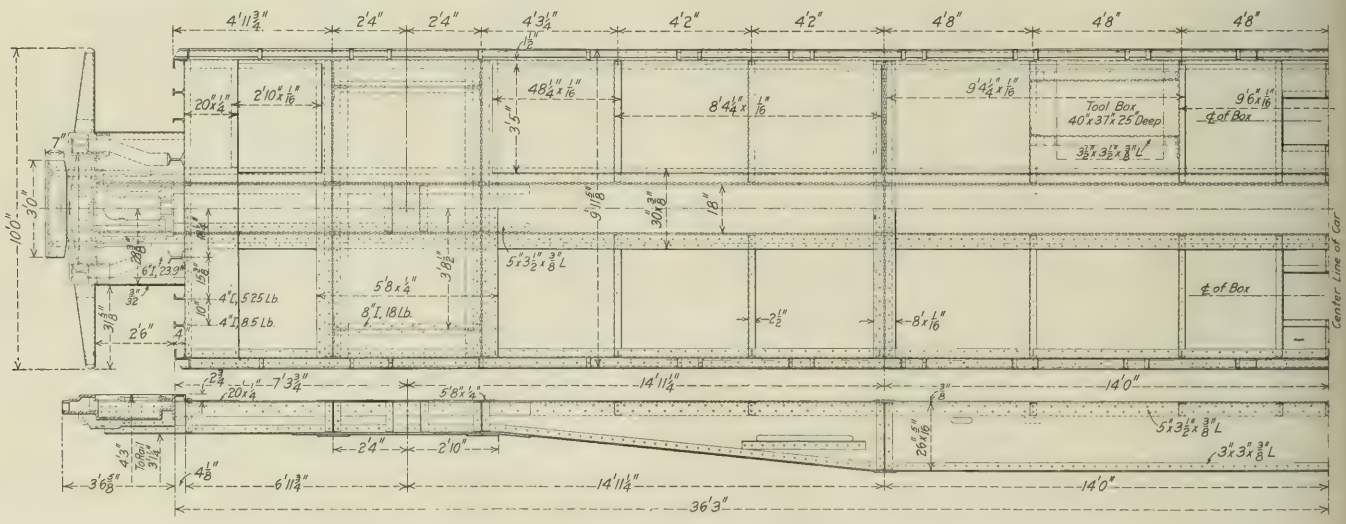
CAR FOR THE TRANSPORTATION OF LIVE FISH

The McGuire-Cummings Manufacturing Company, Chicago, recently completed for the Illinois State Game and Fish Commission a car for use in the transportation of live fish. It is of steel construction with interior finish of plain sawed oak, with the exception of the wainscoting which is of steel. It is 72 ft. 6 in. long over end sills, 81 ft. 2 in. long over platforms and the trucks are spaced 57 ft. 10½ in. between centers. The weight of the car is 139,100 lb. The center sills are of the built-up fishbelly type; the web plates are 26 in. deep at the center and 12 in. at the ends and are 5/16 in. thick. The top chord of the member is a 5 in. by 3½ in. by ⅜ in. angle and the bottom chord is made up of two 3 in. by 3 in. by ⅜ in. angles running the full length of the car body. There is a top cover plate running the full length of the car, 30 in. wide by ⅜ in. thick. Each side sill is a 4-in. by 3-in. by 5/16-in. angle and a 5-in., 11.6-lb. Z-bar riveted together. The body bolsters are of the built-up type and have a top cover plate ¼ in. by 68 in. extending the full width of the car body. The floor plates are 1/16 in. sheet steel and there are also two pressed steel cross-bearers.



Floor Plan of the Illinois State Game and Fish Commission's Fish Car





Arrangement of the Underframe of the Illinois State Fish Car



Car for Use in Live Fish Transportation

In the body framing the side sill forms the bottom chord of a girder whose web member is a plate 3/16 in. by 34⅜ in.,

extending the full length of the car body, while the top chord consists of a 4 in. by 1⅜ in. by 7/16 in. dropper bar. The side plate is a 4-in., 8.2-lb. Z-bar and the posts are of pressed steel, ⅛ in. thick by 4 in. wide. The floor is insulated with Flexolith and the insulation in the superstructure is Woolbestos. Agasote, ¼ in. thick, is used in the interior in the upper deck and the same material 3/16 in. thick in the lower deck. The trucks are of the 6-wheel type with 10 ft. 6 in. wheel base, 36 in. rolled steel wheels and 5 in. by 9 in. journals. The heating is provided for by stoves, no interior steam piping being applied, and the car is fitted with living accommodations.

The car is equipped with an aerating and water circulating system for the purpose of keeping the water in proper condition in the fish tank to keep the fish alive while in transportation. This is accomplished through a system of reservoirs and piping. There are 16 fish tanks, each one being connected with the system and having an overflow drain whereby the overflow water circulates to the receiving tank located underneath the car which has a capacity of 200 gallons.

There is also a tank placed in the roof of the car of 240 gal-



Interior of the Car, Showing the Fish Tanks

ions capacity which is the main reservoir for the system. The water is fed from this tank into the fish tanks as required, then out of the fish tanks through the overflow into the receiving tank below the car, and when the receiving tank is filled it automatically empties, the water being forced out of this reservoir by air pressure to the storage tank in the roof of the car.

The plant consists of a gasolene engine of 3 hp., and an air compressor of a capacity of 8 cu. ft. of free air per minute. The air reservoir is a high pressure tank 2 ft. by 5 ft., carrying a pressure of 80 lb. The circulation is automatically controlled by a float in the receiving tank which in turn is connected with electric contacts that operate an electric valve, cutting in the air when the receiving tank is full and cutting it out when the water is displaced.

The car is also supplied with its own electric plant for furnishing 22 lights in the car and also for furnishing power for operating the switches for the water circulating system. The generator is driven by the gasolene engine, with storage battery service. The storage battery is capable of thirty-six hours' service in operating the lights, etc., with the plant idle.

"POSITION LIGHT" SIGNALS ON THE PENNSYLVANIA

The drawing printed herewith shows the standard aspects and indications of the position light signals, block and interlocking, giving indications to trains both night and day by uncolored lights, which are now in service on the Pennsylvania between Overbrook and Paoli, on the Philadelphia division, and to be installed on the New York division from West Philadelphia to North Philadelphia when that section of the line is electrified.

These signals have now been in use nearly a year and a half. When they were first put in, and as they were described in the *Railway Age Gazette* of January 8, 1915, page 61; February 26, 1915, page 366; and March 5, 1915, page 404, each signal had two rows of lights burning continuously, the arrangement being made to correspond with a semaphore with two arms; but the scheme has now been simplified so that as shown, for example, in aspects 12, 13, 14, etc., only one signal or row of lights need be burning. In series with the upper row of lights there is a low resistance relay which, through its contacts, controls the circuit energizing the second row; so that, if the upper row should accidentally be extinguished, the circuit of the second row would be opened, extinguishing that also. Thus there is no danger of giving a false indication by the lower lights when the upper row has been put out.

It will be noticed that aspects 1, 12 and 20 are identical; and also, in the same way, 2, 14, 17 and 22; 3, 18 and 25; 4, 15, 19, 21, and 24 are identical. The same is true of 13 and 23; and thus there are, in all, only fifteen aspects to provide all the indications required for scheme No. 3 of the Railway Signal Association.

Aspect No. 16 may be changed at will to 12; that is, a Stop-and-Proceed may be changed to Stop-and-Stay, and vice versa. Where an automatic signal is used as a hold signal for train orders, the operator, on throwing his office switch to set the signal, opens the circuit of the single fixed light (which is the mark of a Proceed-after-Stopping signal) and, when he throws his switch back to clear the signal, it becomes again an automatic signal. Some signals are now being intalled with this arrangement. A take-siding indicator (No. 26) is also to be installed. This will be mounted on a mast by itself and will have lamps 12 in. apart, on centers, with a background 3 ft. square. It will be lighted only when in use.

It will be noted that the backgrounds of Nos. 1, 2, etc., appear unduly large. As a matter of fact, in the construction, aspects 12 to 25, inclusive, will have their own backgrounds of various shapes, depending on the number of positions displayed. All backgrounds will be made as small as practicable, thus reducing the wind pressure on the structure.

The fixed light in aspect No. 16 is mounted in front of the mast, and, as only one horizontal row is ever displayed, except on the interlocking signals, it is intended to use a short mast, R. S. A. standard.

Two signals have been put in service, protecting a single-track tunnel, which are lighted up by the approaching train. On these, for a period of four months, no adjustments or repairs were made; there was neither a failure of any kind nor a lamp renewal. Batteries (caustic soda) continued in first-class shape; the plates showed practically no signs of wear, and there was only a slight sediment in the bottom of the jar. The maintenance of these signals consists of inspection trips which, on account of distance from headquarters, consume three hours each. Several trips were made in January; two in February and two in March, at a cost in the latter two months of 80 cents per signal per month. The first and only failure so far occurred April 26; trackmen dragged cinders over the track and caused a short circuit, resulting in one

signal showing stop when it should have been clear and the other remaining lighted for about three hours. The normal time which these signals are lighted is one hour in twenty-four.

From a report made by Signal Engineer A. H. Rudd, it appears that the results from the operation of this type of signal have been very satisfactory. The number of failures of all kinds has been greatly reduced, and by doing away with all moving parts except the control relays the chance of false clear signals is reduced to a minimum. The enginemen are practically unanimous in their approval of the signals; and they say that the lights can be seen better in fog and in snowstorms than any other signals. The number of signals on a railroad may be reduced, as compared with the older types, because four aspects can be given with each signal, whereas other types afford only three. With the additional aspect it is sometimes practicable to use fewer signals. With colored lights only three colors are available, and with the semaphore arm only three aspects can be used, for all must be given in one quadrant. The arm cannot be moved from the lower to the upper quadrant without having it momentarily show stop.

These signals are lighted by alternating current. This is the ideal plan and is of course available at all places where electric propulsion is used. To light these signals continuously from a primary battery would, ordinarily, involve undue cost; but on lines of light traffic this source can be used, as the signals can be arranged to light up on the approach of a train and to go out as the rear of the train passes.

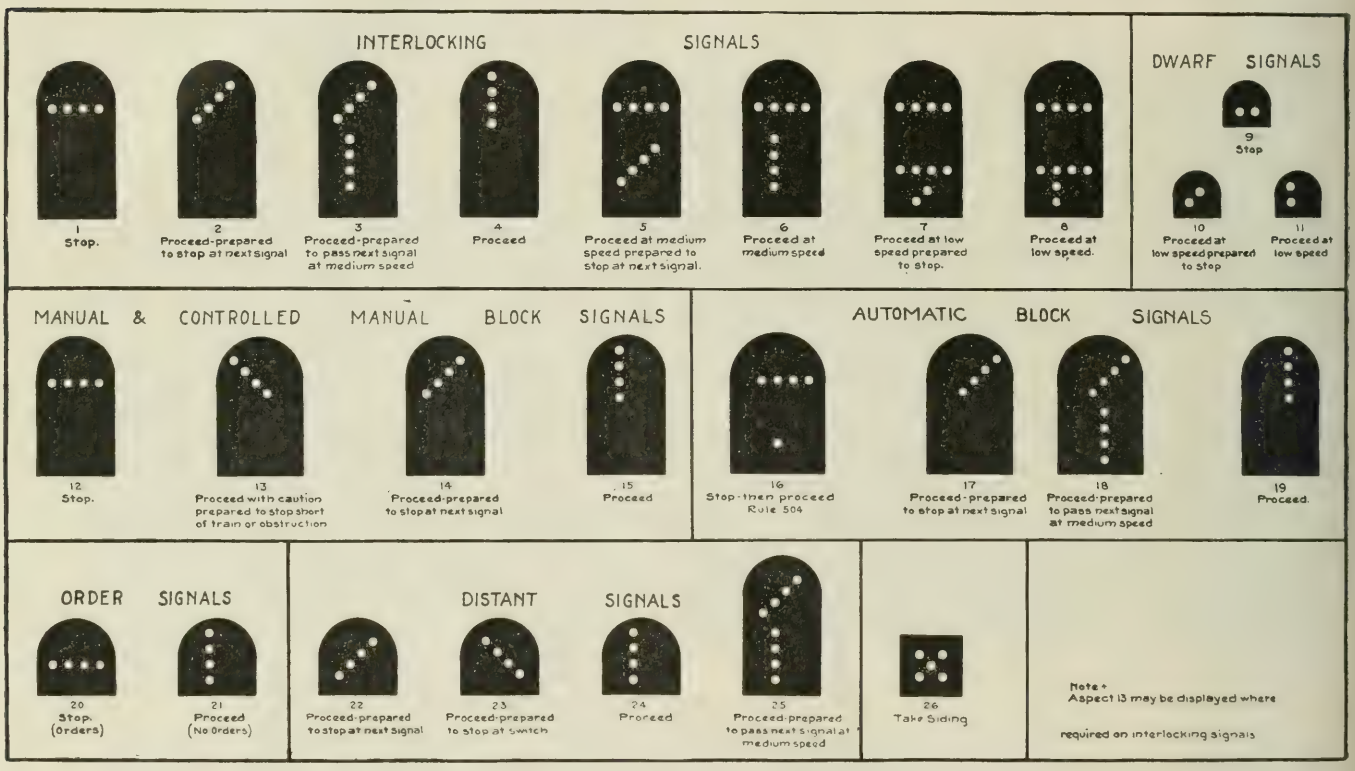
The signal installation from Overbrook to Paoli, about fourteen miles, cost approximately $355,000, including part of the cost of power house and of costly ducts for carrying wires underground, but excluding the new track bonding required in connection with electric propulsion. The cost also includes some changes that were made in interlocking. The signal locations were changed so that ninety automatic signals now take the place of the 110 signals formerly used.

Taking into account all elements, Mr. Rudd estimates that the average cost of a block section with a four-track automatic signal bridge, including signals and all fittings complete, is $10,071.22; with the least expensive semaphore a similar installation would have cost $10,633.07. This shows a saving per block section of $561.85; per signal, $140.46; and for the ninety signals, $12,641.40.

This saving of $12,000 would be greater on another installation, as a number of details could be left out. Moreover, the new standard aspects, now shown, if they had been adopted at first, would have lessened the cost $4,500. In short, the system as now developed will cost $1,100 a mile less than was the case eighteen months ago.

Mr. Rudd, because of his part in designing and developing these signals, classes himself as prejudiced; but he says that many of the officers of the road look to see light signals take the place of the movable arm for general use where semaphore signals would be operated by electric or pneumatic power.

In his report Mr. Rudd gives an interesting sketch of the development of the light signals. Experiments were first begun in the early part of 1914, Mr. Rudd's principal assistant being C. E. Goings. The glass was developed by Dr. William Churchill, of the Corning Glass Works, Corning, N. Y. The first signals were put in service February 14, 1915, and the first patent was issued March 14, 1916. A number of patents are still pending. All of the men who participated in the invention pooled their interests and licenses have been issued to the four principal signal companies. The Union and the General companies are prepared to fill orders. A long series of experiments had to be made to get rid of the glare of the sun on the lamps, which, under favorable conditions—favorable to the sun, not to the railroad—would illuminate the whole of the signal so that the lighted lamps were indistinguishable from those which were not lighted. On lines running east and west the lights for west bound movements were troublesome at sunrise, and those for east bound movements developed the same condi-



Standard Aspects and Indications as Given by "Position-Light" Signals on the Pennsylvania Railroad

on at sunset. These difficulties were present only for two r three weeks twice a year, when the sun, on its journey orth or south, shone on the lights at just the right angle to roduce the effect mentioned. On lines of railroad running orth and south this difficulty does not exist. The filaments the lamps are very small and delicate and have to be ocussed with great precision. By repeated changes in this ature and in the position of the lens, with the addition of reflector to more surely throw the rays downward, for the enefit of enginemen close to the signals, the trouble was tisfactorily overcome. Careful provision had to be made r the short distance view, because the signals, being fixed the overhead bridges supporting the electric wires for ropulsion, are about forty feet above the track. For dwarf gnals, which need not be visible more than about 1,000 et, the lamps are "frosted" by the use of chiffon.

THE WAR WEARING OUT IMPERIAL TRAINS

By Walter S. Hiatt.

Our Special European Correspondent.

Among other railroad material that is being worked over- ne now because of the European war may be mentioned the latial trains of the Emperors of Russia and Germany, the ing of Italy, and that of the President of the French Re- ublic. These trains have never been in service so fre- iently before.

Indeed, it is likely, should the war last many months nger, that the train of the President of the French Re- ublic will have to be rebuilt. It is a war order that some terprising American car builder may keep in mind. The ain was about to be rebuilt when the war started but the orthanded conditions in the French car factories have not rmitted the work to be carried out.

This train, while not the most luxurious and convenient the official trains of Europe, has perhaps the most inter- ting history of them all. It has figured in more impor- nt political events than any of the others, and has carried some time nearly all of the great men of the world, includ- g, possibly, France's greatest enemy, the Emperor William mself. The train was hurriedly built in the autumn of 96 for the immediate purpose of receiving the unexpected sit of the Czar of all the Russias, whose visit at this time mented and put the official seal on the alliance between ance and Russia, the most portentous political affair pos- ly in the whole history of modern Europe. The French nted, as is their custom, to celebrate this visit themselves d to welcome their visitor with every possible honor. It s on this occasion, for example, that the trees of the amps Elysees were decorated with hundreds of thousands flowers, artificial flowers to be sure, owing to the lateness the season, but yet flowers.

For the same reason the then most palatial of trains was ilt to carry the emperor from the frontier to Paris. Its ur cars were built in 13 days at the order of President lix Faure, and incidentally without the legal sanction that dinarily must accompany such expenditures. This sanc- n was formally granted long after the emperor had gone me. So hastily was the private personal car of the four ilt that it was not recalled until the tenth day that the peror might want to take a bath. So the roof of the car s promptly cut open and a space made large enough to rmit the lowering of a huge bath tub into a corner of the , not an ordinary bath tub, but one of solid silver. The is there after all these years, as is the patch in the car f. I was at pains to note it when visiting the cars. This in has its own great special housing shed at Villeneuve Georges, some miles out of Paris, though it has been as quently out as in that shed this year.

In October the train was used to convey the King of England to the French front where he reviewed in company with President Poincare 50,000 of the troops that had taken part in the victory of late September about Rheims, the victory today known as that of the fields of Champagne. Although the review took place but 12 miles behind the front, neither the King of England, nor the troops, nor the train was bombarded by the Germans, for the simple reason that the Germans did not know the place where the review was being held.

The train was used late in August for the purpose of conveying the King of Belgium to Paris. It was on this occasion that the king lost his suspenders, or rather, being used to a soldier's life and uniform, he forgot to put them on the morning he left the train after his night ride from Paris back to the northern front.

The ceremonial train of the French Republic differs from the Imperial trains in that it is not armored, and has no protection whatever against bullets and shells. It was built at a time when such trains had neither been conceived nor thought necessary. All of the four cars are elaborately upholstered in red and yellow silk velvets, and all are of wood construction, each 40 tons in weight. The cars are not at all of the typical French construction, but look rather like the massive American Pullman parlor car, except that the roofs are not fully rounded at the car ends. The interiors of the cars resemble somewhat the inspection or tourist cars used on the western railways of the United States, and have none of the abrupt divisions and cross compartments peculiar to the English or continental cars. While thoroughly comfortable, however, it is apparent by their fading curtains and upholstering, by their too palatial parlors, by their clumsy and ponderous arrangements which can no longer be called conveniences, that they have outlived their time and usefulness. They vaguely remind one of the old palace at Oiron, whose magnificence is falling into decay because no one can afford to live in the place.

In sharp contrast is the Imperial train of Germany which conveys the Emperor William to his several battle fronts. All of the seven cars of the train are partially armored, with bomb-proof bottoms and tops. When the train is run near the front it is pulled by one of the many armored locomotives now so common in France and Germany, a locomotive prepared to resist not only aeroplane bombs but cannon shell, a locomotive whose armor reaches down to the tracks and curves sharply upward until it resembles a land Merrimac.

A feature of the train is the library car in which is hung up a multitude of military maps, more than 700, for the study of the operations of German and enemy troops. Of course the train has its special telephone which can be connected at any station.

The special train of the Emperor of Russia is the most luxurious and longest of them all. It is composed of a dozen cars and is often run in two sections. It was adapted to war uses long ago, before the present conflict was thought of, its top, bottom, and sides being heavily armored and proof against dynamite charges planted on the tracks. Some of the cars are set aside for the Emperor's suite and guard, in others provision is made for a real Russian bath, a real kitchen, a smoking saloon and every comfort that the emperor might find in one of his own great palaces. There is also a chapel for worship and religious services.

Despite the many journeys now being made in these special trains, and the vigilance and effort of the enemy aeronauts, none so far has actually been injured during the war. Granting that all of them escape destruction, it is pretty certain, in view of the rapid wear and tear of train operation at the present time, that after the war the nations owning them will have to foot new bills for other official trains.

General News Department

The Boston Elevated Railway has announced an increase in the pay of employees which is said to aggregate $2,000,000 a year.

In court at Jamaica, N. Y., July 11, Michael Halleran, 27 years old, a crossing flagman of the Long Island Road, was sentenced by Justices Edwards, McInerney and Salmon to six months imprisonment for being intoxicated on duty.

It is reported that negotiations are in progress between officers of the Southern Pacific and the authorities of the Mexican government to restore the line of the Southern Pacific of Mexico to the officers of the company for operation. For some time the line has been in the hands of Mexican military authorities.

On the Broadway Limited of the Pennsylvania, east-bound, on the night of July 13, near Bucyrus, Ohio, four passengers were slightly wounded by shot from a shotgun. The passengers were sitting on the observation platform at the rear of the train and the shooting is said to have been done by a boy at the roadside, presumably animated by mere mischief.

The Lehigh Valley has given an annual pass to each employee who has been in the service of the company over fifty years, good for himself and his wife over all of the company's lines. On the list of these men there are 16 names, including two machinists, two boiler-makers, two car repairers, three watchmen and three laborers.

In connection with the passage by Congress of appropriations for railroad construction in Alaska, Lieutenant Mears, of the Alaskan Commission, announces that there is still a surplus supply of labor in Alaska, both skilled and unskilled. The government has just made the final payment of $650,000 on the Alaska Northern Railway, which was bought to be made a part of the new government railroad.

The employees of the Buffalo, Rochester & Pittsburgh at the shops of the company at Du Bois, Pa., said to number 900, who went out on strike July 12, came to an agreement with the officers of the road on the 14th and returned to work. The settlement between the company and the employees provides for increases in pay varying from 10 to 15 per cent; and it is said that time and a half will be paid for overtime work.

The Northern Pacific, in an effort to reduce loss and damage claims, has issued a circular to agents, conductors and yard foremen, announcing the organization of a freight claim prevention department as a part of the bureau of efficiency. The department is tentatively operating east of the Missouri river. Its province is to determine the causes which originate claims and to endeavor to eradicate them. The circular states that each case will be carefully investigated and given attention along educational lines. Printed cards have been furnished to the employees on which they may send suggestions to their superintendents.

Resignation of Professor C. Frank Allen

C. Frank Allen, professor of railroad engineering and for the past 30 years a member of the faculty of Massachusetts Institute of Technology, resigned July 10. Professor Allen graduated from the Institute in the class of 1872. For six years after his graduation he was engaged in work connected with the water and sewerage systems of several cities, including Boston and Newton, Mass., and Providence, R. I. In 1878 he entered the service of the Atchison, Topeka & Santa Fe, and was assistant engineer for the Santa Fe until 1885. In the meantime he studied law, and was admitted to the bar in New Mexico. He was later, in 1901, admitted to the Massachusetts bar. Professor Allen was made assistant professor of railway engineering at Massachusetts Institute of Technology in 1887. He became associate professor two years later, and subsequently was also appointed professor of railroad engineering. Among his technical writings are included: "Railway Curves and Embankments," "Tables for Earth Computations" and "Field and Office Tables."

It Pays to be a Railroader

[Harrisburg (Pa.) Star-Independent]

A galaxy of automobiles—including Fords and Packards—parked together, which to the bystander brought to mind scenes identified with funerals, ball games, track meets, a $2 show or a duel along the countryside, attracted considerable attention today at the Pennsylvania Railroad siding opposite the Reading terminal.

"Who is coming or going?" asked the man in the ice cream suit.

"Nobody," replied a well-fed gentleman counting a wad of yellowbacks. "Today is pay day."

The man in white sighed and wished he were a conductor, brakeman or engineer—or in his own words, "anything but an official."—*Harrisburg (Pa.) Star-Independent.*

Regulation of Railway Purchases

Frank Trumbull, president of the Chesapeake & Ohio; Robert S. Lovett, chairman of the board of directors of the Union Pacific, and Alfred P. Thom, general counsel of the Southern Railway, acting for the Railway Executives' Advisory Committee, and representing 84 per cent of the railroads of the country, on Wednesday of this week called on President Wilson to recommend the suspension of that section of the Clayton act, Section 10, which requires competitive bidding for railroad supplies. They ask to have the subject investigated by a joint committee of Congress, or by the Interstate Commerce Commission. It is understood that the President gave them a favorable response. They also appeared before the House Judiciary Committee, and were informed that favorable reports in the pending resolution have been made by sub-committees in both houses of Congress.

As noted last week, page 73, this law, as it now stands, goes into effect October 15 next. A resolution has been introduced in Congress to suspend Section 10 for two years, and this the President was asked to endorse. It is believed that the section was adopted by Congress in the conference report of the Senate and the House, without careful consideration of its drastic effect. As is well known, most of the larger railroads are made up of several separate corporations, and dealings between parent and subsidiary companies consist largely of mere bookkeeping technicalities. The parent companies do purchasing for the entire system, obtaining, because of large orders, lower prices than could be secured by the subsidiary lines.

Arbitration of Telegraphers' Wages

The arbitration of the claims of the telegraphers of the New York Central for increased pay and easier conditions of work will probably be the subject of a report within the coming week. The arbitrators, Messrs. H. K. Daugherty, a lawyer, of Grove City, Pa.; W. J. Fripp, general manager of the Eastern lines of the New York Central, and E. J. Manion, vice-president of the operators' brotherhood, have been listening to testimony in New York City for the past 10 days, and are now discussing the evidence. The witnesses brought forward by the brotherhood told of the difficulties of their work; the burdensome character of their incidental duties such as handling baggage and freight, keeping stations clean, attending switch lamps and answering telephone calls; and the cost of living. Supporting the demand for a more liberal allowance for vacations, the brotherhood leaders told of other roads on which two weeks, with pay, is allowed each operator once a year. It appears that in Illinois the New York Central pays certain telegraphers on a basis higher than that which prevails in the eastern part of its territory, and the efforts of the spokesmen for the operators were directed to securing the higher rate throughout the Central lines. They declare that they do not want old-age pensions; they want to prepare for old age themselves.

Officers of the road told of the comparatively easy character of most of the work in a large majority of the telegraph offices,

ying some of the claims put up by the spokesmen for the ployees. Attention was called to the fact that many egraphers have an income from the express company; and telegrapher said that from that source he received $30 a nth. As showing the possibilities of running a double track road without telegraphers, one witness for the company said t on the occasion of the Dayton (Ohio) flood in 1913, the e Shore & Michigan Southern ran trains between Cleveland Toledo, 106 miles, without the aid of the telegraph, for a iod of 11 days; and many extra passenger trains were run, be- se of washouts on other roads. The interference of the iority rule, demanded by the brotherhood, with the best ar- gement for making promotions, was set forth in some detail. he rates of pay of telegraphers on the New York Central, ac- ding to the principal witness for the brotherhood, average or $68 a month; whereas, according to his claim, the Pitts- gh & Lake Erie pays an average of $81.53 a month; the ton & Albany, $78.86; the New Haven, $77.28, and the Boston Maine, $75.37.

he chairman of the telegraphers' brotherhood on the New k, Chicago & St. Louis, subsidiary of the New York Central, le a statement in which he declared that telegraphers re- ed smaller pay than teachers, bank clerks and clerks in ories and other industrial establishments in various towns Ohio, Indiana and Pennsylvania.

Transportation of the National Guard

answer to criticisms concerning the transportation, etc., of national guard, Secretary Baker and the war department made public some of the reports from the army officers who e been investigating the matter. In giving out the reports retary Baker himself said that "the war department regards handling of the details of the movement of the troops to border as excellent in every respect."

ajor General Leonard Wood, commanding the eastern de- ment, in his report said that "All troops leaving mobilization ps in the eastern department were furnished with ten days' el rations. Trains were provided with either a cook car baggage car with a range set up in it, and this has been e in all cases wherever possible. Where there was no op- unity to furnish coffee to troops they were provided with ey. It is not possible that troops which have been reported t of rations at Kansas City and Cincinnati could have been t unless rations had been thrown away, as every precaution been taken to see that they started with an ample supply. leeping space furnished national guard troops mustered into ice of the United States en route to the Mexican border was prescribed by the war department. When available, tourist ers have been provided, and when not available, day coaches ided by war department regulation of three men to each double seats. When day coach equipment was available, the oads provided one double seat to each man without extra ge. Troops have been transferred from day coaches to tour- leepers when en route whenever possible to do so. Cars out lights were not used to transport troops. Troop trains not sidetracked or delayed to accommodate private busi- but troop trains have been held on request of commanding ers to exercise men and animals and for bathing the . . . . . ."

ajor General Thomas H. Barry, commanding the central de- ment, said: "Under instructions from the war department ing cars were furnished only by the quartermaster general's e, and orders directed that coaches must be used on the basis ree men to each two double seats, and that troops must not eld at mobilization camps awaiting tourist sleepers, explain- that where forwarded from point of origin in day coaches y effort was made to meet trains en route with tourist ers. In some cases troops started in day coaches.

ll troop trains from the central department left with proper ing facilities. No information that any cars were side- ed or delayed to accommodate private business. All troops ng mobilization camps in the central department after July rried ten days' rations. The comparatively few organiza- leaving prior to July 1 carried sufficient rations to allow lelays en route, and all troops had sufficient to carry them ie border. . . . All troop trains were provided with r baggage or open-end box cars with cooking arrangements. Water was provided for all troop trains before detparture, in accordance with the regulations, and in many cases extra water cans and ice were carried.

"All troop trains were inspected by camp quartermasters, and in many cases by senior mustering officers, surgeon, organization commander and railroad officials."

Major General J. Franklin Bell, commanding the western department, made a similar report and concluded:

"I personally inspected and supervised administration of mobilization camps. Everything which could be controlled by subordinates of the regular army and those at headquarters was done as promptly and thoroughly as possible under the circumstances. Consider mobilization and forwarding of troops to border relatively most creditable to all concerned.

"Not a single complaint received at department headquarters from any source."

The Wage Controversy

Members of the organizations of train and engine employees, now taking a strike vote to enforce their demands for an increase in wages, are holding public meetings in railroad centers throughout the country at which addresses are made on the subject of the wage controversy. At such a meeting held at Spokane, Wash., recently, resolutions were adopted which included the following:

"Regardless of any controversies which may be pending as between the railroads and our brotherhoods, we stand ready to perform any and all duties which will make for the prompt movement of such trains as may be necessary for the transportation of troops and supplies to the border, and at all times to do our full duty toward upholding the dignity of our country and the honor of our flag."

The Transportation Brotherhoods' Publicity Bureau has issued a statement regarding the proposal of the railways that the wage controversy be settled either by arbitration or by reference to the Interstate Commerce Commission. The statement is in part as follows:

"The Interstate Commerce Commission has no authority under the law to regulate wages of employees any more than it has to regulate the price of steel rails and other supplies purchased by the railroad companies. Therefore, any investigation made by the Interstate Commerce Commission into the subject of wages would come to naught for the reason that the commission has no power to settle the matter.

"Under the Newlands arbitration law, it is distinctly provided that arbitration can be set in operation when a strike is threatened. No man has a right to say that a strike is threatened until the result of the strike vote, now being taken, is ascertained. The will of the employees must be known before a strike can be threatened.

"If the Interstate Commerce Commission would assume the responsibility of agreeing that the demands of the men should be met, it would clearly be up to the commission to provide the means for meeting any increased cost of operation. The railways, of course, would like to put the Interstate Commerce Commission under this obligation to grant increased freight rates.

"If it is right and proper for the freight train employees to go into an arbitration as to whether they shall be worked excessive hours and as to what they shall sell their labor for, then it would only be consistent for the railway car and engine builders and railway supply dealers to agree to arbitrate with the railroads as to the price the railroads should pay for these things.

"The principle objection, however, of the employees to arbitration would be on the ground of the inability to secure impartial arbitrators who were sufficiently acquainted with the technicalities of a problem of this kind."

The National Conference Committee of the Railways, Elisha Lee, assistant general manager of the Pennsylvania Railroad, chairman, has published advertisements in many of the weekly papers, giving figures showing the wages of train employees in eastern, western and southern territory. The advertisements are signed by the members of the National Conference Committee, and read as follows:

To the American Public:

Do you believe in arbitration or industrial warfare?

The train employees on all the railroads are voting whether

they will give their leaders authority to tie up the commerce of the country to enforce their demands for a 100 million dollar wage increase.

The railroads are in the public service—your service. This army of employees is in the public service—your service.

You pay for rail transportation 3 billion dollars a year, and 44 cents out of every dollar from you goes to the employees.

On all the eastern railroads in 1915, 75 per cent of the train employees earned these wages (lowest, highest and average of all) as shown by the payrolls:

	Passenger		Freight		Yard	
	Range	Av'ge	Range	Av'ge	Range	Av'ge
Engineers	$1,641 } 3,224 }	$1,931	$1,585 } 2,992 }	$1,783	$1,303 } 2,178 }	$1,543
Conductors	1,553 } 3,004 }	1,831	1,552 } 2,901 }	1,642	1,145 } 1,991 }	1,315
Firemen	951 } 1,704 }	1,128	933 } 1,762 }	1,109	752 } 1,633 }	935
Brakemen	957 } 1,707 }	1,141	862 } 1,521 }	973	834 } 1,635 }	1,085

The average yearly wage payments to *all* eastern train employees (including those who worked only part of the year), as shown by the 1915 payrolls, were:

	Passenger	Freight	Yard
Engineers	$1,796	$1,546	$1,384
Conductors	1,724	1,404	1,238
Firemen	1,033	903	844
Brakemen	1,018	858	990

A 100 million dollar wage increase for men in freight and yard service (less than one-fifth of all employees) is equal to a 5 per cent advance in all freight rates.

The managers of the railroads, as trustees for the public, have no right to place this burden on the cost of transportation to you without a clear mandate from a public tribunal speaking for you.

The railroads have proposed the settlement of this controversy either under the existing national arbitration law, or by reference to the Interstate Commerce Commission. This offer has been refused by the employees' representatives.

Shall a nation-wide strike or an investigation under the government determine this issue?

The figures given for the western and southern roads are as follows:

On all the southern railroads in 1915, 75 per cent of the train employees earned these wages (lowest, highest and average of all), as shown by the payrolls:

	Passenger		Freight		Yard	
	Range	Av'ge	Range	Av'ge	Range	Av'ge
Engineers	$1,972 } 3,983 }	$2,306	$1,455 } 3,505 }	$1,916	$1,156 } 2,424 }	$1,566
Conductors	1,552 } 2,696 }	1,847	1,353 } 2,358 }	1,580	1,055 } 1,749 }	1,245
Firemen	943 } 1,652 }	1,209	649 } 1,638 }	979	406 } 1,302 }	777
Brakemen	957 } 1,736 }	1,109	755 } 1,854 }	958	754 } 1,405 }	990

The average yearly wage payments to *all* southern train employees (including those who worked only part of the year), as shown by the 1915 payrolls, were:

	Passenger	Freight	Yard
Engineers	$2,144	$1,712	$1,313
Conductors	1,723	1,488	1,157
Firemen	1,096	865	688
Brakemen	1,013	845	868

On all the western railroads in 1915, 75 per cent of the train employees earned these wages (lowest, highest and average of all) as shown by the payrolls:

	Passenger		Freight		Yard	
	Range	Av'ge	Range	Av'ge	Range	Av'ge
Engineers	$1,747 } 3,094 }	$2,195	$1,537 } 3,076 }	$2,071	$1,056 } 2,445 }	$1,378
Conductors	1,543 } 2,789 }	1,878	1,454 } 2,933 }	1,935	1,151 } 2,045 }	1,355
Firemen	1,053 } 2,078 }	1,317	751 } 2,059 }	1,181	418 } 1,552 }	973
Brakemen	854 } 1,719 }	967	874 } 1,961 }	1,135	862 } 1,821 }	1,107

The average yearly wage payments to *all* western train employees (including those who worked only part of the year), as shown by the 1915 payrolls, were:

	Passenger	Freight	Yard
Engineers	$2,038	$1,737	$1,218
Conductors	1,772	1,624	1,292
Firemen	1,218	973	832
Brakemen	921	1,000	1,026

Canadian Board of Inquiry

A. H. Smith, president of the New York Central, is chairman of a board of three members, which is to inquire into the railway situation in Canada, a temporary commission just appointed by the Canadian government, and announced at Ottawa, July 14. The other members are Sir Henry L. Drayton, K. C., chairman of the Canadian Railway Commission, and Sir George Paish. The Railway Board of Inquiry, as it will be called, will be constituted under the Inquiries Act, and provincial governments have been requested to co-operate with it. The board is required to report without delay. Sir Henry Drayton has had long experience as chairman of the Board of Railway Commissioners, and has a record for ability, firmness and impartiality.

Sir George Paish, the eminent financial authority in Great Britain has always taken a lively interest in Canadian affairs.

The scope of the proposed inquiry is outlined as follows:

1. The general problem of transportation in Canada.

2. The status of each of the three transcontinental railways, the Canadian Pacific, the Grand Trunk and the Canadian Northern, having special reference to the following considerations:

(a) The territories served by each, and the service which it is capable of performing.

(b) Physical conditions, equipment and capacity.

(c) Methods of operation.

(d) Branch lines, feeders and connections in Canada.

(e) Connections in the United States.

(f) Steamship connections.

(g) Capitalization, fixed charges and net earnings, having regard to present conditions and probable future development.

3. The re-organization of any of the systems, or the acquisition thereof by the state, and in the latter case the most effective system of operation, whether in connection with the Intercolonial Railway or otherwise.

4. All matters which the members of the board may consider relevant.

Disastrous Floods in North Carolina and Tennessee

Floods in the Catawba and French Broad rivers, July 16, submerged scores of buildings in Asheville and Biltmore, N. C., and in numerous smaller places; and did damage amounting to millions of dollars; and five or more persons were drowned. The station of the Southern Railway at Asheville together with many cars and locomotives were submerged. In Charlotte, N. C., a bridge of the Southern Railway was carried away, together with ten or more men, including workmen of the railroad company and linemen of the Western Union Telegraph Company. The men were reported lost, but the report is not confirmed. The Seaboard Air Line bridge at Mount Holly, N. C., was destroyed, and traffic on that company's lines was interrupted at a number of places by washouts. Much damage was done in East Tennessee, a number of bridges being destroyed on the Virginia & Southwestern. The Carolina, Clinchfield & Ohio, and other roads suffered in many places, rivers rising from 15 feet to 30 feet above normal level. The Norfolk & Western was flooded west of Radford, Va. Press despatches from Wilmington, N. C., and Charleston, S. C., reported floods at many places and traffic generally interrupted.

An officer of the Southern Railway summarized the situation on that company's lines on July 19 as follows:

"The most serious flood damages to the Southern Railway are in North Carolina on Catawba river draining east through the Piedmont region, and French Broad river draining west through Asheville, caused apparently in both cases by failure of dams, as our main line bridges on the several other rivers in the coastal plain all withstood ordinary flood waters. Catawba river has taken out bridges of all railroads west of Camden and Wateree, S. C., including four Southern Railway bridges on radiating lines, Salisbury-Asheville, Charlotte-Atlanta, Charlotte-Columbia and Rockhill-Camden. Through passenger service from the east to Atlanta, Birmingham, Memphis and beyond was maintained via Lynchburg, Bristol and Knoxville. The roadbed on our mountain lines in western North Carolina was badly scoured. Work of reconstruction at all breaks is now progressing satisfactorily."

The Norfolk & Western, on the 18th, reported its main line repaired, so that normal train movement was restored.

MONTH OF MAY, 1916

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Ann Arbor	294	$181,614	$40,649	$236,076	$27,396	$34,716	$5,516	$81,457	$549	$13,949	$163,577	$72,499	$15,900	$54,652	$4,595
Arizona Eastern	378	302,496	44,160	364,394	64,585	35,881	2,369	62,515	1,602	11,000	177,659	186,736	16,200	170,445	75,956
Atlantic & St. Lawrence	167	130,642	19,461	160,669	20,652	26,309	4,636	94,988	.....	4,895	151,480	9,189	11,505	—2,316	55,047
Atlantic City	170	72,741	130,904	214,312	35,977	21,013	1,069	99,266	56	1,080	158,462	55,850	10,000	45,819	28,296
Atlantic Coast Line	4,705	2,124,511	606,383	2,990,987	368,323	525,557	61,605	962,680	9,308	81,176	2,006,229	984,757	137,000	847,258	282,087
Baltimore & Ohio	4,535	8,139,116	1,293,868	10,201,713	1,483,451	2,065,305	158,074	3,320,488	62,871	256,260	7,346,302	2,855,411	316,887	2,534,679	—299,477
Baltimore & Ohio Chicago Terminal	79	.....	653	165,770	20,409	26,552	1,554	70,050	1,385	10,132	126,907	38,863	22,689	16,174	—7,811
Baltimore, Chesapeake & Atlantic	88	57,837	24,822	88,511	11,791	14,571	1,302	45,537	.....	2,705	75,906	12,605	2,243	10,362	—2,370
Bangor & Aroostook	632	276,291	50,778	344,284	44,310	44,261	4,701	76,343	2,331	12,822	184,767	159,517	14,150	145,367	54,474
Belt Ry. Co. of Chicago	31	.....	.....	262,089	17,072	33,183	1,573	108,895	.....	6,075	166,798	95,292	15,199	80,093	—15,908
Buffalo & Susquehanna R. R. Corporation	253	108,244	6,762	118,570	21,176	36,970	1,241	33,175	.....	4,952	97,514	21,055	2,600	18,455	8,124
Canadian Pacific Lines in Maine	233	103,811	15,295	129,669	7,187	14,706	5,413	59,982	.....	4,171	91,458	38,211	.....	38,211	45,492
Carolina, Clinchfield & Ohio	283	256,084	20,795	283,555	26,434	37,517	16,818	51,914	.....	14,829	146,552	137,003	9,500	127,503	56,503
Carolina, Clinchfield & Ohio of S. C.	18	15,997	1,117	17,555	811	108	2,360	2,595	.....	798	6,623	10,932	500	10,371	7,572
Central of Georgia	1,924	637,194	234,832	978,565	162,038	181,245	41,292	307,153	1,961	44,295	736,197	242,367	54,548	183,379	46,046
Central of New Jersey	681	2,101,703	533,006	2,850,499	223,302	396,066	26,888	980,363	14,652	61,235	1,701,904	1,148,595	139,594	1,009,001	275,893
Central New England	304	403,563	26,910	451,827	42,947	35,799	1,530	144,008	.....	4,256	228,534	223,293	17,800	205,493	51,373
Central Vermont	411	272,830	64,719	371,864	42,312	45,322	8,153	162,153	150	8,485	266,575	105,289	15,640	89,652	19,029
Charleston & Western Carolina	342	108,385	24,994	141,087	28,051	21,307	3,581	51,406	.....	4,300	108,644	32,443	5,000	27,414	410
Chesapeake & Ohio Lines	2,374	3,416,560	509,952	4,243,767	553,190	841,161	60,426	1,196,806	29,802	86,157	2,763,347	1,480,421	162,272	1,317,601	346,957
Chicago & Alton	1,052	949,755	307,044	1,369,246	165,196	299,451	39,674	449,438	10,445	32,802	996,518	372,728	51,877	316,374	69,386
Chicago & Eastern Illinois	1,136	969,314	225,907	1,299,148	228,198	282,550	25,540	439,969	8,175	38,558	1,021,860	277,288	62,500	214,556	336,629
Chicago & Erie	270	635,265	44,382	739,819	73,900	77,527	20,342	261,064	2,504	15,173	449,590	290,229	22,230	267,999	177,920
Chicago & North Western	8,108	5,354,441	1,689,758	7,914,805	1,465,335	1,197,021	100,519	2,794,794	60,481	164,435	5,769,823	2,144,983	405,000	1,739,797	280,076
Chicago, Indianapolis & Louisville	622	488,349	163,079	704,030	88,536	114,217	20,371	217,976	476	17,342	458,687	245,342	36,505	208,778	67,360
Chicago, Peoria & St. Louis	255	122,151	22,540	152,994	15,035	39,845	6,088	61,239	.....	5,590	127,797	25,196	6,000	19,196	25,743
Chicago, Rock Island & Gulf	477	198,624	44,767	262,962	41,764	47,246	9,381	85,608	1,118	8,008	193,122	69,840	10,000	59,728	52,625
Chicago, Terre Haute & Southeastern	373	160,736	15,498	181,469	53,461	69,391	4,361	53,972	963	8,765	190,813	—9,344	13,383	—22,978	—41,334
Cincinnati, Hamilton & Dayton	622	724,794	94,396	923,321	218,376	154,944	14,339	310,363	3,404	16,996	717,506	205,815	29,796	175,881	110,330
Cincinnati, Indianapolis & Western	322	123,265	44,405	186,232	39,027	19,544	6,179	78,361	463	6,819	149,773	36,459	8,665	27,793	.....
Cincinnati Northern	246	136,086	14,228	155,954	27,503	27,976	3,852	52,284	.....	3,122	114,738	41,216	6,000	35,216	22,701
Colorado Midland	338	89,806	11,993	110,994	23,781	28,668	8,631	51,544	1,049	5,286	118,959	—7,965	6,800	—14,765	4,521
Colorado & Southern	1,102	560,464	108,676	721,134	102,312	137,271	11,750	199,830	3,374	20,371	470,908	250,226	35,000	215,212	142,874
Denver & Salt Lake	255	107,446	28,389	140,319	17,640	32,919	3,075	47,148	.....	2,424	103,206	37,113	7,008	30,104	—5,682
Detroit & Mackinac	393	80,494	25,412	111,725	15,346	20,622	1,754	33,067	.....	3,015	73,804	37,921	8,029	29,892	22,232
Detroit & Toledo Shore Line	81	144,641	.....	144,986	11,655	9,019	1,799	35,068	.....	3,052	60,593	84,392	6,925	77,467	23,630
Detroit, Grand Haven & Milwaukee	191	227,000	44,000	307,393	53,905	33,184	5,216	129,385	663	4,290	226,644	80,749	3,770	76,764	76,444
Detroit, Toledo & Ironton	441	178,510	11,819	205,242	21,852	25,300	4,704	86,229	.....	6,467	144,552	60,690	6,000	54,690	34,253
Duluth & Iron Range	288	889,192	18,966	922,228	93,230	75,910	1,402	181,425	2,042	10,085	362,384	599,844	45,932	513,910	69,768
Duluth, Missabe & Northern	399	1,644,781	29,790	1,741,039	139,713	157,017	2,583	263,350	1,175	12,578	576,416	1,164,622	86,687	1,077,936	249,802
Duluth, South Shore & Atlantic	628	206,382	76,587	311,956	64,721	40,094	8,851	106,679	3,938	9,602	233,884	78,072	19,000	59,063	46,055
Duluth, Winnipeg & Pacific	187	115,579	16,124	137,053	19,242	13,961	1,872	42,033	551	6,420	84,079	52,973	6,853	46,121	26,610
Erie	1,988	4,396,952	761,932	5,710,310	484,465	1,190,451	96,300	2,003,986	34,320	114,907	3,921,265	1,789,045	194,147	1,593,377	583,222
Fort Worth & Denver City	454	322,557	108,003	453,661	63,855	77,579	6,754	121,606	2,431	15,952	288,178	165,483	15,217	150,267	73,616
Galveston, Harrisburg & San Antonio	1,351	707,129	240,313	1,038,077	151,860	154,455	32,611	410,380	9,735	31,230	801,093	236,984	48,502	188,148	152,139
Galveston Wharf	12	.....	.....	112,608	478	2,871	333	32,224	16,194	370	52,469	60,138	12,000	48,138	7,847
Georgia	307	168,968	59,075	247,343	29,036	43,173	12,805	104,316	74	8,893	198,279	49,064	4,873	44,065	26,459
Georgia, Southern & Florida	395	117,793	48,819	193,440	25,496	43,103	8,810	65,391	927	8,463	152,177	41,263	12,594	28,391	10,754
Grand Rapids & Indiana	575	335,212	107,697	481,471	65,823	90,265	12,301	181,011	203	15,157	364,764	116,707	24,081	92,622	42,314
Grand Trunk Western	347	680,000	102,000	822,113	82,179	119,819	15,965	262,468	6,276	13,717	500,424	321,689	32,970	288,409	245,458
Great Northern	8,102	5,288,003	1,013,860	6,917,872	1,382,550	850,186	108,549	1,920,225	72,061	114,153	4,112,146	2,505,726	438,431	2,066,834	1,016,452
Gulf, Colorado & Santa Fe	1,938	906,352	224,363	1,217,487	260,666	196,238	28,884	454,611	.....	44,331	978,740	238,747	54,687	183,713	59,281
Houston & Texas Central	895	322,778	116,261	481,966	81,827	72,753	16,838	174,256	4,666	18,344	368,329	113,637	30,517	83,045	28,686
Indiana Harbor Belt	110	.....	.....	377,001	61,019	51,966	2,824	139,203	.....	8,791	263,804	113,197	7,845	105,322	23,622
Kanawha & Michigan	177	287,149	32,572	327,941	37,374	70,980	2,852	73,870	50	7,137	192,263	135,678	14,150	121,503	42,698
Kansas City, Mexico & Orient	738	167,750	77,099	207,072	46,157	48,228	8,805	87,395	.....	10,053	200,638	6,434	11,032	—4,600	23,168
Lehigh & Hudson River	97	155,326	3,552	189,334	18,342	22,372	1,341	60,908	.....	4,333	107,296	82,037	5,000	77,037	15,444
Lehigh Valley	1,442	3,649,790	358,568	4,318,612	316,344	880,028	84,341	1,459,841	14,438	103,008	2,856,275	1,462,338	145,000	1,311,573	91,827
Long Island	397	388,679	746,576	1,313,144	152,070	136,062	12,913	481,059	6,245	34,220	821,160	491,984	72,627	419,215	71,533
Louisiana Western	208	140,763	52,550	208,446	29,742	35,536	7,381	49,251	1,411	6,102	129,419	79,027	10,583	68,357	34,589
Louisville & Nashville	5,038	4,012,972	978,702	5,358,819	683,278	1,008,832	123,586	1,529,030	20,582	108,775	3,465,493	1,893,326	195,710	1,697,137	846,939
Louisville, Henderson & St. Louis	200	100,301	33,142	142,418	33,886	9,111	4,983	40,970	.....	3,203	92,153	50,266	3,800	46,452	35,887
Minneapolis & St. Louis	1,646	662,880	144,191	855,850	120,774	134,993	18,537	308,100	90	23,088	605,581	250,269	41,158	208,810	—13,629
Minneapolis, St. Paul & S. S. Marie	4,229	2,244,378	444,637	2,888,212	311,290	393,363	50,895	837,396	13,570	58,185	1,659,617	1,228,594	119,281	1,109,314	711,762
Missouri, Kansas & Texas	3,865	1,848,540	671,125	2,731,345	535,581	570,637	57,976	902,629	17,558	98,799	2,183,128	548,217	129,958	416,826	—52,047
Missouri, Oklahoma & Gulf	334	94,631	22,608	125,009	22,783	21,845	4,949	57,312	110	7,659	114,659	10,350	8,272	2,054	47,503
Missouri, Oklahoma & Gulf of Texas	125	16,018	708	16,907	3,193	3,470	1,845	10,146	.....	1,522	20,176	—3,269	361	—3,629	8,925
Mobile & Ohio	1,122	924,871	101,209	1,084,534	106,912	228,661	35,641	361,090	2,245	30,967	765,516	319,018	36,460	281,959	24,521
New Orleans & Great Northern	285	130,186	26,699	171,975	19,394	17,914	2,846	42,467	186	6,640	89,447	82,527	3,886	78,613	34,619
New York, New Haven & Hartford	2,005	3,428,111	2,536,898	6,866,229	779,652	871,706	45,619	2,506,626	79,664	133,568	4,415,485	2,450,744	250,000	2,200,583	462,311
New York, Ontario & Western	568	487,352	111,619	722,212	92,873	98,139	8,063	282,144	.....	16,140	495,329	226,883	23,000	203,865	28,278
New York, Philadelphia & Norfolk	112	390,144	34,848	457,092	34,100	97,602	4,741	147,703	4,182	11,577	299,385	157,707	8,500	149,153	69,039

Roadmasters' and Maintenance of Way Association

The annual meeting of the Roadmasters' and Maintenance of Way Association will be held at the Hotel McAlpin, New York, September 19 to 22. A special train will be provided over the New York Central for members from Chicago and the West.

The Track Supply Association, which meets with the Roadmasters' and Maintenance of Way Association, is now completing arrangements for its exhibit. Practically all the space has now been assigned, and indications are that the exhibit will be one of the largest in the history of this association. The following firms have signified their intention of exhibiting:

Ajax Forge Company, Chicago.
Ajax Rail Anchor Company, Chicago.
American Hoist & Derrick Company, St. Paul, Minn.
American Steel & Wire Company, Chicago.
American Valve & Meter Company, Cincinnati, Ohio.
Bowman, T. B., Chicago.
Carborundum Company, Niagara Falls, N. Y.
Carnegie Steel Company, Pittsburgh, Pa.
Chicago Malleable Castings Company, West Pullman, Ill.
Cleveland Frog & Crossing Company, Cleveland, Ohio.
Creepcheck Company, New York.
Crerar-Adams Company, Chicago.
Dressel Railway Lamp Works, New York.
Duff Mfg. Company, The, Pittstburgh, Pa.
Elliot Frog & Switch Company, East St. Louis, Ill.
Empire Railway Appliance Corp., New York.
Eymon Continuous Crossing Company, Marion, Ohio.
Fairbanks, Morse & Company, Chicago.
Fairmont Gas Eng. & Ry. Motor Car Company, Fairmont, Minn.
Frictionless Rail Company, Boston, Mass.
Hatfield Rail Joint Mfg. Company, Macon, Ga.
Hauck Mfg. Company, Brooklyn, N. Y.
Hayes Track Appliance Company, Richmond, Ind.
Hussey-Binns Shovel Company, Pittsburgh, Pa.
Indianapolis Switch & Frog Company, Springfield, Ohio.
Ingersoll-Rand Company, 11 Broadway, New York.
Jordan, O. F., Company, Chicago, Ill.
Keystone Grinder & Mfg. Company, Pittsburgh, Pa.
Lackawanna Steel Company, Buffalo, N. Y.
Lundie, John, New York.
Madden Company, The, Chicago.
Mitchell Rail Anchor Company, W. M., Louisville, Ky.
Mudge & Company, Chicago.
Morden Frog & Crossing Works, Chicago.
National Malleable Castings Company, The, Cleveland, Ohio.
P. & M. Company, The, Chicago.
Pocket List of Railroad Officials, New York.
Positive Rail Anchor Company, Louisville, Ky.
Q. & C. Company, The, New York.
Rail Joint Company, The, New York.
Railroad Supply Company, The, Chicago.
Railway Review, Chicago.
Ramapo Iron Works, Hillburn, N. Y.
Reading Specialties Company, Reading, Pa.
Sellers Mfg. Company, Chicago.
Seltite Company, Inc., Westchester, N. Y.
Simmons-Boardman Publishing Company, New York.
Southern Railway Supply Company, St. Louis, Mo.
Templeton, Kenly & Company, Chicago.
Track Specialties Company, New York.
Union Switch & Signal Company, The, Swissvale, Pa.
Verona Tool Works, Pittsburgh, Pa.
Wharton, Wm., Jr., & Company, Inc., Philadelphia, Pa.
Wyoming Shovel Works, The, Wyoming, Pa.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, date of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, New Orleans, La.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.

American Association of Railroad Superintendents.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Annual meeting, August 16-18, 1916, Memphis, Tenn.

American Electric Railway Association.—E. B. Burritt, 8 W. 40th street, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Electric Railway Manufacturers' Association.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Railway Association.—J. E. Fairbanks, general secretary, 75 Church St., New York.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, New Orleans, La.

American Railway Tool Foremen's Association.—Owen D. Kinsey, Illinois Central, Chicago. Annual meeting, August 24-26, 1916, Hotel Sherman, Chicago.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

Association of Manufacturers of Chilled Car Wheels.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

Bridge and Building Supply Men's Association.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

International Railroad Master Blacksmiths' Association.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next meeting, August 15-17, 1916, Hotel Sherman, Chicago.

International Railway General Foremen's Association.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, August 29 to September 1, Hotel Sherman, Chicago.

Maintenance of Way and Master Painters' Association of the United States and Canada.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

Master Car and Locomotive Painters' Association of the United States and Canada.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 12-14, 1916, "The Breakers," Atlantic City, N. J.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

Railway Fire Protection Association.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Annual meeting, October 3-5, 1916, New York.

Railway Real Estate Association.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 10, 1916, Chicago.

Railway Signal Association.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 12-14, 1916, Grand Hotel, Mackinac Island, Mich.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

Roadmasters' and Maintenance of Way Association.—F. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Salt Lake Transportation Club.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

Signal Appliance Association.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

Society of Railway Financial Officers.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Washington, D. C.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of Newark.—Roy S. Bushy, Firemen's Bldg., Newark, N. J. Regular meetings, 1st Monday, in month, except July and August, The Washington, 559 Broad St., Newark.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August. Waldorf-Astoria Hotel, New York.

Traffic Club of Pittsburgh.—D. L. Wells, Gen'l Agent, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

Traffic Club of St. Louis.—W. S. Crilly, 620 South 7th St., St. Louis, Mo. Annual meeting, December 5, 1916. Noonday meetings, October to May.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next meeting, September 5-8, 1916, Hotel Sherman, Chicago.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The Pacific Mail Steamship Company, now said to be controlled by W. R. Grace & Co., announces that on August 19 it will resume sending ships across the Pacific. Three vessels have been engaged for use on this route, as an experiment. Rates for transportation of freight are now so high that it is expected that the extra expense due to the present navigation law of the United States will be partly or fully offset.

The Chicago, Burlington & Quincy last week ran a special train from St. Paul to Chicago, carrying a party of Shriners to a convention at Buffalo, which was completely equipped with telephones in every car and every berth. The train was composed of 12 cars, including a diner and a car equipped for band concerts. The telephones were installed by the Tri-state Telephone Company of St. Paul and Minneapolis, and the exchange was of the automatic type.

The Pennsylvania Railroad announces that beginning today, July 21, the Federal Express, between Washington and Boston, discontinued last January, will again be put in service; but it will be run only once a week each way, northbound on Friday, and southbound on Sunday evening. The train runs by way of the Lehigh & Hudson river and the Poughkeepsie bridge, as before; and one of the reasons given for putting it on at this time is that passengers desire to travel to and from the New England summer resorts without passing through New York City during the prevalence there of infantile paralysis.

The executive traffic officers of the western transcontinental lines were in conference for several days in Chicago last week for the purpose of considering the Interstate Commerce Commission's recent order rescinding the relief granted under the fourth section, on "Schedule C" commodities westbound, and certain Pacific coast products eastbound, on account of the absence of competition through the Panama canal. It is understood that no final conclusions were reached by the railroads as to just how they will proceed in complying with the order, which gives them the alternative of advancing the rates to the Pacific coast or reducing certain rates to intermediate points; and the details are still being considered.

Car Surpluses and Shortages

The American Railway Association Committee on Relations Between Railroads has issued Statistical Statement No. 18, giving a summary of freight car surpluses and shortages for July 1, 1916, with comparisons.

TOTAL SURPLUS

July 1, 1916	67,014
June 1, 1916	70,310
July 1, 1915	276,421

The surplus for June 1, 1916, includes figures reported since the issue of Statistical Statement No. 17.

There has been little change in the total car surplus situation since the report for June 1. There is a considerable box car surplus west and northwest of Chicago and on the Pacific Coast, but little in any other section. The coal car surplus shows a slight decrease, the greater part of the surplus being west and northwest of Chicago and in the East. The miscellaneous car surplus is mostly on the Pacific Coast and in the Middle West.

TOTAL SHORTAGE

July 1, 1916	14,898
June 1, 1916	12,617
July 1, 1915	785

The shortage for June 1, 1916, includes figures reported since the issue of Statistical Statement No. 17.

There is a very small increase in the box car shortage in practically all parts of the country, and a small increase in the coal car shortage in the East, but no large amount of shortage of any class of equipment in any one section.

The figures by classes of cars follow:

Classes	Surplus	Shortage
Box	26,455	8,465
Flat	3,189	902
Coal and gondola	14,097	5,003
Miscellaneous	23,273	528
Total	67,014	14,898

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Minneapolis grain merchants have filed a complaint with the Interstate Commerce Commission against alleged discriminatory rates and transit privileges on carload shipments of grain and grain products from Washington, Oregon, Idaho, North and South Dakota and Montana to Chicago, Milwaukee, Minneapolis, Duluth and Superior, and through these cities to eastern destination.

The Interstate Commerce Commission began a hearing in Chicago on July 10 in its inquiry into the matter of rates on and classification of lumber and lumber products. The hearing, which lasted throughout last week and into this week, is being conducted by Chairman Meyer with the assistance of Examiner-Attorney Hines and Examiner Esch. In advance of the hearing the commission had gathered a mass of information on the subject by submitting interrogatories to lumbermen all over the country, and at the hearing both the shippers and the carriers were asked to answer other questions suggested by the commission. The hearing has been attended by approximately 200 persons, including lumber shippers, railroad traffic men and attorneys. The first week was devoted to the testimony of shippers, and the carriers followed. The testimony presented during the first week indicated a general satisfaction on the part of both shippers and railroads with the present situation as to lumber rates and classification, with minor exceptions, and with comparatively little disagreement between the position of the shippers and that of the railroads. A statement on behalf of the West Coast Lumbermen's Association, the Eastern Oregon Lumber Producers' Association, the Western Pine Manufacturers' Association, the California White and Sugar Pine Association and the California Red Wood Association was made by Joseph N. Teal, their attorney, and the representatives of the Western railroads announced that they would accept it as their own.

New York Storage

Opinion by Commissioner Harlan:

Prior to January 1, 1915, inbound domestic freight awaiting delivery in New York harbor or for transshipment coastwise could be held without storage charges for 10 days, either in cars or in railroad warehouses on the New Jersey shore, or at the Sixtieth street station of the New York Central. The charge for the following 10 days, or fraction thereof, was 1 cent per 100 lb., and for each succeeding 10 days one-half cent per 100 lb. By tariffs approved in *Lighterage and Storage Regulations at New York*, 35 I. C. C., 47, 54, the free storage period on domestic inbound freight was reduced from 10 days to 5 days, and the storage charge thereafter was made 1 cent per 100 lb. for each succeeding 10 days or fraction thereof. The respondents later filed tariffs in which storage charges in cents per 100 lb. were proposed, after the expiration of five days' free time, of one-half cent, respectively, for the first and second five-day periods, and 1 cent for each of the succeeding five-day periods. These tariffs having been suspended were finally canceled without becoming operative. Thereafter, by special permission of the commission, the tariffs at present in force were filed to become effective on January 16, 1916, on less than statutory notice. These latter tariffs provided, after five days' free time, a storage charge of one-half cent per 100 lb. for each succeeding five-day period or fraction thereof.

This adjustment apparently proving unsatisfactory, the respondents now propose a storage charge that increases with each successive period of 30 days. That is to say, after the expiration of five days' free time, the charge proposed of one-half cent for each of the successive five-day periods remains constant until six of such periods, or 30 days, have elapsed; for the next six five-day periods the charge proposed is 1 cent, and for the third period of the same duration, 2 cents per 100 lb. The following statement shows the variations in the charges in cents per 100

lb., after the expiration of free time, during the various periods hereinbefore mentioned:

Periods of storage	Prior to Jan. 15, 1916	Suspended I. and S. 780 subsequently canceled	Effective Jan. 16, 1916, and at present in effect	Proposed and here under suspension
5 days	1	½	½	½
10 days	1	1	1	1
15 days	2	2	1½	1½
20 days	2	3	2	2
25 days	3	4	2½	2½
30 days	3	5	3	3
35 days	4	6	3½	4
40 days	4	7	4	5
45 days	5	8	4½	6
50 days	5	9	5	7
55 days	6	10	5½	8
60 days	6	11	6	9
65 days	7	12	6½	11
70 days	7	13	7	13

Export traffic is affected by the proposed charges to the extent that the increased storage charges will apply if such traffic is placed in storage after the expiration of 15 days' free time. The chief complaint against the advanced rates was made by the dealers in flour. The commission finds that the new rates are justified and that the carriers are right in taking this measure to compel the removal of freight from their piers and warehouses within a reasonable period after it is tendered the consignee for delivery. (40 I. C. C., 265.)

Telephone Rates

Lott B. Malone v. New York Telephone Company et al. Opinion by Commissioner McCord:

The commission holds that a through "particular person" rate of $1.65 from Flushing, N. Y., to Canaan, N. H., composed of a rate of 15 cents for the first three minutes and 5 cents for each additional minute on calls from Flushing, N. Y., to New York City for beyond, and $1.50 for the first three minutes and 50 cents for each additional minute on calls from New York City to Canaan, N. H., is not proved unreasonable by a hypothetical through rate of $1.55 between Flushing and Canaan composed of a 5-cent "two-number" or local rate from Flushing to New York City and a $1.50 particular person rate from New York City to Canaan.

Telephone calls may be classified, and a through rate for one kind of service is not necessarily unreasonable merely because it exceeds an aggregate of intermediate rates for a different kind of service. Through calls at combination rates require fewer terminal services than separate calls under the rates combined, but combination through rates that include charges for terminal service not performed are unreasonable. The reasonableness of contract provision under which the service of complainant was discontinued is not decided, nor does the commission take up the question of the application of the fourth section to telephone charges. (40 I. C. C., 185.)

The Missouri River-Nebraska Cases

Opinion by Commissioner Clark.

This proceeding embraces five complaints brought by the commercial clubs of Sioux City and Council Bluffs, Iowa, St. Joseph and Kansas City, Mo., and Atchison, Kan., which are similar in character. The complainants attack as unreasonable, discriminatory, and prejudicial the class rates between the above-named cities and all points in Nebraska. Allegations of discrimination and prejudice are predicated upon comparisons of the rates in question with class rates which became effective for intrastate transportation between Omaha, Lincoln, and other Nebraska cities and points in that state on September 6, 1914, pursuant to an order of the Nebraska State Railway Commission, generally known as general order No. 19. This order prescribed new schedules of class rates applicable to the principal distributing centers on the Missouri River and in interior Nebraska which compete for the trade of Nebraska. Other allegations of unjust discrimination have reference to classification differences. Nebraska classification No. 1, effective December 15, 1911, names certain ratings applicable to intrastate shipments which are lower than those fixed by western classification No. 53 governing interstate traffic. The intrastate rates are also governed by certain exceptions to the Nebraska classification, which provide more liberal rules and lower ratings on intrastate traffic than are accorded to interstate shipments.

The defendants embrace all of the railroads having lines in Nebraska with the exception of the Santa Fe, the Great Western, the St. Paul and the Wabash, which reach only one city in that state.

The total reduction in revenues of all railroads serving Nebraska which would result from the application of the Nebraska rates to interstate as well as intrastate transportation was estimated to be from $1,200,000 to $1,400,000 annually.

The commission is convinced of the earnest endeavor of the Nebraska commission to deal with the complex problem of rate making with justice to all parties before it. It is its conclusion, however, that the intrastate rates prescribed in general order No. 19 are too low for application as reasonable maximum interstate rates between the Missouri river cities and points in Nebraska, and therefore too low to form the measure by which discrimination found to exist should be removed. This conclusion is sustained by the many rate comparisons and other related evidence, and by the material reductions in the defendants' revenues which would be consequent upon the application of the intrastate rates to interstate transportation.

The commission's conclusions are as follows: The defendants by charging higher class rates and by applying higher classification ratings and exceptions thereto, between Sioux City Council Bluffs, St. Joseph, Kansas City and Atchison, and points in Nebraska than between Omaha, Lincoln, Fremont, Beatrice, Fairbury, Plattsmouth, Hastings, St. Paul, Nebraska City, Grand Island, Columbus, Kearney, and Norfolk, and points in Nebraska for transportation under substantially similar circumstances and conditions, give an undue preference to the Nebraska points named.

It is also found that there is unreasonable preference in favor of the Nebraska cities in that the defendants publish class rates between the Nebraska cities named and other points in Nebraska which equalize in large measure charges between Omaha, Lincoln, Fremont, Beatrice, Fairbury, Plattsmouth, Nebraska City, Grand Island, Columbus, Kearney, and Norfolk, and said points in the state of Nebraska and do not publish between Sioux City, Council Bluffs, St. Joseph, Kansas City, and Atchison, and points in Nebraska, class rates which embody the same or similar equalizations.

The commission holds that the present class rates on interstate shipments between Sioux City and Council Bluffs, Iowa, St. Joseph and Kansas City, Mo., and Atchison, Kan., and points in Nebraska are unreasonable to the extent that they exceed a scale of reasonable maximum class rates prescribed. These rates are given for distances from 1 to 700 miles.

This scale is constructed, in substance, upon the first-class rates of the Iowa-Nebraska scale prescribed in Iowa State Board of R. R. Commissioners V. A. E. R. R. (28 I. C. C. 193,-563.) in connection with the percentage relation of classes which was adopted by the Nebraska commission. The first-class rates for distances 40 to 700 miles are the same as under the Iowa-Nebraska scale, while for distances less than 40 miles the first-class rates under that scale have been here readjusted by increasing the base rate and reducing the money rate of progression. The base rate of the Iowa-Nebraska scale is 13 cents, to which is added 3 cents per 5 miles from distances 6 to 20 miles and 2 cents per 5 miles for distances 21 to 40 miles, making a rate of 30 cents for 40 miles. The base rate of the scale found reasonable is 22 cents, to which is added 1 cent per 5 miles for all distances to 40 miles, making also a rate of 30 cents for 40 miles. While the result of this readjustment is to make some increase for the shorter distances over the rates of the Iowa-Nebraska scale, it is believed that the increased base rate more nearly reflects the actual terminal costs than does the base rate of that scale.

The money rate of progression is 1 cent per 5 miles for 100 miles, stated for 5-mile groups; 1 cent per 5 miles for distances 101-200 miles, stated for 10 mile groups; 0.75 of 1 cent per 5 miles for distances 201-700 miles, stated for 20-mile groups. This is substantially the same as the money rate of progression adopted by the Nebraska commission which, is 1 cent per 5 miles for distances 6 to 200 miles, stated for 5-mile groups; 1 cent per 5 miles for distances 201 to 400 miles, stated for 10-mile groups; 0.5 of 1 cent per 5 miles for distances 401-700 miles, stated for 10-mile groups.

The percentage relationship of classes adopted by the Nebraska commission, which meets with unqualified approval, is higher on certain classes than that prescribed in the Iowa-Nebraska scale. The principal change is in the fourth-class rate, which is increased from 50 per cent of first class to 60 per cent of first class, while fifth class is increased from 40 per cent of first class to 45 per cent of first class. The result is a spread of 15 per cent of first class between fourth class, under which the movement is largely less than carloads, and fifth class, under which the tonnage is in carloads. The corresponding spread of the Iowa-Nebraska scale is 10 per cent. Class A is increased from 45 per cent of first class to 50 per cent of first class, while Class E is reduced from 20 per cent of first class to 17 per cent of first class.

For transportation over two or more lines, not parts of the same system and not under a common ownership or control, the following arbitraries, in cents per 100 pounds, may be added:

Class	1	2	3	4	5	A	B	C	D	E
Cents	5	4	3½	3	2½	2½	2	1½	1½	1

(40 I. C. C. 201.)

STATE COMMISSIONS

Pennsylvania Full Crew Law

The public service commission of Pennsylvania, acting on complaints brought by the Brotherhood of Railroad Trainmen, has decided a number of questions concerning the interpretation of the law of that state, adopted June 19, 1911, prescribing the number of men that shall be employed on trains. The complaints were against the Pennsylvania, the New York, Chicago & St. Louis, the Pittsburgh & Lake Erie, the Baltimore & Ohio, the Central of New Jersey, and the Cumberland Valley.

The questions at issue were:

Is a combination passenger and baggage car to be considered one car or two under the law?

Is it complying with the law to permit an expressman to act as a baggageman, or vice versa?

Is it complying with the law to have a conductor of a cafe car serve as a brakeman?

Is a train traveling between a series of classification yards subject to the provisions of the full-crew law?

Is it sufficient defense for a railroad to show that its mail cars comply with the federal postal regulations in point of construction?

Should the railroad be required to carry a baggageman on a train, even though the baggage car is kept locked and there are no duties for a baggage man to perform?

The Pennsylvania runs a train, from Pittsburgh to New York, of nine cars, one of which, a combination car, contains baggage, but no train baggage man is employed, the baggage compartment being locked, and opened by the station baggage men; the commission rules that a train baggage man must be employed. The law requires the rear car, on a train made up only of mail cars, to have a rear platform and provision for easy access to it from the interior of the car. The railroad (the Pennsylvania) is required to provide a car with a suitable platform. On the Baltimore & Ohio one crew of six men includes the dining car conductor classed as a brakeman. The commission says that this is not a compliance with the law. The brakeman must be a brakeman all the time; one of his duties is constant watchfulness. This decision also applies to cases on the Central of New Jersey and the Philadelphia & Reading. One of the defendants claimed that parlor cars and sleeping cars are not to be classed as passenger coaches as specified in the statute; but the commission says that no such fine distinction in names of cars is allowable; sleeping cars are passenger coaches.

On the Cumberland Valley, the complainants alleged that a train consisting of a passenger coach and a combination baggage and smoking car should be called a train of three cars; but the commission rules that the correct number is two; and the train does not come within the requirement of the law.

A train of the Pennsylvania consisting of three passenger coaches and a fourth car used for both passengers and baggage is a train of four cars. On a certain train of the New York, Chicago & St. Louis the baggage man acts also as an express messenger; but the complaint of the Brotherhood that this man is wrongfully counted as a member of the crew, is dismissed.

The commission rules that the three yards of Pittsburgh & Lake Erie at McKee's Rocks, 23rd street, Pittsburgh, and 34th street, Pittsburgh, are virtually one yard, and that, therefore, the full-crew law does not apply to a movement within these limits.

COURT NEWS

Construction of Missouri Foreign Companies Law

The Missouri Supreme Court holds that the state statute of 1913, providing that no railroad corporation, except one incorporated under the laws of Missouri, shall be permitted to carry passengers or freight from one point in the state to another, is prospective, not retroactive; it should be construed as applying to railroads built after its enactment, and should not be so construed as to contravene existing rights.—State ex rel. Wabash v. Roach (Mo.) 184 S. W., 969.

Duty to Licensees

A derailed engine was being put back on the track when a person from curiosity took up a position just off the right of way, about 50 feet from the engine, knowing it was somewhat dangerous, and after he and others had been warned off. In placing a cable around the boiler it was placed back of some lugs, against which, on one of the pulls, the cable slipped. On making another pull, a lug snapped and was hurled against the bystander, inflicting injuries for which he sued, basing his right of action on the rule requiring those engaged in the use of machinery to use a proper degree of care to prevent injury to persons on adjoining property and those passing on adjacent streets. The Supreme Court of the State of Washington held that the plaintiff was a mere licensee who had exposed himself to the apparent danger of his own free will, and could not recover. The case was not analogous to those where persons on adjoining property are injured by articles thrown from trains.—Shafer v. Tacoma Eastern (Wash.) 137 Pac., 485.

Liability Under Separate Coach Laws

The state of Texas sued the Galveston, Harrisburg & San Antonio for penalties under the Texas statute of 1907, providing for separate accommodations for white and colored passengers. Colored passengers were carried in a Pullman sleeping car on a train running from Los Angeles to New Orleans. The Texas Court of Civil Appeals holds that the statute does not assess a pecuniary penalty against the railroad for failing to compel members of each race to ride in coaches or compartments provided for such race; the only penalty prescribed against the railroad is for a failure to furnish separate coaches and compartments. If it furnishes such accommodations, no penalty can be recovered from it, although a passenger may subject himself to a penalty by riding where he is not entitled to, and the conductor may also be subject to a penalty for permitting him to do so. The burden is on the state to show that the required accommodations were not provided. Evidence that white and negro passengers occupied together a particular Pullman coach is not sufficient to show that other coaches, properly marked and fitted, were not provided. Neither the railroad nor the conductor has, under such statutes, the right to compel an interstate negro passenger to leave the coach in which he was riding and go into another, though equal in point of comfort and convenience. Under such statutes, if it be conceded that they apply to Pullman sleepers (though the court thought they did not) the burden is on the state to show that no other Pullman coaches in the train were equipped as prescribed. If the train contained Pullman coaches, properly marked and fitted, the fact that a negro was permitted to ride in a Pullman not so marked or equipped, would not entitle the state to recover the penalty from the railroad. The court quoted with approval the Kentucky case of Commonwealth v. Illinois Central (1911), 141 Ky., 502, 133, S. W., 1158, decided under a similar statute. In that case it was held that the fact that a railroad hauls a sleeping car does not make it liable to indictment because of its hauling the sleeping car with its unseparated white and colored passengers within or through the state, as the railroad did not operate the sleeper within the meaning of the statute. The statute does not require railroads to have sleepers on their trains or own them; they are owned and furnished by the Pullman Company.—State v. G., H. & S. A. (Tex.), 184 S. W., 227.

Railway Officers

Executive, Financial, Legal and Accounting

P. L. Overman, freight auditor of the Western Maryland, at Baltimore, Md., has been appointed auditor of freight and passenger accounts.

Howard V. Platt, whose appointment as vice-president and general manager of the Oregon Short Line has been announced, was born at Lynn, Ind., on July 27, 1865. He entered railway service in 1885, in a clerical capacity on the Union Pacific. From 1886 to 1892 he was in train service on the same road. He was stationed at Pocatello, Idaho, as agent for the Oregon Short Line between February, 1892, and April, 1902, when he became agent at Salt Lake City. In March, 1903, he was appointed superintendent, and in May, 1905, left the Oregon Short Line to become superintendent of the Los Angeles division of the Southern Pacific. On October 31, 1908, he was appointed general superintendent of the southern district of the Southern Pacific, with headquarters at Los Angeles. In February, 1914, he was made assistant general manager at that city. His appointment as vice-president and general manager of the Oregon Short Line was effective on July 1. His headquarters are at Salt Lake City, Utah.



H. V. Platt

Louis A. Farquhar, whose appointment as assistant auditor of the Oregon-Washington Railroad & Navigation Company, has been announced, was born on July 17, 1880, near Hempstead, Tex. He graduated from Hempstead high school in 1896, and entered railway service with the Houston & Texas Central on August 1, 1900. He was consecutively clerk and cashier in the local freight office of that road at Hempstead until November 3, 1905, when he went to Austin, Tex., as depot freight agent of the Houston & Texas Central and the Missouri, Kansas & Texas. On August 24, 1906, he was made chief clerk to the superintendent of the Houston & Texas Central at Austin. From June 9, 1909, to August 15, 1909, he was chief clerk of general accounts of the Central Lines at Houston, Tex., and from the latter date until September 2, 1910, was traveling and office accountant of the same roads at Houston. He was then chief clerk to the auditor of the same lines at Houston, and on October 1, 1911, was made special accountant of the Sunset Central Lines, with headquarters at Houston. From November 19, 1911, to January 31, 1913, he was special accountant of the Union Pacific and Southern Pacific systems at Chicago and New York. From February 1, 1913, to September 30, 1914, he was special accountant for the Union Pacific system, with headquarters at New York. He was then auditor of the Norfolk Southern, with headquarters at Norfolk, Va., until April 10, 1915, when he again became special accountant for the Union Pacific system, with headquarters at New York. On June 1, 1916, he was appointed assistant auditor of the Oregon-Washington Railroad & Navigation Company, with headquarters at Portland, Ore.



L. A. Farquhar

The Western Pacific went out of the hands of the receivers on July 14, and the board of directors has announced that the following officers are reappointed: A. R. Baldwin, general attorney; J. F. Evans, general auditor, and Charles Elsey, treasurer, all with offices at San Francisco, Cal. Lyman Rhoades has been appointed assistant treasurer with headquarters at New York City.

C. C. Glessner, auditor of coal and coke receipts of the Baltimore & Ohio system at Baltimore, Md., has been promoted to auditor of freight claims, and the position of freight claim agent has been abolished. L. A. Lambert, auditor of miscellaneous receipts and accounts at Baltimore, has been appointed auditor of coal and coke receipts, succeeding Mr. Glessner, and the duties of the auditor of miscellaneous receipts and accounts will be assumed by J. M. Watkins, auditor of revenue at Baltimore.

O. P. Van Sweringen of Cleveland, Ohio, has been elected chairman of the board of the New York, Chicago & St. Louis. J. J. Bernet, vice-president of the New York Central and the Michigan Central at Chicago, has been elected president, and will also assume the duties of general manager of the New York, Chicago & St. Louis, with office at Cleveland, Ohio, succeeding W. H. Canniff, resigned, as commented on elsewhere in this issue. M. J. Van Sweringen, W. S. Hayden and J. R. Nutt have been elected vice-presidents, W. D. Turner has been elected secretary and Otto Miller, treasurer. The secretary and treasurer's offices will be moved from New York to Cleveland. The firm of M. B. & H. H. Johnson, Cleveland, have been appointed general counsel to succeed F. B. Carpenter, resigned. A. W. Johnston, general manager at Cleveland, has been appointed assistant to president.

Operating

C. E. Littlefield has been appointed assistant to manager of dining cars and hotels of the Union Pacific system, with office at Ogden, Utah.

George S. Everitt, trainmaster of the Kansas City, Mexico & Orient, has been appointed acting superintendent to succeed A. H. Dickinson, who resigned as superintendent at Wichita, Kan., to engage in other business.

H. B. Voorhees, general superintendent of the Cincinnati, Hamilton & Dayton at Cincinnati, Ohio, has also been appointed general superintendent of the northwest district of the Baltimore & Ohio Southwestern, with headquarters at the same city.

H. A. Hansen, assistant superintendent of dining cars and hotels of the Union Pacific at Omaha, Neb., has been appointed superintendent of dining car and hotel department of the Oregon-Washington Railroad & Navigation Company, with office at Portland, Ore., vice J. C. Morrison, assigned to other duties. Effective July 12.

R. B. White, superintendent of the Illinois division of the Baltimore & Ohio Southwestern, has been transferred to the Indiana division, with headquarters at Seymour, Ind., vice E. W. Scheer, promoted. M. H. Broughton, assistant superintendent at Cincinnati, Ohio, has been appointed superintendent of the Illinois division, with headquarters at Flora, Ill.

Victor V. Boatner, trainmaster of the Illinois Central, with office at Mattoon, Ill., has been promoted to superintendent of the New Orleans division of the Yazoo & Mississippi Valley, with headquarters at Vicksburg, Miss., vice Fred B. Oren, transferred to Mattoon as roadmaster of the Indiana division of the Illinois Central. Floyd R. Mays has been appointed trainmaster of the New Orleans division of the Yazoo & Mississippi Valley, with office at Wilson, La., vice J. B. Yellowly, transferred. Henry Fletcher has been appointed trainmaster of the

Vicksburg division, with office at Greenville, Miss., vice Floyd R. Mays, transferred. He will also continue to handle the duties of traveling engineer. Paul E. Odell has been appointed trainmaster of the Indiana division of the Illinois Central, vice V. C. Boatner, promoted, effective July 15.

The Virginia & Southwestern was leased on July 1, 1916, by the Southern Railway, and is now operated as the Appalachia division of the Middle district, with the following officers: C. E. Burchfield, superintendent; F. C. Simpson, master mechanic; J. W. Wampler, roadmaster—all with headquarters at Bristol, Va.-Tenn. The jurisdiction of general and district officers of the operating department of the Southern Railway has been extended over the Appalachia division.

J. S. Bergman, superintendent of the Norfolk division of the Southern Railway at Norfolk, Va., has been appointed assistant superintendent of the Winston-Salem division, with headquarters at Winston-Salem, N. C.; R. L. Avery, superintendent of terminals at Spencer, has been appointed superintendent of the Norfolk division, with headquarters at Norfolk, vice Mr. Bergman, and J. H. Rickmond has been appointed superintendent of terminals at Spencer, vice Mr. Avery.

Leonard B. Allen, whose appointment as general superintendent of the Central general division of the Chesapeake & Ohio, with headquarters at Huntington, W. Va., has been announced, was born on April 19, 1879, at Lexington, Ky. He was educated in the public schools of his native town, and graduated from the Kentucky State University in 1899 with the degree of civil engineer. Mr. Allen began railway work in June, 1899, as masonry inspector on the Southern Railway; in November of the same year he went to the Chesapeake & Ohio on an engineering corps, and has been in the continuous service of that road ever since. In 1903 he served in the construction department, and from 1903 to 1905 with the maintenance of way department of the same road. He was then appointed division engineer, Kentucky division, remaining in that position until 1910. From 1910 to 1913 he was engineer maintenance of way, and subsequently for a short time served as assistant chief engineer. In 1914 he was appointed superintendent of the Huntington and Big Sandy divisions at Huntington, which position he held at the time of his recent appointment as general superintendent of the Central general division of the same road, as above noted.

Edward Waldemar Scheer, recently appointed general superintendent of the Baltimore & Ohio Southwestern, with office at Cincinnati, Ohio, was born on April 28, 1875, at Zaleski, Ohio. He entered railway service on February 10, 1890, as a messenger in the office of the superintendent of the car department of the Cincinnati, Washington & Baltimore. From May 1, 1890, to December 15, 1895, he was employed as a clerk and stenographer on the Baltimore & Ohio Southwestern. From the latter date until January 1, 1899, he was chief clerk to the division superintendent, and then served as secretary to the vice-president and general manager until February 1, 1906. From 1906, to June 24, 1912, he was consecutively chief clerk to the general manager and assistant secretary and chief clerk to the general superintendent of the same road at Cincinnati, Ohio. From June 24, 1912, to June, 1913, he was assistant to the general superintendent of the Baltimore & Ohio Southwestern, and the Cincinnati, Hamilton & Dayton. He was superintendent of the Illinois division of the Baltimore & Ohio Southwestern, with headquarters at Flora, Ill., until June 1, 1915, when he was transferred to the Indiana division, with headquarters at Seymour, Ind. On July 10, 1916, he was appointed general superintendent of the Baltimore & Ohio Southwestern, with office at Cincinnati, Ohio.



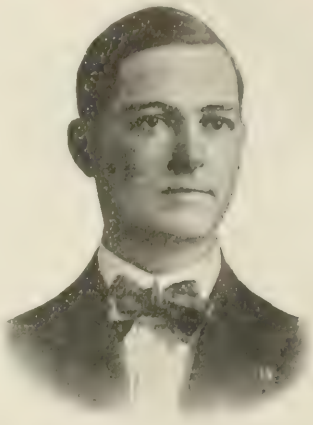
E. W. Scheer

Traffic

C. E. Macy has been appointed manager of mail traffic of the Denver & Rio Grande, with headquarters at Denver, Colo.

W. S. Upshur having been assigned to other duties, the office of assistant general freight agent of the Chesapeake & Ohio and the Chesapeake & Ohio of Indiana at Richmond, Va., was abolished on July 1. R. A. Knightly has been appointed chief of tariff bureau, with office at Richmond, Va., effective July 15.

Edgar T. Willcox, whose appointment as general freight agent of the Seaboard Air Line, with office at Norfolk, Va., has been announced in these columns, was born on November 7, 1871, at Memphis, Tenn. He graduated from the high school at Memphis in 1888, and the same year began railway work as a mail clerk with the Texas & Pacific, at Dallas, Tex. From February, 1889 to September, 1892, he was a clerk in the auditor's office of the Louisville, New Orleans & Texas, now a part of the Yazoo & Mississippi Valley, and then to December, 1893, was rate clerk in the assistant general freight agent's office of the Kansas City, Memphis & Birmingham, now a part of the St. Louis & San Francisco. He served as chief clerk in the same office from 1893 to 1895, when he became soliciting freight agent and chief clerk of the same road at Birmingham, Ala. In September, 1896, he was made contracting freight agent and chief clerk at the same place, remaining in that position until 1901, when he was appointed commercial agent. From June, 1905, to July 1, 1907, he was division freight agent of the St. Louis & San Francisco at Birmingham, and from 1907 to 1911, he was assistant general freight agent of the same road at Memphis, Tenn. In September, 1911, he was appointed assistant general freight agent at St. Louis, Mo., and the following December he became assistant general freight agent of the Seaboard Air Line, at Birmingham, Ala., which position he held at the time of his recent appointment as general freight agent of the same road, as above noted.



E. T. Willcox

Engineering and Rolling Stock

Charles W. Extrand, locomotive engineer, St. Paul division, Northern Pacific, has been appointed acting road foreman of engines, with headquarters at Northtown, Minn.

H. Clewer, engineer of fuel economy of the Chicago, Rock Island & Pacific at Chicago, has been appointed master mechanic of the Missouri division, with office at Trenton, Mo., vice E. J. Harris resigned. Effective July 15.

Milton B. Morgan, assistant engineer maintenance of way of the Illinois Central and the Yazoo & Mississippi Valley, has been appointed district engineer of the Yazoo & Mississippi Valley, with office at Memphis, Tenn., vice Daniel W. Thrower, transferred. William G. Arn, roadmaster of the Indiana division of the Illinois Central, has been appointed assistant engineer maintenance of way of the Illinois Central, and Yazoo & Mississippi Valley, with office at Chicago, vice Mr. Morgan, promoted, effective July 15.

R. N. Kincaid, master mechanic of the Chicago & Eastern Illinois at Villa Grove, Ill., has resigned to become associated with the Buick Automobile Company at Flint, Mich. William R. Meeder, master mechanic at Danville, Ill., has been transferred to Villa Grove, in place of Mr. Kincaid. William F. Heiser, master mechanic at Evansville, Ind., has been trans-

ferred to Danville, Ill., vice Mr. Meeder. A. W. Standiford, general foreman at Salem, Ill., has been appointed master mechanic at Evansville, Ind., vice W. F. Heiser.

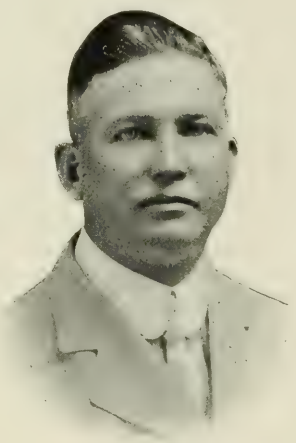
Gustave A. Haggander, whose appointment as bridge engineer of the Chicago, Burlington & Quincy, with headquarters at Chicago, has already been announced, in these columns was born at Sioux City, Iowa, on January 30, 1885. He graduated from the Armour Institute of Technology in 1907. Following graduation he entered the service of the Burlington as a draftsman, later being a concrete inspector and a designer until June 10, 1910, when he was made office engineer. From July, 1912, to July 1, 1916, he was assistant bridge engineer of the lines east of the Missouri river, with office at Chicago, Ill. As bridge engineer he will continue to have his headquarters at Chicago.



G. A. Haggander

E. J. Harris, master mechanic of the Chicago, Rock Island & Pacific at Trenton, Mo., has been appointed shop superintendent of the Denver & Rio Grande, with office at Salt Lake City, Utah, vice D. G. Cunningham resigned to accept service with another company.

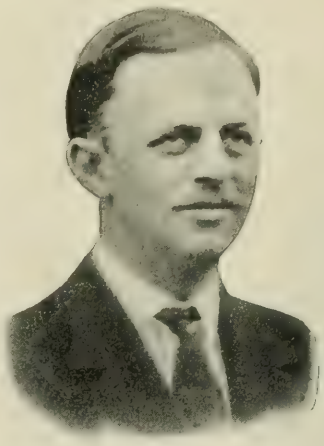
Dan G. Cunningham, who has been appointed superintendent of motive power of the Denver & Salt Lake, with headquarters at Denver, Colo., as has already been announced in these columns, was born at Roanoke, Va., on April 19, 1873. Mr. Cunningham was educated in the public schools of his native city, and at the Virginia Polytechnic Institute, graduating from the latter institution in 1898. He entered railway service in 1890 as a machinist apprentice in the Roanoke shop of the Norfolk & Western. From 1898 to June, 1900, he was employed as a machinist in the same place. He then entered the service of the Atchison, Topeka & Santa Fe as general foreman at Needles, Cal., returning to the Norfolk & Western in 1904, as roundhouse foreman at Portsmouth, Ohio. From 1907 to March 10, 1912, he was general foreman of the same road at Williamson, W. Va. From March 20, 1912, to June 30, 1916, he was superintendent of shops of the Denver & Rio Grande at Salt Lake City, Utah. His appointment as superintendent of motive power of the Denver & Salt Lake was effective on July 1.



D. G. Cunningham

Daniel W. Thrower, district engineer of the Yazoo & Mississippi Valley, with office at Memphis, Tenn., has been appointed assistant valuation engineer of the Illinois Central and the Yazoo & Mississippi Valley, with headquarters at Chicago, Ill. Mr. Thrower first entered railway service in March, 1900, with the Yazoo & Mississippi Valley at Vicksburg, Miss. After holding the position of assistant engineer on various divisions of the Yazoo & Mississippi Valley and Illinois Central, he was roadmaster consecutively on the Iowa division of the Illinois Central, the Memphis division of the Yazoo & Mississippi Valley, and the Illinois division of the Illinois Central. For a few months in 1913 he was assistant engineer maintenance of way at Chicago, Ill., following which he went to Memphis as district engineer of the Yazoo & Mississippi Valley. On July 1, 1916, he was appointed assistant valuation engineer of the Illinois Central and the Yazoo & Mississippi Valley, with headquarters at Chicago, Ill.

Eliot Sumner, who has been appointed superintendent of motive power of the Pennsylvania Railroad, with headquarters at Williamsport, Pa., as has been announced in these columns, was born on October 18, 1873, at New Haven, Conn. He attended Yale University, and in 1896 entered the service of the Pennsylvania Railroad as an apprentice at the Altoona (Pa.) machine shop. In February, 1901, he was appointed inspector on the Philadelphia division, and the following October was made assistant master mechanic of the Middle and Western divisions. He was promoted in 1902 to assistant engineer of motive power on the Buffalo and Allegheny Valley division, and the following year was transferred to the office of the general superintendent of motive power. In 1907, he was appointed master mechanic on the Baltimore division, and in 1911, was transferred in the same capacity to the Williamsport division. On December 1, 1913, he was appointed master mechanic at the west Philadelphia shops, which position he held at the time of his recent appointment as superintendent of motive power of the same road at Williamsport, as above noted.



E. Sumner

Purchasing

R. H. Adams has been appointed assistant purchasing agent of the San Pedro, Los Angeles & Salt Lake.

O. V. McQuilkin, storekeeper of the Baltimore & Ohio at Glenwood, Pa., has been appointed district storekeeper, vice L. H. Tutwiler, transferred to the accounting department.

F. W. Wilson, road foreman of equipment of the Chicago, Rock Island & Pacific at Rock Island, Ill., has been appointed engineer of fuel economy, with office at Chicago, vice H. Clewer, promoted.

Isaac B. Thomas, who has been appointed assistant purchasing agent of the Pennsylvania Railroad, with office at Philadelphia, Pa., as has already been announced, was born on June 26, 1872, at West Chester, Pa., and was educated at Friends' High School and at Haverford grammar school. He graduated from Sheffield Scientific School, Yale University, in 1892, and later in the same year entered the service of the Pennsylvania Railroad as an apprentice at the Altoona (Pa.) shops. In August, 1897, he was appointed inspector of the same shops, and in April, 1899, became inspector in the office of the assistant engineer of motive power of the same road at Altoona. He was appointed assistant master mechanic at Renovo, Pa., in February, 1900, and in October, 1901, became assistant engineer of motive power at Altoona. He remained in that position until August, 1903, when he became master mechanic at Pittsburgh, and was transferred as master mechanic in February, 1906, to the Altoona machine shops. On May 1, 1911, he was promoted to superintendent of motive power of the Erie division (now the Central division) of the same road, and of the Northern Central at Williamsport, Pa., which position he held at the time of his recent appointment as assistant purchasing agent of the Pennsylvania Railroad, as above noted.

OBITUARY

A. O. Wellman, assistant treasurer of the Atchison, Topeka & Santa Fe, died at his home in Topeka, Kan., on July 10, following a stroke of apoplexy.

C. E. Andrews, superintendent of the Escanaba division of the Chicago & North Western, with headquarters at Escanaba, Mich., died at Garden City, Kan., on July 17.

Fred H. White, purchasing agent of the Duluth, Missabe & Northern, died on July 17, at Duluth, Minn., following a two weeks' illness after an operation for carbuncles.

R. S. Ruble, assistant general passenger agent of the Union Pacific, with headquarters at Denver, Colo., died at that city on July 15. His death followed an attack of heart failure.

James Hobart Moore, formerly a director of the Chicago, Rock Island & Pacific, and one of the group of financiers controlling that road, died on July 18 at Lake Geneva, Wis., at the age of 64.

Thomas E. Lewis, locomotive inspector of the Norfolk & Western, died on July 16, at the home of his brother, W. H. Lewis, superintendent of motive power of the same road, at Roanoke, Va. He was born on January 11, 1836, in Devonshire, England, and in 1857 entered the service of the New York Central as machinist and foreman at Syracuse, N. Y. He subsequently served as master mechanic on the Hannibal & St. Joseph, and on the Union Pacific. For three years from 1888 he was superintendent and master mechanic of the Kansas City Elevated Railway and then was master mechanic on the Kansas City, Wyandotte & Western. In 1898 he was appointed inspector of locomotives on the Norfolk & Western.

Don Juan Whittemore, consulting engineer of the Chicago, Milwaukee & St. Paul and for nearly 50 years its chief engineer, died at his home at Milwaukee, Wis., on July 16, at the age of 86 years. He was born at Milton, Vt., in 1830, and was educated at Bakersfield Academy in the same state. He entered railway service in 1847, in the engineering corps of the Vermont & Canada. In 1849 he was appointed assistant to the chief engineer in charge of the construction of the Vermont & Canada between Swanton, Vt., and Rouse's Point, N. Y. Upon the completion of this road he was appointed assistant engineer in charge of a division of the Great Western of Canada. In 1852 he left that road to become contractor's engineer in building the Central Ohio between Zanesville, Ohio, and Wheeling, W. Va. From July, 1853, to 1857, he was assistant to the chief engineer of the La Crosse & Milwaukee and from the latter date until 1860 was chief engineer and director of the Southern Minnesota. In the winter of 1860-1861, he was chief assistant engineer of the Ferrocarril Del Oeste in Cuba. He then reëntered the service of the La Crosse & Milwaukee as chief assistant to the chief engineer, and in 1863, when the La Crosse & Milwaukee was merged into the Chicago, Milwaukee & St. Paul, he was made chief engineer of the St. Paul, in which capacity he served actively until December 6, 1910, when he retired. Since 1910, he has continued to serve the St. Paul in a consulting capacity. He took an active interest in the affairs of the technical societies, having been president of the American Society of Civil Engineers in 1884.



D. J. Whittemore

Equipment and Supplies

LOCOMOTIVES

The Susquehanna & New York is inquiring for several Consolidation locomotives.

The Nevada Copper Company is inquiring for several six-wheel switching locomotives.

The Canadian Northern has ordered one rotary snow plow with 12 ft. cut from the American Locomotive Company.

The Italian State Railways have issued inquiries to builders in this country for prices on a number of Consolidation locomotives.

The Braden Copper Company, 165 Broadway, New York, owning mines in Chile, is inquiring for one 60-ton Shay locomotive.

The New York Central is in the market for 5 Pacific type locomotives. It is understood that these engines will be bought for the Cleveland, Cincinnati, Chicago & St. Louis.

The Bangor & Aroostook has ordered one superheater Consolidation locomotive from the American Locomotive Company. This locomotive will have 23 by 30-in. cylinders, 56-in. driving wheels and a total weight in working order of 208,000 lb.

The Togoland Military Railway, of Africa, has ordered 2 Mikado locomotives from the American Locomotive Company. These locomotives will have 15 by 20-in. cylinders, 38-in. driving wheels and a total weight in working order of 96,000 lb.

FREIGHT CARS

The Western Pacific has issued inquiries for prices on 1,000 fruit cars.

The United States Government is in the market for 50 armored cars.

The Department of the Interior has issued inquiries for 3 mine rescue cars.

Phelps, Dodge & Co., New York, are in the market for a number of side dump cars.

The Minneapolis & St. Louis has issued inquiries for 500 to 1,000 40-ton wooden box cars.

The Mattheissen & Hegeler Zinc Company, La Salle, Ill., is inquiring for underframes for 50 tank cars.

The Gasolene Corporation, New York, has ordered 50 tank cars from the German-American Car Company.

The Solvay Process Company, Syracuse, N. Y., has ordered 15 gondola cars from the Pressed Steel Car Company.

The Gadsden Car Works, Gadsden, Ga., is inquiring for 1,400 center constructions, 1,000 for box cars and 400 for furniture cars.

The Chicago & North Western, reported in last week's issue as inquiring for 200 mine cars, has increased this inquiry to 600 cars.

The Illinois Central has withdrawn its inquiry for 500 steel underframe refrigerator cars, mentioned in the *Railway Age Gazette* of July 7.

The United States Steel Corporation has divided an order for 448 cars for the Carnegie Steel Company among the Pressed Steel Car Company, the Standard Steel Car Company and the American Car & Foundry Company.

PASSENGER CARS

The Mississippi River & Bonne Terre is inquiring for one 65-ft. baggage and mail cars, and 2 62-ft. steel coaches.

IRON AND STEEL

The Canadian Pacific is reported in the market for 30,000 tons of rails.

The French Government has issued inquiries for an additional 20,000 tons of rails.

The Elgin, Joliet & Eastern has ordered 117 tons of steel from the American Bridge Company for bridges at Joliet, Ill.

The Illinois Central has ordered 465 tons of steel from the American Bridge Company for track elevation bridges in Chicago.

The Southern Railway has ordered 500 tons of steel from the McClintic Marshall Company for a bridge over the James river.

The Chicago & Western Indiana has ordered 219 tons of steel from the American Bridge Company for bridging for the 87th street railway, Chicago

The Pennsylvania Railroad has ordered 2,300 tons of bridge steel for 21 spans from the American Bridge Company and 1,200 tons for 17 spans from the Pennsylvania Steel Company.

The New York Public Service Commission for the First District has awarded to the Pennsylvania Steel Company at $65,316 the contract for a supply of special work, including frogs, crossovers, switches, etc., for use on the new Seventh avenue subway in Manhattan.

MISCELLANEOUS

The Chicago, Burlington & Quincy has ordered a coaling station, to be erected at Rochelle, Ill., from the Ogle Construction Company.

The Chicago, Rock Island & Pacific has ordered two "RandS" measuring coal loaders for installation on its lines for recording locomotive coal.

The Virginian has awarded a contract for the construction of a concrete coaling station at Whitethorne, Va., to the Ogle Construction Company. The building includes a toilet room and shower bath for employees.

The Pennsylvania Railroad has awarded a contract to the Roberts & Schaefer Company, Chicago, for the building of a 300-ton capacity, two-track, automatic electric counterbalanced bucket locomotive coaling station at Erie, Pa., and also for two "RandS" gravity sand plants, using the beamer patent steam sand dryer.

The Illinois Central has awarded a contract to the Roberts & Schaefer Company, Chicago, for the building at Effingham, Ill., of a large 600-ton capacity, 3-track, reinforced concrete locomotive coaling plant, using automatic electric elevating equipment and the new "RandS" silent traction hoist. It has also awarded contracts to the Ogle Construction Company, Chicago, for a 300-ton frame coaling station at Hart, Ill., and to the Railroad Water & Coal Handling Company, Chicago, for the erection of a 500-ton frame coal chute at Waterloo, Ia.

Railway Extension in India.—The following projects have recently been sanctioned by the Indian Railway Board: The construction of a branch metre-gage line from Katakhal, on the Assam-Bengal Railway, to Lalabazar, a distance of about 23 miles; of a branch on the 2-ft. 6-in. gage from Larkhana, on the North-Western Railway, to Jacobadad, via Kamber and Shahdadpot, a distance of about 75 miles; of a branch on the same gage from Khulua to Baginhat, a distance of about 20 miles; by the Hoshiarpur Doab Branch Railway, of an extension of the Phagwara Rahon 5-ft. 6-in. line from Nawashahr, to Jaijon, via Garhshanker, a distance of about 19 miles; a survey by the South Indian Railway has also been sanctioned for a line on the metre-gage between Arni, on the Villapuram Katpadi section of the South Indian Railway and Padalam or Madurantakam alternatively, a distance of 60 miles; and by the Madras & Southern Mahratta Railway for a light line on the metre-gage from Ollapalim to Kanigiti, via Singuray Akonda, on the Madras & Southern Mahratta Railway, a distance of about 45 miles.

Supply Trade News

A. S. Work, mechanical expert on the sales force of the Nathan Manufacturing Company, died on July 13, 1916, at the Illinois Central Hospital, Chicago, Ill., from the effects of an operation performed for a gastric ulcer of the stomach. Mr. Work had been connected with the Nathan Manufacturing Company for seven and a half years, and previously had a long experience as a practical railroad man, as fireman and engineer on the Panhandle division of the Pennsylvania, road foreman of engines of the New York, Chicago & St. Louis and road foreman of engines on the Chicago & Alton.

American Arch Company

J. T. Anthony, manager of the service department of the American Arch Company, New York, has been appointed assistant to the president and has been succeeded by R. J. Himmelright, hitherto assistant to the manager of the service department.



J. T. Anthony

Mr. Anthony has been in the employ of the American Arch Company since January, 1912. He was born in February, 1883. After completing a common and high school course, he entered the Georgia School of Technology, from which he graduated in 1902. He was then engaged in the textile manufacturing business for four years; but in 1906 entered railway service in the roadway department of the Atlantic Coast Line. He remained with that road until 1907, when he became a draftsman in the motive power department of the Central of Georgia. In January, 1912, he entered the employ of the American Arch Company as combustion engineer. In March, 1914, he was made assistant general eastern sales manager. A few months later he was made manager of the service department, in direct charge of traveling engineers and the supervising of all road work. It is this position he leaves to take up his new duties as assistant to the president.



R. J. Himmelright

R. J. Himmelright was born in Barberton, Ohio, in 1883. After completing the common and high school courses there, he took a summer course of two years at Kentucky State University. In 1904 he entered the employ of the Stirling Boiler Company. One year later he entered Purdue University, and graduated in the class of 1909 with the degree of mechanical engineer. He immediately entered the service of the Lake Shore & Michigan Southern as special apprentice; and after serving two years in this capacity was employed by the Locomotive Stoker Company as mechanical expert. This position he held until 1913,

when he entered the service of the American Arch Company as traveling engineer. In 1915 he was made assistant to the manager of the service department.

The St. Louis offices of the Westinghouse Air Brake Company and the Westinghouse Traction Brake Company, C. P. Cass, southwestern manager, have been removed from the Security building to Suite 1407-1415 Boatmen's Bank building, St. Louis, Mo.

The Central Trust Company of Illinois was appointed receiver for the Kennicott Company of Chicago, Ill., on July 12, following a petition of creditors. Chauncey J. Blair, the late president of the company, it is understood, was trying to float a bond issue for the purpose of obtaining more working capital at the time of his death last May. Further efforts to effect this purpose were unsuccessful.

M. D. Montgomery, acting manager of the Denver district of the Goodyear Tire & Rubber Company, has been appointed manager of that district. F. C. Moyer, manager of the Des Moines (Iowa) branch, has been appointed manager of the Minneapolis (Minn.) district, vice G. H. Barmore, who has been appointed manager at Milwaukee, Wis. F. W. Telford, supervisor of motor truck sales at Chicago, Ill., has been appointed manager of the Des Moines branch, vice F. C. Moyer. T. J. Fitzgerald has been appointed manager of the El Paso (Tex.) branch, left vacant by the death of G. F. Dennis.

TRADE PUBLICATIONS

Scales.—The Standard Scale & Supply Company, Pittsburgh, Pa., in its recently issued price list No. A210, gives illustrations, brief descriptions and price lists of the line of Standard scales. The scales shown include a wide variety for many kinds of businesses and uses.

Locomotive Appliances.—The G. F. Cotter Supply Company, Houston, Tex., general sales agents for the Simplified Steam Chest Company of the same city, has issued a folder relative to the simplified piston valve steam chest for supplying slide valve locomotives with piston valves for use with superheated steam.

Car Wheels.—The Griffin Wheel Company has issued a seven-page booklet containing nine reasons why the chilled iron car wheel is preferable to other types of wheels, as follows: safety, low initial cost, low maintenance cost, guaranteed service, brake efficiency, saving in brake shoes, saving in rail wear, minimum of flange wear and liberal allowance for old wheels.

Coal Unloader.—The Roberts & Schaefer Company, Chicago, has issued Bulletin No. 31, which described the "RandS" measuring coal loader for locomotives, a device which automatically measures the coal as it is being discharged into the locomotive tenders. The operation of this device is explained in detail with ample illustrations. The pamphlet also contains a description, with illustrations, of the duplex 12-ft. shallow pit loader, a new arrangement of the substructure of coaling stations which will decrease the cost of foundations for any coaling station of the bucket type.

On the Firing Line with Battery Bill.—The story of W. Alkaline Battery, otherwise known as Battery Bill, has now been published in booklet form by Battery Bill's employer, the Edison Storage Battery Company, Orange, N. J. Battery Bill is already well known to readers of the advertising pages of the *Railway Age Gazette*. He is the enterprising salesman of Edison storage batteries whose adventures, detailed in the form of letters to his boss, center around his successful attempt to sell Edison batteries to the X. Y. Z. Railroad and to help the officers of that road answer the query of President X: "Why aren't we using Edison batteries?" These letters, both humorous and snappy, give the arguments he presented; the questions he answered; or, in other words, they give in a rather unique and most interesting manner the salient advantages of the Edison battery for railway service. There is also included a series of interesting illustrated lectures (which perhaps some of the readers of the *Daily Railway Age Gazette* "attended") given by Battery Bill before the M. C. B. and M. M. conventions at Atlantic City. The booklet contains 32 pages and is a bit above the regular run of catalogs from the standpoint of illustration, paper and printing.

Railway Construction

Chicago, Milwaukee & St. Paul.—This company is checking up surveys for the extension of its line from Grass Range, Mont., to Winnett, 20 miles, and expect to commence construction work soon.

Florida Roads (Electric).—According to press reports, capital has been secured, and work will be started soon on an interurban line from St. Petersburg, Fla., northeast to Tampa, about 18 miles. The plans include building a bridge over Old Tampa Bay. W. S. Gandy, St. Petersburg, is said to be interested.

Ft. Smith, Subiaco & Eastern.—This company will extend its line from Scranton, Logan County, Ark., to Dardanelle, a distance of about 15 miles. The work will be done by company's forces, and the contracts for rail and other material have already been let.

Great Northern.—The Montana Eastern, which is a subsidiary of the Great Northern, has awarded a contract to A. Guthrie & Co., St. Paul, Minn., for the completion of the line from Lewistown, Mont., to Higgins, 25 miles. About one-half the line was completed in 1913.

Illinois Central.—This company is constructing about 30,000 ft. of passing tracks at 13 points on the Minnesota division between Freeport, Ill., and Albert Lea, Minn.

Lakeland, Bartow & Winterhaven Interurban.—Application is to be made in Florida for a charter by this company, it is said, with $700,000 capital and headquarters at Winterhaven. The plans call for a line to connect Lakeland, Fla., with Bartow and Winterhaven. J. L. Wilson, president, Altoona, Pa.; E. B. Nelson, vice-president and general manager, Baltimore, Md.; A. X. Erickson, secretary, Lakeland, Fla.

Mississippi Roads.—Plans are being made to build a line from Clarksdale, Miss., west to a point on the Mississippi river, also to build from Clarksdale southeast to Webb, in all about 35 miles. M. J. Bouldin is chairman of the City Railroad Commission, and L. W. Mashburn, engineer, Clarksdale.

New York Subways.—The New York Public Service Commission, First district, has received bids for the construction of the new two-track tube under the East river from Second avenue and Sixtieth street in the borough of Manhattan, to a connection with the new elevated lines in the borough of Queens, at Queensboro Bridge Plaza station. Patrick McGovern & Co., the lowest bidder, offered to do the work for $4,194,797. (June 30, p. 1609.)

Ocklawaha Valley.—According to press reports this company has under consideration the question of building an extension from the southern terminus at Ocala, Fla., via Umatilla, Eustis, Mount Dora and Tangerine, about 80 miles. The company now operates a 54-mile line from Palatka, Fla., southwest to Ocala.

Pennsylvania Lines West.—This company will re-locate its line adjacent to the north bank of the Ohio river from a point a short distance east of Glen Osborne Station, Pa., through Sewickley and Edgeworth Boroughs to a point west of Shields Station, a distance of 2.7 miles. This will be a four-track line, and will involve about 550,000 cu. yd. of fill and 105,000 cu. yd. of cut. It will have a maximum curve of 1 deg. and 45 mm., and maximum grades of 0.112 per cent ascending east bound, and 0.10 per cent ascending west bound. There will be five undergrade street crossings and five passenger station subways, involving 13,000 cu. yd. of concrete and 18,000 sq. ft. of steel solid floor bridges. A new freight and passenger station layout will be constructed at Sewickley.

Port Boliver Iron Ore.—This railway is locating a route for an extension from Big Cypress Bridge, three miles north of Ore City, Tex., to Avinger, a distance of 10 miles. The road will connect with the Missouri, Kansas & Texas at Avinger.

St. Louis, Iron Mountain & Southern.—This company has

awarded a contract to the List & Gifford Construction Company, Kansas City, Mo., for from 60,000 to 80,000 cu. yd. of bank widening work between Dupo, Ill., and Roots, on the Illinois division, a distance of about 45 miles. The work has been sublet to the List & Bagwell Construction Company, which concern now has it under way.

Savannah & Atlanta.—See Savannah & Northwestern.

Savannah & Northwestern.—Work has been finished on the extension, built under the name of the Savannah & Atlanta, from St. Clair, Ga., northwest to Camak, about 35 miles. (January 14, p. 85.)

South Florida & Gulf.—This company recently opened for operation a 20-mile section, it is said, from Halsey, Fla., to Prairie Ridge. The plans call for a line from Kenansville south via Bassenger. It is being built by the Southern Colonization Company to develop land owned by this company. The line may eventually be extended south to Lake Okeechobee.

Southern Pacific.—This company has completed grading work on a line from Hoover, Ore., southeasterly along the north fork of the Santiam river for a distance of 11 miles. It is not known when the line will be completed.

RAILWAY STRUCTURES

Berkley, Pa.—A contract has been given to C. H. Reimard, Bloomsburg, Pa., by the Philadelphia & Reading for building two 25-ft. concrete arches over Willow creek, at Berkley.

Columbus, Ohio.—The Cleveland, Cincinnati, Chicago & St. Louis has awarded a contract to the Walsh Construction Company, Davenport, Iowa, for the elimination of four grade crossings between First avenue and Seventeenth avenue. The project involves about 180,000 cu. yd. of embankment and 10,000 cu. yd. of concrete work. The tracks will be elevated an average of six feet, and the streets will be depressed. Four steel through girder bridges with solid floors will be erected.

Malden, Mass.—A subway is to be built under the tracks of the Boston & Maine at Malden station, it is said, at a cost of about $11,000.

McGregor, Iowa.—The Chicago, Milwaukee & St. Paul has begun construction of extensive terminal facilities at McGregor.

New York.—The lowest bid was submitted by the Thomas J. Waters Company, at $22,649, to the New York Public Service Commission, for the construction of station finish for the Grand Central station of the Queensboro subway. The work includes lengthening the island platform of the present station in Forty-second street between Lexington and Third avenues. (June 30, p. 1609.)

Work has been started on a new pier at the foot of Jackson street for the Lehigh Valley to be known as Pier 44, East river. The new pier will be a two-story structure, 60 ft. wide and will have a frontage of 280 ft. on South street.

Pine Valley, N. J.—A contract has been given to Joseph B. Rowen, Moorestown, N. J., for building a passenger station for the Atlantic City Railroad at Pine Valley. It will be 12 ft. high, 17 ft. 4 in. wide and 32 ft. long, and will be of stucco on hollow tile construction, with green slate roof, brick base and concrete foundation.

Rochester, N. Y.—The Lehigh Valley has given a contract to the Patterson-Moran Company, New York, for the masonry sub-structure, and to the Pennsylvania Steel Company, Steelton, Pa., for the steel superstructure of a bridge to be built over the barge canal, near Rochester.

Warsaw, N. Y.—Bids will be received by the Erie Railroad for a three-span bridge to be built over its tracks at Warsaw, at a cost of about $12,000.

West Tulsa, Okla.—The St. Louis & San Francisco will build a frame roundhouse at an estimated cost of about $26,000, and will construct a car repair shed and other buildings, which, together with a 100-ft. turntable and other mechanical facilities and yard tracks, will cost over $200,000.

Railway Financial News

Boston & Maine.—The executive committee has declared effective the plan for the extension to August 31, 1916, of the notes due July 17, 1916. Holders of more than 97 per cent of the notes have assented to the plan.

Dallas Union Terminal.—An additional issue of $807,000 bonds to pay for the completion of the Union passenger station at Dallas has been recommended by the engineer of the State Railroad Commission of Texas. This will make the total amount of bonds of the Dallas Union Terminal $5,000,000. The terminal will be used by the Atchison, Topeka & Santa Fe, the St. Louis Southwestern, the Texas & Pacific, the Chicago, Rock Island & Pacific, the St. Louis & San Francisco, the Houston & Texas Central, the Missouri, Kansas & Texas, and the Texas & New Orleans.

Georgia Coast & Piedmont.—Judge Speer, of the United States district court, has placed this road, which runs from Brunswick, Ga., to Collins, 100 miles, in the hands of B. C. Aiken, C. H. Levy and J. H. Bailey as receivers. The petition for receivership was made by a holder of $6,000 of the company's bonds.

Lehigh Valley.—The New York Public Service Commission, Second district, has authorized this company to issue $1,100,000 5 per cent debenture bonds to be sold at not less than par, to reimburse the company for expenditures for additions and betterments.

Nashville, Chattanooga & St. Louis.—The directors have declared a semi-annual dividend of 3½ per cent. This makes the annual rate 7 per cent, which was the rate paid previous to 1915. In the fiscal year ended June 30, 1916, the annual rate was 5 per cent.

Norfolk & Western.—A press report from Roanoke, Va., says that the Norfolk & Western has bought the majority stock of the Virginia-Carolina Railway, which stock was formerly held by W. E. Mingea, of Abingdon, Va. The Virginia-Carolina Railway runs from Abingdon into Ashe County, North Carolina, and is 85 miles long.

Pittsburgh & Lake Erie.—This company has filed amended articles of incorporation increasing its authorized stock from $30,000,000 to $50,000,000. If it is decided to sell additional stock it is understood that the shares will be offered for subscription by stockholders. The New York Central Railroad owns 51 per cent of the $30,000,000 Pittsburgh & Lake Erie stock now outstanding.

West Jersey & Seashore.—The New Jersey Board of Public Utility Commissioners has approved the proposed issuance of $1,945,050 additional capital stock of the West Jersey & Seashore. This is equivalent to 20 per cent of the now outstanding stock, and the new stock is to be offered to stockholders at par.

Dog-Worked Railways.—When the transport of supplies through the snow in the Vosges last year was of urgent importance, the French authorities conceived the idea of using dog-drawn sleighs, and several hundred trained animals from Alaska, Northwestern Canada and Labrador were obtained. With the end of the snow the dogs continue to be found useful. They are now being harnessed to small 2-ft. gage light railways which run everywhere behind the front, and they are very capable. Eleven dogs with a couple of men can haul a load of a ton up some of the most precipitous slopes in the mountains, and two teams of seven dogs each can do the work of five horses in this difficult country with a very great economy of men. Of the three breeds in service the best is the Alaskan. His courage never fails, and he will work until he drops though he is perhaps the weakest of them all. Their chest development so necessary for hauling is remarkable. They are mainly fed on rice, horse flesh and waste military biscuits.

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The Interstate Commerce Commission has now set November 13, 1916, for a hearing before the commission at Washington on the question of changing the fiscal year from June 30 to December 31. This question has been up between the commission and the Association of American Railway Accounting officers for a long time, and on April 6, 1916, R. A. White, president of the association, wrote the chairman of the commission, pointing out that the principal objection that the few who were opposed to the change of the fiscal year had raised was due to the fear that comparisons would be disturbed. President White said, however, that the change in the fiscal year would not disturb comparisons to any serious extent if the commission were to require one report covering the twelve months ending June 30 and one report covering the twelve months ending December 31. As President White added, "In this way the comparisons on the June 30 basis would be maintained through the first year of the change and also there would be established a new basis for comparison thereafter for the twelve months ending December 31." In fixing a date as far away as November for a public hearing, which implies presumably a very considerable period after this date before any action will be taken by the commission, it might appear that the commission was somewhat overcautious, but the actual fixing of a date is a step in the progress toward this very desirable reform. If, after the hearing in November, prompt action is taken an order can be issued effective December 31, requiring a report for the 1916 calendar year; the 1917 fiscal year will be continued to June 30, 1917, and a report for that year made and in this way there will be no disturbance of comparisons, although some duplication of work.

Hearing on Change in Fiscal Year

At West Peabody, Mass., on the fifteenth of June a passenger train was derailed by running into an automobile truck on a highway crossing, and the driver of the truck, an employee of the Woburn Machine Company, was fatally injured. In the *Railway Age Gazette* of February 25, two similar accidents were reported, one in New Jersey and one in Ohio, killing four persons, altogether. The Long Island Railroad, whose officers study the automobile peril from every angle, has records of derailments from this cause in all parts of the United States. These facts are noted here simply as a reminder of the broad aspect of this question. Unlike the trespasser evil, this is a many-sided matter. The railroad officer cannot leave everything to the state and municipal authorities—who, usually, are so incurably apathetic—for he may have a carload of passengers overturned any day. In the case of such a smash-up the railroad might be ever so free from blame yet, in accordance with custom, the cash settlements for deaths and injuries of passengers would be made, no doubt, on about the same basis as if the trainmen had been grossly negligent. With the situation as it is, the railroad manager is called upon to be not only a strict disciplinarian with his own men, but also to provide police and detective service, to prosecute law breakers in the courts and to run a first-class press bureau. General Manager J. A. McCrea of the Long Island has set a notable example in these matters, and his company has done an important public duty in providing the large sums of money necessary to carry out this public-spirited policy. The New York, New Haven & Hartford, whose general manager is on the new American Railway Association grade-crossings committee, is doing useful publicity work in Massachusetts. Mr. McCrea says that there is no apparent decrease in recklessness at crossings. Supplementing his statistics for 1915, heretofore published, he reports for 1916, to June 15, on his railroad, 92 cases of reckless driving; 2 persons killed and 12 injured; gates run through 49 times; 27 persons arrested.

The Automobile Peril

When Fairfax Harrison sets forth the ideal qualifications of a local freight agent—"in addition to having the qualities which make for success in the management of a general merchandise store he must usually be a telegraph operator, a rough-and-ready lawyer, a first-aid surgeon, a substitute for a certified public accountant, a pretty good bank president, a political economist, a peacemaker, a captain of men in action, and an organizer of victory"—he sets a standard of versatility with which the prestige of the position by no means keeps pace. Yet the lack of any of these quali

The Ideal Local Freight Agent

fications will, in some way or other, at some time or other, be reflected in the prestige of the business of the railway by which he is employed. They represent the scintillations of the star to which the agent must hitch his little wagon if he would do his utmost to pull the business of his company to that lofty altitude. It is probably a fact, however, that the possession of such qualities does not meet with anything like full recognition of their value except occasionally at highly competitive points. But, as Mr. Harrison also says in the address which appears elsewhere, "in reality there is no such thing as a non-competitive railroad station." A disgruntled shipper may have to start business at an apparently non-competitive station, but may turn it over to another line at the first junction point and short-haul the local line. The matter of competition is then to be fought out at rifle range instead of hand to hand. The combatants do not change positions. In either case the local agent's influence operates upon every pound of business the railroad handles. His more obvious duties may be confined to co-operation with the shipper and securing the shipper's intelligent co-operation with him, in the proper packing, marking and loading of his goods; but they are not confined to this. He is the local representative of the company by which he is employed. In this go-between relation he needs something of each of the qualifications which, in a highly specialized organization, is represented in its completeness in each of the heads of many departments. And because "he probably comes into contact with as much meanness and dishonesty as any man in business," he needs, in addition, as Mr. Harrison so felicitously puts it, "a patience and good humor which will qualify him for a robe and a harp and a seat in heaven alongside of Job himself." As a practical matter, however, it is perhaps well once in a while to call attention to the commercial value of these qualifications while the occasional possessor of them is still represented on earth.

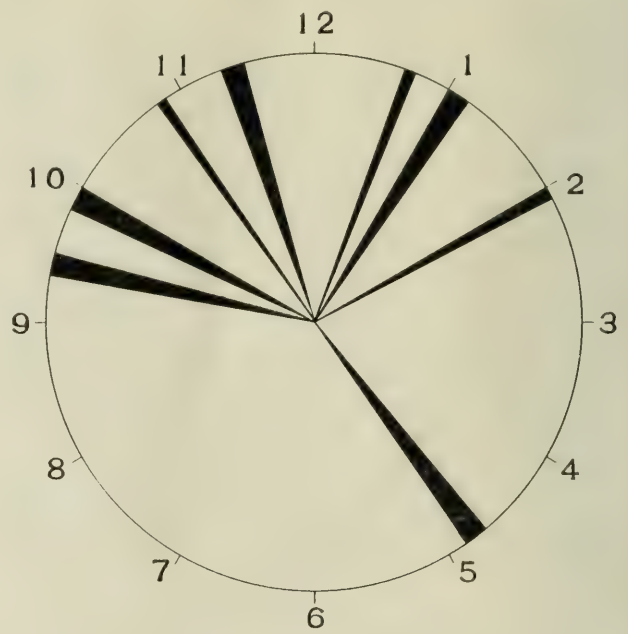
HOW MANY HOURS DOES A TRAINMAN WORK A DAY?

ASSUME that the enginemen and trainmen were actually attempting to get an eight-hour day and not an increase in wages by the threatened strike of the four brotherhoods. Would they even then have any justification for their demands? Eight hours of good hard work, even though split into two periods with a certain length of time off for a midday meal, may be as much work as a man ought to be asked to do in 24 hours if he is a highly skilled mechanic. It is not nearly as much work as the farmer, small tradesman, station agent or the division superintendent does. However, for sake of argument allow that the demand of a skilled laborer for only eight hours' work in each 24 is reasonable. Do the trainmen now work more than eight hours? As a matter of fact, except in exceptional cases, they do not. The accompanying diagram shows the actual hours of work of a head brakeman.

This man reported for duty at 9 a. m. From 9:20 to 9:30 he took out the engine and coupled it to the train; from 9:50 to 10 he got the train ready, from 10:50 to 10:55, cut off the engine and took water at A; 11:20 to 11:30, helped set off cars at B; 12:40 to 12:45, coupled and uncoupled engine and took water at C; 1 to 1:10, set off cars at D; 2 to 2:06, coupled and uncoupled engine and took water at E; 4:40 to 4:50, cut off the engine at the terminal. This was the sum total of his day's labor. This is not a picked case, but a typical case. The man actually worked an hour and five minutes, was on duty seven hours and fifty minutes, and was paid for ten hours.

The printing trade in large cities like New York and Chicago is entirely under the domination of the unions. It admittedly employs well paid skilled labor. The eight-hour day, with time and a half pay for overtime, is compulsory. The linotype machine man, however, who goes to work at 8:30 finds copy at his machine and is actually at work in 99 cases out of 100 before 8:35. It is safe to say that in 99 cases out of 100 and in 99 days out of 100 working days the linotype machine man is not interrupted in his continuous work for a total of 20 minutes from the time he begins work at 8:30 until he quits for lunch at 12:30. The same is true in the afternoon. In his eight-hour day, therefore, he is working at least seven hours and twenty minutes. The same is true of the compositor. In the steel trade the skilled laborer is actually at work more than 80 per cent of the time that he is on duty. The same is true in the factory. There is a steady grind which may possibly be a justification for a limitation of hours.

There is no such corresponding grind in the work of train men. The trainman's job is far more analogous in this respect to that of a traveling salesman than to that of a printer or a steel worker. The traveling salesman may not be actually engaged in selling a customer more than four or five hours out of each 24 hours, but unlike the trainman is on duty often 12 or 14 hours and in a sense is on duty the whole 24



A Head Brakeman's Day

Black represents time actually at work.
Reported for duty, 9 A. M.
Cut off engine at terminal, 4:50 P. M.
Labor, 1 h. 5 min.
On duty, 7 h. 50 min.
Paid for 10 h.
Ran 90 miles.
Paid for 100 miles.

hours each day that he is on the road. To take another example, how much justice would there be in sailors asking for an eight-hour day and pay at the rate of time and a half for all the remainder of the time that they were on shipboard, exclusive of their watch below? As a matter of fact even in their watch below they are subject to call at any time.

The fact of the matter is that a trainman would not be working eight hours a day if he were on duty sixteen. In other words, even if the trainmen were asking for an eight-hour day, which they are not, there would be no justification for such a demand.

LOCOMOTIVE REPAIR FACILITIES

THE operating department is the one most directly affected by the length of time which locomotives are held out of service undergoing repairs. When traffic is heavy and yards are congested this department requires every pound of tractive effort which can be made available. It is its business to get the freight over the road and it is ofttimes difficult for operating officers, who are not in general thoroughly familiar with mechanical department problems, to understand why locomotives sometimes have to be held out of service for what seems to them unnecessarily long periods. But locomotives have to be repaired if they are to be kept in condition to move traffic and avoid failures. It may have been possible at one time in the history of American railroading to neglect necessary repairs and still keep locomotives in service even though the results obtained were far from economical, but whatever conditions may have obtained in the past, it is certain that the present-day exacting requirements of heavy trains and prompt delivery of freight place upon motive power officers a greatly increased responsibility in order to keep the locomotives in the proper condition. Even if American motive power officers of the present day were prone to neglect some of the necessary repair work in order to get the engines back into service a little more promptly, there is government inspection and supervision to prevent any such neglect.

What is causing the extra long delay in many cases is not, as some operating officers seem to think, the desire of the motive power department to hang on to locomotives as long as they can when once they get them in their hands, but an absence of those shop facilities which are necessary if the large locomotives of the present day are to be given needed repairs in the shortest possible time. Railway presidents and vice-presidents have got to be brought to realize that Mallet, Mikado and 2-10-2 type locomotives cannot be repaired in the same time and with the same tools that were used in repairing Eight-wheel and Mogul type locomotives 15 or 20 years ago.

It is the higher executive officers who realize most fully the advantages to be obtained by increasing the average train load. It is they who are responsible mainly for the proportions of the present-day locomotive and it is unfair to the motive power department to place such locomotives in its hands for repairs and expect it to make the repairs and keep the engines in service the maximum possible time with shop and enginehouse equipment that is 20 years out of date. Modern locomotives demand modern shop equipment for their maintenance.

Nor is it a satisfactory way out of the trouble to place new machine tool equipment in the main repair shops and pass on some of the old shop equipment for use in enginehouses. The enginehouse is the repair point that can produce the greatest possible results toward keeping locomotives out of the back shop and on the road and it requires just as efficient and up-to-date machinery as does the back shop. The executive officer who purchases large locomotives in order to increase his train loads is not getting all that he can out of those locomotives unless his shop and enginehouse facilities are thoroughly capable of providing for their maintenance.

Five, six or seven hours additional spent in the enginehouse or two or three working days extra in the main repair shop because of out of date repair facilities means just that much longer that the locomotive is out of the hands of the operating department and, therefore, out of revenue service, and the officer who neglects to provide an appropriation for shop and terminal facilities commensurate with the size and power of his locomotives by so doing is standing in his own light.

EARNINGS OF TRAIN EMPLOYEES

THE National Conference Committee of the Railways, having charge of the negotiations with the train employees, is having published in newspapers throughout the country an advertisement showing the annual earnings of trainmen and enginemen in eastern, western and southern territory for the year 1915. These figures, which were given in last week's issue of the *Railway Age Gazette*, page 121, represent the results of the most comprehensive and accurate study of railway wages ever made.

A very elaborate compilation of the earnings of engineers and firemen on the western roads was made for the 1914 arbitration proceedings, but the only statistics for all four classes of train service employees for the entire country have been those obtained from the Interstate Commerce Commission reports, which, while approximately correct, have been criticised because they were arrived at by using the number of employees in service at the close of the fiscal year. The average figures obtainable from the Interstate Commerce Commission statistics, moreover, gave no indication of the differences in the earnings of the men employed in passenger, freight and yard service. The 1915 figures compiled by the conference committee give the earnings in the three classes of service separately, and therefore show for the first time the pay of the employees in freight and yard service who are now demanding an increase.

While representatives of the employees have been loud in their complaints about the wage statistics published heretofore by the railways, they have used for their own purposes either specific examples of the lowest paid men they could find or have cited the rates of pay per 100 miles, which are merely the minimum rates per day. The figures now published by the railways include the earnings of all of the men working exclusively in their respective classes of service who appear on the January and December payrolls, and give not only the highest and the lowest, but the average earnings. Firemen, for example, who worked part of the time as engineers, and therefore earned more than if they had worked all of the time at firing, are not included, but many of the employees who worked only part of the year are included, thus bringing the average considerably below the average earnings of men who worked all of the year. For this reason separate tables are published, showing the earnings of 75 per cent of the employees, excluding the extra men and those who laid off a large part of the year.

These show that, in spite of the objections they have made to the figures that have previously been published, the freight and yard employees now voting to strike unless they are given a $100,000,000 wage increase are highly paid men. While in most cases the passenger men receive more than either the freight or yard employees, on the western roads the freight conductors average $1,935 per year, as compared with $1,878 for passenger conductors, and both the freight and yard brakemen receive more than those in passenger service, $1,135 and $1,107, respectively, as compared with $967 for the passenger brakemen.

In most cases the employees of the western roads are shown to enjoy higher earnings than those of the eastern or southern roads, the engineers averaging $2,195 in passenger service, $2,071 in freight service and $1,378 in yard service; conductors, $1,878 in passenger service, $1,935 in freight service and $1,355 in yard service; firemen, $1,317 in passenger service, $1,181 in freight service and $973 in yard service; and brakemen $967 in passenger service, $1,135 in freight and $1,107 in yard service.

The pay of the passenger conductors and firemen, all four classes of freight employees and yard conductors and brakemen, is highest on the western roads; passenger and yard engineers on the southern roads are paid more than those on

the eastern or western lines, and passenger brakemen are paid the most on the eastern lines. On the southern roads the earnings of the engineers, the passenger conductors and the passenger firemen exceed those of the same classes of employees on the eastern lines, while the earnings of the other classes of employees included are less than those on the eastern roads.

The highest pay shown is that of a passenger engineer on a southern road, with $3,983 for the year, and the lowest is that of a yard fireman on a southern road with $406. Among those earning over $3,000 a year are passenger engineers in the east, west and south, passenger conductors in the east and freight engineers in the south and west. Averages over $2,000 a year are shown for passenger engineers in the south and west and freight engineers in the west, and averages over $1,500 are shown for passenger and freight engineers and conductors in all three territories and for yard engineers in the south.

Most of the people of the United States that read these figures based on the actual payrolls and compare them with their own earnings will find it rather difficult to sympathize with the recipients of such wages in case of a strike to enforce still higher pay. They may, however, find in these figures part of the reason why the brotherhoods of train employees may prefer to try to settle their controversy by force rather than by arbitration.

NEW BOOKS

Commercial Mortmain. By John R. Dos Passos. Published by the Bench & Bar Company, New York. Price, $1.25.

The name of this little book of 101 pages is derived from the comparison which the author draws between the attempt of the monarchy of England during the twelfth to sixteenth centuries to prevent the permanent acquisition of lands by the religious houses and the attempt of the American government to prevent industrial combination by corporations. Mr. Dos Passos likens the federal anti-trust law to the English laws which attempted to prevent land falling under mortmain. Religious houses for 400 years successfully evaded the laws passed to keep them from acquiring lands. Mr. Dos Passos thinks that after a trial of 25 years the anti-trust act must be pronounced a failure. The greater part of the book is given up to complaint against the power which wealth concentrated in the hands of a few men can have through control of corporations; an explanation of why these evils cannot be overcome through such a law as the anti-trust law, and a discussion of overcapitalization and limitation of capitalization. As to overcapitalization, the author sees clearly that each case must be considered on its own merits. As he points out, in the case of railroads much of the complaint as to overcapitalization is wholly unfounded. The inducements which had to be held out to get capital into the hazardous venture of building a railroad to develop new country are part of the actual costs of building the railroads. In other words, the cost of money is as much a part of the cost of a railroad as is the cost of ties and rails. Neither does the author think that it is possible to prevent overcapitalization by laws limiting capitalization. The remedy which he suggests is to tax corporate profits and to limit individual incomes through a graded income tax. He thinks that the federal government should have full power, and that what he considers the evils of trusts and corporations cannot be overcome by the states working through state statutes. He suggests that there is a series of crime at common law which is known as "offenses against public trade" in which were embraced monopolies and all kindred acts. He believes that: "Congress should readopt the common law—making all acts against public trade punishable criminally and civilly."

Letters to the Editor

MORSE OPERATORS

Haileyville, Okla.

To the Editor of the Railway Age Gazette:

Your note of November 5, page 843, concerning Morse operators, and mentioning the two who took prizes at the San Francisco exposition was, no doubt, of interest to many readers.

There is no doubt that for sometime there will be a demand for *first class* Morse operators; but for the ordinary every-day O. S. operator there cannot be much demand. On the division where the writer is employed there are twenty per cent fewer operators now than five years ago; and it is not the telephone that has displaced them. The reduction has been made because the track and equipment have been improved in that time and the despatchers are for that reason able to handle the trains better. This is true on other divisions and on other lines.

There is no getting away from the fact that the telephone is creeping in on the field of message business; and its capacity for speed and accuracy is its advance agent for further development along that line. There is no telegraph operator, unless he uses the Phillips code, or some other abbreviation scheme, who can send Morse as fast as a competent man on a typewriter can put it down; while, on the other hand, the expert typist is able to copy from the man talking on the phone at a reasonable rate of speech. This is good evidence, substantially conclusive, that the telephone is bound to relieve the telegraph and soon be universal, at least for moderate distances. The use of the telephone will decrease the cost of maintenance for wires, poles and battery, because there will not be so many telephone wires required to handle the same amount of business as there would be with the telegraph.

The argument that the telegraph will still have to be used in connection with the telephone in case the latter fails is of little account. A telephone failure can be repaired just as quickly as a telegraph failure. What did we do in years gone by when the telegraph wire went down? Only waited until it came up. So it will be with the telephone; but the wait will not be so long because linemen are now supplied with motor cars to carry them to points where there is trouble and trains are more frequent.

Again, with the increase of the telephone there will be a great deal of business transacted by word of mouth, of which no record will be made. On the division where the writer is employed and where the telephone is used for despatching trains, lots of communications are only conversations—such as ordering trains, tracing cars, distributing cars, maintenance of way work, and many other things. All of these were formerly handled by the telegraph but to wait for matters of this kind to take that slow course now would be intolerable; although seemingly there is an adequate telegraph force to do it. This works a hardship on the despatcher at times, but it seems that the service demands it; and if it proves beneficial, all well and good.

This state of affairs is bound to decrease the demand for operators. Some operators seem to be doing what they can to hasten their own downfall. They seem to think that, if anything is wanted in a hurry, it will be taken care of on the phone, and so they do not give the message part of the business the prompt care that it used to get.

All these things are helping the telephone along and decreasing the number of Morse operators. J. L. C.

How a Great Corporation Got 5000 to Play*

A Remarkably Successful System Field Meet Was Held at Denison, Tex., with the Help of the Railroad Y. M. C. A.



The Finish of the Potato Race

By C. G. Elliott

Assistant to Chief Operating Officer, Missouri, Kansas & Texas Lines.

AN *esprit de corps* is as essential to the successful operation of a railroad as of an army. That loyalty and efficiency, the two outstanding components of such a spirit, are best developed within healthful and congenial environment will not be questioned. I have been requested to tell you something of a movement yet in its infancy on the Missouri, Kansas & Texas Lines, which we believe, in affording means for physical and social development, is in turn resulting in a more efficient transportation organization.

The necessity for rigid economy in railroad operation is an ever-present one today, and I desire at the outset to disclaim for the management of the M. K. & T., credit for purely philanthropic motives in its encouragement of the activities of which I shall speak. It has happily been found possible to carry them on at surprisingly little cost to either the company or to the employes, and without interference with operation.

At Parsons, Kan., where locomotive shops and certain of the general offices are located, there are approximately 2,800 Katy employes. About two years ago, Secretary Howser, of the railroad and city Young Men's Christian Association at that point, conceived the idea of and organized among the local employes a Katy Athletic Association. Last summer a suggestion by A. G. Knebel, of the Railroad Department of the International Committee of the Y. M. C. A. that the Parsons movement be extended, meeting with the hearty approval of the management, a conference of Young Men's Christian Association and railroad representatives was held at St. Louis, July 23, at which the organization of the Katy Lines Athletic Association was determined upon, the stated object being the promotion of a spirit of good-fellowship and an interest in clean athletics. Membership is restricted to employes and dependent members of their families. Dues are nominal, having been but 25 cents for each employe member during this first year.

Supervision rests with a general committee of 22, composed of Y. M. C. A. secretaries and employees and officials of practically every department of the railroad. At the first meeting of this committee, which was held at Parsons, October 1, 1915, we were extremely fortunate in having with us W. H. Ball, of the physical department of the International Committee of the Y. M. C. A., who subsequently made a trip over the line, presenting clearly the real purpose of the movement, and whose advice and suggestions were invaluable in getting it under headway. It was made clear from the outset that there was no obligation upon the part of any employee to become identified with the association, although all were invited to do so. Paternalism has been studiously avoided, and the future of the movement rests primarily with the employees themselves.

There are at present 15 local associations with headquarters at various points from St. Louis, Mo., and Kansas City on the east and north to Smithville, Tex., and Houston on the south. The territorial jurisdiction of each association is defined, and its local activities are supervised by a local committee. Every portion of the line, including outlying agencies, track gangs, etc., has a definite local affiliation. The local committees, and particularly their chairmen, are selected with especial reference to their standing and influence among employees. The chairman at one point is a conductor, at another a locomotive engineer, while a bridge and building foreman, an upholsterer foreman, agents, superintendent's chief clerks, a division passenger agent and a general baggage agent are heads of the other local committees.

Field and Track Meet at Denison

It having been decided to hold the first system field and track meet at Denison, Tex., November 6, a program of events was announced for which contestants began training after working hours. Everyone, regardless of whether or not he had ever before participated in athletics, and regardless of lack of proficiency, was encouraged to not only try out in the various events, but to keep on trying. We have little or no aspiration to establish new athletic records, but do definitely desire to improve the physical, and consequently the mental condition of the man or boy who is employed at a

*An address, made at a week-end conference on "New Ideals in Industrial Betterment," held at Lake Geneva, Wis., June 30 July 3, 1916. The gathering was composed of industrial leaders, railroad officers and Y. M. C. A. specialists.

desk every day, or who has no regular diversion from constant manual labor of a routine nature.

It was estimated that between 1,500 and 2,000 took some part or other in preparation and in the eliminations for the system meet. That cigarettes and irregular hours were not conducive to wind and stamina was soon discovered, and they were cut out. Even coffee was "tabooed" by many as time for the meet drew near. Fellows in obscure positions, and of whom none outside of their immediate small circle of acquaintances had ever before heard, sprang into local prominence. Departmental lines were entirely eliminated, and everybody pulled for a strong home team. Ties of friendship were formed, which would probably never have existed but for the opportunity thus afforded. Physical directors of the various local Y. M. C. A.'s co-operated splendidly in the training of contestants at their respective locations, thus insuring a desired influence, for emphasis was constantly being laid upon the fact that only honorable and fair victory could be counted a victory at all.

The system meet at Denison, November 6, was successful beyond expectation. A holiday had been declared in all departments. Seven special trains were run from various points north and south to carry the men, women and children of the Katy family. Train and engine crews voluntarily donated their services. The St. Louis crowd of 350 traveled 1,322 miles, going and returning. The Sedalia, Mo., delegation of 450 traveled 836 miles. Nearly 1,000 Parsons rooters rode 550 miles. Dallas was there 700 strong with its employees' band of 30 pieces, organized less than a month previously as an adjunct to the association, and consisting of six experienced players and 24 kids with new instruments, sore lips and a determination to do their worst



View of Athletic Park from Headquarters Tents



Welcome Arch at Denison Union Depot

—which they did. Walnut Springs (Tex.) came with its employees' band. Every part of the line was represented. All officials who could possibly be there were present.

The day was conceded to be the greatest in the history of Denison. The town, which has a population of about 20,000, had made elaborate preparation to entertain the visitors and was in gala attire. Apparently the entire citizenship

efforts and excellent handling than to any other one factor. Among the assisting officials were physical directors of the Y. M. C. A. along the line of whose splendid service previous mention has been made. There were 437 contestants, including employees and officials, entered in the various events, which included track and field athletics, baseball, tennis, tug of war, quoits, and wound up with a football



The Grandstands Were Packed Tight

assumed the responsibility of host. The Denison Herald, the leading daily, issued a "Katy Special" edition. Every automobile in the city was at the service of the visitors. A barbecue dinner was served to 3,800 without cost. The "Twenty-one Club" of society ladies personally served a

game between Denison and Smithville. The attendance was estimated at 10,000. It was a happy care-free crowd, and not an unpleasant feature marred the day. Old-timers of 40 or more years service with the company in Missouri and Kansas shook hands for the first time and swapped experi-



General Committee in Charge of Track and Field Meet

delicious luncheon to the contestants, and there were numerous other delightful entertainment features which I shall not enumerate, but which added immeasurably to the pleasure of the occasion.

Mr. Ball served as referee, and the success of the meet from an athletic standpoint was due more to his unflagging

ences with the long-service men of Texas, while their wives visited and children played together. Everybody rooted for the boys from home and cheered the winners.

The C. E. Schaff trophy, offered by our president to the team winning the greatest number of points, was won by Denison. Gold, silver and bronze medals for the first, sec-

ond and third men in each event were the only individual prizes awarded. The offering or acceptance of cash prizes is prohibited.

Some of the Results

Since the meet, the conditions varying at different points, local associations have been managing their own affairs as circumstances have warranted. Absence of indoor equipment has necessarily restricted athletic activities to those which can be carried on out of doors. At several points entertainments and parties have been held. The Dallas band, which is now doing really creditable work for so young an organization, is giving concerts which are attended by employees of all departments and their families, and are most enjoyable. Bands have been organized at Parsons and Denison and an orchestra at Sedalia. The Houston Association has given indoor athletic programs, and is a contender in the City Indoor Baseball League. Basketball is being played at various points. Trap and rifle shooting is arousing general interest, and the organization of military drill squads is under headway.

Our young ladies have been particularly active and helpful in the local entertainment features. A moving picture of the Denison meet has been exhibited at local points and viewed not only by Katy folks, but by the outside public as



Tents Used for Dressing Purposes and Headquarters

well. Association affairs are given liberal space in the Employes' Magazine and in our local newspapers.

One direct result of the splendid co-operation extended by the City Young Men's Christian Association secretaries and physical directors has been an increase in the number of M. K. & T. members of the city associations at points where there are no railroad associations. At Dallas, for example, 200 of our boys have gone into the Y. M. C. A. At Houston, where we employ comparatively few men, more than 25 have joined. At Fort Worth a movement is on foot for the establishment of a railroad branch, and Parsons recently raised $25,000 with which to enlarge the present building and equip a gymnasium and swimming pool.

Thirty-five baseball teams have been organized and are now playing. Sixteen of these teams started April 29 in a race for the W. A. Webb cup. To reduce the distance to be traveled to and from the points of games these teams are divided into four groups, or leagues of four teams each. The championship deciding game is to be played at Parsons, October 7, as the final event of this year's system meet. A nominal admission fee is being charged at ball games to defray actual expenses. The other 19 teams are playing in city or local leagues.

It is the custom on several of the superintendents' districts to hold a picnic each summer. These are in charge of committees of employees, and are simply old-fashioned "get-together and get-acquainted" affairs with the proverbial fried chicken, deviled eggs, potato chips, dill pickles, "chiggers" and other trimmings. They are extremely popular with both employees and officials and deservedly so, as the spirit of comradeship and friendliness they engender is invaluable.



The Barbecue Tent

Athletic events of some sort have usually been a feature of these picnics. This year eliminations for the system meet are constituting a definite part of their programs.

A permanent athletic field is being prepared at Parsons, where it is planned to hold this year's system meet on ground belonging to the railroad, conveniently located for both shop and office employees. Athletic fields have also been, or are



Listening to an Address on the Value of Athletics; Sedalia, Mo.

being, equipped on a smaller scale at other local points on railroad ground where available, and where not on ground leased by the local associations. The expense of equipping these fields has thus far been very small, the actual labor having been performed largely by association members.

There are approximately 20,000 M. K. & T. employees.

An organization of this sort with a possible active membership of many thousands scattered over nearly 4,000 miles of railroad necessarily requires careful supervision and involves some risk of objectionable features. Thus far, however, our troubles of this character have been particularly nil.

Keen rivalry naturally exists between the various local associations, but anything bordering on professionalism is forbidden. Eligibility rules are clearly defined, and under no circumstances is a man employed on account of his athletic prowess. To illustrate, no one is permitted to play in scheduled baseball games this year who has played, or has been under contract to play, professional baseball since December 31, 1915, nor can a man play in a scheduled game prior to his having been in the service 30 days. A slogan of the ball teams is "Let Every One Won Be Fairly Won." "Get-Rich-Quick-Wallingford" tactics in business life are not infrequently traceable to crooked baseball in youth.

Loss of working time incident to participation in association activities is discouraged, and pay is not allowed for time so lost. Baseball and other schedules are arranged with a view to minimum conflict with the regular working hours of participants.

The movement is too young to warrant a prediction as to its ultimate development. Its promotion, simply to determine who can run the fastest, jump the highest, or put the shot the furthest would be of little, if any, permanent value, and I have endeavored to make it plain that these considerations are of secondary, if not entirely negligible, importance.

There is an intimate relationship between work and play, which we are endeavoring to maintain in its proper balance. The spirit that influences men to keep fit to do their best in play is usually accompanied by the spirit that will help them to do their best in work, and the developing of this spirit is the furthering of efficiency in service.

A transportation system is but an organization of men working unitedly to perform a public service. Constant emphasis is laid on the necessity for team work in our traffic solicitation, in the better handling of freight to prevent claims, in the Safety First movement—in fact, in connection with every feature of our operation. We believe that the true spirit of team work, not only in play, but in the serious side of our business lives as well, can be, and is being, promoted as a result of the activities of which I have made mention.

I have yet to hear the first word of adverse criticism of the movement. A typical expression was that of one of our system traffic officials, who recently remarked that, if the association accomplished nothing but the improvement he had observed in the physical condition of one of his sons, in his opinion, it had been well worth while.

It is to the Young Men's Christian Association, which is recognized as an invaluable adjunct to M. K. & T. operation that we are indebted, not only for the suggestion of the movement, but very largely for what has been accomplished. As I think of the mork to which you gentlemen are devoting your lives, these lines come to mind:

> Isn't it strange that princes and kings
> And clowns that caper in sawdust rings,
> And common people, like you and me—
> Are workers for eternity?
>
> Each is given a set of tools,
> A shapeless mass and a book of rules,
> And each must make, ere life be flown,
> A stumbling block, or a stepping stone.

Dining Cars in India Withdrawn.—The East Indian Railway has withdrawn its dining cars from the Punjab and Bombay mail services and is allowing time at the stations for meals.

THE PENSION SYSTEM AND A STRIKE

The Southern Pacific Bulletin publishes the following as a warning to the train employees now being called upon to vote for a strike:

"Let us take counsel together.

"Do you know that the pension system is in danger? It was devised for the purpose of enabling employees of the company who have rendered long and faithful service to retire when they have reached an age requiring relief from duty. One of the pension rules is that those who leave the service lose any further claim to pension.

"The aim of the pension plan is to show in a practical and grateful way the appreciation of the company for those employees who have given the best years of their life so well to the company. The reward is for the fulfillment of faithful and continuous duty. Its essence is long and unbroken service. The employee who quits his job, of his own accord, gives up his right to expect such reward.

"At this time we would fail in a friendly duty to the men and women in the service if we forgot to remind them of dangers they can escape.

"You cannot quit the service and maintain your pension rights. You cannot abandon your work, leaving the company, the train service and the public to their fate, and be faithful to the company or anything connected with it at the same time.

"Enginemen, trainmen and switchmen have demanded changed schedules and increased wages. The railway managers have been compelled to decline the demands, but have offered to arbitrate all the points at issue embraced within their demands. Notwithstanding this, the representatives of the organizations are taking a strike vote. The strike is suggested although the men know that this company is not responsible for the agitation and it has no desire to change existing rates of pay or working conditions to the disadvantage of the employees. This has not prevented the company from offering to arbitrate, because of its desire to maintain harmonious and friendly relations with its employees. That desire the company has always.

"On the other hand, when a man strikes he leaves his work. He abandons his company to get along as best it may without him. His act is his own.

"Can any man quit his work of his own will and still be considered as giving continuous service or have future claims upon his employer? Can any man abandon the company and its property and still claim to be rendering the company faithful service? No man can go back upon his trust and be faithful to it at the same time; he cannot be facing both ways. The terms "faithful service" and "continuous service" would become a mockery under such circumstances and a delusion of which it is our purpose in this article to ask all concerned to take heed.

"The question is even more serious than this, for it brings the whole pension plan into question if it proves to be of so little value to the employee. Remember that, too.

"There is no use dodging the facts. The responsibilities of old age are too serious not to be faced openly. The loss of the pension is one of the most heartbreaking results of a strike for the man who walks out. Hasty action leads to regret. It is better to think the matter over, weighing the factors carefully, before making a decision. To strike is to abandon everything—employer, now, and well-earned relief, later, from the cares of the future.

"Let us ask every man and woman who reads this to remember that the pension plan has been a free-will offering from the company to the men and women for whose old age the company has desired to make provision. It costs the company between $300,000 and $400,000 annually. It costs the employees nothing. It brings to their old age comfort; it brings family pride instead of pitiful dependence;

it brings the glow of satisfaction to the family home and hearth; and yet it costs the employee nothing. The only requirement that the company makes is continuous and faithful service. That is the only price. Men and women who depend upon the Southern Pacific for your needs and your comforts, is the price too high? If you are in doubt, ask the men and women of the Veteran Corps."

CRUSHED GRAVEL BALLAST ON THE ROCK ISLAND

The Chicago, Rock Island & Pacific is making considerable use of a crushed and washed gravel for ballasting its tracks, the material being obtained from a commercial pit at Rockdale, near Joliet, Ill. Except for the fact that a considerable portion of the stone is too large for use in track, this gravel would be an excellent natural ballast; at the same time the pit presents physical characteristics which are most favorable for economical operation. The face of the pit is 1¾ miles long and 65 ft. high above a general ground level, which can readily be drained, while there is a considerable deposit of material below this level which affords possibilities of future development by dredging. The content of clay or loam is small and the stripping is so thin that with the use of the washing process no attempt is made to strip. The sand contains only a small amount of the extremely fine particles. The pit is owned and operated by the Chicago Gravel Company and the output is used commercially as well as for railroad ballast.

Aside from the mineralogical character of the stone of which a gravel is composed, the availability of a natural gravel for use as ballast depends principally upon the relative proportions of the various sizes of particles and the content of clay or loam. If the amount of fine sand or foreign matter is high the gravel will give a dusty ballast and one that drains improperly. If, on the other hand, the gravel contains a considerable amount of particles or boulders which will not pass through a 2 or 3-in. screen, it will be troublesome and expensive to handle in the track. The first objection can be overcome by washing the gravel and this has been done in certain pits during the past eight years or more. The other difficulty can be overcome by passing the gravel through a rock crusher and this is now being done, in combination with washing, in the pit serving the Rock Island. The success of either of these remedies depends, of course, upon the economy with which they can be carried out, as affected by the opportunity for the installation of an efficient plant.

The gravel at Rockdale is excavated with a 175-B Bucyrus turn-table steam shovel with a 65-ft. boom and a 3½-cu. yd. dipper. This machine has a capacity of 3,500 cu. yd. in nine hours. The gravel is hauled to the crushers over standard gage tracks in two trains consisting of two Roger ballast cars of 40 cu. yd. capacity each, handled by 40-ton, 4-wheel switch engines. The crushing plant consists of four No. 6 Allis-Chalmers gyratory crushers with a capacity of 300 cu. yd. per hour. Two Symons Brothers disc crushers are provided to recrush all stone which fails to pass through the largest size screen. A grizzly is provided under the hopper over the four primary crushers in order to by-pass as much as possible of the fine material to avoid the possibility of choking up the crushers. The rock is transmitted from the track hopper to the crushers and from the crushers to screens, etc., on heavy conveyor belts.

The screening and washing plant consists of seven steel tanks 19 ft. in diameter and of varying heights, to a maximum of 48 ft. and seven rows of four screens each arranged in two banks by which the material is separated into six different sizes. In one bank the sizes of the mesh in the screens are in order, 2 in., 1¼ in., ⅜ in. and ¼ in., and they separate the stone respectively into what are known as 2-in. stone, 1-in. stone, roofing gravel and torpedo sand. In the other bank the sizes are 2½ in., 1½ in. and ¼ in.

The process of screening is the direct opposite of the usual method in that the material passes over the largest size screen first, all the material retained on the screen being passed directly to a bin while that which passes through the screen is carried to the next smaller screen. Fifteen hundred gallons of water per minute is used for washing, a stream of water being played on each screen. The separation of the clay and loam takes place in a box under the last screen, where a tilting device periodically pours off the water containing the suspended matter and permits the sand to drop into a bin. Bins are provided for each of the sizes enumerated above and there is also one bin for ballast which consists of the run of the pit for the material retained on the 1¼-in., ⅜-in. and ¼-in. screens plus 10 per cent of the torpedo sand. The run of the pit for the three larger sizes consists approximately of one-fourth roofing gravel, one-fourth 1-in. stone and one-half 2-in. stone. Ten per cent of torpedo sand is added because it has been found that this amount of sand facilitates the handling of the ballast in track.

Gravel from this pit was first used on the Rock Island for ballast in 1912, the gravel being crushed to a 2-in. size without washing. This gave a fairly satisfactory ballast, but some tendency toward churning of track was noted and it was finally concluded that it was not entirely suitable for the standard of track desired for the main lines of the Rock Island. As a result, the washing feature was added in 1913 and has been carried on for the three last seasons, according to the arrangement described above. The ballast has been used on the main line of the Illinois division between Chicago and Rock Island, and on the main line of the Missouri division between Rock Island and Eldon, Iowa. During the season of 1915 the average daily output was about 65 cars, about 35 cars of which was used for concrete on track elevation in Chicago, and ordinary commercial purposes, the rest used as ballast.

A general improvement of the tracks is being carried out over the district mentioned above, including a raise out of face and extensive tie and rail renewals. A special effort is made not to mix the new ballast with the old. In general no new ballast is delivered until all the old ballast has been removed to the level of the bottom of the ties, either by raising the tracks or by using it to widen the shoulders. Ordinarily the ballast is unloaded in two portions: first, a sufficient amount for making the lift with skeleton track, and later the amount necessary for dressing to the standard ballast section. The track is raised by shovel tamping and then left for about two weeks, when it is gone over again and all low spots are raised with the use of tamping picks.

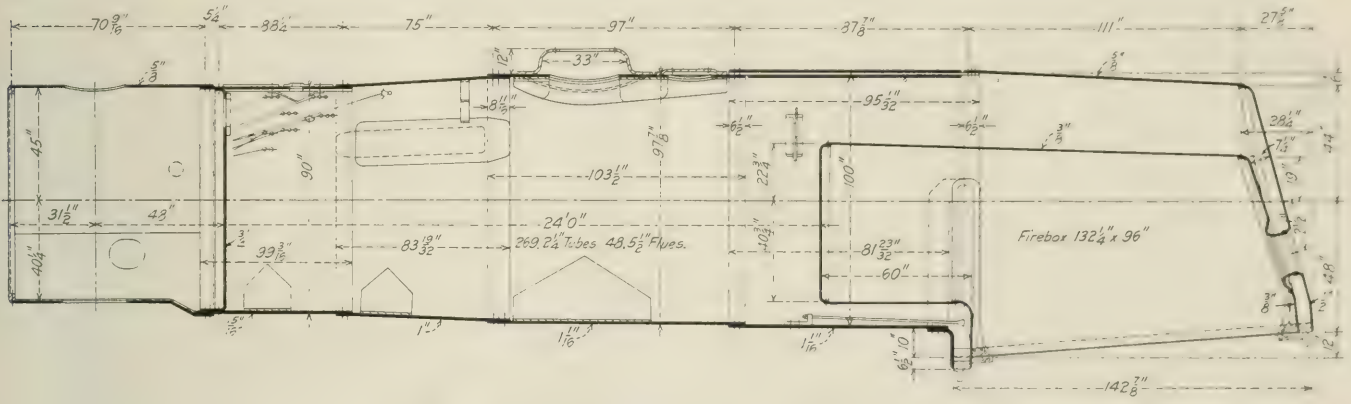
This crushed and washed gravel costs approximately two-thirds the average cost of crushed stone ballast available in the same general territory, and with the experience had thus far the results obtained have been entirely satisfactory. It is much easier to handle in track than rock ballast. In fact, it can be worked almost exactly the same as gravel, shovels being used for most of the tamping as mentioned above. Owing to the fact that a considerable portion of the stone has passed through a crusher, a large portion of the particles are angular in shape rather than round, a fact which adds materially to the holding power of the material as a ballast and there is not the tendency to roll which has sometimes been experienced with washed gravel which has not been crushed. The ballast gives a good appearance in track very much like rock ballast and is equally clean and free from dust.

GERMAN STEEL AND IRON.—A recent United States consular report says that the German production of pig iron in 1915 was 11,790,199 metric tons, as compared with 19,300,000 tons in 1913, or 39 per cent less. Steel production in 1915 was 13,187,616 metric tons and 14,946,212 in 1914.

Mallet Locomotives for Use in Road Service

Baltimore & Ohio Engines Exert Tractive Effort of 103,000 lb.; for Use on Ruling Grades Over 2 Per Cent

THE Baltimore & Ohio has recently received from the Baldwin Locomotive Works 15 Mallet articulated locomotives of the 2-8-8-0 type. These engines exert a tractive effort of 103,000 lb., and are used in road service on the Cumberland division, replacing single expansion locomotives of the 2-10-2 type, which have been transferred to a section of the road having lighter grades. The maximum grades on the Cumberland division are 2.4 per cent east bound and 2.28 per cent west bound. The traffic is very heavy, consisting chiefly of coal, and on few roads in this country are more difficult operating conditions to be found.



Boiler for the Baltimore & Ohio Mallet Type

The boilers of the new Mallets are of the conical type, the second ring in the barrel being tapered, increasing the shell diameter from 90 in. at the first ring to 100 in. at the throat. As far as front end diameter, number of tubes and principal firebox dimensions are concerned, the boilers of the Mallets are similar to those of the 2-10-2 engines previously referred to. The length of the tubes, however, is 24 ft., as compared with 23 ft. in the 2-10-2 type, and the combustion chamber is 32 in. longer. This accounts for an increase in total heating surface of 263 sq. ft. Both engines are equipped with Schmidt superheaters, the Mallets having 86 sq. ft. more superheating surface than the others. The grates and the arrangement of the cab fittings are practically alike in both engines, and both are fired by Street stokers.

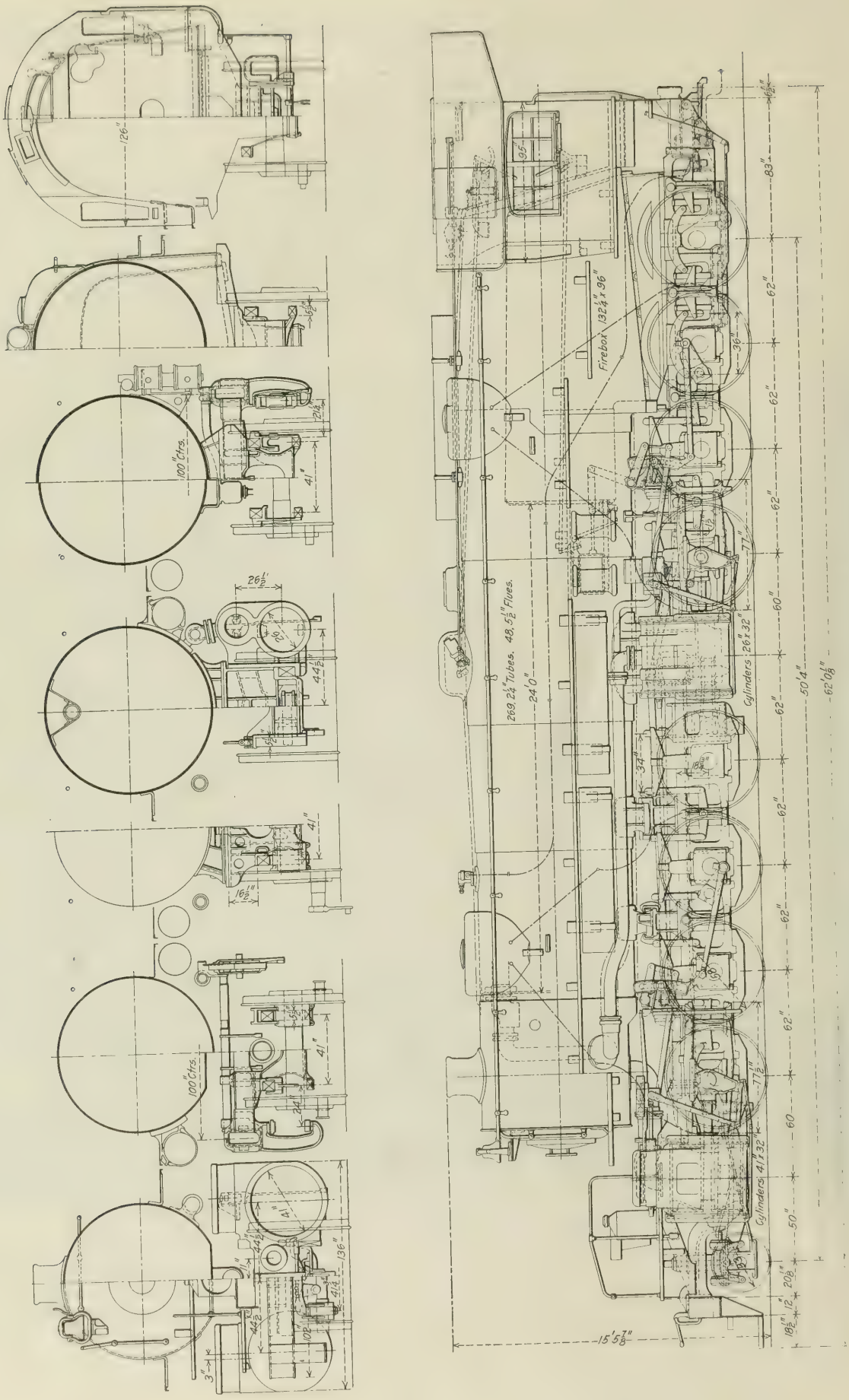
The combustion chamber is 60 in. long, and the front end of the combustion chamber crown is supported on three rows of Baldwin expansion stays. There is a complete installation of flexible stays in the water-legs. The middle seam in the barrel, and the seams uniting the throat and outside firebox shell with the fourth ring are triple riveted. Some of the combustion chamber stays are necessarily tapped into the throat and outside shell seams and where this occurs the stays are so located as to replace rivets in the center row. The Security brick arch, in the Mallet type, is supported on five 3-in. tubes. These extend from the bottom of the combustion chamber to the back sheet of the firebox. This arrangement of tubes improves the circulation in the horizontal water space under the combustion chamber, and as the arch tubes are comparatively long they add considerably to the firebox heating surface.

The shell plates of the boiler are heavy, those constituting the third and fourth rings being 1 1/16 in. thick. The high-pressure cylinder saddle and the two waist-bearers over the front frames are bolted to the boiler barrel, an inside liner being riveted to the shell in each case. Bolts, rivets and liners are electrically welded to insure tight joints.



Mallet Locomotive for Road Service on the Baltimore & Ohio

The high-pressure steam distribution is controlled by 14-in. piston valves. These have cast iron bodies and malleable iron heads, while the bull-rings and packing rings are of Hunt-Spiller metal. The cylinders and steam chests are fitted with bushings of the same material. The high-

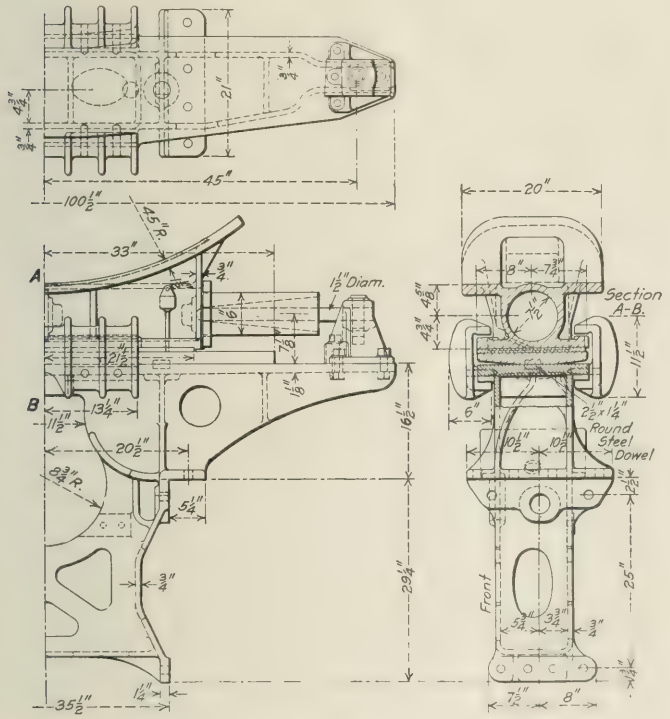


Elevation and Cross Sections of the Baltimore & Ohio Locomotives

pressure cylinder saddle consists of two steel castings, placed one above the other. The bottom casting is provided, on its top face, with lugs at the front and back and keys are driven in against the front lugs, thus making an exceedingly secure joint between the two sections of the saddle. The bottom section is cored out to receive the ball joint at the back end of the receiver pipe.

The low pressure cylinder castings are bolted together on the center line of the locomotive and the axes of these cylinders are set on an inclination of 1 in 39. The low pressure distribution is controlled by Allen ported balanced slide valves. The valve gears are of the Walschaert type, and are controlled by the Ragonnet power reverse mechanism. In accordance with the usual practice of the builders, the front and back reverse shafts are connected by a centrally located reach rod. This rod has a flexible joint which is guided between the inner walls of the high pressure cylinder saddle. The starting valve is of Baldwin design and is placed in a pipe connection leading from one of the high pressure steam pipes to the back end of the receiver pipe.

The high pressure pistons are of box form, each cast in



Forward Waist Bearer

one piece, Hunt-Spiller metal being used; the low pressure pistons have cast steel bodies of dished section on which iron bearing faces are cast. In neither case are extension rods used. The piston rods, main crank pins and main axles are of Nikrome steel.

The articulated connection between the front and rear frames is designed to provide ample flexibility. The radius rod is pinned to the front frames, and has a ball-jointed connection with the hinge-pin. The front and rear frames are neither interlocked nor connected by hanger bolts. For the rear group of wheels there is a continuous equalization system on each side of the locomotive, while in the case of the front group the equalization divides between the second and third pairs of drivers. The Cole design of long driving box is used on the main wheels. The front truck is fitted with three-point suspension links.

The boiler is supported on the front frames by two waist bearers both under load. The wear is taken in each case by a brass shoe 5/8 in. thick which is bolted to the upper section of the waist bearer. This shoe slides on a steel plate, finished transversely to a long radius on its under side, which is held in position by dowels entering the lower section of the waist bearer. The latter constitutes a most effective transverse brace, as it is bolted to both the upper and lower frame rails. The rear bearer supports the brake cylinders for the forward group of wheels, while the front bearer is fitted with the centering springs and suspension clamps.

These locomotives are designed to traverse curves as sharp as 22 deg. The play between rails and flanges is 1 in. on the front and rear wheels of each group of drivers, and ¾ in. on the intermediate wheels. The weight distribution is very satisfactory, as there is a difference of only 1,100 lb. between the total amounts carried by the front and rear groups of drivers.

The Vanderbilt tender has been used on all the freight locomotives recently built for the Baltimore & Ohio. In the present case, the tank is of unusual capacity, as it carries 12,000 gal. of water and 20 tons of fuel. The wheels are of solid forged and rolled steel.

The principal dimensions and ratios are as follows:

General Data

Gage	4 ft. 8½ in.
Service	Freight
Fuel	Bit. coal
Tractive effort	103,000 lb.
Weight in working order	485,600 lb.
Weight on drivers	462,500 lb.
Weight on leading truck	23,100 lb.
Weight of engine and tender in working order	692,000 lb.
Wheel base, driving	41 ft. 2 in.
Wheel base, total	50 ft. 4 in.
Wheel base, engine and tender	87 ft. 5¼ in.

Ratios

Weight on drivers ÷ tractive effort	4.5
Total weight ÷ tractive effort	4.7
Tractive effort × diam. drivers ÷ equivalent heating surface*	751.0
Equivalent heating surface* ÷ grate area	90.4
Firebox heating surface ÷ equivalent heating surface,* per cent	4.9
Weight on drivers ÷ equivalent heating surface*	58.0
Total weight ÷ equivalent heating surface*	61.1
Volume both cylinders	30.4 cu. ft.
Equivalent heating surface* ÷ vol. cylinders	26.2
Grate area ÷ vol. cylinders	28.9

Cylinders

Kind	Compound
Diameter and stroke	26 in. and 41 in. by 32 in.

Valves

Kind	H. P., 14 in. piston; L. P., balanced slide

Wheels

Driving, diameter over tires	58 in.
Driving, thickness of tires	4 in.
Driving journals, main, diameter and length	10½ in. by 16 in.
Driving journals, others, diameter and length	10 in. by 13 in.
Engine truck wheels, diameter	33 in.
Engine truck, journals	6 in. by 10 in.

Boiler

Style	Conical
Working pressure	210 lb. per sq. in.
Outside diameter of first ring	90 in.
Firebox, length and width	132¼ in. by 96 in.
Firebox plates, thickness	sides, back and crown, ⅜ in.; tube, ½ in.
Firebox, water space	front, 6 in.; back, 4 in.; sides, 6 in. to 4 in.
Tubes, number and outside diameter	269—2¼ in.
Flues, number and outside diameter	48—5½ in.
Tubes and flues, length	24 ft.
Heating surface, tubes and flues	5,443 sq. ft.
Heating surface, firebox	393 sq. ft.
Heating surface, total	5,836 sq. ft.
Superheater heating surface	1,415 sq. ft.
Equivalent heating surface*	7,958.5 sq. ft.
Grate area	88.2 sq. ft.

Tender

Weight	206,400 lb.
Wheels, diameter	33 in.
Journals, diameter and length	6 in. by 11 in.
Water capacity	12,000 gal.
Coal capacity	20 tons

*Equivalent heating surface = total evaporative heating surface + 1.5 times the superheating surface.

LONDON & NORTH WESTERN MEN WITH THE COLORS.—A recent poster issued by the London & North Western shows that 18,858, or 20 per cent of its employees have joined the colors, and that thirty have received the distinguished conduct medal, one the distinguished service medal, six the military medal, sixteen have been mentioned in despatches and eleven have been commended by the commanding officer.

THE LOCAL FREIGHT AGENT*

By Fairfax Harrison
President, Southern Railway.

As common carriers it is our business to accept freight from the shipper and deliver it to the receiver, whether on the originating line or on some other line, with reasonable promptness and in as good condition as when it was entrusted to us.

The local freight agent starts and stops every pound of business we handle, and—in the language of the forceful and efficient superintendent of agencies of the Southern Railway who is known to many of you—"If it don't start right, it's dollars to doughnuts it won't stop right." You and I both know the consequences. If a package of freight does not stop right a dissatisfied shipper, a disgruntled receiver and a loss or damage claim are inevitable. It follows that efficient service by the local agent is one of the most effective forms of solicitation, and that efficiency in his office shows directly on the balance sheet.

The most important part of your duty is undoubtedly that connected with the receipt and handling of money and the keeping and rendering of accounts—for substantially all the revenue of the railroad passes through your hands—but next to this, my own belief is, your opportunity for success lies largely in starting a shipment right. I shall not attempt to give you technical advice as to how to do this because you probably all know more about it than I do, but shall make some brief philosophical observations as to efficiency in railroad employment which apply with special force to the local agent.

The local agent is the man on the railroad with whom the public comes most in contact and the opinion which his neighbors have of him is apt to become their opinion of the company. His realization of this will inspire him with a determination to maintain the good name both of himself and of his company. Uniform courtesy in dealing with the public should be the rule of every railroad officer and employee, but it is of supreme importance to the local agent, for discourteous treatment may lead a shipper to give his business to a competing line or to short-haul that of the man who has offended him and it is well for the agent to remember that in reality there is no such thing as a "non-competitive" railroad station. Though the business may have to start by his line, a disgruntled shipper may turn it over to another at the first junction point.

There are many ways in which the local agent and the shipper may co-operate to their mutual advantage, and the most successful local agent will be one who strives unceasingly to bring about this co-operation and especially to secure the intelligent interest of the shipper in the proper packing, marking and loading of his goods. You may make a lifelong friend for yourself and for your company by explaining to a shipper just how certain goods may have been lost or damaged as a result of improper packing, marking or loading. On the other hand, if goods have been lost, damaged or delayed through the fault of the railroad, is it not better to go to the shipper and frankly tell him the whole truth, accept full blame, tell him just what happened, why it happened, what you are doing to prevent the same thing happening again, and show him what he may be able to do to help you? It is human to err, but the wise man profits by his errors and will not make the same mistake twice.

I yield to no one in appreciation of the difficulties of the agent's job. He probably comes into contact with as much meanness and petty dishonesty as any man in business, but where he is successful he probably earns as much esteem and good opinion and gets as cordial co-operation from the great majority of business men who are honest and straightforward as does any public servant.

He must, however, be a versatile man. In addition to having the qualities which make for success in the management of a general merchandise store he must usually be a telegraph operator, a rough and ready lawyer, a first aid surgeon, a substitute for a certified public accountant, a pretty good bank president, a political economist, a peacemaker, a captain of men in action, and an organizer of victory. He must interpret and do his best to enforce a multitude of detailed and often obscure regulations prescribed by law and by public regulating authority as well as those which originate at the railroad headquarters. He must have a patience and good humor which will qualify him for a robe and a harp and a seat in Heaven alongside of Job himself, and, with all this, he must be a self-respecting citizen, a church member and rear a family on a modest wage. It would seem that if every local agent qualified in all of these respects the political parties would all go to your association to find candidates for President of the United States. But seriously, your job is an important job on every railroad and no self-respecting managing officer fails in respect and esteem for the successful agent.

The German army is the wonderful fighting machine that it has proved itself to be, not because the individual soldiers of whom it is composed are in any way superior in natural ability to an equal number of men of any other nationality. Its superiority is due to the fact that, from the time of von Moltke to the present, there has always been at the head of the German general staff a man of the highest efficiency, who would be contented with nothing but superior service throughout the entire organization, from a general commanding an army to a private in the ranks. The same rule holds good in every human organization, including the local agency of a railroad. As the agent is, so will his force be. If he is a man of efficiency himself, who will not be content with anything short of superior service from his entire organization down to the office boy and truckers, he will get that kind of service. There may be different ways of doing this in different parts of the country and in different railroad organizations, but I believe that the best way will uniformly be for the agent to be a leader of his men and not a driver. I know it is the best way on the Southern Railway, for the southern man is hard to drive; but there is nowhere that he will not follow a leader who has his full confidence and respect.

There are three requisites for advancement in railroad service—loyalty, efficiency in your present job, and preparedness for larger responsibilities. Efficiency and preparedness for higher place go together, for that man will be most efficient in his present job who is not content with mere mechanical performance of his duties, but who has an intelligent understanding of them in their relation to the service as a whole, and who has qualified to take over the duties and responsibilities of his immediate superior on a moment's notice. Applying this to the local agency, it follows not only that the agent should be a man measuring up to these requirements for advancement, but that he should carry out the principle in the organization of his force.

I suggest that a young man who gives evidence of a desire and a determination to make the most of his opportunities, should not always be passed over for one whose present qualifications may seem to be superior, but who would probably develop into nothing higher than the mechanical, clock-watching type of employee. Starting with the best material available, every man in the agency should, of course, be expected to perform his immediate duties efficiently, but, in addition to this, he should be encouraged to familiarize himself with all the business of the agency, to qualify himself for any place in it, and to make suggestions for the improvement of the service. The right kind of an agent need not be afraid to have men under him

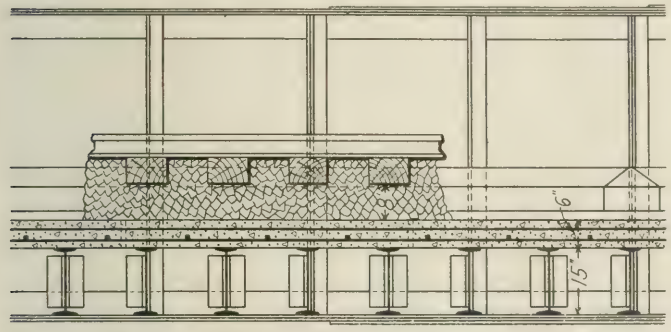
*An address before the American Association of Freight Agents at Cincinnati, Ohio, June 20, 1916.

qualified to take his place, for if he is the right kind of an agent no subordinate will be so well qualified for his place as he himself, and, if his subordinates are all qualified for promotion along the lines I have suggested, by efficiency in their present jobs combined with an intelligent understanding of their relation to the service as a whole, and with preparedness for larger responsibilities, the agent's mind will be relieved of details, he can be a constructive leader, and the work of his agency will be of such high grade that it cannot avoid attracting the attention of his superiors.

SOLID FLOORS FOR THROUGH GIRDER SPAN

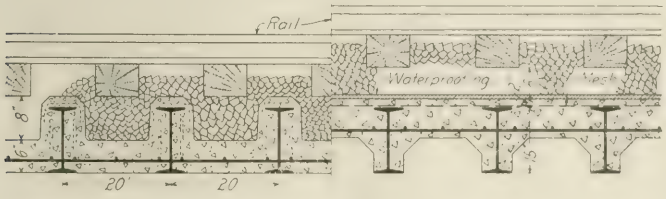
A reinforced concrete floor for use with through girder spans has been developed on the Wabash, which affords a solid floor that is practically equivalent to the concrete deck for ballasted tracks on deck girders. The floor thickness or distance from base of rail to the under clearance is almost as small as it is possible to obtain with any of the usual types of ballasted floors in use.

This floor is a substitute for the combination steel and concrete floors used with through girder spans where head



Type A—I-Beams with Superimposed Slab

room is small and offers several improvements over these earlier types from which it was developed. The most common of these consists of I-beams spanning between the girders to which they are attached by connection angles riveted to the webs. With increased use of ballasted tracks on bridges, there I-beam floors were adapted to this purpose by flooring them over in various ways. Steel apron plates were first used followed by creosoted planking and later by reinforced concrete slabs, designated as type "A" in the accompanying drawings. Concrete as a covering for

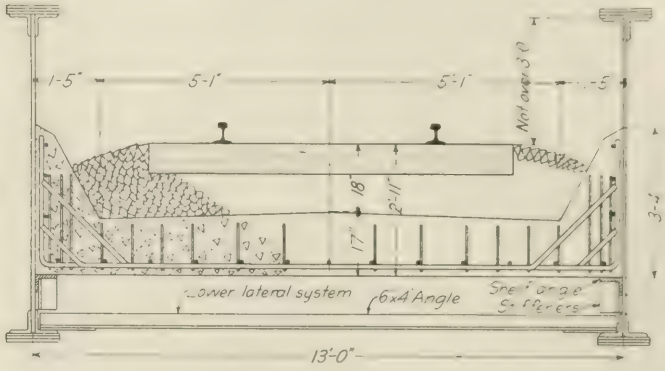


I-Beams Encased in Concrete, Type B—Hollowed Out on Under Side, Type C—Troughs Between Beams on Upper Side

the I-beams has entirely superseded the other materials. The development of the various kinds of floors in track elevation structures is described in an article entitled "The Track Elevation Subways in Chicago," which appeared in the *Railway Age Gazette* on March 6, 1914, page 549.

The principal objection to the type "A" floor, is that it adds 5 or 6 in. to the floor thickness. This difficulty is overcome in some designs by depressing the slab until it surrounds the I-beams and projects only 1 or 2 in. above the top flanges. This, however, adds a large amount of extra dead weight. A method commonly used to overcome this is that shown as type "B" in which the concrete is hollowed out between the beams on the under side, but this requires expensive form work and does not pay unless the beams are at least 18 in. deep and are spaced an equal distance.

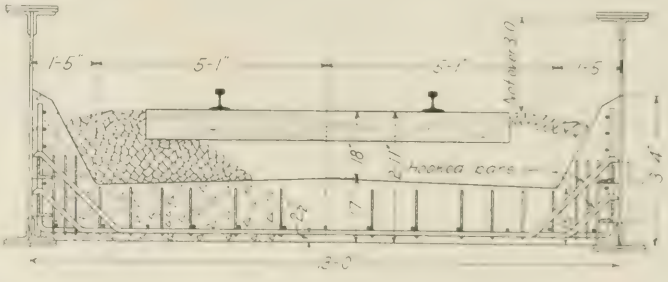
Another scheme which has been used partly for the purpose of saving concrete, but principally for decreasing the head room is that designated as type "C." The slab is hollowed out between the beams on the upper side and the troughlike spaces thus formed are filled with ballast in which the ties are depressed. This form has not been entirely successful because it places certain restrictions on the track



Type D—Slab Bearing on Shelf Angles, Structural Steel Tie Between Girders

construction, and the drainage of these troughs between the beams has proven troublesome.

Concrete slabs spanning from girder to girder have been used extensively to afford ballasted track on deck bridges for a number of years. A. O. Cunningham, chief engineer of the Wabash, has applied the same method to a through span by the use of a monolithic slab of concrete supported between the girders as illustrated by types "D" and "E" in the accompanying drawings. In the case of type "D," the slab is not connected rigidly to the girders, but bears on shelf angles



Type E—Girders Tied Together by Slab Suspended Between Them

riveted against the webs on the inside, these shelf angles being supported on short stiffener angles. As the load of the slab is placed upon the shelf angles it is eccentric with respect to the girders, and there is a tendency for the latter to rotate in a direction that would move the top flanges inward and the bottom flanges outward. This turning moment is resisted at the bottom by a lower lateral system of the ordinary type and at the top by the concrete parapet or curbing which extends above the top face of the slab, and bears against the web of the girder.

The main reinforcement of the slab consists of 1⅛-in. diameter rods, spaced 4 in. center to center, and running transversely from girder to girder. These bars are given three types of bends at the ends to take different positions

within the parapet. Half-inch rods, spaced 12 in. center to center, run lengthwise of the girders and ½-in. stirrup bars, variously spaced, loop every third main reinforcement bar.

The type "D" floor was designed to bring the elevation of the base of rail high enough so that the flanges of the girders will not cut into the standard bridge clearance diagram. By keeping the base of rail within a distance of three feet from the backs of the upper girder flanges the clearance is not interfered with. This leaves a space between the bottom of the slab and the lower flanges which is occupied by the shelf and stiffener angles. In bridges under 50 ft. in length and where a minimum headroom is required, the space between the bottom of the floor and the lower flanges is not sufficient for these angles. To overcome this the type "E" floor was devised, which brings the slab into partial bearing on the lower flanges of the girders. There is no structural steel connection between the two girders in the present design, dependence for a tie between them being placed entirely on the slab structure and its connection to the girders. An additional tie bar or strap riveted between the lower flanges at about 5 ft. intervals would tend to relieve the stress in the reinforcing bars of the slab and to resist the overturning moment.

The slabs are secured to the girders by means of sockets attached to the girder web, into which the reinforcing bars are hooked. These sockets are formed by riveting 6 in. by 4 in. by ½-in. angles 8 in. long to the web, from which they are separated by filler plates 1⅜ in. thick. Two fillers are provided for each angle, and being separated 1⅜ in. a square hole is formed, which serves as a socket for the reception of the hook bar. These sockets are arranged in two rows for the entire length of the girders and serve, with the bottom flanges, as supports for the slab.

Except for the details of the ends of the main reinforcing bars, to permit them to hook into the sockets mentioned above, the reinforcement in the type "E" floor is the same as in the type "D" floor. This type "E" floor gives a total depth of 2 ft. 11 in., including ballast, which is about the same as that obtained with a floor composed of I-beams imbedded in concrete. The I-beams, however, are saved and the extra cost of bending and placing the heavy steel reinforcement is offset by the saving in the field riveting of the I-beams to the girders. Like any concrete floor, it is imperative that the track on which the span is to be placed be taken out of service until the concrete can be placed and cured, or else arrangements must be made to erect the girders and concrete the slabs to one side of the final location and roll or slide them into place.

A comparison of costs of ordinary I-beam floor construction and types "D" and "E" shows slightly in favor of the latter. The following is an estimate based on the normal prices of materials and omitting duplicate items.

DESIGN A

0.43 cu. yd. reinforced concrete at $7	$3.01
50 lb. reinforcing rods at 2½ cents	1.25
407 lb. structural steel at 2 cents	8.14
	$12.40

DESIGN D OR E

0.74 cu. yd. reinforced concrete at $7	$5.18
208 lb. reinforcing rods at 2½ cents	5.20
78 lb. structural steel at 2 cents	1.56
	$11.94

The Wabash has prepared plans, incorporating the new floor designs in grade separation work on which it is expected to start work in the near future. It also has in service in St. Louis, a bridge of similar design in which the floor is supported partly on the lower flanges and on reinforcing rods, which pass through the stiffener angles of the girders. This bridge has given satisfactory service and demonstrates that this type of floor can be built and operated successfully.

REPORT OF A. R. A. COMMITTEE ON MOBILIZATION

The American Railway Association Special Committee on Co-operation with the Military Authorities has submitted to the executive committee of the association a preliminary report of its work in connection with the mobilization of the National Guard, as follows:

In May, 1914, following a determination by the War department to co-ordinate the agencies required for emergency transportation of large bodies of troops and military supplies, a letter from the quartermaster general suggested to the president of the American Railway Association that the association locate an officer in Washington who could advise with the quartermaster corps on this subject. A member of the executive committee was at once designated a sub-committee to pledge the co-operation of the American Railway Association in any practicable way. After conference an understanding was reached as indicated in a letter dated May 22, 1914, addressed to the quartermaster general by such sub-committee, a portion of which was as follows:

"We are advised that the routing of all movements of troops will be determined in your office and that you do not desire any co-operation or assistance from any association of the railways in determining such routing.

"We are advised that you do not want us to do anything at this time, but it is understood that, upon notice from you to me at my office, the American Railway Association will designate a representative to co-operate with your office in all matters relating to the transportation of troops and supplies, other than the routing thereof, to the end that the actual movement upon the route or routes you shall have selected may be facilitated and expedited. In the event of emergency demanding immediate action in this respect, I have undertaken to send a competent representative of the American Railway Association to put himself at your service on the same day that you call for him, but, if and as it is convenient to you, we will appreciate several days' notice so that the executive committee of the American Railway Association may be summoned to meet in Washington to designate a representative to be stationed in Washington for such service so long as he is required, and to make any other arrangements for co-operation which may be then agreed upon."

Here the matter rested until October 26, 1915, when the Secretary of War referred to this discussion and suggested that the American Railway Association establish a committee to whom the War department could look for information that might be desired as to the railroads of the United States.

In response to this invitation the executive committee appointed a sub-committee of four to confer with the Secretary of War, and later constituted the members of such sub-committee as the present Special Committee on Co-operation with the Military Authorities, the creation of such special committee being ratified by the association at its May, 1916, meeting. Immediately after its first appointment this committee sought and had a conference with the Secretary of War on December 6, 1915, and were then told that the Special Committee would be advised further how its co-operation might be made effective. Subsequently informal conferences were had also with officers of the general staff and of the quartermaster department, but, pending official determination of a method and a point of contact for official co-operation, no definite work of preparation for the co-ordination of the railways with the military authorities could be undertaken. On May 16, 1916, the Secretary of War advised the chairman of the Special Committee as follows:

"The quartermaster corps is, by army regulations, charged with the duty of providing for transportation of troops, munitions of war, military property and stores, and it is requested that you advise the quartermaster general when it will be convenient for your committee to consult with representatives

of the quartermaster corps relative to such action as may be necessary with a view to co-ordination and co-operation between the railroads and the War department."

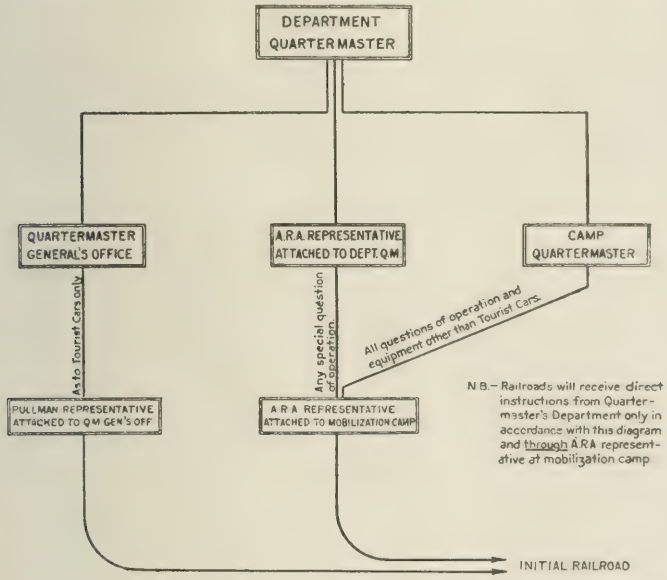
Under this direction the Special Committee arranged a conference on May 29, 1916, with Col. Chauncey B. Baker of the quartermaster department in charge of military transportation by rail.

At this conference Col. Baker outlined his individual views of a basis for co-operation in an able and exhaustive paper which he submitted to the committee. Such paper discussed, among other things, principles for the study of

First: The co-ordination of the railways, as a whole, with the broad principles or plans of procedure which are or are to be developed, passed upon and finally approved.

Second: The orderly movement of troops or ammunition in accordance with the general policy outlined in paragraph No. 1 above; this in co-operation with the quartermaster corps.

While the committee was engaged in studying Col. Baker's paper, affairs on the Mexican border became critical. On June 18, 1916, orders were issued for the mobilization of the militia of the several states. On June 19 a tentative list of the camps in each state at which state troops were to be



Plan of Organization as to Relation Between Military Authorities and the Railroads

mobilized was furnished to the Special Committee by the quartermaster department, with the request that the American Railway Association designate a railway official thoroughly conversant with transportation for duty at each camp; this official to report to the camp quartermaster; and that a similar representative be designated to consult with the department quartermaster at the headquarters of each of the military departments.

The railroads interested were immediately asked to name competent men for the duty outlined, and through their prompt action it was possible to notify all concerned of their names in Circular 1701, June 24, 1916. In the meantime a tentative plan for the work of such representatives of the association was prepared in conference with the War department. This plan of organization was distributed in a bulletin issued June 27, 1916.

Mobilization was quickly followed by orders to move those troops which were most nearly prepared for service on the Mexican border. The Special Committee was not consulted as to routings, but one of its first serious problems was that of providing for interchange of passenger equipment in order fairly to protect the lines originating movements of troops. At a general conference of the railways called by the Special Committee and held in Washington June 28, 1916, the chairman of the Special Committee was directed to establish a bureau for handling the distribution of passenger equipment of all railroads members of the American Railway Association, necessary for the movement of troops and the return of same. In accordance with this direction such a bureau, located in Washington, has been established under the supervision of George Hodges, who has been designated as Secretary of the Special Committee on Co-operation with the Military Authorities.

It was further desired by the War department that, as a part of this bureau, there be appointed inspectors for the American Railway Association at border points, in charge of a chief inspector to be located at the department headquarters at San Antonio. The railways were requested to designate individuals to perform this service, and on July 6, 1916, Bulletin No. 5 was issued containing their names. The function of these inspectors is to keep all concerned fully informed as to conditions at unloading points, in order to avoid congestion so far as may be possible.

The Special Committee has issued various bulletins for the information of the railways in respect of details of general interest.

The work of the Special Committee in relation to the movement of troops has so far been largely one of organization for efficiency. It has been conducted, under pressure for prompt action, without previous preparation and without precedents. It can be done better another time. The experience has been valuable for all concerned, as it has developed mutual confidence and an understanding with the military authorities which has made the work one without friction with the responsible representatives of the government. The Special Committee gratefully acknowledges the cordial, unselfish and unstinted support which it has had from all the railways, without which its efforts would have been futile. The unanimous expression of willingness to exchange passenger equipment, something entirely new in railroad experience in any national sense, has been evidence of a sincere patriotism. The work of the representatives at department headquarters and at the mobilization camps is also to be highly commended. Thrown into a novel experience, without other instructions at the start than to represent all the railways and to do what seemed necessary, they have given new evidence of the versatility and efficiency of the American railroad officer. The official governmental appreciation of what has been done is expressed in the following letter, dated at the White House, June 24, 1916, and forwarded to the president of the American Railway Association:

> The Secretary of War has just called my attention to the arrangements made by The American Railway Association for co-operation by the railroads of the country with the Quartermaster General and the Quartermaster's Corps, and to place at the service of the government for military purposes the railroads of the country in the emergency created by the call to arms of the National Guard.
>
> I beg to express to your associates my appreciation of the effectiveness of this co-operation and of the patriotic impulse which led to its spontaneous suggestion by The American Railway Association.
>
> Cordially yours,
>
> Woodrow Wilson.

This preliminary report is intended to contain merely a recital of the circumstances which justified prompt and somewhat unprecedented action by a committee of the association in making co-operation with the War department an accomplished fact. A further report will attempt to deal with the problems encountered and to make certain suggestions which may be of value in similar circumstances in the future.

Railway Gages of Australia.—It is said that, in order to unify the gages between Queensland, New South Wales, Victoria, South Australia and Western Australia, an expenditure of $180,060,000 to $228,725,000 would be involved, while it is asserted that a third rail could be placed at an expenditure of about $12,165,000.

A SUBSTANTIAL PASSENGER STATION

The accompanying photographs show two views of the new passenger station of the Chicago, St. Paul, Minneapolis & Omaha, at Chippewa Falls, Wis., and illustrate a substantial type of station for towns of moderate size. While not a fireproof building, because of a timber frame roof, the fire hazard is reduced to a minimum by the use of fireproof tile for the walls and asbestos shingles on the roof. In addition to well-selected proportions, considerations of esthetics have been well taken care of, by covering the tile walls with stucco and trimming with hard burned brick quoins at all



Rear of the Station

angles and half timbered gables. Architectural skill is also displayed in the treatment of the projecting bay of the agent's office, and in holding back the gable above it, to clear the train order board.

The arrangement is simple, embodying in order from one end,—a baggage room, an agent's office, an entrance lobby from the team side, the main waiting room, a women's room and the toilet facilities. An ample shelter is provided at the end of the building. A basement is provided of sufficient size to house a boiler room and a coal bin, and space is



The Station from the Track Side

afforded in the attic, with a stairway leading from the agent's office for the storage of records.

The floor of the building with the exception of the baggage room is raised three steps above the platform level, and is constructed of reinforced concrete and hollow tile, spanning the full width from wall to wall. The baggage room has a floor on the platform level, consisting of concrete slabs on an embankment. The platform is of brick around the building, with cinders for the wing platforms, all enclosed by concrete curbs.

The entire interior of the building with the exception of the baggage room is plastered, Keene's cement being used for a five-foot wainscot with hard plaster above. All of the floor except in the agent's office and in the baggage room, is covered with small cement tile, in two colors, grey and red. A terrazzo base extends around all the rooms for a height of 10 in., and joins the floor with a cove, to facilitate cleaning. The agent's office floor is covered with ⅞-in. maple to afford easier footing. The woodwork is birch, having a dark stain with a dull finish and the walls and ceilings are painted in three colors. The outside woodwork is rough and has a dark brown stain.

The heating system is direct steam with plain enamelled radiators. The fixtures in the toilet rooms are plain earthen ware with exposed plumbing. Ventilation is afforded by means of registers near the floor and ceiling. The building and platforms are electrically lighted and all electric work for lighting and telephones is brought in through an underground duct to a cutout box in the agent's office.

The building was designed and constructed under the direction of H. Rettinghouse, chief engineer, and H. P. Padley, principal assistant engineer and architect of the Omaha. Baumeister & Co., St. Paul, were the contractors.

TRAIN ACCIDENTS IN JUNE[1]

The following is a list of the most notable train accidents that occurred on railways of the United States in the month of June, 1916:

Collisions.

Date	Road	Place	Kind of Accident	Kind of train	Kil'd	Inj'd
16.	Ulster & D.....	Arkville.	bc	P. & F.	1	4

Derailments.

Date	Road	Place	Cause of Derail'm't	Kind of train	Kil'd	Inj'd
†2.	Chicago, R. I. & F'...	Packard.	flood	P.	17	49
2.	Wabash	Saunemin	tornado	P.	0	18
3.	Great Northern	Katka.	slide	F.	2	0
6.	Denver & R. G.....	Colton.	acc. obst.	P.	6	9
7.	Chicago & A.....	Francis.	b. rail	P.	0	16
15.	Boston & M.....	W. Peabody.	acc. obst.	P.	0	2
15.	Balt. & Ohio.....	W. Alexander	unx	F.	0	0
17.	Tuscarora V.	E. Waterford.	washout	F.	1	1
17.	Texas & Pac.....	Putnam.	acc. obst.	P.	0	..
18.	Southern Pacific	Wellton.	b. rail	P.	0	3
22.	Louisville & N.....	Long View.	.....	P.	0	4
26.	Ches. & Ohio.....	Hurricane.	b. rail	P.	0	1

The trains in collision on the Ulster & Delaware near Arkville, N. Y., on the 16th were an eastbound passenger train and a westbound train consisting of a locomotive without train. Both engines were damaged, but the cars did not leave the rails. One fireman was killed, and two trainmen and two mail clerks were injured. The light engine had encroached on the time of the other train, which was regular passenger No. 18.

The train derailed near Packard, Iowa, on the morning of the 2d (reported in the *Railway Age Gazette* of June 23) resulted in the death of 17 passengers and the injury of 46 passengers and 3 employees. It was the Chicago-Minneapolis express, No. 19, and the cause of the disaster was the weakening of the south abutment of the bridge over Flood creek. A worktrain had passed over the bridge about 25 minutes before train 19 reached that point, and nothing wrong was seen at that time.

The train derailed near Saunemin, Ill., on the morning of the 2nd was southbound passenger No. 17. The first six

[1] Abbreviations and marks used in Accident List: rc, Rear collision——bc, Butting collision——xc, Other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc.——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One of more passengers killed.

cars in the train were blown off the track by a tornado. Sixteen passengers and two employees were injured.

The train derailed near Katka, Idaho, on the 3rd was eastbound passenger No. 4. The engine was overturned and fell down a bank into Kootenai river. The engineman and fireman were drowned. The derailment was caused by a rock slide.

The train derailed near Colton, Utah, on the 6th at 1 a. m. was westbound passenger No. 15. The engine and four cars ran off, and a freight engine standing on the siding was badly damaged. The engineman, fireman and four trespassers were killed and five trainmen and four trespassers were injured. The derailment occurred at a switch and was caused by a hose, on the locomotive, falling down and catching between the rails.

The train derailed at Francis, Mo., on the 7th was a westbound passenger. Three cars were overturned and 16 passengers were injured. The cause of the derailment was a broken rail.

The train derailed near West Peabody, Mass., on the 15th was an eastbound passenger. The engineman and fireman were injured, but no other persons on the train were hurt. The cause of the derailment was an automobile truck on a crossing. The truck was wrecked, and its driver was fatally injured.

The train derailed at West Alexander, Pa., on the 15th, at 1 a. m., was an eastbound freight, drawn by two engines. Both of the engines were ditched in a cut, and, with 11 cars of coal immediately following, blocked the cut so that the road was not opened for 18 hours. The cause of the derailment is believed to have been excessive speed.

The train derailed on the Tuscarora Valley Railroad near East Waterford, Pa., on the 17th consisted of a locomotive, five freight cars and two passenger cars. The wreck was caused by a washout which left the rails and ties in position so that the engineman did not see the defect in the track soon enough to stop. The engine and four freight cars plunged into the gully. The fireman was killed and the engineman injured.

The train derailed near Putnam, Tex., on the 17th was westbound passenger No. 1. Four passenger cars ran off the track and about 25 passengers were slightly injured. The derailment is believed to have been due to the breakage of some part of the locomotive.

The train derailed at Wellton, Cal., on the 18th at 12:22 a. m. was westbound passenger No. 1 consisting of 11 cars. The train was running about fifty miles an hour and four cars left the rails. One passenger and two trainmen were injured. The cause of the accident was a broken rail. The rail was found to have been piped along the upper part of the web and the lower part of the head.

The train derailed at Long View, Ala., on the 22nd was southbound passenger train No. 1. Four of the passengers were slightly injured. The cause of the derailment was a loose rail.

The train derailed near Hurricane, W. Va., on the 26th of June was westbound passenger No. 3, second section, and the tender and three coaches were ditched. One passenger was injured. The cause of the derailment is believed to have been a broken rail.

Electric Car Accidents.—Of the accidents to electric cars noticed by the newspapers as occurring in the United States in the month of June, two were reported as attended with fatal results. Near New Castle, Pa., on the 23rd a rear collision between a freight car and a passenger car in a fog injured a large number of passengers; two at least fatally, and six probably so. On the Manhattan Elevated, New York City, near One Hundred and Forty-ninth street, on the 8th, a rear collision resulted in the death of the motorman. This collision was reported in the *Railway Age Gazette* of June 16, page 1342.

AN EIGHT-YEAR HISTORY OF ARBITRATION

The special report of the United States Board of Mediation and Conciliation on the effects of arbitration proceedings on rates of pay and working conditions of employees, ordered printed by the Senate in May, will shortly be issued as a congressional document. The report, as will be recalled, was called for by a resolution of the Senate. It is said to be the most comprehensive study of the results of arbitration ever made in the United States. While the board expresses no opinions and makes no summary, the report shows how arbitration has in practically every instance benefited the employees. It includes all arbitration proceedings held under the provisions of the federal law, and also a review of four other cases—the arbitration in 1911 between the Youngstown & Ohio River Railroad and its employees, the arbitration in 1912 between locomotive engineers and 52 railroads of the East, the arbitration in 1912 between the Georgia Railroad and its conductors, and the arbitration in 1913 between the Norfolk & Western and its maintenance-of-way employees.

The general method pursued was to compare rates of pay and working conditions before and after the awards of the arbitration boards. Each case has been presented under seven general heads: history of case; articles of arbitration agreement; testimony and argument of employees; testimony and argument of the railroads; comparison of the requests of the employees with the award of the board; application of the award of the board to operating conditions; changes in rates of pay and working conditions by individual railroads as the result of the arbitration award.

An appendix summarizes Federal legislation relative to the mediation and arbitration of railway labor disputes.

The cases reviewed are as follows:

Year

1907—Southern Pacific (Atlantic system) and Brotherhood of Locomotive Firemen and Enginemen.

1907—Southern Pacific (Pacific system) and Order of Railroad Telegraphers.

1909—Georgia Railroad and Brotherhood of Locomotive Firemen and Enginemen.

1909—Illinois Central, Yazoo & Mississippi Valley and Louisiana & Southern railroads and the Order of Railroad Telegraphers.

1910—Eight railroads leading out of Chicago and Switchmen's Union of North America.

1910—Cleveland, Cincinnati, Chicago & St. Louis and Order of Railroad Telegraphers.

1910—Baltimore & Ohio Southwestern and Order of Railroad Telegraphers.

1910—Fifty-three railroads in western territory and Brotherhood of Locomotive Firemen and Enginemen.

1910—Southern Railway and Order of Railroad Telegraphers.

1910—Missouri Pacific system and Order of Railroad Telegraphers.

1910—Denver & Rio Grande and Brotherhood of Locomotive Firemen and Enginemen.

1911—Coal & Coke Railway and Brotherhood of Locomotive Engineers, the Order of Railway Conductors and the Brotherhood of Railway Trainmen.

1912—Fifty-two railroads in eastern territory and Brotherhood of Locomotive Engineers.

1913—Fifty-four railroads in eastern territory and Brotherhood of Locomotive Firemen and Enginemen.

1913—Forty-two railroads in eastern territory and the Order of Railway Conductors and the Brotherhood of Railroad Trainmen.

1913—Chicago & Western Indiana and Belt Railway Co. of Chicago and the brotherhoods of engineers, firemen and hostlers.

1913—Chicago, Burlington & Quincy and the brotherhoods of conductors and brakemen.

1913—Wheeling & Lake Erie, Wabash Pittsburgh Terminal and West Side Belt railroads and the telegraphers, telephone operators, station agents and signalmen.

1913—Southern Railway and maintenance of way employees.

1914—Georgia & Florida Railroad and the brotherhoods of engineers and firemen.

1914—Ninety-eight railroads in western territory and the brotherhoods of engineers and firemen.

Georgia Railroad and the brotherhoods of conductors and brakemen.

Norfolk & Western and its maintenance of way employees.

1913—Controversy between the Amalgamated Association of the American Street Railway Employees of America and the Youngstown & Ohio River Railroad.

MASTIC FLOORS FOR RAILROAD BUILDINGS

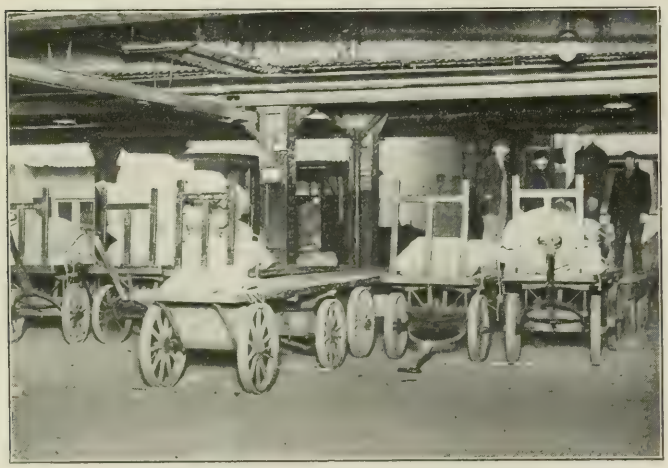
Floors made of a mastic of hard aggregate, cemented together with bitumen compounds have proved applicable to a wide range of conditions. A floor of this type which has met with extended success is the J-M Mastic Flooring of the H. W. Johns-Manville Company. In this floor the aggregate may be either crushed limestone, granite or torpedo sand, with particles ranging from a size passing a ¼-in. screen down to those which will pass a 200-mesh. The



Great Northern Freight House at Great Falls, Mont.

cementing material consists of Trinidad Lake asphalt and other natural asphalts properly combined by fluxing oils.

Success with this type of floor demands a careful grading of the aggregate particles and their intimate mixture with the cementing materials in a manner that will insure the densest possible product in which even the finest particles are thoroughly coated with asphalt. To insure that this will be properly done in the J-M floor, the aggregates passing the



Heavy Trucking Service—Mail and Baggage Room, La Salle Street Station, Chicago, Ill.

60 screen are combined with the asphalt at the plant rather than at the site of the work. To this end they are heated and mechanically agitated for a period of six to seven hours and then moulded into blocks of convenient size for shipment. On the work these blocks are broken up and reheated to a temperature of 450 deg. F. and mixed with a coarse aggregate, using a pure asphalt flux. The resulting softened mass is transported to the work in oak buckets or iron wheel barrows and is laid down in one or two courses depending upon the required thickness and trowelled to the desired surface. The process of spreading and trowelling is exacting work which must be done by skilled and experienced artisans.

This floor can be applied to any base that is sufficiently strong and unyielding for the particular service required and may consist of concrete, wood, brick or tile. The thickness commonly varies from 1 to 1½ in. The thinnest floor is used where a walking surface only is desired. An intermediate thickness of 1¼ in. will suffice for light trucking, while the 1½-in. thickness will serve for heavy trucking service.

This floor is said to possess a variety of desirable qualities which make it suitable for widely differing services. As it is quiet, resilient and not slippery it has an advantage in situations where persons are compelled to walk or stand for long periods of time. The facility it offers for sweeping or washing is an advantage in many installations. Because it is water-, alkali- and acid-proof, it is applicable to many special purposes. It is odorless and sanitary, an important consideration in freight or warehouses, where perishable or easily contaminated goods may be stored. The facility it offers for repairs may be used to good advantage in the relocation of machines in shops, or in making other alterations. As a result of the service to which floors of this kind



Laying Mastic Floor in Car Repair Shop, Chicago & North Western, Chicago, Ill.

have been subjected for a number of years it is being recommended for service of a most severe character.

The application of this floor to railroads includes baggage, express and mail rooms, stair treads and platforms in passenger stations. It also includes freight houses, storerooms, cold storage rooms, corridors, toilet rooms, machine shops, round houses and battery rooms. Among the railroads which have floor installations of this kind may be mentioned the Canadian Pacific, the Pennsylvania Lines, the Southern, the Illinois Central, the Rock Island, the Sante Fe, the Erie, the Lackawanna, and the Lehigh Valley. The Calgary shops of the Canadian Pacific contain 10½ acres of this mastic floor which has been in use 3½ years. In the Topeka shops of the Sante Fe, 21,000 sq. ft. of this floor has had three years of service. The Southern has freight houses at Richmond and Mobile containing 52,000 sq. ft. An installation of 90,000 sq. ft. in the Memphis passenger terminal of the Illinois Central has withstood two years of use.

RAIL EXPORTS.—Rail exports from the United States averaged 38,594 gross tons per month from January to May, 1916. This five months' average compares with 38,379 tons per month in 1913, the record year. For the eleven months ended May 31, 1916, the average was 44,730 tons per month.

Efficiency Testing in Train Service

Rationale of Effective Methods; the Difference Between Efficiency Testing and Surprise Checking

By H. E. Haanel
Trainmaster, Canadian Pacific, Regina, Saskatchewan

ONE is altogether prone to refer to efficiency testing as something novel—the progeny, perhaps, of these times of high tension and calculated effort, which, in the commercial and industrial realms more especially, have finally resulted in a method of keying up to standard pitch the individual as well as the ensemble performance of labor. While it is true that the adoption of efficiency tests in various garbs to suit conditions has spread with amazing rapidity of late, one may find evidences of its existence no matter how deep into history he may wish to delve, and it might not be incorrect to state that in all ages it has in some form been the inseparable companion of notable achievement. Napoleon's phenomenal success at arms was in no small measure due to his remarkable organization, which was kept up to the mark through the continual application of efficiency tests. One day at Schoenbrunn, for instance, "As the engineer corps passed with about forty wagons, the Emperor cried 'halt!' and, pointing out a wagon to General Bertrand, ordered him to summon one of the officers. 'What does that wagon contain?' 'Sire, bolts, bags of nails, ropes, hatchets and saws.' 'How much of each?' The officer gave the exact account. His Majesty, to verify the report, had the wagon emptied, the pieces counted, and found the number correct, and, in order to assure himself that nothing was left in the wagon, climbed up into it by means of the wheel."

In railroad work, particularly the operating department, the field for efficiency testing is almost illimitable, and here it should thrive and produce abundant fruit. Essentially, efficiency testing is the unexpected creation of situations, in the performance of meeting which will be demonstrated the quickness of perception, preparedness for action, knowledge of correct procedure and ability to put such knowledge into practice. To suggest situations the tester has at his disposal many of the general rules, special instructions and legal enactments upon which the safety of the movement of passengers and freight depends, and, for material to test, he faces many degrees of mental and moral fiber in the gamut of employees from despatchers to trackmen. While an efficiency test proper is made by creating a situation as stated, many important rules and safety regulations obviously cannot be employed in this way, and that such are being properly fulfilled can only be ascertained by observation. When such observations are made without the previous knowledge of the parties concerned they are termed "surprise checks," and are classed as efficiency tests. For instance, to observe from a moving train whether or not operators put the board in the stop position behind the trains; for two testers to take positions a mile apart and check the speed of passing trains; to watch, unknown to him, a brakeman throwing a switch to ascertain whether or not he verifies the position of the points; the cutting off of engines before taking water; the signing by engineers of their conductors' copies of orders; the inspection of trains by trainmen. These are among the surprise checks that can be advantageously made in the interest of efficiency.

Note the distinction between these checks and the following examples of efficiency tests. The tester places one detonator on the rail and retires from view. When a train explodes it, the tester makes a note of the promptness on the part of the engineman in stopping his train and whistling out a flagman. He also notes how promptly the flagman gets away, the distance he goes and how quickly he reaches the required distance. He notes also how the conductor and other brakemen employ their time, how promptly the train gets to moving again, etc., and when it is gone, the tester goes back to see that the detonators have been properly placed by the flagman.

Or the tester may leave a fusee burning on the track; place two detonators on the rail; extinguish a train order light; withhold the answer to the whistle signal indicating the display of green signals carried; put any semaphore or signal at stop, etc., and watch the performance of the men affected. A test in which there is the slightest element of danger should, of course, not be made. To produce nervousness is to diametrically oppose the proper function of this work. For a tester, for instance, to turn a switch light so it shows red to an approaching train might cause the men on the engine to jump off. Tests of this nature were actually made on some roads in the early stages of the work, but these are now carefully avoided. Quite recently the Northern Pacific decided to abandon the uncovering of headlights on sidings as it was considered hazardous.

Someone has said that real railroaders are born and not made. Certain it is, however, that an appreciable percentage of the employees in the train and engine service are "misfits"—men who may be endowed with health and with apparent moral and mental soundness, but who seem never to fully comprehend the subtleties of safe and expeditious train operation, and who sometimes by their unconscious remarks and acts, plainly evidence an absence of keen apprehension and peculiar alertness which is so certain sooner or later to result in trouble. Often indeed is a disaster directly traceable to such a man, or to the collective performance of a combination of misfits. Excepting the "chance taker," the most insidious danger is from the misfit who can answer promptly and correctly any question regarding his work, who indicates anxiety to perform efficiently and against whom in the routine work no fault can be found: but who fails miserably at the psychological moment because of the sudden creation of conditions or circumstances which demand unusual treatment and quick action; or who, when an emergency arises, is not "on the job" because of his lack of the intuitive appreciation of responsibility. It is to locate and cure or remove such menaces to life and property that efficiency tests and surprise checks are employed. At the same time the tests and checks keep the meaning and application of important rules and instructions fresh in the minds of all employees, and, by such constant practice and repetition, the general performance can be made to grow toward perfection. "The highest efficiency is obtained by keeping the men constantly on the lookout for an unusual condition. The rank and file of older men are highly efficient in their way, but a laxity sometimes exists even among the older men, and when they are spurred to extraordinary effort by an unknown quantity, the service and the public at large profit by the experience."

An employee should receive without delay a written notification concerning any test with which he was concerned. If he properly fulfilled the requirements of the test he should have the satisfaction of knowing it. On the other hand also,

he should be fully informed of any detail of his performance which could be improved, and such notifications as are passed from one employee to another—which they are sure to do—should be kept track of. The dissemination of profitable information—whether by formal or informal methods—may be the means of preventing someone else from committing the same error. In such ways also, an employee may pick up knowledge of little details about which his pride, perhaps, has kept him from openly inquiring. The other day a conductor confessed to me that for months when he was a brakeman he started his fusees by lighting them in his lantern, and he only found out the right way of doing it after hearing the trainmaster speak to another young brakeman who had ignorantly thrown away the scratch cap and was attempting to light a fusee in a high wind with a sulphur match. Not long ago a passenger engineman ran past a flag and a serious and costly collision resulted. After the dismissal of this man many of the trainmen were known to give a sigh of relief and to make a remark to the effect that this engineer had been in the habit of disregarding flagmen. A passenger train running at full speed was derailed at an open switch on a curve and six lives were lost. It was found that the engineer was at the time with his fireman on the left side of the engine watching the crowds on the fair grounds they were passing. After the inquest a fellow employee who knew the engineer well passed the remark, "That's the end-up of all habitual chance takers."

Other examples are in my mind, involving nearly every class of operating employees, but these two I cite because they concern passenger engineers—men of long service, of whom Dame Fate had deferred the inevitable doom certainly long enough to have given efficiency testing, had it been resorted to, every chance to effect a remedial cure or cause the excision of the menace by dismissal of the man before any catastrophe occurred.

On many roads in the States efficiency testing is conducted wholly by the trainmasters. On the road with which I am identified it is the duty of all district officers to participate in the work, and I think this the more efficient arrangement. A test which is expected because of the crew being forewarned fails in its purpose, and this, unfortunately, is very often the case when district officers conduct the tests. It is next to an impossibility to keep secret an officer's movements. If anyone wants to know exactly where I have been during the last 24 hours, he can have his curiosity gratified by the first trainman he meets. As I go from place to place I hear inquiries ticked off by the telegraph instruments, and this system, together with signs and countersigns with passing trains, keeps every uneasy employee fully posted. Of course, the uneasy employee as a rule is the doubtful one. Under such conditions efficiency testing is extremely difficult if not altogether abortive. Then, again, to be productive of satisfactory results, testing, particularly where there are many crews, must be carried on continually. The occasional test has little result other than the irritation of the men tested and the social ostracism of the tester. Unintentionally one man may be involved so many times that he comes to believe that he is singled out for destruction, and most of his fellow workers on the same district, since they had escaped any test because they did not happen to enter the test zones when the tests were on, begin to murmur among themselves about unfairness; and seeds of discord are sown.

The aim and purpose of constructive efficiency testing should be systematically to test *every* employee *frequently,* and to *uncover* and *remedy,* by educative or punitive measures, the weaknesses, if any, in *every* man. Not a single road on the continent, to my knowledge, yet approaches anywhere within hailing distance of this ideal. One road, for instance, has drawn up a set of 17 tests. One of each of these tests is made every 30 days. Another road has seven tests which are made on each division twice a month—14 tests a month for each division—and so on. Is it possible to put every employee through a comprehensive drill with tests so infrequently made?

On a certain road the number of signal operations in two years was ninety millions, while in the same period the efficiency tests affecting the observance of those signals numbered only some ten thousand. That is, for every nine thousand signal operations *some* engineman was subjected to *one* signal test. Can this be considered effective? A trainmaster who has a large territory under his jurisdiction—in fact, any officer in charge of a department requiring close supervision—cannot spare the necessary time for doing this important test work systematically and to the extent required. Because of this it has often occurred to me that better results would accrue were a special man assigned to a division to work on the several districts thereof in conjunction with the district officers. This man, who would be subject to the instructions of the superintendent of any district on which he may be operating, but who would send periodical statements to the higher officers, could be frequently exchanged for the man in similar capacity on another division so that his identity would not be so easily revealed. Such efficiency experts should of course be thoroughly capable operating men, of known integrity; men convinced of the importance of this work and having the courage of their convictions. With this organization one should look for a growing uniformity and efficiency in the performance of employees over the entire system; the multiplication of possible tests and improvements in conducting them, and lastly, the reduction to a common basis of the understanding and effort of all officers concerned.

From inquiries I have made all over the continent I find that unfortunately there are minor officers who by word and action deliberately discourage efficiency testing, and in so doing render difficult if not fruitless the efforts of their colleagues who are otherwise inclined. It is not inconceivable that such officers would relegate to their clerks the task of submitting periodical reports of fictitious tests and thus perfunctorily fulfill their routine obligations rather than actively participate in a work of the merits of which they are not convinced and which, through a false sense of proportion, they characterize as "gum shoeing" or "pussy footing," and therefore contemptible. By judicious handling, the efficiency expert should in time transform such officers and, in revealing by demonstrations the intrinsic value to the company and employees alike of the end sought, might convert them into earnest co-workers. If not, then other and more drastic treatment should be employed rather than submit to a continual threatening of the esprit de corps on a division and rather than countenance the spectacle of a crew of officers attempting to row their bark of organization into the harbor of efficiency by pulling in opposite directions.

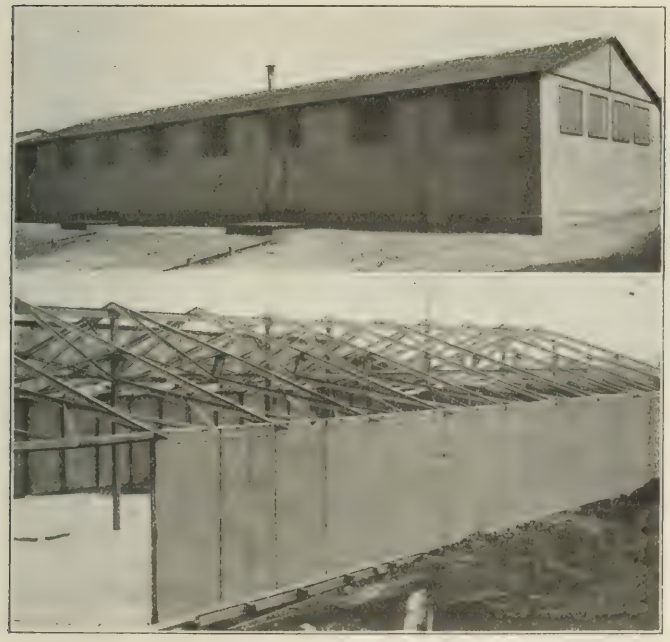
Efficiency tests fairly and judiciously conducted obviously result in the better protection of the trainmen themselves. Many of the better class employees individually acknowledge the benefit from tests and are ready to cite cases which prove it. Incongruously enough, however, against these tests and the men who make them there seems to be a widespread prejudice which is both deep-rooted and determined. An employee who knows his business, who is honest with himself and his employer and who is conscientious in his work needs never fear being caught; on the contrary, he should feel a personal pride in demonstrating his ability and proving his integrity and trustworthiness. That such antipathy, where it exists, is purely selfish and unworthy, is indisputable. This is shown by the approval generally expressed by one class of employees of tests made of another class. The men making the tests should be prompted by a high idea of service, and contemptible indeed is one who takes an unfair ad-

vantage or who experiences any personal satisfaction in catching an employee in the wrong. After Napoleon had conducted the efficiency test recited at the beginning of these notes, the chronicler goes on to say—"There was a murmur of approbation and cries of joy all along the line. 'Bravo,' 'Well and good,' they said. All these things combined to make the soldiers adore the emperor." Adoration is a strong word for these modern times, but between tester and employee should exist at least mutual respect, and a sympathetic appreciation of mutual responsibilities.

PORTABLE STEEL BUILDINGS

The steel building units, manufactured ready to erect in buildings of various sizes by the Trussed Concrete Steel Company, Detroit, Mich., represent an example of highly developed unit construction whereby a limited number of kinds of units are given a wide range of applicability. Buildings made of these units are available for use on railroads as tool houses, bunk houses and other buildings of various sizes and uses, with the advantage that they are made of non-combustible material, are quickly and easily erected and may be taken down and re-erected at a new location in a short time and at small expense.

Aside from the carefully worked out details and accurate workmanship which make the units perfectly interchangeable, the success of the system is based on a simple fastening of



Above—The Completed Building, Below—The Frame

the tee-bolt and wedge type with which all parts are secured, using no other tool than a hammer. The buildings consist essentially of pressed steel panels for the side walls, with electrically-welded flanges, having a standard height of 7 ft. 10 in., and a standard width of 2 ft. or multiples thereof. The walls are stiffened by structural steel mullions or studs, which are enclosed between the flanges of the adjoining sections. The parts are secured to a tight fit by means of the standard tee-bolt connections mentioned above. Special corner panels are provided as well as door and window panels, the last two being equipped with standard grades of hardware. The window panels contain electrically welded steel sash equipped with pivoting and adjusting devices.

The room consists of special overlapping units, secured by clips which insure watertight construction. This is supported on electrically welded steel trusses available in eight span lengths, varying from 6 to 28 ft., inclusive. Lateral and sway bracing are also provided to make a rigid structure. These buildings may be placed either on a timber or concrete foundation, the only special requirements being a level bearing surface. Two men can readily handle any section and can erect any size of house without assistance.

This unit system offers great flexibility as to the arrangement of the finished houses, the only limitation being the height of the side walls and the span lengths for the standard roofs. The lengths of the houses, the number of windows and doors, and the size and location of the same may be varied to suit the conditions encountered.

JOINT GRADE CROSSING REPORT

Members of the American Railway Association committee on the prevention of accidents at grade crossings, met in Chicago, June 28, in a joint meeting with representatives of the National Association of Railway Commissioners and adopted the resolutions printed at the end of this article, confirming and making more definite the action of the American Railway Association, at its meeting May 17, concerning safety at highway crossings.* The chairman of the meeting was Hon. Thomas Duncan, of Indiana, and the other state representatives were Hon. J. H. Wilson, of Iowa, and Secretary James B. Walker, of New York (First District). The railroads were represented by five of the seven members of the committee, namely, J. A. McCrea, Long Island, who was made secretary of the meeting; C. L. Bardo, New York, New Haven & Hartford; W. J. Towne, Chicago &



Proposed Distant Signal on Highways for Automobilists



Hand Signal for Use at Highway Crossings

North Western; J. Q. Van Winkle, C. C. C. & St. L., and Howard Elliott, San Pedro, Los Angeles & Salt Lake.

The discussions developed a marked unanimity of sentiment. While the conclusions reached are substantially the same as those which have resulted from previous discussions, the members of the conference by no means contented themselves with copying what had been said before; they examined numerous devices, and took a trip over the suburban lines of the Chicago & North Western to examine and experiment with the conditions at a number of crossings.

It is increasingly evident that proposals for legislation concerning safety at crossings will soon become a prominent subject in many states. The agitation concerning automobile accidents at crossings, thus far, has been most pronounced in New England, in California and in the region of Chicago; but very soon the subject will be of interest in all of the states. The discussion developed a feeling that the American Automobile Association ought to have a prominent voice in anything that is done toward legislation or in relation to uniformity in any respect, and Messrs. Walker and McCrea

*The meeting of May 17 was reported in the *Railway Age Gazette*, May 19, page 1103, and June 9, page 1219; and the action of the Colorado State Commission on the crossing question June 16, page 1348.

were appointed a sub-committee to meet a committee of that association as soon as practicable. The principal feature in which the present resolutions mark progress is that embodied in resolution No. 1, the distant signal for wayfarers; and the question of the immediate future is that concerning the duty of providing and caring for these signals. The prevailing sentiment of the meeting was that the signals should be maintained by the state or the municipality, and that laws should be enacted to prevent their destruction or abuse.

The accompanying illustrations explain the descriptive matter in resolutions 1, 4 and 5. The letters on the disks are 5 in. high, those in the 24 in. disk being 3¾ in. wide and those in the 16 in. disk 3 in. wide. The larger disk has its backside painted black; the smaller is the same on both sides. The photographic view of the crossing gates has a poor background; but the introduction of this feature was perhaps intentional, as showing the effectiveness of the stripes in making the gates visible at a distance. The resolutions, as finally adopted, are as follows:

"Whereas in the opinion of this joint meeting of the Committee on Grade Crossings and Trespassing on Railroads of the National Association of Railway Commissioners and the Special Committee on the Prevention of Accidents at Grade Crossings of the American Railway Association the time has come for the establishment of uniform methods of protecting all grade crossings of railroads, after a full discussion of the matter the members of both said committees have agreed upon and adopted the following recommendations:

(1) That every grade crossing should be protected by an approach warning sign, to be placed in the highway at a distance not less than 300 feet on each side of the railroad tracks, the sign to be a circular disk not less than 24 inches in diameter painted white with a black border and black cross lines with the letters "R R"—as shown in the accompanying drawing. Where deemed necessary this approach warning sign to be properly lighted at night.

(2) That the railroad companies maintain, within the limits of their rights of way, proper cautionary signs such as are now in use or authorized by law, and where deemed necessary such signs shall be equipped with a red light at night.

(3) That all lights displayed at night towards the highway at grade crossings shall be red.

(4) That all crossing flagmen use during the day a uniform disk 16 inches in diameter painted white with a black border and the word "STOP" painted thereon in black letters about 5 inches high, instead of the vari-colored flags which are now being used.

(5) The uniform painting of all crossing gates with alternate diagonal stripes of black and white.

(6) That the railroad companies, wherever practicable, be required to maintain their property at grade crossings free of obstructions to vision; also that the highway approaches to crossings shall be so graded that the free passage of vehicles shall not be impeded.

(7) That the National Association of Railway Commissioners, the American Railway Association, and the American Automobile Association, consider the advisability of agreeing upon whatever legislation may be necessary in the several states to make thoroughly effective the protection of grade crossings; and that it is our opinion that a uniform law requiring vehicles approaching such a crossing to reduce speed to a safe limit at the warning approach sign is advisable.



Proposed Standard Coloring for Crossing Gates

THE ACTIVITIES OF A RAILROAD TEST DEPARTMENT*

By C. D. Young

Engineer of Tests, Pennsylvania Railroad, Altoona, Pa.

In a recent publication of the Bureau of Information of the Pennsylvania Railroad, the advantages of a test department are aptly summarized as follows:

"It costs half a million dollars or so to run the Pennsylvania Railroad's test department a year, but the management regards the outlay as one of the company's best paying investments. Every dollar spent for tests comes back, with interest many times compounded, in accidents averted and in the lengthened life of engines, cars, tracks, and structures. The test department exists for the purpose of promoting in the highest possible degree the safety of passengers and employees and the utility and durability of everything used in the operation of the railroad. This, in the end, is the truest economy."

Our work has contact with almost all activities of the railroad, but is more intimately associated with the motive power department than with others, and as showing what has been accomplished, we are very gratified to find a reflection of our achievements in the annual report of the railroad for 1915, where a decrease in the operating expenses is attributed to the fuel saved by increased locomotive economy. This has been brought about by the use of certain devices upon the locomotive, as well as by the success of the mechanical engineer in designing locomotives particularly suitable for the work which they are called upon to perform. From a review recently published and bearing upon this point, I quote the following:

"It is seldom that the saving made by a particular mechanical device is relatively large enough to deserve mention in the annual report of the Pennsylvania Railroad. This year, however, a large part of the saving made in transportation expenses is attributable to more effective work of locomotives in both freight and passenger service as the result, on the one hand, of the equipment of locomotives with superheaters and, on the other, of the marked success which has been met with in obtaining locomotives designed for exactly the work which they are called upon to perform.

* From a paper read at the May meeting of the Railway Club of Pittsburgh.

"The economies which have been made by the introduction of the superheater and by the tests which are being carried on by the motive power department each contains material for extensive discussion; but the point that may without over-emphasis be made here is that the success of these two factors bulks large enough to be reflected in the final aggregate figures for the Pennsylvania Railroad's showing for the year."—*Railway Age Gazette*, March 3, 1916, page 383.

Through the work of our locomotive testing plant, information has been disseminated bearing upon the design of the locomotive and its operation and thus indirectly bringing about the results mentioned.

It is now 42 years since this department for the testing of materials had its small beginning—the first department of its kind, to my knowledge, on an American railroad or on any railroad—and it has grown rapidly and continually. For the past 18 months the department has been located in the new laboratory building.† This building has 41,000 square feet of floor area in 50 rooms divided into physical, electrical, chemical and bacteriological laboratories, each with its accessories; and located in separate buildings are the locomotive testing plant and the brake shoe testing plant. In addition to these, the road equipment of the department consists of a dynamometer car and a chemical laboratory car.

An important phase of our work is the inspection of material purchased and the formation of specifications.

The principal duties of a large testing laboratory are not only those necessary to keep informed as to the developments in quality and as to changes made for commercial reasons, in the various materials purchased by the railroad, but also to endeavor to co-operate with other laboratories, both of manufacturers and consumers, in unifying their views regarding the specifications which shall be selected for each of the purchased materials. A great deal of this work of harmonizing and unifying specifications has been accomplished during the past few years and has resulted in materially benefiting both the consumer and manufacturer, in that specifications agreed upon by a large number of people benefit all concerned in the following ways:

First.—The manufacturer, without risk or loss on account of unsalable stock, can anticipate the needs of the large buyer and make material in accordance with what is accepted as good practice, so far as chemical and physical properties are concerned. Therefore, when the consumer is in the market he can readily obtain what he desires, as the manufacturer has some of the material of the grade in question either under way or completed, awaiting orders.

Second.—This fact necessarily reduces the price at which the product can be sold because the manufacturer's production under uniform specifications may safely become large, and, instead of making a variety of products to meet a given demand, a single standard product is made for that particular demand or purpose. A lower price, however, does not necessarily mean that the manufacturer obtain less profit on his material; it may be quite the contrary, as he may, even at a reduction in the price to the consumer under uniform specification purchases, be able to make even larger profits than before, because the same consumer and other consumers purchase a given grade of material more frequently and in larger quantities.

Third.—If buyers are satisfied that, for their service, a material which meets a uniform specification will serve their requirements, they should adopt such specifications, as this will permit them to carry a smaller stock of material in order to protect their necessities for the reason that manufacturers will then be in a better position to furnish what the purchasers desire under short notice. A reduction in the total number and total amount of stocks held for emergency demands effects in turn a further money saving for the purchaser.

This work of harmonizing the various views of manufacturers and consumers and the framing of specifications in which they concur, has been an important part of the work of our test department, because, for the reasons outlined, it is felt that a great benefit may be derived by such agreement. The larger number of our specifications are the result of this procedure, and it is suggested, as most desirable and logical for the smaller purchasers—who do not have laboratories providing for the carrying out of research work to establish the requirements of their specifications—that they adopt such uniform specifications as have been created between those manufacturers and large consumers who do have the laboratories. Such specifications are to be found in the proceedings of the Master Car Builders' Association, American Railway Master Mechanics' Association, American Railway Engineering Association and the American Society for Testing Materials.

A strong argument for uniform specifications is found in the interchange of cars, for, undoubtedly, it will be conceded that the material entering into their construction should satisfy all owners at once. Obviously, where cars are freely interchanged, much of the good effect of the use, by one owner, of material fulfilling a specification designed to insure safety of operation, is partially or wholly nullified if the cars of some other owners, built under an improper specification, and of material *not* of the desired quality and *not* insuring equal safety of operation, come upon his line through the regular course of business interchange, and have to be operated by him.

The Interstate Commerce Commission inspection of locotives tends to bring about like inspection and test conditions for all motive power and other important railway equipment as at present adopted or fast being adopted for cars. Proper uniform specifications for locomotive parts will certainly tend to make such equipment more acceptable to the Government authorities.

Mr. Turner (Westinghouse Air Brake Company) has suggested the use of the Pennsylvania Railroad specifications. I suggest the specifications of the Society for Testing Materials and the M. C. B. Association because you will find these practically identical and much broader in some terms than ours, and they would probably better fit your conditions. Ours are constructed along a certain line of policy and they might not so nearly meet your views as the more general specifications of the societies mentioned.

The manufacturers have gotten to a point where they will accept these specifications without question. Pittsburgh manufacturers, I think, are pretty much of a unit in agreeing that it is desirable to have specifications; and it means that you are now buying a superior article for less money and the manufacturer is making perhaps a larger margin of profit than he formerly did. So if I have made clear, to the consumers particularly, that it is desirable to have uniform specifications, such as the Lloyds, or the British and the German specifications, all of which are not equal to the American specifications of today, I will have accomplished my aim, and I think you will be well pleased with the materials you purchase under these specifications.

†For a description of the work and equipment of the Pennsylvania Railroad's test department see the *Railway Age Gazette*, July 2, 1915, page 6.

Railways in German South-West Africa.—In German South-West Africa there were 1,318½ miles of state-owned and 129½ miles of privately owned railway, and during the war railways of a total length of 215 miles have been constructed by British forces. In addition to the 100 miles between Swakopmund and Usakos converted to the union of South Africa standard gage of 3 ft. 6 in., the Union Railway Administration, on the instructions of the South African Government, has taken over all these railways, and the question as to what, if any, amount is to be charged for them against the railway capital account is to be decided later. The railway administration is of the opinion that the railways in question are not likely to be a source of revenue for many years to come.

FRANK H. BRITTON

Frank H. Britton, president of the St. Louis Southwestern, died at his home in St. Louis on July 26 from stomach trouble. Mr. Britton was one of the fairly large number of successful operating officers who have served an apprenticeship on the Hill lines. He was on the Great Northern from 1894 to June, 1899, and during those five years worked his way up from superintendent of the Montana division to assistant general superintendent of the western district. When Mr. Britton went to the St. Louis Southwestern as general superintendent in 1899, Edwin Gould was president and Russell Harding, vice-president and general manager. Mr. Britton went to the Texas lines and at that time the St. Louis Southwestern was operating 1,250 miles of line, with gross earnings of $5,862,000 and with an operating ratio of 68.68. The average trainload in 1899 was 179 tons. Mr. Britton was made president of the St. Louis & Southwestern of Texas a year after he went to the Cotton Belt, and two years later was made vice-president and general manager of the entire St. Louis Southwestern. The year 1913 was the best in the history of the property, the operation in the two years since having been seriously affected by floods and abnormal conditions in the cotton producing states, due to the war.

In 1913 the St. Louis Southwestern operated 1,609 miles of road and had gross earnings of $13,297,000, or at the rate of $8,263 per mile of road. The operating ratio was 69.31 per cent, but the ratio of transportation expenses to gross, which is a better index of operating efficiency, was but 30.38. The total average trainload of freight was 349 tons in 1913. The company was paying 5 per cent on its $20,000,000 preferred stock and had nearly a million dollars surplus to credit to its profit and loss account.



Frank H. Britton.

The St. Louis Southwestern is an Edwin Gould road. From the time Mr. Britton came into the property its operating officers were given a far greater latitude in the matter of expenditures for upkeep and in initiative as regards management than the operating officers of any other Gould properties. With a thorough training as an operating officer in about the best training school in the world for operating officers—the Hill school—Mr. Britton combined the ability to take responsibility and to carry to successful completion his own ideas of operation. The St. Louis Southwestern has been one of the most successful roads in its territory and much of the credit for this must be given to F. H. Britton. His principles of operation were sound; he never starved the property; he believed in giving good service to the public and did so. The dining car service on the St. Louis Southwestern is better than the public has any right to expect. It is carried on at a loss, of course, to the St. Louis Southwestern, but was one of those concrete instances where Mr. Britton showed in a practical way his belief that there were certain duties which a road owed to the public even when the fulfilling of these duties from a shortsighted point of view might be considered at the expense of the stockholders. As a matter of fact, a measure of the St. Louis Southwestern's success has been pretty surely due to the esteem in which it is held by its patrons.

Mr. Britton had the ability to earn and keep the loyalty of his subordinates, and a railroad officer who has this quality has one of the most to be desired qualities that an executive can have.

Frank H. Britton was born November 29, 1850, at Ovid, N. Y. He began railroad work in August, 1869, as telegraph operator on the Michigan Southern & Northern Indiana, now part of the New York Central. In June, 1869, he went to the Chicago & North Western as telegraph operator, and two years later became assistant train despatcher on the Louisville & Nashville at Clarksville, Tenn. In December, 1874, he was promoted to chief train despatcher of the South & North Alabama division, with office at Birmingham, Ala., and five years later was made trainmaster. In February, 1880, he was made trainmaster of the Mobile & Montgomery and Montgomery & Selma divisions. In June, 1882, Mr. Britton was appointed superintendent of transportation of the Chesapeake, Ohio & Southwestern, now part of the Illinois Central. In February of the following year he was made superintendent of transportation of the Chicago division of the Baltimore & Ohio, and in 1886 was appointed superintendent of this division. He was out of service for a year prior to June, 1893, and was then made general superintendent of the Minnesota & Wisconsin, now part of the Chicago, St. Paul, Minneapolis & Omaha. In September, 1894, he was appointed superintendent of the Montana division of the Great Northern, and in December, 1895, superintendent of the Fergus Falls division. In 1898 he was made assistant general superintendent of the western district, holding this position until his appointment in June, 1899, as general superintendent of the St. Louis Southwestern. In March, 1900, Mr. Britton was made vice-president and general manager of the St. Louis Southwestern system, and in April, 1912, was elected president of the company.

USING SHELLS NOT UP TO SPECIFICATIONS.—A large munitions manufacturer, when he found that over 5,000 cartridge cases had been spoiled, evolved the idea of making an ornamental beverage holder from a shrapnel shell fuse and cartridge case. The cartridge case contains a rack holding four glasses; inside the shell is a container which holds the beverage, and the fuse acts as a cover. The original shrapnel shell, loaded and ready for firing, sold for $15. This beverage holder, not "loaded" nor made to specifications, sells for $10.—*From an article in a recent issue of Machinery.*

General News Department

The Buffalo, Rochester & Pittsburgh has placed its name, in conspicuous lettering, on all overhead bridges where state highways cross the railroad; this for the purpose of giving people in automobiles a convenient landmark and to make the name of the road familiar to everybody.

The Long Island Railroad, in the five days of heavy traffic incident to the Fourth of July holiday season, moved 5,361 passenger trains with an average delay of 4 minutes, 33 seconds. This statement is made in connection with the record of the same 5-day season for the eight years since 1908. The average delay was considerably greater than in any previous year because principally of a derailment at Flatbush avenue, July 1, and a fire, due to a short circuit, on a long trestle on July 3. The number of passengers shown in this 5-day record, 1,029,721, is more than 10 per cent greater than the number recorded last year. There has been a steady increase during the eight years except that 1912 shows a smaller business than 1911. The number of carloads of express and baggage moved in these five days, 1,077, is almost 50 per cent greater than the number reported in 1915.

"13"

The St. Louis & San Francisco, in connection with its campaign against trespassing, is distributing among its employees who come in contact with the public a leaflet headed, "Are you to be one of the unfortunate thirteen?" The leaflet contains a statement of the number of trespassers killed annually on the railroads of the United States, showing that an average of 13 persons is killed every day because of using railroad tracks for a highway. The leaflets are to be distributed among the public by the employees.

The Congressional Investigators

Senate joint resolution No. 60, providing for a general investigation of railway transportation, was signed by President Wilson on July 20. The members of the investigating committee are: Senators Newlands, of Nevada; Robinson, of Arkansas; Underwood, of Alabama; Cummins, of Iowa, and Brandegee, of Connecticut; and Representatives Adamson, of Georgia; Sims, of Tennessee; Cullop, of Indiana; Esch, of Wisconsin, and Hamilton, of Michigan. Congress appropriated for the expenses of this committee $24,000.

The Wage Controversy

The votes of the train and engine employees on the question of authorizing their leaders to call a strike were expected to be in the hands of the general chairman on Wednesday, July 26. The general chairman of the Eastern and Southern roads are to meet in New York not later than August 1, and those from the Western roads not later than August 5, to count the ballots, after which there will be another conference with the National Conference Committee of the railroads.

E. D. Levy, general manager of the St. Louis & San Francisco, has issued a notice that as the train, engine and switching crews on the Frisco are voting on a strike, he will receive applications for employment in such positions, to be sent to him at Springfield, Mo. Mr. Levy expresses the hope that a strike will not be declared but says that he believes in preparedness.

The Denver Clearing House Association recently passed resolutions expressing its disapproval of a strike of the railway trainmen and calling on Congressmen "to interest themselves in the passing by Congress of such a measure as will have the effect of instructing and empowering the Interstate Commerce Commission to take cognizance of these conditions, and effect a fair and equitable adjustment as between the railroads and their employees, thereby preventing a nation-wide railroad strike."

The Railroad Commission of Nevada has adopted resolutions urging both sides in the railway wage controversy to submit their demands to arbitration. The resolutions say: "A general strike, with all the hardships, waste, suffering and loss that would follow from demoralization of the service is at once serious to contemplate, and is intolerable. The principles of arbitration are recognized and approved by all civilized nations and peoples, and arbitration is regarded as the most effective method for securing fair, peaceful and equitable adjustments to all concerned." The commission adds that "it is our earnest request that the refusal of the employees to accede to the offer of the managements to arbitrate be reconsidered, and that out of regard for the public welfare they submit to arbitration."

Landmarks in Signaling History*

INTERLOCKING.

YEAR.

1846—Signal and switch levers concentrated (England).
1847—Stevens' improved arrangement of levers.
1856—Saxby interlocked the levers.
1867—Saxby's patent on latch-lacking.
1873—London & North Western had 13,000 levers.
1874—First interlocking in America (Spuyten Duyvil).
1877—First extensive commercial interlocking in America (Manhattan Elevated).
1884—First pneumatic interlocking (Bound Brook).
1890—First all-electric interlocking (Taylor's).
1890—First electro-pneumatic interlocking.
1891—Eighteen hydro-pneumatic plants in service (482 levers).
1894—Forty-six electro-pneumatic plants (1,600 levers).
1913—Four hundred and forty all-electric plants (21,370 levers).
1915—Pennsylvania (East and West) had 20,000 levers.

BLOCK SIGNALS (MANUAL).

1842—Sir W. F. Cooke proposed the telegraph block system.
1844—Eastern Counties Railway used the block system (abandoned because of the expense).
1851—South Eastern Railway used electric bell code for signaling from station to station.
1852—Tyer's tablet system.
1854—London & North Western used block system with visual-indicator instruments.
1864—Space interval used between New York and Philadelphia.
1876—Metropolitan Railway (London underground), ran trains (by block system) at 3½ minute intervals, or eighteen trains an hour.
1882—First controlled manual in America (New York Central).
1884—First single track block signaling in America (Canadian Pacific).
1889—Webb & Thompson staff system.
1915—Controlled manual system used on 2,600 miles in the United States.

AUTOMATIC BLOCK SIGNALS.

1871—First automatic block system; Hall enclosed disks (Eastern Railroad, Massachusetts).
1872—Closed track circuit; William Robinson.
1879—First track circuit automatic block signals (clock work) (Fitchburg Railroad).
1885—First electro-pneumatic automatic block signals.
1891—First extensive use of automatic block signals on single track (Cincinnati, New Orleans & Texas Pacific).
1899—Second extensive use of automatic installation on single track (Chicago & Alton).
1915—Union Pacific and Southern Pacific had automatic block signals on 4,466 miles of road, single track.

*From a paper on "Railroad Day and Night Signals," by B. H. Mann, signal engineer of the Missouri Pacific, read before the Engineers' Club of St. Louis, April 12, and printed in the club's journal for May. Mr. Mann, employed by the Union Switch & Signal Company, worked on the Cincinnati, New Orleans & Texas Pacific in 1891. In 1898 he was at the South Station, Boston; in 1899 on the Chicago & Alton; 1903, Missouri Pacific. The earliest date shown in connection with the block system (1842) is two or three years later than the date (December, 1839) given by Clement E. Stretton as that in which the block system was introduced, for a short distance, on the Great Western, at the instance of Messrs. Cooke & Wheatstone.

REVENUES AND EXPENSES OF RAILWAYS

Month of May, 1916

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
* Atlanta, Birmingham & Atlantic	640	$173,114	$41,550	$233,784	$41,509	$48,370	$13,889	$90,299	$22	$8,988	$203,077	$30,707	$13,100	$17,607	.....
Bingham & Garfield	27	214,755	2,565	220,015	19,915	16,964	1,099	31,465	52	2,959	72,454	147,561	8,088	139,473	$50,185
Cripple Creek & Colorado Springs	87	92,171	13,032	107,510	8,545	15,042	2,661	22,898	.....	3,155	52,303	55,207	7,603	47,605	7,330
New York, Susquehanna & Western	140	183,550	57,584	273,716	24,206	31,337	2,359	131,848	.....	5,422	194,877	78,839	14,100	64,738	—35,122
Norfolk & Western	2,086	4,663,028	461,751	5,293,541	619,528	849,044	66,815	1,221,551	9,038	78,172	2,830,308	2,463,232	175,000	2,288,116	921,558
Norfolk Southern	908	275,210	84,668	382,268	46,933	62,759	7,642	126,166	67	18,352	261,920	120,347	12,853	107,221	78,209
Northern Pacific	6,509	4,934,175	1,073,085	6,533,155	959,569	623,956	118,190	1,754,895	79,333	99,315	3,583,692	2,949,463	506,892	2,442,088	1,101,314
Northwestern Pacific	507	158,028	179,964	385,489	55,424	47,609	8,128	123,385	922	8,588	242,413	143,076	16,945	126,114	59,500
Oahu Ry. & Land Co.	114	79,637	20,149	110,082	9,034	7,948	660	26,027	.....	4,795	48,464	61,618	8,500	53,118	10,532
Oregon Short Line	2,259	1,487,997	380,116	2,013,605	221,873	225,681	33,493	446,807	27,947	59,782	1,015,583	998,022	131,600	866,389	440,220
Oregon-Washington Railroad & Nav. Co.	2,053	1,056,845	353,243	1,544,073	272,527	162,895	42,302	464,594	22,971	68,157	1,027,634	516,439	93,800	422,604	187,095
Panhandle & Santa Fe	670	381,890	77,906	477,676	82,907	71,929	3,922	114,628	.....	11,046	284,246	193,430	10,573	182,550	113,031
Pennsylvania Company	1,758	5,407,930	926,288	7,015,746	852,901	1,111,222	97,965	2,169,246	36,617	145,632	4,410,506	2,605,240	291,106	2,313,966	1,164,265
Pennsylvania Railroad	4,541	14,238,086	3,708,941	19,792,494	2,334,415	3,872,727	199,980	6,499,435	254,046	433,113	13,593,716	6,198,777	685,435	5,510,859	1,748,447
Pere Marquette	2,249	1,314,919	316,517	1,820,082	267,996	368,828	32,444	630,511	3,817	41,449	1,344,791	475,291	50,791	424,484	214,232
Philadelphia & Reading	1,120	3,954,094	583,458	4,868,838	396,932	740,748	50,382	1,594,777	15,211	78,954	2,870,769	1,998,069	100,213	1,897,159	655,651
Philadelphia, Baltimore & Washington	717	1,146,254	827,442	2,202,772	254,251	391,171	28,839	788,417	113	50,804	1,513,596	689,176	59,785	629,300	263,898
Pittsburgh & Lake Erie	225	1,773,532	161,587	2,070,424	167,515	287,816	14,166	447,223	3,850	34,436	955,006	1,115,418	58,700	1,056,718	428,660
Pittsburgh, Cincinnati, Chic. & St. Louis	1,489	3,079,409	718,320	4,305,753	623,148	860,685	70,933	1,417,813	27,133	107,171	3,106,260	1,199,493	180,610	1,018,809	468,934
Pittsburgh, Shawmut & Northern	294	184,994	9,739	197,238	43,224	57,664	1,492	62,136	.....	5,787	170,304	26,934	3,115	23,819	—15,072
Port Reading	21	115,963	.....	133,924	8,910	15,972	38	54,298	.....	121	79,339	54,585	10,000	44,585	—6,686
Richmond, Fredericksburg & Potomac	88	205,444	95,832	340,778	28,148	34,462	3,400	93,329	4,537	7,527	171,402	169,376	11,401	157,933	31,233
Rutland	468	228,073	90,723	363,104	32,371	59,167	10,754	123,158	1,051	7,019	233,520	129,584	17,215	112,369	33,494
St. Joseph & Grand Island	258	134,023	25,439	170,473	31,705	23,399	4,844	48,166	867	4,838	113,820	56,653	7,962	48,631	31,130
St. Louis Merchants' Bridge Terminal	9	.....	381	186,810	32,534	10,818	836	85,069	.....	6,101	135,358	51,453	7,600	43,853	10,458
St. Louis, San Francisco & Texas	244	54,979	21,001	83,057	18,765	12,788	2,521	38,627	.....	4,225	76,926	6,130	1,565	4,559	10,354
St. Louis Southwestern of Texas	810	216,095	67,009	313,405	67,931	79,218	13,913	140,721	1,633	17,620	309,741	3,664	16,930	—13,300	1,345
Southern Pacific	6,950	6,681,935	2,255,585	9,809,221	844,492	1,411,870	202,308	3,224,430	144,930	233,310	6,045,784	3,763,437	440,694	3,320,675	975,435
Spokane, Portland & Seattle	555	268,855	107,126	412,578	73,480	42,458	8,208	100,870	3,395	16,427	244,442	168,136	57,445	110,466	76,960
Staten Island Rapid Transit Co	11	49,968	29,704	111,057	11,209	9,206	778	36,619	.....	2,317	60,129	50,928	5,500	45,428	—5,087
Terminal Railroad Ass'n of St. Louis	37	.....	266	279,945	43,131	17,375	928	81,451	.....	3,435	146,322	133,623	27,485	106,138	33,287
Texas & New Orleans	468	253,285	84,167	374,800	50,046	70,702	7,969	122,258	9,611	9,529	269,699	105,100	19,816	85,254	55,538
Ulster & Delaware	129	54,453	18,794	92,382	11,837	11,210	5,125	33,886	55	3,620	65,734	26,647	3,500	23,147	18,645
Union Pacific	3,622	3,821,651	857,927	5,176,348	793,087	575,677	108,256	1,204,290	78,502	139,441	2,869,162	2,307,185	210,700	2,095,555	930,122
Union Railroad of Baltimore	8	159,787	25,895	187,880	15,377	.....	.....	4,718	.....	2,036	22,131	165,749	5,868	159,881	57,342
Vandalia	917	729,326	197,068	1,047,925	134,110	207,913	26,112	388,949	10,826	27,011	794,921	253,004	36,957	216,018	96,578
Virginia & Southwestern	225	142,417	14,606	162,535	25,386	53,094	2,054	43,040	.....	4,237	127,811	34,724	7,517	27,206	5,605
Wabash	2,519	2,279,021	540,880	3,071,696	331,500	479,378	92,824	1,085,020	16,744	70,064	2,068,955	1,002,741	87,481	914,361	698,196
Washington Southern	36	67,493	54,529	159,178	17,954	22,400	1,334	43,275	2,020	3,479	90,462	68,716	4,532	64,173	29,773
West Jersey & Seashore	358	208,683	353,209	614,649	100,453	96,501	11,956	235,687	2,731	15,344	462,670	151,979	37,081	114,873	18,733
Western Pacific	941	502,737	83,219	620,338	108,521	68,344	21,116	199,422	9,640	17,548	424,590	195,748	31,671	164,053	68,865
Wheeling & Lake Erie	512	817,134	53,477	942,685	127,394	108,689	8,478	265,624	1,431	16,704	528,321	414,365	43,426	370,938	250,206
Yazoo & Mississippi Valley	1,382	904,044	190,073	1,144,674	171,969	197,524	19,532	350,070	2,005	32,485	771,732	372,942	52,000	320,827	98,583

Eleven Months of Fiscal Year 1916

Alabama & Vicksburg	143	$1,038,276	$377,388	$1,551,407	$188,760	$334,800	$40,938	$526,057	$22,961	$60,004	$1,173,351	$378,057	$96,330	$281,726	$206,027
Alabama Great Southern	309	3,724,864	1,033,583	5,129,272	481,280	1,171,915	144,101	1,490,740	33,110	98,672	3,418,075	1,711,197	181,357	1,529,728	683,182
Ann Arbor	294	1,800,581	491,940	2,442,455	216,934	352,326	53,251	880,872	4,980	124,454	1,632,817	809,638	153,810	653,397	180,817
Arizona Eastern	378	2,435,940	395,435	3,002,546	517,941	303,253	26,005	626,693	13,623	120,571	1,605,183	1,397,363	200,756	1,196,441	616,616
Atchison, Topeka & Santa Fe	8,626	68,398,847	25,126,330	102,227,571	13,778,246	15,717,251	2,129,168	27,567,665	.....	2,082,634	61,103,917	41,123,654	4,899,530	36,196,698	8,027,735
Atlanta & West Point	93	672,672	422,589	1,259,987	149,949	240,328	67,227	366,815	22,240	50,012	896,358	363,629	67,853	290,042	142,221
* Atlanta, Birmingham & Atlantic	640	956,882	189,829	1,241,050	206,463	237,254	69,251	473,805	129	44,340	1,031,241	209,809	65,500	144,309	.....
Atlantic & St. Lawrence	167	1,443,823	246,062	1,820,952	233,409	270,076	44,678	822,094	.....	48,223	1,418,480	402,471	126,555	275,904	87,810
Atlantic Coast Line	4,705	21,391,288	7,688,762	31,663,581	4,005,824	5,080,747	648,614	10,303,279	117,707	806,310	20,939,282	10,724,299	1,646,000	9,064,635	2,438,382
Baltimore & Ohio	4,535	80,400,912	13,496,239	101,323,262	12,364,745	21,596,464	1,768,438	33,562,015	612,298	2,285,434	72,178,857	29,144,405	3,302,916	25,807,371	4,134,520
Baltimore & Ohio Chicago Terminal	79	.....	6,155	1,621,849	174,963	214,959	10,191	752,102	17,176	89,498	1,226,761	395,088	210,278	183,278	—32,295
Baltimore, Chesapeake & Atlantic	88	617,668	353,308	1,017,992	79,651	290,540	15,036	548,657	.....	34,711	968,576	49,416	24,642	24,738	—78,365
Bangor & Aroostook	632	2,690,560	594,133	3,476,944	502,830	536,383	32,749	939,507	33,518	126,788	2,171,130	1,305,814	143,450	1,162,328	28,830
Belt Ry. Co. of Chicago	31	.....	.....	2,666,987	190,179	341,603	11,392	1,155,920	.....	66,459	1,765,554	901,433	138,186	763,247	—486,720
Bessemer & Lake Erie	255	9,112,288	341,045	9,643,801	824,770	1,865,443	104,638	2,249,945	.....	161,399	5,075,117	4,568,684	210,665	4,357,993	1,385,451
Bingham & Garfield	27	1,860,429	35,370	1,908,112	183,476	180,688	11,492	248,149	1,029	26,683	651,517	1,256,594	53,982	1,202,612	557,773
Boston & Maine	2,302	29,107,470	13,767,023	47,383,220	5,457,842	5,998,753	369,783	19,955,069	183,089	1,128,552	33,093,088	14,290,132	1,814,534	12,475,598	4,743,683
Buffalo & Susquehanna R. R. Corporation	253	1,445,662	74,142	1,544,376	224,598	398,851	12,221	424,097	.....	60,081	1,119,849	424,527	28,600	395,925	237,287
Buffalo, Rochester & Pittsburgh	586	9,473,635	1,044,457	10,914,655	1,489,343	2,490,995	130,588	3,488,788	13,953	241,585	7,855,252	3,059,404	230,000	2,829,277	777,517
Canadian Pacific Lines in Maine	233	1,567,501	192,158	1,870,346	200,888	224,411	57,965	751,931	.....	41,017	1,276,211	594,135	96,000	498,135	425,999
Carolina, Clinchfield & Ohio	283	2,412,591	197,472	2,665,615	267,593	343,928	122,883	479,482	.....	110,060	1,312,858	1,352,757	142,500	1,210,127	426,227
Carolina, Clinchfield & Ohio of S. C.	18	138,590	14,480	157,278	14,688	966	21,203	27,632	.....	8,479	72,617	84,662	7,500	77,102	26,736
Central of Georgia	1,924	7,655,988	2,786,722	11,608,073	1,584,043	1,973,194	395,223	3,736,541	16,025	425,038	8,119,504	3,488,569	584,965	2,891,323	409,684
Central of New Jersey	681	22,952,708	5,609,860	30,496,781	2,476,973	5,034,864	330,910	10,677,863	148,452	636,843	19,302,388	11,194,393	1,677,389	9,516,501	1,937,892
Central New England	304	3,817,669	389,677	4,406,652	473,110	385,858	13,342	1,399,133	.....	52,455	2,323,016	2,083,636	157,800	1,925,648	692,603
Central Vermont	411	2,759,907	817,426	3,905,713	417,999	605,142	92,817	1,723,581	22,945	86,688	2,949,173	956,540	171,740	784,769	295,927
Charleston & Western Carolina	343	1,324,205	308,692	1,727,215	291,882	220,890	35,955	559,991	.....	52,145	1,160,488	566,727	55,000	511,364	204,065
Chesapeake & Ohio Lines	2,374	35,783,058	5,447,893	44,017,188	5,080,677	9,770,869	590,164	12,653,054	259,748	879,387	29,206,382	14,810,806	1,444,992	13,345,917	3,875,608
Chicago & Alton	1,052	10,179,704	3,515,579	14,853,910	1,669,379	3,210,953	388,317	5,006,901	106,800	337,901	10,664,911	4,188,999	506,485	3,693,215	1,384,275

* Five months ended May 31.

REVENUES AND EXPENSES OF RAILWAYS

ELEVEN MONTHS OF FISCAL YEAR 1916—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Chicago & Eastern Illinois	1,136	$11,520,317	$2,649,065	$15,379,347	$2,092,569	$3,623,510	$276,965	$5,288,109	$87,570	$416,459	$11,760,295	$3,619,052	$640,957	$2,973,380	$1,020,790
Chicago & Erie	270	6,046,693	525,129	7,130,265	644,040	714,289	194,004	2,668,997	23,831	157,637	4,392,421	2,737,844	242,633	2,495,211	1,256,723
Chicago & North Western	8,108	55,021,390	19,398,078	83,195,221	10,424,747	13,418,027	1,194,032	29,459,781	601,020	1,714,312	56,619,507	26,575,714	4,295,000	22,268,089	4,243,060
Chicago, Burlington & Quincy	9,369	66,060,260	19,271,534	94,075,779	10,648,167	14,063,718	1,405,472	27,507,843	852,681	1,833,384	56,311,264	37,764,514	4,022,986	33,741,528	8,862,307
Chicago Great Western	1,496	9,656,726	2,970,952	13,805,685	1,817,602	2,328,285	497,862	4,871,976	94,055	373,139	9,967,728	3,837,957	503,788	3,324,399	767,280
Chicago, Indianapolis & Louisville	622	4,791,100	1,691,170	7,025,125	762,627	1,145,295	218,264	2,349,364	3,435	198,588	4,672,160	2,352,965	327,602	2,023,197	613,724
Chicago Junction	13	.....	.....	2,125,517	228,989	197,629	12,369	1,161,364	.....	60,297	1,660,649	464,869	34,779	430,078	153,355
Chicago, Milwaukee & St. Paul	10,210	69,786,232	17,005,241	96,482,738	9,682,780	15,174,110	1,707,936	34,582,274	684,028	1,746,959	62,343,979	34,138,759	4,771,972	29,334,592	7,471,314
Chicago, Peoria & St. Louis	255	1,257,460	263,255	1,609,447	219,494	322,290	62,623	651,456	.....	59,536	1,315,399	294,048	55,698	238,350	115,521
Chicago, Rock Island & Gulf	477	2,114,233	568,750	2,914,385	449,582	379,591	105,605	990,770	17,157	89,726	2,032,188	882,196	106,703	774,703	164,035
Chicago, Rock Island & Pacific	7,559	44,726,983	16,459,959	66,202,624	9,260,878	11,466,117	1,496,146	24,053,384	483,105	1,690,567	48,372,910	17,829,714	3,254,278	14,565,506	2,187,002
Chicago, St. Paul, Minneapolis & Omaha	1,753	11,885,131	4,683,542	17,908,018	2,064,337	2,267,034	322,735	6,655,752	170,107	431,448	11,895,161	6,012,857	936,541	5,071,527	717,601
Chicago, Terre Haute & Southeastern	373	2,087,841	179,137	2,325,725	334,285	531,028	43,725	689,792	11,132	93,443	1,703,217	622,508	120,517	501,709	128,796
Cincinnati, Hamilton & Dayton	622	7,390,719	1,226,608	9,618,390	1,625,231	1,941,751	176,804	3,421,134	36,458	230,748	7,415,898	2,202,492	346,797	1,852,739	1,183,538
‡ Cincinnati, Indianapolis & Western	322	752,449	240,100	1,090,798	130,955	149,770	32,793	491,349	2,174	42,184	847,265	243,533	56,935	186,598	.....
Cincinnati, New Orleans & Texas Pacific	337	7,872,298	1,623,019	10,089,032	1,006,831	2,441,221	277,728	2,925,103	15,990	231,114	6,948,709	3,140,323	348,000	2,791,488	757,924
Cincinnati Northern	246	1,399,227	189,249	1,654,836	273,094	272,790	31,877	531,646	.....	33,424	1,142,831	512,005	62,371	449,560	149,575
Cleveland, Cincinnati, Chic. & St. Louis	2,385	27,992,308	8,195,240	39,632,491	4,066,892	7,400,866	852,069	13,280,170	259,194	800,719	26,581,130	13,051,361	1,421,131	11,621,791	4,829,034
Colorado Midland	338	1,119,246	160,255	1,395,478	229,590	339,171	80,005	596,394	11,576	60,144	1,316,881	78,597	91,010	12,413	—80,944
Colorado & Southern	1,102	6,152,914	1,240,861	7,949,297	1,002,879	1,546,493	110,468	2,223,915	42,629	247,028	5,173,412	2,775,885	384,400	2,391,156	792,116
Cripple Creek & Colorado Springs	87	1,053,100	218,149	1,292,602	149,794	144,569	38,470	310,334	.....	37,492	680,658	611,943	61,687	550,256	122,828
Cumberland Valley	164	2,450,133	600,651	3,203,965	333,235	307,296	46,406	940,940	10,329	96,142	1,727,143	1,476,822	65,070	1,411,714	692,626
Delaware & Hudson Co. & R. R. Dept.	857	19,772,076	2,610,424	23,691,065	1,936,719	3,750,122	290,235	7,926,024	200,543	774,410	14,857,769	8,833,295	599,808	8,231,295	1,558,718
Delaware, Lackawanna & Western	955	32,823,963	7,715,162	44,921,807	4,013,842	6,543,348	803,343	14,184,709	335,564	874,650	26,711,538	18,210,270	2,008,234	16,198,823	3,790,741
Denver & Rio Grande	2,577	16,776,103	4,399,734	22,828,350	2,296,284	3,822,505	446,510	6,020,099	389,030	550,608	13,525,036	9,303,314	997,000	8,304,915	2,440,559
Denver & Salt Lake	255	1,352,954	290,607	1,721,018	206,756	350,496	21,871	615,521	.....	51,036	1,245,569	475,449	82,486	392,799	—15,568
Detroit & Mackinac	393	713,526	283,806	1,070,680	118,517	186,350	22,842	363,454	892	29,571	721,266	349,414	89,482	256,632	69,143
Detroit & Toledo Shore Line	81	1,580,576	.....	1,589,948	127,357	91,270	17,027	411,660	.....	30,284	677,599	912,349	73,357	838,992	228,979
Detroit, Grand Haven & Milwaukee	191	2,040,001	525,439	2,951,816	309,708	381,028	57,771	1,360,366	7,730	47,787	2,163,939	787,876	41,470	745,425	526,114
Detroit, Toledo & Ironton	341	1,736,274	148,513	2,019,260	213,355	263,329	45,191	881,690	.....	68,577	1,472,141	547,119	63,500	483,585	444,202
Duluth & Iron Range	288	5,658,671	225,290	5,450,341	629,182	791,396	15,117	1,347,344	15,252	115,782	2,905,979	2,544,362	292,046	2,251,237	874,772
Duluth, Missabe & Northern	399	8,763,055	302,516	9,480,091	1,084,527	1,229,535	27,262	1,642,189	58,875	144,376	4,186,764	5,293,327	525,665	4,767,662	2,616,793
Duluth, South Shore & Atlantic	628	2,101,510	794,741	3,163,960	503,926	394,120	81,703	1,123,262	39,926	102,058	2,244,994	918,966	228,868	689,848	398,375
Duluth, Winnipeg & Pacific	187	1,304,204	206,231	1,558,185	144,680	163,369	18,683	572,783	7,300	67,220	974,037	584,148	77,985	506,164	286,222
El Paso & Southwestern Co.	1,027	7,618,738	1,482,527	9,645,637	1,241,621	1,249,578	201,158	2,400,832	70,077	317,658	5,480,798	4,164,839	425,656	3,738,874	1,389,263
Elgin, Joliet & Eastern	768	11,403,739	106	12,170,820	923,758	2,220,062	74,187	3,356,150	.....	240,481	6,813,158	5,357,662	419,258	4,937,534	2,483,170
Erie	1,988	45,432,527	8,333,097	59,267,372	4,573,036	10,251,365	997,443	21,092,666	373,400	1,234,537	38,453,628	20,813,744	1,910,735	18,864,202	8,485,894
Florida East Coast	745	3,872,683	1,915,823	6,639,376	735,161	718,446	99,583	1,871,951	39,040	215,851	3,652,552	2,986,824	287,888	2,698,447	927,240
Fort Worth & Denver City	454	3,740,420	1,393,983	5,410,460	635,641	878,901	70,419	1,556,224	28,718	172,548	3,342,450	2,068,010	184,612	1,883,397	608,694
Galveston, Harrisburg & San Antonio	1,351	8,205,630	2,808,736	11,722,254	1,799,266	1,633,339	333,773	4,347,631	116,452	353,291	8,553,912	3,168,342	547,945	2,613,657	1,291,215
Galveston Wharf	12	.....	.....	1,254,218	39,921	24,518	4,158	346,371	394,184	4,239	813,392	440,827	112,090	328,737	—339,531
Georgia	307	1,948,876	710,353	2,883,899	261,637	446,956	138,581	1,133,098	999	84,647	2,064,659	819,240	129,687	688,567	310,802
Georgia, Southern & Florida	395	1,351,908	606,387	2,249,673	250,756	407,315	77,130	831,651	3,066	102,039	1,672,679	576,994	124,846	449,991	223,572
Grand Rapids & Indiana	575	3,313,027	1,431,875	5,151,251	582,228	867,092	119,353	2,035,856	14,766	163,488	3,782,782	1,368,469	248,557	1,118,031	233,496
Grand Trunk Western	347	6,043,930	1,445,847	8,001,944	762,371	1,231,491	171,039	2,833,109	58,890	147,046	5,203,945	2,797,999	362,670	2,434,377	1,909,409
Great Northern	8,102	55,015,193	12,353,817	74,100,015	8,183,900	8,102,515	1,050,906	20,469,672	793,150	1,223,426	39,642,165	34,457,850	4,622,268	29,831,396	5,814,666
Gulf & Ship Island	308	1,362,150	320,842	1,813,491	160,891	283,410	33,427	448,003	3,195	82,445	1,011,371	802,120	76,181	725,572	343,277
Gulf, Colorado & Santa Fe	1,938	10,702,395	2,768,791	14,325,602	2,751,522	2,165,378	331,850	6,044,852	.....	439,833	11,677,248	2,648,354	659,002	1,984,814	2,094,163
Hocking Valley	350	5,354,552	783,743	6,625,572	662,996	1,509,907	91,400	1,930,868	.....	158,130	4,353,300	2,272,272	440,400	1,831,400	418,447
Houston & Texas Central	895	4,249,868	1,299,694	6,018,561	938,993	882,069	175,315	2,082,515	62,042	206,008	4,340,122	1,678,439	330,888	1,345,202	330,595
Houston, East & West Texas	191	984,004	311,160	1,381,738	258,101	198,003	22,640	450,341	7,543	35,249	970,592	411,196	48,067	362,264	121,641
Illinois Central	4,767	45,995,654	12,352,585	63,171,828	8,859,652	15,233,645	1,143,132	20,078,078	339,878	1,603,897	47,156,995	16,014,833	3,326,500	12,665,689	2,267,766
Indiana Harbor Belt	110	.....	.....	3,758,261	400,697	404,856	31,409	1,478,047	.....	88,556	2,403,566	1,354,695	84,017	1,269,391	428,376
International & Great Northern	1,159	6,406,834	1,658,226	8,728,286	1,322,178	1,443,546	232,075	3,502,424	42,459	317,557	6,701,477	2,026,809	388,678	1,636,173	820,319
Kanawha & Michigan	177	2,890,577	340,354	3,313,758	436,359	696,163	33,276	836,502	150	74,695	2,077,145	1,236,613	147,935	1,088,311	468,903
Kansas City, Mexico & Orient	738	1,919,244	357,499	2,403,680	579,450	493,431	96,947	997,787	.....	113,724	2,281,339	122,340	130,208	7,891	—232,799
Kansas City Southern	837	7,407,729	1,377,207	9,672,486	1,042,161	1,139,235	301,251	3,028,494	.....	377,561	5,799,779	3,872,707	513,614	3,355,073	515,950
Lake Erie & Western	900	5,344,520	681,542	6,335,871	715,514	1,137,912	141,117	2,094,735	.....	136,667	4,225,944	2,109,927	258,803	1,850,204	937,391
Lehigh & Hudson River	97	1,623,530	80,889	1,916,605	192,559	246,558	16,289	627,483	.....	45,986	1,128,875	787,730	51,800	735,930	217,218
Lehigh & New England	296	2,851,840	13,458	3,031,318	405,542	346,683	21,389	769,524	.....	64,204	1,606,789	1,424,529	79,540	1,344,795	382,741
Lehigh Valley	1,442	36,531,955	3,875,691	43,153,826	4,351,507	8,445,966	906,879	15,482,527	138,467	855,575	30,153,698	13,000,128	1,566,500	11,425,354	1,526,246
Long Island	397	3,808,675	7,306,300	12,799,651	1,476,315	1,408,362	123,907	5,203,736	67,372	353,519	8,625,274	4,174,377	829,747	3,339,704	424,615
Louisiana & Arkansas	279	1,302,471	169,003	1,516,182	271,727	239,196	36,290	390,669	.....	46,462	984,345	531,837	84,642	446,983	—4,187
Louisiana Ry. & Navigation Co.	351	1,579,455	309,621	2,016,219	290,073	303,180	68,485	675,336	.....	57,583	1,394,657	621,562	104,500	516,917	175,886
Louisiana Western	208	1,516,055	589,356	2,255,490	290,636	356,092	78,368	583,940	19,990	66,959	1,395,848	859,642	105,639	753,349	261,228
Louisville & Nashville	5,038	40,970,862	10,445,118	55,241,080	7,585,206	9,985,384	1,344,040	16,179,836	252,809	1,179,068	36,404,882	18,836,198	2,119,947	16,699,516	7,496,141
Louisville, Henderson & St. Louis	200	1,020,639	375,872	1,478,664	335,262	176,102	55,528	442,185	.....	35,331	1,044,407	434,257	41,800	392,083	138,730
Maine Central	1,220	7,064,783	3,041,040	10,895,488	1,487,522	1,563,242	121,033	3,970,388	39,525	316,662	7,497,043	3,398,445	568,376	2,829,708	521,230
Michigan Central	1,803	24,520,171	9,053,384	37,987,834	4,402,927	5,708,202	691,891	13,218,136	569,072	718,489	25,308,716	12,679,117	1,493,936	11,178,947	4,844,670
Midland Valley	380	1,226,653	385,514	1,698,303	302,892	284,646	26,827	535,354	.....	67,461	1,216,540	481,763	74,285	406,948	192,667
Minneapolis, St. Paul & S. S. Marie	4,229	24,044,204	5,779,991	32,081,821	2,916,846	3,846,499	575,588	9,360,715	171,240	641,315	17,480,657	14,601,164	1,407,265	13,193,899	4,981,375
Minneapolis & St. Louis	1,646	7,559,606	1,775,084	9,888,756	1,091,483	1,380,026	193,417	3,601,801	931	244,674	6,512,332	3,376,424	416,584	2,956,409	433,787
Missouri & North Arkansas	365	704,717	317,950	1,100,460	299,576	232,619	33,137	398,862	.....	60,693	1,024,887	75,573	63,754	111,110	213,215
Missouri, Kansas & Texas	3,865	20,058,591	7,543,168	29,841,460	6,301,323	5,213,913	633,786	10,311,209	183,700	1,012,965	23,613,295	6,228,165	1,520,977	4,699,576	3,527,466
Missouri, Oklahoma & Gulf	334	1,017,074	226,583	1,298,206	353,476	266,453	48,344	563,070	1,240	83,233	1,311,784	13,578	72,164	—86,400	19,640

‡ Figures shown here are for 6 months ending May 31.

REVENUES AND EXPENSES OF RAILWAYS

ELEVEN MONTHS OF FISCAL YEAR 1916—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Missouri, Oklahoma & Gulf of Texas	125	$194,796	$4,676	$201,788	$36,215	$27,806	$19,946	$104,443	.....	$15,378	$203,788	—$2,000	$2,405	—$4,405	—$5,373
Missouri Pacific	3,931	22,014,787	4,574,226	28,964,551	4,414,947	6,506,417	742,770	10,268,812	$96,017	92,200	2,449,091	18,272	164,450	5,022,894	226,846
Mobile & Ohio	1,122	9,135,970	1,118,791	10,847,027	1,100,217	2,300,834	391,442	3,754,520	25,706	342,997	7,897,788	2,949,240	366,173	2,580,575	206,145
Monongahela	108	1,635,520	66,248	1,728,129	224,502	148,298	9,633	367,817	.....	38,709	788,959	939,170	54,855	884,315	.....
Morgan's La. & Texas R. R. & S. S. Co.	405	2,930,638	916,577	4,192,501	636,845	701,740	130,634	1,475,030	25,062	127,364	3,095,316	1,097,185	241,530	853,661	112,999
Nashville, Chattanooga & St. Louis	1,231	8,295,754	2,442,347	11,667,587	1,368,820	2,154,285	556,266	4,103,919	110,639	398,889	8,685,632	2,981,955	290,000	2,689,198	1,321,165
Nevada Northern	165	1,530,152	123,391	1,700,473	191,748	150,882	6,902	310,376	808	50,114	710,830	989,643	74,401	915,223	535,560
New Orleans & Great Northern	285	1,228,787	292,577	1,688,470	205,681	238,276	28,947	461,392	1,949	69,298	1,005,544	682,926	37,862	644,719	182,835
New Orleans & North Eastern	204	2,573,468	545,527	3,469,698	375,917	603,097	114,234	1,056,527	63,338	126,958	2,339,948	1,127,751	166,698	963,053	369,479
New Orleans, Mobile & Chicago	402	1,513,694	265,503	1,865,529	281,371	295,342	46,573	572,821	60	76,406	1,272,574	592,955	73,972	517,941	172,864
New Orleans, Texas & Mexico	286	1,204,071	255,640	1,544,492	300,473	246,667	45,562	528,817	.....	105,858	1,227,377	317,114	16,593	299,957	139,075
New York Central Railroad	6,093	120,231,403	43,723,529	190,116,033	18,570,776	33,043,101	2,639,244	59,878,420	2,549,674	4,079,838	120,761,054	69,354,979	8,044,328	61,291,999	.....
New York, Chicago & St. Louis	570	11,492,300	1,201,249	13,192,044	986,849	2,210,055	491,970	5,115,985	42,706	236,325	9,083,890	4,108,154	458,440	3,643,656	2,058,126
New York, New Haven & Hartford	2,005	34,926,711	26,980,763	69,231,325	7,991,485	9,885,960	408,157	25,757,593	752,666	1,587,223	46,327,005	22,904,321	2,659,000	20,240,396	4,389,745
New York, Ontario & Western	568	5,564,779	1,473,430	8,216,234	995,079	1,331,846	83,109	3,189,210	.....	177,401	5,774,131	2,442,103	235,021	2,205,539	249,316
New York, Philadelphia & Norfolk	112	3,565,200	400,224	4,258,167	367,336	833,490	52,894	1,559,965	44,310	122,564	2,977,917	1,280,250	116,562	1,162,412	603,781
New York, Susquehanna & Western	140	2,341,505	575,912	3,270,934	243,076	349,488	21,268	1,541,804	.....	63,818	2,217,439	1,053,495	147,757	905,115	50,526
Norfolk & Western	2,086	45,245,806	5,308,530	52,316,701	5,974,596	9,193,207	638,423	12,918,263	95,991	812,687	29,369,480	22,947,220	1,890,000	21,054,133	9,336,652
Norfolk Southern	908	2,949,529	967,652	4,175,712	503,063	608,695	82,694	1,419,580	1,093	193,869	2,808,993	1,366,719	137,869	1,225,522	522,694
Northern Pacific	6,509	51,030,379	12,433,301	69,274,654	7,836,717	6,788,104	1,061,498	19,149,638	895,795	1,034,041	36,294,507	32,980,146	4,534,685	28,440,612	8,994,593
Northwestern Pacific	507	1,561,388	1,866,279	3,864,606	611,450	468,907	60,018	1,318,682	3,255	87,909	2,531,898	1,332,708	187,862	1,144,420	495,189
Oahu Ry. & Land Co	114	853,508	230,922	1,167,113	108,819	91,107	7,677	265,177	.....	56,700	529,480	637,633	93,611	544,022	—6,114
Oregon Short Line	2,259	16,845,399	4,288,481	22,775,327	2,660,511	2,648,592	381,224	5,091,270	327,022	612,587	11,723,443	11,051,884	1,480,635	9,567,093	3,315,206
Oregon-Washington Railroad & Nav. Co.	2,053	10,500,042	3,984,940	15,833,003	2,573,860	1,775,641	487,168	5,016,767	191,217	678,671	10,674,172	5,158,832	1,098,703	4,058,661	241,411
Panhandle & Santa Fe	670	3,870,556	892,476	4,985,279	906,372	740,492	46,024	1,185,060	.....	118,754	2,991,941	1,993,337	130,613	1,861,583	1,043,102
Pennsylvania Company	1,758	48,561,608	9,999,426	64,442,945	8,192,477	10,583,947	872,036	20,613,171	358,929	1,439,637	42,050,132	22,392,813	3,114,794	19,275,383	10,497,085
Pennsylvania Railroad	4,541	145,014,759	38,103,079	200,729,165	24,828,176	38,562,519	2,146,694	68,887,027	2,611,404	4,725,564	141,761,384	58,967,781	7,161,480	51,761,244	19,902,340
Pere Marquette	2,249	13,868,409	3,769,344	19,428,690	1,750,635	3,909,466	340,860	6,695,056	43,472	451,873	13,186,673	6,242,017	581,465	5,652,819	1,811,627
Philadelphia & Reading	1,120	43,659,803	6,157,068	52,454,241	3,663,365	8,145,611	516,169	17,319,063	140,866	850,275	30,616,108	21,838,133	1,103,026	20,728,987	7,760,691
Philadelphia, Baltimore & Washington	717	11,071,627	8,429,389	21,537,727	2,857,308	3,811,252	292,683	8,127,219	1,133	554,639	15,644,235	5,893,492	609,419	5,281,096	2,463,313
Pittsburgh & Lake Erie	225	17,902,879	1,630,879	20,725,754	1,590,080	2,882,449	148,792	4,396,336	38,079	326,771	9,382,507	11,343,247	590,422	10,752,782	6,656,877
Pittsburgh Cincinnati, Chic. & St. Louis	1,489	30,439,745	8,028,422	43,253,229	6,022,221	8,141,643	722,085	14,577,555	288,251	1,027,221	30,777,005	12,476,224	1,857,843	10,615,940	3,966,922
Pittsburgh, Shawmut & Northern	294	2,072,540	104,099	2,206,530	336,094	547,410	17,351	674,409	.....	53,069	1,628,333	578,197	21,833	556,364	240,955
Port Reading	21	1,453,982	.....	1,659,749	88,757	135,715	422	710,733	.....	1,989	937,609	722,140	110,000	612,140	36,310
Richmond, Fredericksburg & Potomac	88	1,582,720	1,030,206	3,012,349	226,257	334,509	38,215	959,858	40,809	83,523	1,683,172	1,329,178	96,738	1,232,133	376,196
Rutland	468	2,005,627	1,104,576	3,545,477	409,000	585,890	101,305	1,235,390	11,409	67,401	2,410,395	1,135,082	187,680	947,386	291,757
St. Joseph & Grand Island	258	1,285,762	284,648	1,668,880	332,314	248,349	48,713	551,049	1,328	60,222	1,241,974	426,906	89,481	336,948	122,474
St. Louis & San Francisco	4,751	29,603,623	10,050,618	42,361,609	6,362,277	6,948,789	724,282	13,336,743	.....	1,085,829	28,134,206	14,227,403	1,920,288	12,289,092	1,769,103
St. Louis, Brownsville & Mexico	548	1,516,644	689,823	2,393,165	419,986	330,189	64,196	799,451	.....	113,801	1,692,649	700,516	95,389	601,386	98,256
St. Louis, Iron Mountain & Southern	3,555	22,551,573	5,289,635	30,059,215	5,235,071	6,087,341	704,549	8,531,706	97,997	676,958	21,278,109	8,781,106	1,270,638	7,481,133	378,592
St. Louis Merchants' Bridge Terminal	9	.....	2,990	2,066,628	282,669	100,300	8,780	925,543	.....	71,889	1,389,180	677,448	95,998	581,440	198,451
St. Louis, San Francisco & Texas	244	671,144	253,741	1,021,868	232,740	173,657	23,113	462,316	.....	49,205	941,030	80,838	19,282	61,031	38,710
St. Louis Southwestern	943	5,745,506	1,205,018	7,400,849	608,393	1,160,758	320,941	1,812,335	34,362	277,282	4,209,099	3,191,750	345,719	2,843,687	1,038,430
St. Louis Southwestern of Texas	810	2,728,852	827,047	3,864,170	680,609	875,453	150,945	1,643,037	11,283	199,308	3,463,315	400,855	194,518	205,534	484,257
San Antonio & Aransas Pass	724	2,468,818	870,295	3,589,944	729,440	593,030	73,337	1,613,398	.....	135,079	3,142,341	447,603	174,104	272,866	246,597
San Pedro, Los Angeles & Salt Lake	1,154	6,345,157	2,836,303	10,162,211	969,489	1,454,675	357,423	2,896,257	237,740	194,945	6,087,540	4,074,672	529,616	3,544,070	2,474,736
†Seaboard	3,449	9,331,593	2,733,063	13,430,417	1,516,647	1,831,289	422,807	4,398,204	88,454	385,632	8,642,896	4,787,521	597,589	4,185,283	.....
Southern	7,027	43,362,245	15,161,931	64,319,551	7,574,051	10,225,439	1,745,884	20,898,652	364,845	1,866,118	42,285,637	22,033,914	2,666,578	19,337,750	7,077,131
Southern Pacific	6,950	65,901,457	29,716,318	105,374,861	11,540,033	15,203,071	2,010,805	32,557,384	1,885,675	2,554,201	65,571,068	39,803,792	4,619,909	35,167,754	7,721,803
Spokane, Portland & Seattle	555	2,756,474	1,319,373	4,512,770	522,458	412,729	87,852	1,054,404	39,157	151,287	2,263,666	2,249,104	599,535	1,648,408	462,747
Staten Island Rapid Transit Co	11	519,206	283,956	1,128,983	112,601	69,891	7,966	458,749	.....	27,148	676,354	452,629	57,000	395,627	—41,174
Tennessee Central	294	1,048,465	344,523	1,479,186	289,613	207,934	63,656	542,999	.....	73,960	1,178,049	301,137	51,751	248,780	110,520
Terminal Railroad Ass'n of St. Louis	37	.....	2,776	2,857,683	338,131	167,172	9,954	914,736	.....	51,206	1,481,200	1,376,483	297,672	1,078,802	195,998
Texas & New Orleans	468	2,751,377	959,155	4,115,444	648,273	856,580	88,976	1,414,451	109,272	109,931	3,225,771	889,673	222,383	664,917	484,468
Texas & Pacific	1,944	12,440,129	3,920,232	17,698,022	1,927,180	2,763,130	420,121	6,896,508	148,654	562,008	12,697,615	5,000,406	848,438	4,147,641	948,128
Toledo & Ohio Central	436	4,058,669	544,440	4,896,669	625,710	1,044,733	77,401	1,740,788	19,212	108,608	3,616,453	1,280,216	263,227	1,016,377	271,694
Toledo, Peoria & Western	248	634,581	410,002	1,115,770	170,961	318,305	25,030	412,545	.....	40,964	967,806	147,964	67,500	80,464	103,087
Toledo, St. Louis & Western	451	4,508,070	339,917	5,146,789	610,539	751,294	178,543	1,696,114	.....	91,910	3,326,934	1,819,856	200,942	161,868	791,791
Ulster & Delaware	129	483,786	267,042	932,533	96,473	109,324	17,906	375,254	674	35,355	634,985	297,548	38,500	258,680	182,190
Union Pacific	3,622	41,495,967	9,824,793	56,758,614	7,135,978	7,039,510	1,196,655	13,538,709	890,525	1,349,952	31,053,945	25,704,669	2,292,631	23,403,637	6,127,497
Union Railroad of Baltimore	8	1,356,429	254,191	1,631,205	166,891	.....	.....	52,821	.....	23,344	243,057	1,388,148	59,082	1,329,065	143,350
Union R. R. of Pennsylvania	31	.....	.....	4,932,210	403,613	1,078,105	1,248	1,844,366	.....	48,350	3,375,436	1,556,775	80,106	1,476,668	1,276,331
Vandalia	917	7,944,019	2,215,384	11,445,343	1,667,249	2,179,948	259,035	4,047,951	111,301	276,467	8,541,951	2,903,392	409,224	2,492,789	743,671
Vicksburg, Shreveport & Pacific	171	925,273	425,125	1,508,933	235,057	273,617	39,167	466,510	23,092	56,902	1,093,953	414,981	93,991	320,990	281,948
Virginia & Southwestern	225	1,581,795	154,848	1,792,091	277,612	441,355	23,699	489,224	.....	44,648	1,276,537	515,554	77,910	437,644	91,600
Virginian	505	5,941,109	400,175	6,755,798	682,791	1,133,301	59,488	1,339,065	140,669	174,571	3,514,155	3,241,643	259,200	2,982,332	972,297
Wabash	2,519	23,358,147	5,785,417	31,712,826	3,533,602	4,887,023	946,780	11,499,459	168,600	719,882	21,724,609	9,988,216	933,599	9,048,275	4,245,626
Washington Southern	36	528,968	586,985	1,462,679	164,388	175,556	15,191	454,414	18,168	37,102	864,818	597,862	43,627	554,203	278,631
West Jersey & Seashore	358	2,351,807	3,957,403	6,857,444	1,155,901	1,007,666	130,393	2,675,728	29,539	171,147	5,170,375	1,687,069	430,047	1,256,305	463,912
Western Maryland	689	8,554,494	866,246	9,937,207	1,166,728	1,578,168	236,592	3,180,370	75,617	222,678	6,453,246	3,483,961	313,500	3,170,461	1,319,610
Western Pacific	941	4,732,292	1,585,282	6,793,665	992,852	684,194	238,071	2,123,813	155,345	198,394	4,392,669	2,400,995	317,464	2,082,102	1,345,294
Western Ry. of Alabama	133	702,693	374,927	1,209,822	194,026	240,207	65,354	338,307	19,650	50,343	906,545	303,277	60,129	237,618	105,329
Wheeling & Lake Erie	512	7,038,824	574,017	8,226,282	1,031,931	1,266,950	92,200	2,449,091	18,272	164,450	5,022,894	3,203,388	408,027	2,795,291	1,965,989
Yazoo & Mississippi Valley	1,382	9,612,914	2,205,078	12,417,545	1,832,209	1,936,025	204,770	3,902,376	17,061	316,762	8,204,160	4,123,386	558,000	3,652,838	977,347

†Figures shown are for 6 months ended May 31, 1916.

Railroads and the Clayton Act

E. P. Ripley, president of the Atchison, Topeka & Santa Fe, has written a letter to the Chicago Herald, which was published on July 24, referring to an editorial regarding the effect of the provisions of that part of the Clayton law that applies to the purchase of railroad supplies. Mr. Ripley says:

"Possibly in the past there may have been instances where those in control of railroads have lined their own pockets by buying supplies from concerns in which they had a personal interest, but such cases were rare—certainly not more frequent than stealing in other walks of life.

"The Clayton act, while doubtless well meant, is an example of the unintelligent attempts at regulation of which the railroads complain. It is unworkable as a practical matter, for reasons which it would take too long to explain. What the railroads are asking is that they be given a chance to show how unworkable and unreasonable the law is; or, at least, that the taking effect be postponed long enough to enable them to conform to it without too much loss. Just to show you what it means I may say that compliance with the law under existing conditions would probably cost this company $100,000 annually, plus all manner of inconvenience and with absolutely no benefit either to us or anybody else."

Traveling Engineers' Association

The twenty-fourth annual convention of the Traveling Engineers' Association will be held at the Hotel Sherman, Chicago, commencing September 5, 1916, and continuing four days.

A brief program of the meeting follows:

Tuesday, September 5. Morning session, 10:30 a. m.—Opening exercises and consideration of subject: "What effect does the mechanical placing of fuel in fireboxes and lubricating of locomotives have on the cost of operation." W. L. Robinson (B. & O.), chairman. Afternoon session, 1:30 p. m.—Continuation of the same subject.

Wednesday, September 6. Morning session, 9 a. m.—"The advantages of superheaters, brick arches and other modern appliances on large engines, especially those of the Mallet type." J. E. Ingling (Erie), chairman. Afternoon session, 1:30 p. m.—Committee on subjects for discussion at the 1917 meeting. B. J. Feeny (I. C.), chairman. Evening—The entire evening will be devoted to studying and examining the exhibits.

Thursday, September 7. Morning session, 9 a. m.—"Difficulties accompanying the prevention of dense black smoke and its relation to cost of fuel and locomotive repairs." Martin Whelan (C. C. C. & St. L.), chairman. Afternoon session, 1:30 p. m.—"Recommended practice in the makeup and handling of modern freight trains on both level and steep grades, to avoid damage to draft rigging." L. R. Pyle (Soo), chairman.

Friday, September 8. Morning session, 9 a. m.—"Assignment of power from standpoint of efficient service and economy in fuel maintenance." P. O. Wood (St. L. & S. F.), chairman. Afternoon session, 1:30 p. m. "Standing committee on revision of progressive examination for firemen for promotion and new men for employment." W. H. Corbett (M. C.), chairman. Committee report on change of constitution and by-laws. J. C. Petty (N. C. & St. L.), chairman. Election of officers. Adjournment.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, date of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, New Orleans, La.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.

American Association of Railroad Superintendents.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Annual meeting, August 16-18, 1916, Memphis, Tenn.

American Electric Railway Association.—E. B. Burritt, 8 W. 40th street, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Electric Railway Manufacturers' Association.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Railway Association.—J. E. Fairbanks, general secretary, 75 Church St., New York.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, New Orleans, La.

American Railway Tool Foremen's Association.—Owen D. Kinsey, Illinois Central, Chicago. Annual meeting, August 24-26, 1916, Hotel Sherman, Chicago.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

Association of Manufacturers of Chilled Car Wheels.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

Bridge and Building Supply Men's Association.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

International Railroad Master Blacksmiths' Association.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next meeting, August 15-17, 1916, Hotel Sherman, Chicago.

International Railway General Foremen's Association.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, August 29 to September 1, Hotel Sherman, Chicago.

Maintenance of Way and Master Painters' Association of the United States and Canada.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

Master Car and Locomotive Painters' Association of the United States and Canada.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 12-14, 1916, "The Breakers," Atlantic City, N. J.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

Railway Fire Protection Association.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Annual meeting, October 3-5, 1916, New York.

Railway Real Estate Association.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 10, 1916, Chicago.

Railway Signal Association.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 12-14, 1916, Grand Hotel, Mackinac Island, Mich.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

Roadmasters' and Maintenance of Way Association.—F. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Signal Appliance Association.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

Society of Railway Financial Officers.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Washington, D. C.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August. Waldorf-Astoria Hotel, New York.

Traffic Club of Pittsburgh.—D. L. Wells, Gen'l Agent, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next meeting, September 5-8, 1916, Hotel Sherman, Chicago.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The Traffic Club of Chicago held a golf outing on July 27 at the Racine Country Club, Racine, Wis.

The Baltimore & Ohio has furnished for the Industrial Commission of Ohio a car to be used by that Commission in giving exhibits in relation to Safety First throughout that state.

A sleeping car is now run through between Philadelphia and Chicago over the Philadelphia & Reading, the Lehigh Valley and the Michigan Central. Westward, the car leaves Philadelphia at 9:30 a. m. and reaches Chicago at 8 a. m. Eastbound, it leaves Chicago at 9:05 a. m. and reaches Philadelphia at 9:15 a. m.

The Chicago, Burlington & Quincy is equipping its new lounging cars for its Chicago-Denver, Chicago-Omaha and Chicago-St. Paul trains with soda fountains, similar to those used in drug stores, from which passengers may be served at any time of the day or night. It is also planned to install fountains on the older cars.

The New York, New Haven & Hartford, on July 26, again ordered an embargo on all freight coming from connecting rail and steamship lines via Harlem River and Maybrook, N. Y., except perishable freight and livestock, government freight, newsprint paper, materials for the two companies, freight in common for the Boston & Albany, Boston & Maine, Central Vermont and New York Central roads, and freight originating on the New York, Ontario & Western. The embargo will be raised on August 2 at midnight.

At the summer meeting of the National Industrial Traffic League to be held at the Hotel Cadillac, Detroit, Mich., on August 10 and 11, reports will be received from the following committees: Executive, bill of lading, car demurrage and storage, baggage, legislative, rate construction and tariffs, transportation instrumentalities, weighing, freight claims, express, organization, general classification, and also from the special committee on relations with the National Association of Railway Commissioners, the official division, the southern division, the special committee on uniform classification, and the special committee on railway leases and side-track agreements.

The Southern Railway Company reports that during the fiscal year ended June 30, 1916, it carried nearly seventeen million passengers, and that of these passengers four were fatally injured: Two in a rear collision at Salisbury, N. C., "due to a human failure, the disgrace of which the management feels keenly"; one at Jamestown, N. C., when a truck failed under a freight car passing a passenger train; and one at Citico, Tenn., where a passenger was leaning out from the steps of a passenger car, and was struck by the truss of a bridge. The volume of business done was very heavy, compared with the previous year, yet there was a decrease of fifteen in the number of fatal injuries to employees.

The transcontinental lines have decided to advance on September 1 the freight rates from the East to the Pacific Coast terminals, and also certain eastbound rates on which the Interstate Commerce Commission has allowed reductions to meet Panama Canal competition; this in accordance with the recent order of the commission rescinding its previous order, which gave relief from the fourth section as to schedule C commodities westbound and a few Pacific Coast products eastbound. The rates to the coast will be so adjusted as to continue the present rates to intermediate points and to protect them against discrimination. It is reported that Pacific Coast shippers' organizations have decided to ask the commission for a rehearing of the case.

The United States Department of Agriculture announces that the quarantine for tuberculosis in cattle, in effect since October, 1914, has been lifted from Lake McHenry, Kane, Dupage, and Cook counties, in the State of Illinois, the order taking effect August 1. The quarantine placed upon these counties in 1914 forbade the interstate shipment from the quarantined area of cattle, for any purpose other than immediate slaughter, unless the cattle had been tested with tuberculin by, or under the supervision of, a Bureau of Animal Industry inspector and were accompanied by a Bureau of Animal Industry certificate, including a tuberculin test chart, showing the cattle to be free from the disease. It was placed at the request of the State Live Stock Sanitary Commission of Illinois, and its purpose has now been met. The State of Illinois now has a law enabling the State authorities to control the local situation.

Rail Traffic Into Mexico

Freight traffic to and from Mexico by rail remains almost at a standstill notwithstanding the recent action of the United States government in lifting the embargo against exportations of foodstuffs and other commodities. The Southern Pacific, the International & Great Northern, the Texas & Pacific and other lines are refusing to permit freight cars to cross the Rio Grande, and the equipment of the Mexico railroads is so scarce and shabby that what little freight is offered cannot be accepted. The Southern Pacific has about 1,200 freight cars lost "somewhere in Mexico," a result of its policy of a few months ago of permitting its cars to go into that country for use of the de facto government. The International & Great Northern has steadfastly refused to allow any cars on its line to cross the river even when offered a bond to cover losses.

Freight Rates in Georgia

The Georgia Shippers' Association has sent to each member of the legislature of the state a long letter, protesting against the proposed changes in freight rates which are to be the subject of the hearing before the railroad commission on August 17. It is alleged that the railways are preparing to "levy an additional tax" on the people of Georgia of $3,000,000 a year. The letter cites examples from the old and the proposed tariffs in which it appears that increases of 28, 42, 69 and 94 per cent are to be made in the rates for transportation of apples, watermelons, livestock, factory products, lumber, iron and steel, fertilizer and other articles.

The railroads of Georgia have again presented their case in the press, advertisements in large type appearing in the newspapers of the principal cities. Attention is called to the fact that the sixty cities which have been favored with "basing point rates" are the opponents of the proposed new tariff. What the railroads propose to do is to revise the intrastate rates in conformity with the principles which the interstate commerce commission has prescribed in the matter of interstate rates. The roads promise not to discriminate unjustly against Georgia producers in favor of other states. Some rates will be increased while others will be lowered; but to those who claim that an increase of income will be an unreasonable favor to the railways, it is shown that there has been a "tremendous advance" in everything which enters into the manufacture of transportation.

Economy in Distribution of Folders

The railroads in the Western Passenger Association, whose territory extends from Chicago and St. Louis west to the Rocky Mountains, have issued orders to the folder distributing agencies to discontinue the placing of time table folders and other similar advertising matter in hotels throughout the territory, with the exception of a few large cities, such as Chicago, St. Louis and Kansas City, in which the distribution will be continued in a few of the larger hotels. The exception as to these cities was made because they are located on the borders of the territory of other passenger associations in which the roads have not yet taken similar action. Committees of the various territorial passenger associations have been studying this question for more than two years, and many individual roads have already effected considerable economies. The Central Passenger Association roads have also recently taken action similar to that of the Western Passenger Association, and the Southwestern and Transcontinental Passenger Associations have been planning similar action. Many of these folders cost from $15 to $18 a thousand to print, and the railroad officers believe that there is a very great waste in their use when they are placed in hotels.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission has ordered an investigation into the practice of making freight rates conditional upon the size of shipments, and notices have been sent to railroads to show cause before October 1 why the custom should not be discontinued.

Lumber from Louisiana Points

Opinion by Commissioner Clark:

Proposed increased rates on lumber in carloads from Leesville and other points in Louisiana on the Kansas City Southern to Galveston and intermediate points in Texas on the Gulf, Colorado & Santa Fe are found not to have been justified. (40 I. C. C., 268.)

Transit at Kansas Points

Opinion by Commissioner Meyer:

The commission finds that the Missouri Pacific-St. Louis, Iron Mountain & Southern system has justified a proposed restriction of the transit arrangement now in effect at Atchison and Leavenworth, Kans., on grain products and grain, drawn from Omaha and South Omaha, Nebr., and Council Bluffs, Iowa, and reshipped to Mississippi River and points east thereof. (40 I. C. C., 358.)

Pacific Coast—Southwest Lumber

Opinion by Commissioner Clark:

Proposed increased rates on lumber and lumber articles from points in Oregon, Washington, Idaho, Montana, and western Canada to points in New Mexico, Oklahoma, and Texas are found not justified.

The proposed increases ranged from one cent to 8½ cents per 100 lb., and the traffic affected thereby, with the exception of that to points in New Mexico, was limited to fir, larch, hemlock, cottonwood, pine, and spruce lumber and certain articles manufactured therefrom, all of which are designated in the tariff as group D. This group includes doors, not glazed, and sash knocked down. (40 I. C. C., 387.)

Clay from Florida

Opinion by Commissioner Daniels:

The commission finds that the carriers have justified proposed increased all-rail and rail-water-and-rail carload rates on kaolin clay from Edgar and Okahumpka, Fla., to points in central freight association territory, and certain points in Pennsylvania and West Virginia. This Florida clay is used chiefly in the ceramic arts in the manufacture of dinnerware, sanitary earthenware, bathroom equipment, floor and wall tile, electric porcelains, and minor specialties like door knobs, rings for hanging gas mantles, and spark plugs. It competes for the most part with clay imported from England. (40 I. C. C., 275.)

Molasses from Texas and Louisiana

Opinion by Commissioner Clements:

The commission finds that the carriers have justified proposed increased carload rates on domestic molasses (other than blackstrap) from New Orleans and other Louisiana and Texas points, to points on the Ohio, Mississippi, and Missouri rivers and to points in Tennessee, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, South Dakota, Iowa, and Missouri and also proposed increased rates on domestic blackstrap, carloads, in tank cars, from New Orleans, La., and other Louisiana points, Mobile, Ala., Gulfport, Miss., Pensacola, Fla., and other points, to Memphis, Tenn., St. Cloud, Minn., and Missouri river cities.

They have not justified proposed increased rates on molasses (other than blackstrap) from the same originating points to points west of the west bank of the Missouri river and west of the line of the Kansas City Southern, except Lincoln, Neb., and Fort Scott, Kans., or proposed increased rates on domestic blackstrap, in carloads, in tank cars, from the same originating points to points in Kansas and Oklahoma and to Fort Calhoun, Neb. (40 I. C. C., 435.)

Applications Under the Panama Canal Act

In re Ashtabula-Port Maitland car-ferry service. Opinion by Commissioner McChord:

The Toronto, Hamilton & Buffalo upon the application of the Michigan Central is allowed to institute a car-ferry service between Port Maitland, Ont., and Ashtabula, Ohio. The Toronto, Hamilton & Buffalo is owned 17.9 per cent by the Michigan Central and 37.1 per cent by the New York Central. It has purchased a ferry boat with a capacity of 30 loaded freight cars of 50 tons each, at a cost of $385,000. It is also extending its line from Dunnville to Port Maitland, at which point necessary slip docks are also under construction and will institute a car-ferry service between Port Maitland and Ashtabula, where connection will be made with the New York Central. (40 I. C. C., 143.)

In re Delaware & Hudson boat lines. Opinion by Commissioner Harlan:

The commission finds that the Delaware & Hudson competes with the steamers of its controlled companies, the Lake Champlain Transportation Company and the Lake George Steamboat Company. The railway is allowed to continue its interest in the steamboat lines, however, because the service of the two lake lines is in the interest of the public and is of advantage to the convenience and commerce of the people. (40 I. C. C., 297.)

Rates on Glucose

J. C. Hubinger Brothers Company v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner Harlan:

At the present time there is applicable on shipments of glucose in tank cars from Keokuk, Ia., to north Pacific coast points, a commodity rate of 80 cents per 100 lb., the minimum weight being the capacity of the car. There is also applicable a rate of 75 cents per 100 lb. when box-car equipment is used and the glucose is contained in barrels, the carload minimum weight being 36,000 lb. In this case the rate on glucose in tank cars is alleged to be unreasonable insofar as it exceeds the lower rate on the same commodity when shipped in barrels in box cars. The commission finds, however, that the rate of 80 cents is just and reasonable, basing its findings on the fact that there is no return loading for the tank-car equipment and that in the case of barrel shipments the container must be furnished by the shipper and freight must be paid on the weight of the barrel as well as on the commodity. Further, when shipments are made in tank cars, the carrier must pay for the use of the car if the car is furnished by the shipper. Reparation is awarded, however, for payment of a rate in excess of 80 cents. (39 I. C. C., 672.)

Export Rates from Missouri River Cities to Norfolk and Newport News Va.

In re export grain products from Missouri river points (No. 2). Opinion by Commissioner McChord:

During the season of navigation on the great lakes, the Atchison, Topeka & Santa Fe, the Chicago & Alton and the Chicago Great Western, in common with other carriers, maintain joint proportional rates from Missouri river cities to Norfolk and Newport News, Va., on grain products for export equal to the prevailing rate from the same points of origin via rail-lake-and-rail routes to Baltimore, Md. At the close of the season of navigation each year such rates are customarily withdrawn, leaving higher through rates in effect. The proposed withdrawal of these rates via respondents' lines was suspended and an investigation was made into the propriety and reasonableness thereof. The commission finds that the rates which would result from the proposed withdrawal form part of a general adjustment of rates on grain and grain products exported through Atlantic and Gulf ports made in competition with rates to other ports. That the establishment of the higher rates would not be in contravention of the provisions of the fourth section of the

act to regulate commerce, and that the proposed withdrawal of the joint rates has been justified under the circumstances of this case. (40 I. C. C., 195.)

St. Louis, Mo. (Cupples Station) Terminal Regulations

Opinion by Commissioner Daniels:

The Wabash and Chicago & Alton, at Cupples Station, St. Louis, Mo., without charge to the consignee, unload carload package freight onto trucks and lift it, by elevator, from the depressed track level to the station platform on the street level, where the freight is received from trucks, in some instances at points on the platform contiguous to warehouse doors by certain consignees in various buildings in Cupples Block adjacent to the station; and in some instances at a space on the platform opening out on a driveway leading to Spruce street by consignees who have no direct connection with the station and who have to haul away their freight by wagon. Certain warehousemen who receive their carload freight from private sidings, at their own expense for unloading, complain that by reason of the free service described carload shipments of freight, principally pool cars, are attracted through that station that otherwise would come to them for distribution for hire. The commission finds that although about 85 per cent of the station's freight is handled for consignees with warehouses immediately adjacent to the station platform, Cupples Station is a bona fide railroad station, and that under the peculiar conditions there existing the practice described does not discriminate against other shippers who receive freight through the station or in favor of all patrons of the station against receivers of freight from team tracks, private sidings, or other public freight stations in St. Louis. The arrangement under which Cupples Station is operated is unusual but not in itself unlawful. It does not result in discrimination between patrons of the station or is it otherwise in violation of the act to regulate commerce. (40 I. C. C., 425.)

Wharfage at Gulfport, Miss.

Andreas Gunderson v. Gulf & Ship Island. Opinion by Commissioner McChord:

Under the defendant's rules governing the use of its wharf at Gulfport, Miss., vessels engaged in miscellaneous cargo service are given preference in the assignment of space for loading over vessels engaged in the transportation of solid cargoes of lumber or other commodity. The complainant's bark Edderside refused, when first requested, to vacate temporarily for the benefit of another vessel, and for its refusal was denied space that later became available, until all other waiting vessels had been served. The commission holds that this action on the part of the defendant was not warranted by the rule and was unreasonable. The amount of the complainant's damage is held, however, not to have been sufficiently established upon the record to warrant a reward of reparation.

The lawfulness of purpose of the defendant's rule is not definitely passed upon in this report, in view of the complainant's independent cause of action arising from its improper application. The commission holds that as now framed, the rules are indefinite and should be revised. It is held further that they should also be filed with the commission, subject to future review, if necessary, upon complaint.

The record affords an unsatisfactory basis for determining who is entitled to the refund of demurrage that unreasonably accrued by reason of the Edderside's inability, during the period it was denied loading space, to take the lumber, which was the commodity here involved, from the defendant's cars. The case is held open for 30 days within which the complainants may petition, if they desire, for further hearing on the question of reparation. (39 I. C. C., 747.)

Complaints Dismissed

Eastern Shore of Virginia Produce Exchange v. New York, Philadelphia & Norfolk et al. Opinion by Commissioner Hall:

The rates on vegetables and berries from points on the New York, Philadelphia & Norfolk in Accomac and Northampton counties on the eastern shore of Virginia to points in Ohio, Indiana, Michigan, Illinois, Wisconsin and Iowa are not found unreasonable nor unduly preferential. The complaint arises because the New York, Philadelphia & Norfolk carries traffic from Norfolk, where it meets the rates on other carriers, at lower rates than the points intermediate on its line on the eastern shore of Virginia. (40 I. C. C., 328.)

Procter & Gamble Distributing Company v. Alabama & Vicksburg et al. Opinion by Commissioner Meyer:

Complaint is made that the rates on soap, soap powder, cleansing powder, and lard substitute from Ivorydale, Ohio, and St. Bernard, Ohio, suburbs of Cincinnati, Ohio, and Kansas City, Mo., and Kansas City, Kans., and the through rates on lard substitute in carloads and less than carloads from Macon, Ga., to points in Louisiana are unreasonable, discriminatory, and constitute departures from the rule of the fourth section of the act.

The commission's findings are as follows: The finding of the commission in *Through Rates to Points in Louisiana and Texas*, 38 I. C. C., 153, disposes of the allegations respecting the reasonableness of the rates involved and the allegations that they exceed the aggregate of the intermediate rates. The matter of rates alleged to be in contravention of the long-and-short-haul rule of the fourth section is reserved for further consideration. Existing rates from Cincinnati unjustly discriminate against that point in favor of Chicago, Ill. Readjustments of rates in response to findings of the commission in *Through Rates to Points in Louisiana and Texas* may make an order to remove that discrimination unnecessary. (40 I. C. C., 367, 373.)

Less Than Carload Rates on Live Stock

National Society of Record Associations et al v. Aberdeen & Rockfish et al. Opinion by Commissioner Clements.

Complainants, associations representing nearly 100,000 breeders of pedigreed live stock, seek in this proceeding uniformity throughout the United States in the classifications, rules, and regulations relating to the transportation of live stock in less than carloads. All rail carriers reporting to this commission are parties defendant. Complainants, whose shipments are from and through different classication territories, allege that the rules, regulations, and practices of the defendants relating to minimum weights, standard or basic values, increased charges for increased values above the standard, attendants accompanying shipments, and the rates charged on small stock in crates, are unlawful, diverse, and conflicting. The comprehensiveness of the allegations of the complaint and the fact that all rail carriers engaged in the interstate transportation of live stock are parties defendant present issues the decision of which requires the commission to determine whether or not uniformity with respect to the transportation involved is practicable; and, if so, what classifications and rules should be prescribed as just and reasonable.

The commission's findings are as follows:

The minimum weights applied to these shipments in the various classifications are unreasonable in so far as they exceed minima herein found reasonable, which will be the same for all territories. These reasonable minimum weights are as follows:

Animal	Minimum weight Lb.	Animal	Minimum weight Lb.
Stallions or jacks	3,000	Cow and calf (6 months)	2,500
Additional	3,000	Additional	2,500
Horses, mules or horned animals	2,000	Yearling bulls	2,000
Second	1,500	Yearling cattle	1,000
Third	1,500	Colts, 1 year and under	750
Additional	1,000	Additional	750
Bulls	2,000	Calves less than 1 year old	500
Additional	2,000	Hogs	250
Mare and colt (6 months)	2,500	Sheep and goats	200
Additional	2,500		

The standard or basic values limiting the liability of the carrier for animals so shipped are unreasonable in so far as they are less than the valuations herein found reasonable.

These reasonable basic values are as follows:

Each horse or pony (gelding, mare or stallion), mule, jack, or jenny	$150	Each cow	$50
Each colt under 1 year old	75	Each calf	20
Each ox, bull, or steer	75	Each hog	15
		Each sheep	5
		Each goat	5

Rates should not increase for increased value above the reasonable standard values by percentages in excess of 2 per cent for each 50 per cent or fraction thereof of value in excess of such standard.

All provisions in the classifications and tariffs of defendants requiring shippers to furnish attendants with such shipments are

unreasonable and should be canceled. This provision will henceforth be permissive.

Rates on less-than-carload shipments of live stock crated are found unreasonable to the extent that they exceed rates on like animals uncrated.

Provisions of defendants' live-stock contracts will be considered in connection with the commission's general investigation now pending, *In the Matter of Bills of Lading*, Docket 4844. (40 I. C. C., 347.)

Nashville Switching

Opinion by Commissioner Meyer:

In City of Nashville v. Louisville & Nashville, 30 I. C. C. 76, the commission found that the Louisville & Nashville and the Nashville, Chattanooga & St. Louis preferred each other and discriminated against the Tennessee Central in the matter of switching at Nashville. These two first named carriers maintain and operate jointly their terminal facilities at Nashville, except their individual team tracks and freight depots, under an arrangement called the Nashville Terminals. Shippers over the Tennessee Central have paid nothing in addition to the line-haul rates for switching by the Tennessee Central, but have been charged $3 per car by the Nashville Terminals for switching noncompetitive traffic to and from the Tennessee Central and at rates equivalent to from $7 to $36 per car for switching competitive traffic. The commission found in the former case that the Nashville Terminals arrangement constituted a facility for the interchange of traffic between the Louisville & Nashville and the Nashville, Chattanooga & St. Louis; that respondents' refusal to switch competitive traffic to and from the Tennessee Central on the same terms as noncompetitive traffic, while they switched both kinds of traffic on the same terms for each other was discriminatory; and that so long as they switched both competitive and noncompetitive traffic for each other at cost, they could not charge more than the cost of the service for switching both kinds of traffic to and from the Tennessee Central.

The respondents have now proposed a charge of $7.50 a car for both competitive and noncompetitive switching. The commission, after investigation, finds that this charge would be unreasonable, but that a charge of not exceeding $5 would not be improper. (40 I. C. C. 474.)

Rates on Coal to Memphis, Tenn.

Galloway Coal Company et al. v. Alabama Great Southern et al. Opinion by Commissioner Clements:

The relative adjustment of carload rates on bituminous coal from mines in southern Illinois, western Kentucky and northwestern Alabama to Memphis and other points in southwestern Tennessee are found not to be unduly prejudicial to mines in northwestern Alabama. Differentials in rates to common markets in favor of certain producing points can be prescribed only when discrimination can be found, and discrimination can be found only where the traffic from those points and from competing points moves all or a part of the way to the common markets over the rails of the same carrier.

The relative adjustment of carload rates on coal from the same mines to Mississippi and Louisiana east of the Mississippi river are found prejudicial to mines in northwestern Alabama, but the adjustment approved in Bituminous Coal to Mississippi Valley Territory, 39 I. C. C., 378, is found remedial. Long established rate adjustments that accord competing producing districts located at different distances from common markets equal rates will not be disrupted unless substantial justice requires it. The interests of consumers must be considered as well as the interests of producers, and dissatisfied producers deprived of the natural advantage of location must establish actual injury as a result of the discrimination.

The divisions of joint rates received by short lines in Mississippi on shipments of coal purchased by them for fuel are held not to be prejudicial to mines in northwestern Alabama.

The relative adjustment of carload rates on coal from the same mines to points in southwestern Arkansas, Louisiana west of the Mississippi river, and southeastern Texas, are held not to be prejudicial to mines in northwestern Alabama. (40 I. C. C., 311.)

COURT NEWS

Limitations of "Attractive Nuisance" Doctrine

The Missouri Supreme Court holds that a railroad right of way between two highways, fenced in the usual manner and having at one end an abutment to a bridge over a highway, constructed so as to form steps leading from the highway to the track, is not an attractive nuisance rendering the company liable for injuries to a girl who climbed up the abutment and was injured while walking along the track. Only very exceptional circumstances would render the attractive nuisance doctrine applicable to an intelligent girl, 15½ years old.—Shaw v. Chicago & Alton (Mo.) 184 S. W., 1151.

Reduction of Damages by Contributory Negligence

The Texas statute provides that, in a servant's action for injuries arising out of and in the course of his employment, in the event of contributory negligence, "the damages shall be diminished by the jury in proportion to the amount of negligence attributable to such employee." Where a plaintiff demanded $50,000, the Texas Court of Civil Appeals held that a special verdict of $17,500 was too indefinite to stand, since it could not be determined whether the jury found large damages, and reduced them because of great contributory negligence, or damages of, say, $18,000 and only slight negligence of the plaintiff.—Missouri, K. & T. v. Pace (Tex.) 184 S. W., 1051.

Liability for Injuries Resulting from Violation of Separate Coach Law

The Texas Court of Civil Appeals holds that where the servants of a railroad knew, or by the exercise of due care might have known, that a white man was in a negro coach, in violation of the separate coach law, and was negligent in not removing such white person from the coach, the road was liable for injuries inflicted on a negro passenger.—Texas & Pacific v. Baker (Tex.) 184 S. W., 664.

Recent Cases Under the Federal Employers' Liability Act

The Kentucky Court of Appeals holds that an employee engaged as a pan puller in a railroad yard, assisting in cleaning engines of ashes, and required to go into the pit under the engines and pull the ashes down into the pit, and afterwards clean the pit of ashes, which pit was an instrumentality in the operation of the railroad's engines, and was used by engines engaged in interstate commerce, was engaged in interstate commerce though he was injured by the backing down of a yard engine.—Cincinnati, N. O. & T. P. (Ky.), 185 S. W., 94.

The Alabama Supreme Court holds that a fireman in a crew making up interstate trains, injured during a temporary lull in the work, was engaged in interstate commerce within the act.—Alabama Great Southern v. Skotzy (Ala.), 71 So., 335.

The Kentucky Court of Appeals holds that a baggagemaster whose run was from Cincinnati, Ohio, to Maysville, Ky., and back, and who was injured at Maysville while assisting in sidetracking the train to permit the passage of another, pursuant to the usual custom regarding his train, was injured in interstate commerce.—Chesapeake & Ohio v. Shaw (Ky.), 182 S. W., 653.

In an action for the death of an engine hostler, killed by the sudden falling of a bucket which was being moved by a hoist it appeared that in response to a call by a machinist to help remove the yoke from the bucket, the deceased left an engine which had come in for hostling, walked some 150 feet to the place where the bucket was being hoisted, and was there killed by its fall. The Circuit Court of Appeals, Third Circuit, held that, assuming the deceased was engaged in interstate commerce while acting as hostler, the machinist in attempting to remove the yoke was not so employed, the hoist was not, while moving the bucket, an instrumentality used in such commerce, and the deceased, in assisting with the bucket, was not assisting the machinist in interstate commerce within the act.—Erie v. Van Buskirk, C. C. A., 228 Fed., 489.

The Michigan Supreme Court holds that the engineer of a train engaged in hauling gravel for the repair and improvement of

his company's roadbed, over which interstate commerce regularly passed, was engaged in interstate commerce, so that for his injury from a collision he might maintain an action under the act.—Holenberg v. Lake Shore (Mich.), 155 N. W., 504.

The New Jersey Court of Errors and Appeals holds that, as a car which had been engaged in interstate commerce lost its character as an "interstate commerce" car the instant the cargo was fully discharged, and did not acquire a new character as an interstate commerce car until the railroad manifested its intention by act or word to so use it, an employee injured by the car while it was empty and awaiting orders could not recover under the act. —Moran v. New Jersey Central (N. J.), 96 Atl., 1023.

The Circuit Court of Appeals, Fourth Circuit, holds that one who is injured while attempting to erect a telegraph pole to support wires over which messages are to be sent in directing the operation of trains of a company engaged in interstate commerce is engaged in interstate commerce within the act.—Coal & Coke Railway Co. v. Deal, 231 Fed., 604.

In an action for death of a railroad employee under the federal employers' liability act, there must be evidence of pecuniary damage to his beneficiaries before such damage can be allowed. The measure of damages of a widow and children is the probable amounts they would have received from the deceased if he had lived, and not his probable earnings; the amount the deceased would probably have earned for their benefit, taking into consideration his age, ability and disposition to work and habits of life and expectancy. The damages to the widow should be calculated on the basis of her expectancy of life as well as her husband's. The damages to the minor children for the loss of support should be confined to their minority. Where there was proof of the earning capacity of the deceased and of his expectancy of life, but nothing to show what his beneficiaries, his widow and minor child, might reasonably have expected to receive from him for their support, the Tennessee Supreme Court held that a recovery for nominal damages could alone stand.—N. C. & St. L. v. Anderson (Tenn.), 185 S. W., 677.

Where the evidence showed that a switchman was employed in switching cars in a yard, putting them into strings of cars for transportation into another state, the only transportation by railroad out of the state being such as was given by the switching crew, and the cars being destined for immediate interstate transportation, the Minnesota Supreme Court held that a finding that he was employed in interstate commerce was justified.—Hurley v. Illinois Central (Minn.), 157 N. W., 1005.

The Supreme Court of the State of Washington holds that a person inspecting the main track of a railroad engaged in intra and interstate commerce is engaged in interstate commerce within the act. The rules of a railroad required section men to keep a lookout for trains. The deceased, who was inspecting the track on a speeder, was held to be guilty of negligence in not maintaining a lookout for trains, regular or irregular, particularly as he wore a cap which covered his ears so as to affect his hearing, and his negligence was at least equal to that of the railroad in running an engine backwards without maintaining a proper lookout. The action was tried without a jury, and the trial court made no deduction for the deceased's contributory negligence. It was held that the Supreme Court might make such deduction from the award and affirm the judgment.—Anest v. Columbia & Puget Sound (Wash.), 154 Pac., 1100.

The Nebraska Supreme Court holds, in an action under the act, that an employee on a train who failed to perform his duty of placing signals on the track when his train stopped, and was killed by a rear collision, was guilty of contributory negligence. The court instructed the jury that the man's contributory negligence had been shown, but the jury made no deduction in the amount of the verdict because of it. It was held that the court might order such remittitur as seemed proper under the evidence. —Hadley v. Union Pacific (Neb.), 156 N. W., 765.

The Kentucky Court of Appeals holds that where the deceased was earning about $100 a month as brakeman, a verdict under the act against a railroad for his death giving $6,500 damages to his father, who had an expectancy of only 11.48 years, and whom the deceased had never supported, although he had declared his intention to do so, was excessive.—Pittsburgh, C., C. & St. L. v. Collard's Admr. (Ky.), 185 S. W., 1108.

Railway Officers

Executive, Financial, Legal and Accounting

H. C. Holloway has been elected vice-president of the Ft. Smith, Poteau & Western, with headquarters at the Railway Exchange building, Chicago, Ill., vice F. W. Coolidge, Jr.

John F. Turner, auditor of freight receipts of the Boston & Maine at Boston, Mass., has been appointed general auditor, with office in North Station, Boston, vice Stuart H. McIntosh, resigned to engage in other service. Effective August 1.

Operating

Daniel B. Dickey, assistant chief despatcher of the St. Louis division of the Illinois Central, has been appointed chief despatcher, with office at Carbondale, Ill., vice P. E. Odell, promoted.

The jurisdiction of Superintendent E. L. Bock now extends over the Huntington and Big Sandy divisions of the Chesapeake & Ohio; C. A. Pennington, superintendent of terminals at Louisville, Ky., has been appointed assistant superintendent of the Huntington and Big Sandy divisions. Both with headquarters at Huntington, W. Va. H. A. Davin has been appointed trainmaster of the Handley district, with headquarters at Handley, W. Va., vice F. L. Fletcher, transferred. D. S. Baals, assistant trainmaster and road foreman of engines at Paintsville, Ky., has been appointed assistant trainmaster and road foreman of engines of the Handley district, with headquarters at Cane Fork, W. Va., vice Mr. Davin, and M. B. Daniels has been appointed assistant trainmaster and road foreman of engines of the Big Sandy division, with headquarters at Paintsville, vice Mr. Baals.

Vincent Victor Boatner, whose appointment as superintendent of the New Orleans division of the Yazoo & Mississippi Valley has been announced, was born at Bethlehem, Miss., on May 6, 1881, and was educated at Mississippi College. He first entered railway service on September 8, 1901, as trainmaster's clerk on the Yazoo & Mississippi Valley at Greenville, Miss. He later served in the same capacity at Wilson, La., and on July 1, 1903, entered the telegraph service of the road. He was promoted to train despatcher on April 13, 1904, and to chief despatcher on April 1, 1906. He was appointed trainmaster on the New Orleans division on April 1, 1907, and later was trainmaster on the Vicksburg and Memphis divisions. On July 1, 1915, he was transferred to the Indiana division of the Illinois Central at Mattoon, Ill., where he remained until his appointment as superintendent of the New Orleans division of the Yazoo & Mississippi Valley, with headquarters at Vicksburg, Miss., effective July 15.

John Willard Fitzgerald, whose appointment as superintendent of the Southern Pacific at Tucson, Ariz., has been announced, was born at Brighton, Mich., on June 24, 1869, and was educated at Brighton high school. He first entered railway service as an operator and clerk on the Detroit, Lansing & Northern and continued as such from 1883 to 1899. Between 1889 and 1890, he was employed by the Denver & Rio Grande as agent and by the Union Pacific as operator. He first entered the service of the Southern Pacific in 1890 as a telegraph operator at Mojave, Cal. In the same year he was transferred to the Sacramento division as operator and continued as such until 1895, when he was promoted to despatcher. He was appointed night chief despatcher on April 1, 1903, and chief despatcher at Dunsmuir, Cal., on July 31, 1903. He was appointed assistant superintendent of the Shasta division on September 1, 1910, and on May 15, 1916, was transferred to the Western division at Oakland Pier, Cal. His appointment as superintendent of the Tucson division took effect on July 1.

William Francis Thiehoff, whose appointment as assistant general manager of the Chicago, Burlington & Quincy, lines west of the Missouri river, has been announced, was born at Hunnewell, Mo., on June 25, 1866, and was educated in the public schools. He entered railway service in 1883 as a section laborer

on the Burlington. From August 10, 1885, to March, 1887, he was telegraph operator on the same road. He then entered train service as a freight brakeman, and from May, 1889, to January 1, 1905, was successively freight and passenger conductor. He was then made trainmaster of the St. Joseph division, and on March 1, 1906, was transferred in the same capacity to the Brookfield division. From October 10, 1907, to July 3, 1908, he was assistant superintendent, and then superintendent on various divisions of the road. He was appointed general superintendent of the Nebraska district, with headquarters at Lincoln, Neb., in February, 1915, and was promoted to assistant general manager of the lines west of the Missouri river, with headquarters at Omaha, Neb., on July 1, 1916.

George J. Derbyshire, whose appointment as superintendent of the Chesapeake & Ohio of Indiana, with headquarters at Peru, Ind., has been announced, was born at Richmond, Va., on March 11, 1875. He was educated in the public schools at Huntington, W. Va., and first entered railway service on November 1, 1893, as a night operator on the Chesapeake & Ohio at Ona, W. Va. From March 14, 1894, to April 20, 1898, he was operator and night ticket clerk on the same road at Ashland, Ky. He was then stationed at Peach Orchard, Ky., as agent and operator. On July 1, 1889, he was transferred to Whitehouse, Ky., as agent and operator, and on November 1, 1904, was made extra despatcher at Ashland, Ky., on the Lexington and Big Sandy divisions. He was later made regular despatcher at that point, and on September 11, 1911, was appointed trainmaster of the Miami district of the Chesapeake & Ohio of Indiana. From January 1, 1913, to July 1, 1916, he was trainmaster of the Chesapeake & Ohio of Indiana, with jurisdiction over both the Wabash and Miami districts. His appointment as superintendent with headquarters at Peru, Ind., was effective on July 1.

Traffic

R. C. Caples, general traffic manager of the Western Maryland, at Baltimore, Md., has resigned to go into other business.

G. L. Oliver has been appointed general freight and passenger agent of the Ft. Smith, Poteau & Western, with headquarters at Ft. Smith, Ark., vice J. E. Parrott.

J. C. Haile, general passenger agent of the Central of Georgia at Savannah, Ga., has been appointed passenger traffic manager, and F. J. Robinson, assistant general passenger agent, has been appointed general passenger agent. Both with headquarters at Savannah.

Engineering and Rolling Stock

The title of H. O. Kelley, division engineer of the Evansville & Indianapolis at Terre Haute, Ind., has been changed to engineer maintenance of way.

B. B. Shaw, assistant engineer of the Chicago, Rock Island & Pacific at Haileyville, Okla., has been appointed division engineer of the Arkansas division, with headquarters at Little Rock, Ark., vice J. G. Bloom, promoted.

E. Meinhold has been appointed supervisor of equipment of the Evansville & Indianapolis, with headquarters at Greenwood yard, Terre Haute, Ind. He will report to the superintendent in all matters pertaining to inspection and maintenance of cars, and will have supervision over inspectors and car men at various points.

Samuel Murray, whose appointment as chief engineer of the Oregon-Washington Railroad & Navigation Company, with headquarters at Portland, Ore., has been announced, was born at San Francisco, Cal., on June 20, 1880. He graduated from the University of California in 1902, and entered railway service with the Southern Pacific in August, 1902, after a short period of employment with the American Bridge Company. He was draftsman and laborer on bridge construction for the Southern Pacific until 1906, when he was appointed chief draftsman in the office of the consulting engineer of the Harriman lines. In 1907 and 1908 he was bridge engineer of the San Pedro, Los Angeles and Salt Lake, and in 1909 he was appointed bridge engineer of the Oregon & Washington, with headquarters at Seattle, Wash. He continued to hold this position after this road was merged with the Oregon-Washington Railroad & Navigation Company. Following the temporary retirement of J. R. Holman in September, 1915, he was made acting chief engineer, and upon Mr. Holman's permanent retirement he was appointed chief engineer, effective July 1, 1916.

W. R. Armstrong, general manager and chief engineer of the Salt Lake & Utah, has been appointed engineer maintenance of way of the Union Pacific, with office at Omaha, Neb., effective August 1. Mr. Armstrong has had 25 years of railroad experience, both as an engineer in charge of construction and maintenance of way and as an operating official. Prior to coming to the Oregon Short Line in 1905, he was connected with various lines in the Middle West. During his first year with the Oregon Short Line he carried out some special engineering work, and in the following year was placed in charge of the construction of the Yellowstone Park branch and also in charge of the extension from Huntington, Ore., down the Snake River canyon, to Homestead. In 1908, Mr. Armstrong was made superintendent of the Montana division, which position he held until 1913, when he was appointed general manager and chief engineer of the Salt Lake & Utah, then under construction.



W. R. Armstrong

OBITUARY

James Peabody, statistician of the Atchison, Topeka & Santa Fe at Chicago, died on July 25 at Topeka, Kan.

Edward C. Clifton, assistant general solicitor of the Lehigh Valley, at New York, died on July 24, at his home in Glen Ridge, N. J., at the age of 39.

RAILWAY EXTENSION IN URUGUAY.—A project has been presented to the Uruguayan chamber of deputies, authorizing the government to make surveys and prepare plans for a railway line to start near the Santa Lucia bar, on the Northern (State) Railway, and to traverse the Departments of San Jose and Flores, via Libertad, San Jose (city), and to the left of Trinidad (which is to be joined up by a short branch line). Thereafter the projected route, following the direction of the Cuchilla Grande range of hills, is to cross the River San Gregorio to the north of the Paso de Las Piedras, proceeding to Las Flores, and finally connecting with the Midland of Uruguay Railway at the station of Algorta.

"PROJECTED AUSTRIAN RAILWAYS."—The Hungarian correspondent of The Times (London), writing from Budapest, says that the military and civil governors of the "occupied Southern Slav provinces," as Serbia, Montenegro and the occupied part of Albania are being officially styled, have instructed a small army of engineers and surveyors to prepare the plans of a net of railways the building of which it is proposed to start immediately. It is intended to construct three main lines. One is in connection with the Budapest-Belgrade railway, to lead through Bosnia and the Drina Valley, via Stephanovo Dolje and the Tara Valley to Lake Skutari, and continuing through Northern Albania to terminate at Avlona. The second main line is destined to connect Uskub via Prizrent with San Biovani di Medua, while the third line is to be a continuation of the existing Salonika-Monastir railway, via Resnia, Ochrida, and Ljes to Avlona. The tracing work is mostly in the hands of German engineers, and it is rumored that the concessions for these railways have been granted to a syndicate of German and Austro-Hungarian banks, led by the Deutsche Bank of Berlin. These railways are to constitute a new trade route to Egypt and North Africa.

Equipment and Supplies

LOCOMOTIVES

THE PENNSYLVANIA EQUIPMENT COMPANY, 1438 So. Penn square, Philadelphia, Pa., is in the market for a second-hand 55 to 60 ton standard gage Heisler locomotive and for a second-hand 80 to 85 ton standard gage passenger locomotive.

THE DULUTH, WINNIPEG & PACIFIC has ordered 10 Consolidation locomotives from the American Locomotive Company. These locomotives will have 24 by 32 in. cylinders, 63 in. driving wheels, a total weight in working order of 240,000 lb., and will be equipped with superheaters.

FREIGHT CARS

THE CHICAGO & ALTON is inquiring for 50 40-ft. and 50 50-ft. automobile cars.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 900 center constructions from the Bettendorf Company.

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, Pa., is in the market for a few 2-ton billet cars of 24 or 30 in. gage.

THE CHICAGO & NORTH WESTERN has ordered 200 wooden mine cars from the Duncan Foundry & Machine Company, Alton, Ill.

THE RUSSIAN GOVERNMENT is reported to have placed an order through the Imperial Munitions Board at Ottawa for 7,000 box cars, to be built by the Canadian Car & Foundry Company and the National Steel Car Company.

PASSENGER CARS

THE MISSOURI PACIFIC is inquiring for prices on six steel dining cars.

THE PENNSYLVANIA RAILROAD has ordered 2 70-ft coaches from the Pressed Steel Car Company for the New York, Philadelphia & Norfolk.

IRON AND STEEL

THE CANADIAN PACIFIC is in the market for 25,000 tons of rails.

THE FRENCH GOVERNMENT has ordered 14,000 tons of rails from the United States Steel Corporation.

THE SOUTHERN PACIFIC has ordered 80,000 tons of rails from the Tennessee Coal, Iron & Railroad Company.

MISCELLANEOUS

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, Pa., is in the market for a second-hand belt-driven air compressor with a capacity of 500 cu. ft. and of 90 to 100 lb. pressure.

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, Pa., is in the market for one second-hand, 10-ton Browning four-wheel standard locomotive crane with about 40 ft. boom and equipped with steel canopy top, double drum and cables. The crane is to be furnished with complete equipment, with the exception that no bucket is required.

SWEDISH STEEL INDUSTRY IN 1916.—Sweden's production of pig iron and puddled iron and of steel ingots in the first quarter of this year was 381,200 tons, against 325,600 tons to April 1, 1915, and 359,300 tons to April 1, 1914. The pig-iron output was 197,600 tons, against 162,300 and 186,100 tons to April 1, 1914 and 1913, respectively. Exports of iron ore to April 1, 1916, were 772,000 tons, against 711,000 and 934,000 tons in the same periods in 1915 and 1914, respectively. Pig-iron exports were 45,200 tons in the first quarter of this year, against 43,300 tons to April 1, 1915, and 19,600 tons to April 1, 1914.—*Iron Age.*

Supply Trade News

The American Steel Foundries are reported to be negotiating for a duplication of the $18,000,000 order closed last year.

The American Locomotive Company has closed a contract for 8-inch shells for Great Britain, totaling about $15,000,000.

The American Car & Foundry Company has closed contracts for 9.2-inch shells amounting to approximately $18,000,000.

The Protective Signal Manufacturing Company, Denver, Colo., has opened a Chicago office at 550 Peoples' Gas building, under the direction of J. M. Fitzgerald and O. S. Flath.

M. T. Kirschke, sales representative of the Baldwin Locomotive Works, with headquarters at Chicago, Ill., died at his home in that city on July 18, after an illness of several weeks.

Oscar F. Ostby, until recently general sales agent of the Commercial Acetylene Railway Light & Signal Company, with office in New York, has been appointed general manager of the Refrigerator, Heater & Ventilator Car Company, St. Paul, Minn. Mr. Ostby, is very well known in the railway supply field. He has been particularly active in the work of the Railway Supply Manufacturers' Association, having been chairman of the badge committee, a member of the executive committee from 1912 to 1914, vice-president of the association in 1914-1915 and its president in the year just ended. He has also been active in the International Acetylene Association, having been a director and vice-president and in 1909-1910 its president. As the chairman of the association's legislative committee, he led the fight against the passage in several states of headlight laws requiring the use of electric equipment only. Mr. Ostby was born March 5, 1883, and received his education in the public schools of Providence, R. I. From 1901 to November, 1904, he engaged in publicity work. He then entered the service of what was later the Commercial Acetylene Railway Light & Signal Company, and at the time of his resignation on June 1 of this year was the general sales agent of the company.



O. F. Ostby

W. G. Cook, who was recently appointed assistant to the general sales manager of the Garlock Packing Company, has been appointed manager of the Chicago branch of the company.

L. H. Mesker has been appointed sales manager of the Kearney-Trecker Company, Milwaukee, Wis., with direct supervision over sales in Ohio territory.

The Pressed Steel Car Company has declared a dividend of one per cent on its common stock. No dividend on this stock has been declared since the dividend of 75 cents in the last quarter of 1914.

Judge Clarke of the United States District Court has decided in a suit brought by the Berger Manufacturing Company against the Trussed Concrete Steel Company for infringement of patent that the claim of the Berger patent under which the suit was brought for infringement is void and has dismissed the bill of complaint.

J. S. Hobson, general manager of the Union Switch & Signal Company, has been appointed western manager in charge of the Chicago, St. Louis and San Francisco offices with headquarters

in Chicago. C. E. Denney, assistant general manager, has been appointed assistant to the president with headquarters at Swissvale. The positions of general manager and assistant general manager have been abolished.

The Rail Joint Company, New York, has made the following announcement: "The Bonzano Rail Joint Company, as well as the Q & C Company, by advice of their counsel after investigation of the Thomson and Thomson rail joint patents owned by the Rail Joint Company, have recognized the utility and validity thereof, and have taken a license thereunder in order to utilize the Thomson and Thomson novel system of metal distribution, for head reinforcement, in connection with their Bonzano types of splice bars. Accordingly, notice is given by the Rail Joint Company that the aforesaid companies are authorized under the Thomson and Thomson patents in the manufacture and sale of the Bonzano type of splice bars having the Thomson and Thomson system of metal distribution for head reinforcement."

Charles Kirchoff, for 20 years ending in 1909, editor-in-chief of the Iron Age, died July 23 at his summer home, Wanamassa, near Asbury Park, N. J., at the age of 64 years. Mr. Kirchoff was born in San Francisco. He was educated in this country and in Germany, and graduated from the Royal School of Mines in Clausthal, Germany, in 1874. He then returned to this country and for a while was a chemist in the Delaware Lead Mills, at Philadelphia. He then joined the staff of the Metallurgical Review, but in 1878 became a member of the editorial staff of the Iron Age. In 1881, however, he became managing editor of the Engineering & Mining Journal, but returned to the Iron Age about four years later. He became editor-in-chief of the Iron Age in 1889 and retained that position until 1909, becoming in 1904 also business manager of the David Williams Company, the publishers. Mr. Kirchoff was at the time president of the American Institute of Mining Engineers.

United States Steel Corporation Declares Extra Dividend

The directors of the United States Steel Corporation at a meeting on Tuesday of this week declared the regular quarterly dividend of 1¾ per cent on the preferred stock, the regular quarterly dividend of 1¼ per cent on the common stock and an extra dividend of one per cent on the common stock.

The net earnings of the corporation for the second quarter reached the unexpected total of $81,126,048. This compares with $60,713,624, the previous high record reached in the first quarter of this year. Until that time the highest record for a quarter was in the second quarter of 1907 when earnings totaled $45,503,705.

The net earnings for the second quarter of 1916 were nearly $10,000,000 in excess of what they were in the entire four quarters of 1914. The net earnings of $141,839,672 for the first half of this year were larger than for any full year with the exception of 1906 and 1907 when the net earnings were $156,624,000 and $160,964,000 respectively.

Even after the payment of the extra one per cent dividend there remained a surplus for the quarter of $47,964,535. In the first quarter there was a final surplus of $32,854,172, making $80,818,707 added to the surplus in the first six months. The steel corporation will, however, spend about $70,000,000 for additions.

TRADE PUBLICATIONS

Pere Marquette.—This company has published an attractive 40-page booklet on Michigan summer resorts, containing maps and information as to rates and train service.

Oil Engines.—The National Transit Pump & Machine Company, Oil City, Pa., in Bulletin No. 502 describes the National Transit, 4-cycle Diesel oil engine, type DH4A.

Locomotive Driving Box Wedge.—Series E bulletin 600 recently issued by the Franklin Railway Supply Company deals with the Franklin Automatic adjustable driving box wedge.

Turret Lathes.—One of the recent publications of the International Machine Tool Company, Indianapolis, Ind., deals with the "Libby" heavy duty turret lathe in railroad shops. The booklet contains illustrations of the lathes, and gives operating records dealing with their work in railroad shops.

Railway Construction

Alabama & Mississippi.—Plans have been made by this company to start work at once on a line from Leakesville, Miss., to Laurel, about 60 miles, and the work is to be completed in about one year. This company recently finished work on a connecting link from Leakesville, south to the Pascagoula-Moss Point Northern at Evanston. (July 14, page 89.)

Chicago & North Western.—This company has applied to the Wisconsin Railroad Commission for a certificate of convenience and necessity for the extension of a spur from Kingston, Wis., 8.9 miles, into Oconto and Langlade counties.

Clarksdale Municipal Railway.—Preliminary surveys are being made to build a railroad to connect Clarksdale, Miss., with Webb and Trios Point. M. J. Bouildin, president and L. W. Mashburn, chief engineer, Clarksdale. (See Mississippi Roads, July 21, p. 133.)

Colorado, Kansas & Oklahoma.—This road contemplates the extension of its line south across western Kansas to Forgan, Okla.

Minkler Southern.—This company, a subsidiary of the Atchison, Topeka & Santa Fe, is building an extension from Lindsay, Cal., to Porterville, 12½ miles.

New York Subways.—The New York Public Service Commission, First district, will receive bids on August 10, for the installation of tracks on 15 sections of subway work, including that portion of the Broadway-Fourth avenue subway system between Fifty-ninth street and Seventh avenue, also the Canal street connection between Canal street and Broadway and the Manhattan approach of the Manhattan bridge, in the borough of Manhattan, and the Flatbush avenue extension at Prince street in the borough of Brooklyn.

The commission has awarded to the Degnon Contracting Company, New York City, for $9,600, the contract for certain construction work at the Manhattan terminal of the Brooklyn bridge as a preliminary to the construction of the Nassau street subway. The work to be done consists of the building of certain supports under the recently constructed connection between the Brooklyn bridge and the Centre street loop subway.

A contract has been awarded to Patrick McGovern & Co., the lowest bidder at $4,194.797, for the construction of the new two-track tube under the East river from Second avenue and Sixtieth street in the borough of Manhattan, to a connection with the new elevated lines in the borough of Queens, at Queensboro Bridge Plaza station. (July 21, p. 133.)

Northwestern Pacific.—This company is surveying a line from Cummiskey, Cal., to Marshall Summit, 20 miles.

North Texas & Santa Fe.—This company has applied for a charter to build a railroad from Shattuck, Ellis county, Okla., about 100 miles west through Libscomb, Ochiltree and Hansford counties, Texas. The company is a subsidiary of the Atchison, Topeka & Santa Fe.

Pascagoula-Moss Point Northern.—See Alabama & Mississippi.

Wheeling & Lake Erie.—This company is constructing a belt line 3½ miles long at Canton, Ohio, to reach the new furnaces of the United Furnace Company. This line will cross Tuscarawas street with a double track under-grade crossing, to be constructed of reinforced concrete and steel. J. C. Carland, Toledo, Ohio, has the contract for the work which is now practically 50 per cent. completed.

Wisconsin & Northern.—This company is extending its main line from Shawano, Wis., to Black Creek, 24 miles. The contract for the grading has been awarded to P. W. O'Connor & Co., Grand Rapids, Mich. The tracklaying and the erection of bridges will be done by company forces. About 10,000 cu. yd. of material is being handled per mile and about 300 cu. yd. of concrete will be placed in the construction of culverts. The maximum curvature is 2 deg. and the grade southbound 0.6 per cent, and northbound 0.8 per cent. Three pile trestles totaling about 300 ft. in length will be constructed.

RAILWAY STRUCTURES

BALTIMORE, MD.—The Pennsylvania Railroad is planning to start construction work soon on a concrete grain elevator at Canton. The new structure will replace elevator No. 3, which was destroyed by fire on June 13.

BOSTON, MASS.—The Public Service Commission of Massachusetts has authorized the construction of a new bridge over the tracks of the Boston & Albany at Brookline avenue, near Fenway Park. The improvements will be started as soon as the proportionate cost is determined. The city of Boston, the Boston & Albany and the Boston Elevated will each pay a part of the cost of the work.

CHICAGO, ILL.—Bids are now being asked on the superstructure of the Illinois Central office building at Sixty-third street, which will be nine stories in height. The building will cost about $500,000. Work is now under way on the substructure. (April 14, p. 865.)

HALIFAX, N. S.—Bids are wanted until August 7, it is said, by J. W. Pugsley, secretary of the Department of Railways and Canals, Ottawa, Ont., for the construction of Halifax ocean terminals passenger station.

KANSAS CITY, KAN.—The Kansas City Terminal will make terminal improvements at an approximate total cost of $4,000,000. The project includes the erection of two $100,000-passenger stations, two freight stations and a long double-track steel viaduct. About five miles of new track will be laid. The work will involve the use of 17,000 tons of steel and 40,000 cu. yd. of masonry.

NORTH MCGREGOR, IA.—The Chicago, Milwaukee & St. Paul has started the construction of extensive terminal facilities including a 22-stall roundhouse, a 90-ft. turntable, a 100,000-gal. water tank, a 154-ft. cinder pit, a sand house, a coaling station, a power house, 50 ft. by 63 ft., a blacksmith and machine shop, 40 ft. by 60 ft., a car repair building, 40 ft. by 80 ft., and an entirely new yard layout, involving 15 miles of track. The project also involves an extensive channel change of Giard creek and the raising of the yards above the flood level. Aside from part of the grading contract which has been awarded to Morris Shephard & Dougherty, St. Paul, Minn., all of the work is to be done by company forces.

OKLAHOMA CITY, OKLA.—The St. Louis & San Francisco contemplates the installation of a 10-stall roundhouse, a 100-ft. turntable, mechanical department buildings and yard tracks, to cost about $200,000.

PEORIA, ILL.—A contract has been awarded to the Widell Company, Mankato, Minn., for the construction of a reinforced concrete viaduct to carry Adams street over the tracks of the Chicago & North Western, the Chicago, Burlington & Quincy, and the Minneapolis & St. Louis. The structure will be approximately 1,100 ft. long between abutments, and will rest on 29 piers. A roadway 24½ ft. wide and sidewalks on either side, 5 ft. 8 in. in width, will be provided. An additional structure branching off the main viaduct, about 400 ft. long to its abutment, and providing for a 16 ft. roadway with no sidewalk, will also be built. The approximate cost of the structure has been estimated at $100,000, which will be shared by the city and the railroads.

SACRAMENTO AND OROVILLE, CAL.—The Northern Electric has awarded a contract to the Missouri Valley Bridge & Iron Company, Leavenworth, Kan., for the erection of a steel bridge over the American river at Sacramento, Cal., and a steel bridge over the Feather river, near Oroville, Cal. The American river bridge will consist of three 200-ft. through pin-connected spans resting upon four concrete piers on pneumatic caissons. The bridge company has the contract for the foundations and the erection of the superstructure, the steel having been purchased elsewhere by the railway. The contract at Oroville involves the erection of two through pin-connected spans, 150 ft. long, and one through plate girder span, 50 ft. long, on a foundation already in place.

TIFTON, GA.—A brick passenger station is to be built at Tifton for the joint use of the Atlantic Coast Line and the Georgia Southern & Florida. The proposed structure will cost about $25,000.

Railway Financial News

GEORGIA COAST & PIEDMONT.—Judge R. W. Walker, of the United States circuit court, has granted an appeal asking for the suspension of the receivership granted by Judge Emory Speer until the hearing of the appeal in October. The order directs a return of the property to the stockholders.

MISSOURI, KANSAS & TEXAS.—The receiver has been directed to pay the interest which was due February 1 on the Kansas City & Pacific first mortgage 4 per cent bonds of 1990.

MISSOURI PACIFIC.—A modified plan for the readjustment of the Missouri Pacific and St. Louis, Iron Mountain & Southern securities and a reorganization of the company has been adopted by Kuhn, Loeb & Co., reorganization managers, and by the committees representing the stock, 5 per cent first and refunding mortgage bonds, the 50-year gold bonds and the 40-year 4 per cent gold loan bonds of 1905. The committee representing the trust, 5 per cent bonds, due 1917, and the first collateral mortgage 5 per cent bonds, due 1920; and the committee representing the Central Brand Railway first mortgage 4 per cent bonds, due 1919, have approved of the plan as now modified. The original plans were outlined in the *Railway Age Gazette* of July 9, page 82, and July 30, page 184. The principal changes from this plan are as follows: The holders of the trust 5 per cent bonds, due 1917, and first collateral mortgage 5 per cent bonds, due 1920, were originally offered in exchange for their bonds new first and refunding 5 per cent bonds, due not earlier than 1965, whereas under the modified plan the holders of the 1917 bonds are offered, par for par, new first and refunding mortgage bonds, maturing January 1, 1923; and holders of the 1920 bonds are offered first and refunding bonds, par for par, maturing 1926. The holders of Central Branch Railway first mortgage 4 per cent bonds were under the original plan to receive in exchange for their bonds 50 per cent in new preferred stock and 50 per cent in new general mortgage bonds; under the modified plan holders of these bonds are offered, par for par, new general mortgage 4 per cent bonds. Holders of the Central Branch-Union Pacific bonds, due 1948, originally offered 50 per cent in preferred stock and 50 per cent in new general mortgage 4 per cent bonds, are under the modified plan offered, par for par, new general mortgage 4 per cent bonds.

Holders of any of the above mentioned bonds may, if they so elect, exchange their securities under the provisions of the original plan instead of the modified plan.

NEW YORK CENTRAL RAILROAD.—See Pittsburgh & Lake Erie.

PITTSBURGH & LAKE ERIE.—The directors have declared an extra dividend of 20 per cent. They have also authorized the sale to stockholders at par of $6,000,000 new stock. The extra dividend will just pay for the stock which each stockholder is entitled to subscribe for. Regular dividends are 10 per cent annually. The New York Central Railroad will receive $3,000,000 of the new stock, or an increase of $300,000 annually in its "other income."

ST. LOUIS & SAN FRANCISCO.—This property was sold under foreclosure on July 19 to representatives of Speyer & Co. and J. & W. Seligman & Co., both of New York, who are acting as reorganization managers. The sales price was $45,700,200, or almost exactly the same as the upset price fixed by the court of $45,700,000.

TEXAS & PACIFIC.—This company has filed with the state railroad commission an application for the approval of the issue of equipment trust certificates to pay part of the cost of equipment, including 8 locomotives, 100 steel underframe 50-ton ballast cars, and 8 steel 70-ft. combination baggage and mail cars, the purchase price being $615,025.

SUBWAY WASTE PAPER.—Five tons of newspapers are daily thrown away in the New York City subways. If these were not cleaned away the trains would be blocked every few days.—*Merchants' Association Bulletin.*

Railway Age Gazette

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Scientific Selection of Men

More and more interest is being taken by railway officers generally in studying how best to select men for certain jobs, or for promotion. A word of caution is needed. There is no royal road to the accomplishment of this task, despite the statements and writings of a certain class of psychologists, or alluring magazine advertisements. There is a simple, practical means for encouraging supervising officers to study and analyze their subordinates to which attention has been called repeatedly in our columns (*Railway Age Gazette*, August 6, 1915, page 232); it is slow, but sure, and requires patience and a firm purpose on the part of those in charge to put it through. Reliable investigations at the University of Cincinnati have demonstrated the fallacy of placing reliance on phrenology or the claims that physical characteristics indicate certain abilities. Applied experimental psychology is in its infancy and as Dean Herman Schneider has said in reference to its use for selecting men, it "seems to be at the point where chemistry was when it was alchemy." It is well to use science in selecting men, but let it be the science of hard work in making a thorough and critical study of each individual while he is actually working on a job. On the basis of this study encourage and help him to strengthen his weak points, so that he will develop and fit himself for a bigger job. If he fails, the reasons for failure should suggest the sort of work to which he can be transferred with good results.

Arbitration or a Strike

The conferences between the National Conference Committee of the Railways and committees of the train-service brotherhoods will be resumed in New York next Tuesday. They will probably be short. The railways committee will renew its offer to (1) submit the proposals of both sides to the Interstate Commerce Commission, or (2) submit them to arbitration under the Newlands act. It seems probable that the committees of the employees will suggest some counter plan with the expectation that the railways will reject it and thereby put themselves in the position of declining a means of peaceful settlement. For example, they may repeat the trick played by them two years ago, of agreeing to arbitrate, provided only the demands of the employees are arbitrated; or they may suggest the creation of a board so constituted that, from the railway point of view, it would be utterly objectionable. One thing seems certain, however. This is, that the railways will not concede any more than they already have offered. They are willing to arbitrate, but they will not consent to arbitration by some one-sided board, and they will not consent to arbitration which does not include consideration of their demands as well as those of the employees. If the alternative is further concessions on the part of the railways or a strike, then the strike should be allowed to come. There will never be a better time for settling whether or not the railway labor brotherhoods can dictate their own terms to the railways and defy the opinion of the public and trample on its rights.

A Unique Reorganization

As announced in the financial news columns of the *Railway Age Gazette* last week, the committee representing the Central Branch Railway first mortgage bonds of the Missouri Pacific has succeeded in having the reorganization plan, which was formulated by Kuhn, Loeb & Co., changed so as to provide for the exchange of these bonds for new general mortgage bonds, par for par, instead of 50 per cent in new general mortgage bonds and 50 per cent in new preferred stock. Two other committees representing comparatively small issues of bonds have also succeeded in having the plan modified so as to give them somewhat more favorable terms than they would have had under the original plan. The fact that these concessions have been made is strong evidence that justice was on the side of these committees representing small bond issues. The Missouri Pacific reorganization has gone forward with extraordinary swiftness. The whole affair is unique in American railroad history. For years George Gould had been losing his grip on the Missouri Pacific and Kuhn, Loeb & Co. had been playing a more and more important part in the dictation of the policy of the management. When the bankers were at last completely successful in eliminating Gould control, a reorganization plan was put forth calling on securityholders to submit voluntarily without receivership to the provisions of this plan. The conflicting interests, however, were too varied and the steam roller of receivership was considered a necessity. The road was placed in the hands of its own president, B. F.

Bush, as receiver on August 17, 1915. Committees were formed by interests opposed to some of the provisions of the reorganization plan. Conferences were at once begun by these committees with Kuhn, Loeb & Co. looking toward an adjustment of differences, and now, in a little less than a year after the appointment of the receiver, the reorganization plan has been declared effective and consents to it are rapidly coming in. If a readjustment of a railroad company's financial structure is a necessity, and no one doubted that in the case of the Missouri Pacific it was a necessity, such expedition as has been shown in working out the financial plans of the Missouri Pacific is, if it is done thoroughly and fairly, as well as quickly, in the interests of the organization of the road, its securityholders and the future development of the property.

AND SO THE BROTHERHOODS ARE MERELY BLUFFING!

RAILWAY officers and other persons who have followed the wage controversy between the railways and the train employees have felt some apprehension lest there should be a strike. This apprehension has been due to the facts that some of the leaders of the employees have said that they will not arbitrate, and that a strike vote actually is being taken. Now, however, Chairman Adamson of the House Committee on Interstate and Foreign Commerce, has made an oracular statement indicating either that certain leaders in Congress have allowed themselves to be duped, or that the leaders of the labor brotherhoods are merely bluffing.

Recently a bill providing for an investigation of the general subject of railway regulation was before the House. Chairman Adamson, who was in charge of the bill, was asked if the wage controversy was included within its scope. He replied that it was not, and gave the following explanation: "Four months ago when the clouds gathered above the horizon the Republican leader [James R. Mann] and I investigated to see whether there would be a strike. I will not say where we went, but we were assured by the representatives of the employees that there would be no walkout and they did not mean to stop the wheels. The Interstate Commerce Commission did not favor an investigation and I concluded that no action was necessary and dropped the subject." This shows that one or the other of two things is true. Perhaps Chairman Adamson and Mr. Mann allowed themselves to be misled by ambiguous or disingenuous statements on the part of the representatives of the employees. Either this, or the leaders of the brotherhoods, while saying loudly that they are unalterably opposed to arbitration and taking a strike vote, are merely bluffing. In either event, the course for the railways to take is clear. They ought to continue to refuse to concede the employees anything without previous arbitration. Any railway officer who would suggest making any concession whatever, except after arbitration, ought to be branded as a coward, and as a traitor to the interests of the railways and the country. If the leaders of the brotherhoods should then call a strike some eminent gentlemen in Congress will be greatly embarrassed, and there may be a dispute as to what actually was said at their conference with the representatives of the employees. For their future protection we suggest that they get an agreement in writing with the leaders of the employees as to what really passed between them.

Meantime, this statement of Mr. Adamson that the leaders of the employees assured him and Mr. Mann, in effect, that they are merely bluffing will be most gratifying to the managers of the railways. They intended to call the brotherhoods' bluff, anyway; and it will be very comforting to them to know, on the assurance of such an eminent public man as Mr. Adamson, that when this is done the brotherhoods will more or less promptly and gracefully back down.

DECLINE OF RAILWAY DIVIDENDS IN 1915

WHILE many people are talking about the remarkably large current earnings of the railways, the statistics of the Interstate Commerce Commission for the fiscal year ended on June 30, 1915, which have just been issued, have disclosed some striking facts illustrating the extent to which the railway business was depressed before the phenomenal increases of earnings began. They show that in the fiscal year 1915 the percentage of railway stock on which dividends were declared was the smallest since 1904, and that the average rate declared on all stock was the smallest since 1905. The total stock in existence necessarily increases from year to year as a result of the raising of funds for improvements and extensions. Nevertheless, the absolute amount of stock on which dividends was paid was smaller in 1915 than in any year since 1909.

The stock on which any dividends were paid was only 60.45 per cent of the total. In other words, no dividends at all were paid on 39.55 of it. The average rate paid on all stock was but 3.8 per cent. The following table gives the amount of stock on which dividends were declared, the amount of dividends declared, the percentage of all stock on which dividends were paid and the average rate paid on all stock for the years 1905 to 1915, inclusive:

	Amount of stock paying dividends	Amount of dividends paid	Per cent of stock paying dividends	Average rate on all stock
1915	$5,219,846,562	$328,477,938	60.45	3.80
1914	5,667,072,956	451,653,346*	64.39	5.13
1913	5,780,982,416	369,077,546	66.14	4.22
1912	5,581,289,249	400,315,313	64.73	4.64
1911	5,730,250,326	460,195,376	67.65	5.43
1910	5,412,578,457	405,771,416	66.71	5.00
1909	4,920,174,118	321,071,626	64.01	4.18
1908	4,843,370,740	390,695,351	65.69	5.30
1907	4,948,756,203	308,088,627	67.27	4.19
1906	4,526,958,760	272,795,974	66.54	4.01
1905	4,119,086,714	237,964,482	62.84	3.63

*Includes extraordinary dividends of the Union Pacific and Central Pacific of over $86,000,000 greater than the dividends of those companies for the preceding year.

It will be noted that the largest amount of dividends ever declared was in 1911, and that the next largest amount was in 1914. The amount in 1914, however, was swelled by large extra dividends declared by the Union Pacific and the Central Pacific in connection with the dissolution by the courts of the Harriman system. Except for the large extra dividends of these roads, the total dividends declared would have shown a steady decline from 1911 onward.

It should be noted that the figures given here are not those for dividends paid on stock actually "outstanding in the hands of the public." As is well known, a large part of the stock of railway companies is owned by other railway companies, and in consequence a large part of the dividends declared are paid by some railways to other railways, and then again paid out to their stockholders as dividends on their stock. Consequently, the amount of dividends declared exceeds the amount finally paid on the stock outstanding in the hands of the public. In 1914, for example, the total amount of dividends declared was $451,653,346, while the net dividends finally paid on stock actually in the hands of the public amounted to only $339,768,533. But the total amount of dividends declared is highly important and significant, for all the dividends finally paid on stock in the hands of the public must come out of the gross amount originally declared.

The reduction in the amount of stock paying dividends and the amount of dividends paid in 1915 was due to the decline in the net operating income of the railways in 1914 and 1915. This was due chiefly to increases in operating expenses and taxes. The increases in operating expenses were due chiefly to advances in the wages of labor; and it may be said truly that the entire reduction in net operating income and in dividends, and the fact that many roads be-

came unable even to pay their interest, were attributable to increases in wages and taxes.

It is especially important that the public should be reminded of these facts at this time. The railways are now enjoying a large increase in earnings. But they had large increases in earnings before, as in 1910 and 1913, for example, and these were accompanied, or immediately followed, by so much larger increases in wages and taxes that the general tendency of net return and of dividends was downward. Even though the present earnings should be maintained it would be easy to soon more than offset them if wages and taxes should be advanced as rapidly in proportion as they have been in past years.

The Interstate Commerce Commission recently has received criticism from uninformed or unfair persons because it permitted increases in rates in 1915. It has been said that the earnings of recent months have shown that these were not needed. But the commission was confronted with the figures for 1914 and part of the figures for 1915, and the final figures for 1915 show that if it had refused to permit any increases in rates it would have ignored facts which should have exerted a controlling influence on its judgment. Furthermore, the statistics for past years show that in spite of the present large earnings the commission unquestionably will have to grant further increases in rates if the upward tendency of wages and taxes is maintained.

Neither the results of the best years nor the results of the worst years should determine the policy of the public in dealing with the railways. It should be determined by the great, dominating tendencies in the industry, and these can be ascertained only by studying results for a period of years. If the policy of the public in dealing with the railways is based not on the results of any one year, but on the results of the last ten years, the way in which wages and taxes and the regulation of rates recently have been dealt with will be greatly modified.

THE HEADLIGHT QUESTION

IT seems probable that the recent order of the Interstate Commerce Commission regarding headlights will be attacked in the courts by some of the eastern roads having a dense traffic handled on multiple tracks under block signal protection. The order of the Commission, which was issued in June, requires that each locomotive "shall have a headlight which will enable persons with normal vision in the cab of the locomotive under normal weather conditions to see a dark object the size of a man for a distance of 1,000 ft. or more ahead of the locomotive." (See *Daily Railway Age Gazette*, June 16, page 1358, for the complete order.)

The petition for the commission to regulate headlights came from the railway labor brotherhoods. The order sought by them was opposed by the representatives of the railways. It is a circumstance both remarkable and significant that the requirement finally made is that which the Brotherhood of Locomotive Engineers decided at a convention held in May, 1915, to seek, and that even the verbiage of the order is almost the same as that used in the resolution adopted by the brotherhood. The Commission has been charged ever since it was organized with being subservient to the railway labor unions. Its handling of the headlight question will not improve its reputation in this respect. A committee of the American Railway Master Mechanics' Association somewhat over a year ago made exhaustive tests of high-power headlights. This committee was composed of mechanical officers of the Pennsylvania Lines West, the New York Central, the Louisville & Nashville, the Chicago & North Western, the Chicago, Burlington & Quincy, the Baltimore & Ohio and the Boston & Maine. High-power headlights are used on some of these roads but not on others. The committee, nevertheless, reported against their use on multiple track lines handling a dense traffic, and the Master Mechanics' Association accepted its report. The Interstate Commerce Commission seems to have completely ignored the action of the Master Mechanics' Association.

A large part of the railways of the United States have shown their belief in high-power headlights by voluntarily buying and using them, but it does not follow because many railways have done this that their use everywhere should be required. The physical and operating conditions on our railways vary enormously. There is no similarity between the conditions on a single track light-traffic line in a desert in Nevada or Arizona and those on a four or a six track line in New York or Pennsylvania handling a traffic perhaps 30 or 40 times as dense. Because of these differences in conditions a requirement for headlights applying uniformly throughout the country is absurd on its face. In the second place, the phraseology of the Commission's order is wholly indefinite. What is "normal vision"? What are "normal weather conditions"? What is "a dark object"? A man in a black suit is obviously "a dark object the size of a man." Plainly also, a man in a white suit is not. But how about a man in a gray suit? Are weather conditions normal both when there is bright moonlight and when there is no moonlight? When it has been determined, if it ever shall be, what are "normal vision," "normal weather conditions" and "a dark object the size of a man" it will still be a question as to exactly what kind of a headlight will meet the requirement.

Probably the Interstate Commerce Commission ought to adopt some form of regulation for headlights, but its requirements ought to recognize varying conditions, they ought to be clear and definite, and they ought not to ignore the results of the investigations of the leading railway mechanical experts of the country. The Commission in dealing with questions of safety will always have to rely, to a considerable extent, on the judgment of its subordinate boards, and it is extremely unfortunate that its boards which have to do with such matters have been constituted so largely of men whose point of view is that of the railway labor brotherhoods. The point of view of the labor brotherhood is not necessarily either that of the mechanical expert or that of the public.

"INVOLUNTARY SERVITUDE"

THE reason why the spokesmen of the railway labor brotherhoods are opposed to arbitration is that they fear that it would reduce their followers to "involuntary servitude." This is disclosed by an article in the July number of the Locomotive Firemen and Enginemen's Magazine. The *Railway Age Gazette* said in an editorial in a recent issue that the train service brotherhoods, by supporting their demands for higher wages by a nation-wide movement, had raised a question for the officials of the nation to settle, and indicated that they should settle it by forcing the controversy to some form of arbitration. This suggestion makes the Locomotive Firemen and Enginemen's Magazine anticipate the early restoration of human slavery on this continent. In its July issue it heats itself up greatly and gives forth the following blast of rodomontade—otherwise more vulgarly known as "guff".

> The duties of the officials of the government at Washington are clearly specified by the Constitution of the United States and nowhere in the Constitution is it defined as either a duty, prerogative or privilege of any public official or body of officials no matter what their station or power, to establish, enforce or maintain involuntary servitude, particularly in the interest of private privileged profit takers, but on the contrary such an act would be a gross violation of the Constitution and should it be attempted these undertaking it will be brought to vividly realize that the lesson of 1776 has not been taught in vain.

If certain of the leaders and spokesmen of the labor brotherhoods would devote their voices and pens less to this sort of rant and cant, and more to the discussion of the questions really involved in the present wage controversy,

they would serve their followers quite as well and do less to earn for themselves the reputation of mere ear-splitting blatherskites. The remarks of the Firemen and Enginemen's Magazine are directed entirely to the comments of the *Railway Age Gazette* on the need for action by the government in regard to railway labor controversies. Therefore, it is the province of the *Railway Age Gazette* to answer it; and in doing so it should be understood that, as is always the case, it expresses nobody's views but its own.

Be it known, then, that the *Railway Age Gazette* never, either in the editorial from which the Firemen and Enginemen's Magazine quoted, or in any other, either directly or by implication, advocated "involuntary servitude" either for all railway employees, or any individual employee. We are quite aware, as is learnedly pointed out by our contemporary, that "involuntary servitude" is prohibited by the Constitution of the United States. Furthermore, not only have we never advocated any kind of legislation which would make it impossible for railway employees as individuals to quit their jobs, but we have never advocated, and do not now advocate any kind of legislation which would make it unlawful for any or all of them to strike. What we have advocated in the past, and what we advocate now, is federal legislation which will make it illegal for railway employees to strike until some body representing the public (preferably the Interstate Commerce Commission) shall have held hearings regarding the subject matter of any controversy that may arise, and rendered a report indicating how, in its opinion, the controversy ought to be settled, in fairness to the parties directly concerned, and to the public. We would have the law such that, if, after such an investigation and report had been made, either the railways or the employees wanted to disregard it they could do so, thus reserving to the latter the right to strike.

Clearly, this would not establish "involuntary servitude" for the employees. It would merely compel both them and the railways to submit their differences to some public body for hearing and report so that the public could be informed as to the true merits of the issues involved before they would be allowed to resort to desperate and destructive measures. The trouble with the present Newlands arbitration act is that a lockout or a strike may be resorted to before there has been a public investigation of the merits of a controversy. The advantage of the proposed system would be that there could not lawfully be a lockout or a strike until there had been a public hearing and report, and that public opinion would so strongly support the findings of a public tribunal that in a large majority of cases neither the railways nor the employees would dare refuse to abide by them.

The system proposed is very similar to that established by the Lemieux act of Canada; and it is the system which the *Railway Age Gazette* has advocated for years. All the talk about this paper, or railway officers, for that matter, advocating "involuntary servitude" is silly bosh intended to mislead the members of the labor brotherhoods and the public, and the leaders of the brotherhoods know it is as well as anybody else.

THE FEDERAL VALUATION

RAILWAY men have watched with a great deal of interest the activities of the federal valuation forces as they have been organized and have undertaken the solution of their unusual problems. In this work, which is very largely without precedent, it is to be expected that wide differences of opinion will arise regarding many details. In fact, railway men themselves have differed widely in their attitudes on many of the fundamental principles involved. It is not, therefore, surprising that exception has been taken to some of the findings of the federal forces in the first tentative reports which they have submitted on the properties of three of the smaller carriers. These reports, which are discussed in another column, are of particular interest to railway men in all branches of the service, as they give the first intimation of the attitude of the government on some of the fundamental principles involved in the valuation which are of vital importance to the carriers with which they are connected.

In work such as this the professional reputations of the men in charge are at stake, as it is assumed that their decisions reflect their best efforts to determine the correct solution of the problems involved. While it is true that the reports as presented at this time are tentative and were probably brought to the attention of the carriers in an informal way in order to ascertain their attitude on certain points before placing them in final form for presentation to the Interstate Commerce Commission, they undoubtedly represent the attitude of the valuation department and its ultimate decision upon most of the points involved. The methods of the federal forces have been freely criticized (sometimes unjust, and without a full knowledge of the facts) as being impractical. It is highly important from their standpoint that they allay any such feeling as far as possible, because the creation of a feeling of confidence among the carriers and the public at large is essential to the ultimate success of this work.

The federal forces occupy a judicial rather than a partisan position, their problem being not to eliminate all possible elements of cost to keep the valuation down to the minimum, but rather to ascertain the fair value of the properties under consideration on the different bases specified. They must assume that the lines have been built under conditions encountered in actual practice, rather than under ideal conditions. It is in details such as these that experienced railway engineers measure the practical ability of the government forces.

Among the conclusions in the reports discussed to which the carriers take exception is the time allowed for construction. The carriers maintain that in all the three instances referred to in the article, the period specified is too short, and that it would not be practically possible to complete the lines in the periods specified. This is a question of experience rather than one of theory, and the best measure of the reasonableness of the periods specified is secured by a comparison with the time actually required to construct similar lines under similar conditions. It would undoubtedly have been physically possible to construct some of these lines in the time specified by the government if large forces had been organized and the work pushed without regard to cost. But the government has not figured the cost of the work on this basis, and no railway would build a line in this way. The problem of the federal engineers is to determine what the construction would have cost under the methods which they would have followed had they been in responsible charge of the construction. It is doubtful if they would be willing to stake their personal reputations upon the completion of all of these lines in the periods stated and for the costs allowed.

Likewise, the carriers attack the implied conclusion of the government representatives that the contract prices for grading comprise the entire cost of this detail of construction. Every engineer knows that contract work entails other expenses properly chargeable only to this account and which are as much a part of the cost of this work as the money paid to the contractors. The transportation of contractors, men, equipment and supplies is only one item of this class. Likewise, while theoretically there should be no waste of track materials in the construction of a line, practical experience has proved that there is always a certain loss even with the most careful supervision. To ignore such elements of cost is to deny actual matters of record. Also, while under ideal conditions it would be necessary to finance the work only as it progresses, practical experience has shown that this cannot be safely followed, but that money must be arranged for a sufficient time in advance to insure that it will be available to meet the bills as they become due. This must be considered

when making proper allowances for the amount of interest accruing during construction.

While it is not to be expected that the representatives of the government and the carriers will agree upon all the points in question, it is to be hoped that in the final reports they will be found to be in accord upon all those questions of practical experience which are matters of record, leaving for the possible attention of the courts, later only those problems which are of legal uncertainty at the present time.

STANDARDIZING SIGNALS AT HIGHWAY CROSSINGS

FOR a committee of only eight men to represent, truly and effectively, 100 million people, is a rather unusual occurrence, except in the halls of Congress; but that is what may fairly be said of the committee of state commissioners and railway managers who recently met in Chicago to consider the question of safety at highway crossings, and whose doings were reported in the *Railway Age Gazette* last week, page 157. It is safe to say that they did accurately voice the sentiments of the people of the whole country; and, what is more, that they aimed their resolutions in the right direction. A less important body of men might see and define the need of meeting the crossing-safety problem, but these representatives are particularly well situated to influence the right persons and to do whatever may be necessary to convert their good resolutions into actual accomplishment. This is a comparatively new problem, and it is highly desirable to secure uniform action throughout the United States, for the automobile and other improvements are constantly tending to make of the whole country a single neighborhood. Moreover, the duty of state railroad commissioners to guide and instruct their respective legislatures—a particularly plain and important duty in this case—is one which demands quick action all around.

That these eight men truly represented all parts of the country, and all shades of opinion will be seen from the care with which they limited their recommendations for action to points on which there can be no reasonable difference of opinion among legislators or others who may be called upon to act. The thing to do is to adopt without delay such standards as can be agreed upon, even if the introduction of ideal conditions has to be deferred for a time.

The two most important features of the committee's report are the cautionary approach signal and the red light. The placing of the responsibility for maintaining the caution signal is a question yet to be dealt with; but the clear declaration that such a signal is needed is an important point settled. How far away from the track; whether in the middle or at the side of the highway; how far above the ground; how and when to be artificially lighted; these and other details must be agreed upon as soon as practicable. It is to be hoped that both of the organizations,—the National Association of State Commissioners and the American Railway Association—will give their committees extensive authority, for some of these details are of that character which will permit of interminable discussion where there are many men to discuss; while yet the interests of all may be truly subserved by summary action, in the spirit of compromise, as soon as there is a full understanding among those who have most thoroughly studied the problem. New Hampshire already has a law requiring the cautionary or distant signal, and the useful experience of the officers of that state can be made available for all states.

The question of the color of the light to be used at night, —to be hung on the gates or to be swung by the hand of the crossing attendant—is one which the railroads ought quickly to settle among themselves. To make the use of red universal will necessitate a change on many roads; but, without doubt, the committee is fully justified in deciding in favor of red. Red is nearly or quite universal as a night warning in city streets, and in no detail is uniformity more desirable than in this matter of a warning light. Red is called by scientific men the most "arrestive" color. In addition to using the accepted stop color, there may be a need of considering uniformity in other respects. There are crossings with gates, crossings with automatic bells and no gates, and crossings where there is a flagman but no gate or bell; and the use of lights, their position, number and size ought to be made as nearly uniform as possible.

A railroad superintendent has a valid objection to the free use of red lights on the ground that they will stop trains, or, at any rate, will annoy enginemen and perhaps introduce an element of potential danger. This difficulty, however, has been met satisfactorily by using a four-sided light, the two sides facing enginemen being made dark or made to show some color other than red; and the need of uniformity, the comparative ease with which cities and all public bodies will undoubtedly be brought to agreement on that color, and the simplicity of the question, ought to be sufficient to bring all railroads in line in support of the position taken by the committee.

The public service commissions of the country are to be congratulated on the vigor with which they have taken up this question and the businesslike action of their committee. New legislation is needed and is sure to come; and that it ought to be uniform goes without saying. The commissioners, the American Railway Association and the American Automobile Association (with which conferences are being held) have an unusual opportunity to mark real progress.

BROOKLYN RAPID TRANSIT

WHEN the Brooklyn Rapid Transit undertook its share of the new dual subway system for New York city, involving, as it did, the extension of existing lines and additions to the parent company's facilities, it was thought that there might be so small a margin over dividends that the advisability of continuing the 6 per cent rate would be questionable. This was because new lines which would have to be taken into operating expenses as soon as they were put in operation would not be likely to prove immediately profitable. There has been an unexpectedly satisfactory increase in business with the installation of new facilities. In the fiscal year ended June 30, 1916, net income available for dividends amounted to $5,612,000, which left a surplus over and above the 6 per cent dividends of $1,145,000.

The subsidiary company of the Brooklyn Rapid Transit, which is working jointly with the city in building the Brooklyn Rapid Transit's part of the new dual subway system, is the New York Municipal Railway Corporation. This company has now spent $40,835,000 under city contracts and the company has completed or has under contract nearly all of the new lines and improvements which it obligated itself to build. The results of operation of these new lines also have been rather unexpectedly satisfactory. None of the lines from which a large net revenue is anticipated have been placed in operation. The operating company is the New York Consolidated Railroad and from August 4, 1913, when operation of some lines was begun under city contracts, to June 30, 1916, net earnings have been sufficient to make good all of the company's first preferential of $3,500,000, with the exception of a few thousand dollars. Nineteen sixteen contributed $424,000 more than interest charges and the first preferential of that year, which amount was applied toward reducing the deficiency of previous years. President Williams, in his annual report for the year ended June 30, 1916, calls attention, as he did last year, to the delays in opening new lines caused by the city's failure to perform its part of the work. Delays on the Broadway subway have

been especially long drawn out. These criticisms are entirely justified, despite the attempts of the New York World to make them out hypocritical. The delays on the city's part in a number of instances are due to the failure of government officials comprehensively to plan out a big piece of work, so that those parts which are needed first will be ready first. It is not so much due to incompetency on the part of the present New York administration as to the mass of red tape which is wrapped about any large project which the city undertakes.

Total operating revenues of the Brooklyn Rapid Transit (this is the old company and does not take into its accounts direct the operations of the building company for the dual subways or the operating company) amounted to $27,949,000 in 1916, an increase over the previous year of $1,521,000. Operating expenses amounted to $15,694,000 in 1916, an increase of $734,000. A part of this increase in expenses is due to a greater volume of traffic handled and a part is due to an increased scale of wages which the Brooklyn Rapid Transit voluntarily established the first of January, 1916. The increase in passenger earnings over 1915 was 6.28 per cent. The number of passengers carried was 728,466,000, as against 689,823,000 in 1915, and the earnings per revenue car-mile were 27.4 cents in 1916, or exactly the same as in 1915. The average earnings per passenger were 3.72 cents in the year 1916 and 3.69 cents in 1915.

The Brooklyn Rapid Transit can set a good example to many well managed steam roads in the work which it is doing to improve the personnel and morale of its employees. Not many years ago Brooklyn Rapid Transit motormen and conductors had the reputation of being a pretty hard lot. They were probably painted blacker than they really were, but there has been a very decided improvement in the last few years.

For the first time in 1916 an opportunity was given to the employees to participate in group insurance, and of the 8,000 employees eligible for this insurance, 6,300 took out policies. The insurance was offered to all employees who had been in the service of the Brooklyn Rapid Transit two years or more and each employee was insured for $1,000 without medical examination. A very low premium was secured, but furthermore the company itself pays half the premium on policies of $1,000 for employees whose wages do not exceed $3,000 a year. The company also assumes the entire premium on $1,000 of insurance when the insured employee retires under the pension rules of the system. Participation in the insurance plan was made contingent on belonging to the Employees' Pension Association. This association has, since its foundation, paid out $346,543 in sick benefits and $150,000 on account of deaths of members.

The Brooklyn Rapid Transit now has a staff of six physicians employed continuously in the work of the Medical Inspection Bureau. The work of this bureau includes inspection of all candidates for employment in the transportation department; compulsory medical inspection and free medical attendance for transportation employees and free medical attendance for members of the Employees' Benefit Association outside of the transportation department; medical attendance for all employees in any department injured in the course of their duties; the instruction of certain employees in first aid work, and periodical re-examination of all motormen.

If the public but realized it the greater part of the annoyances to passengers on elevated, subway and surface lines is due to incompetent or uninstructed employees in transportation service. In treating its employees fairly, in paying them well, in holding out inducements for them to continue in the employ of the company, the Brooklyn Rapid Transit is striking at the root of this evil. It is therefore rendering a public service which the public will only come to appreciate some years after the company has been hard at work on it and after a very considerable amount of money has been spent in that way, and probably the great majority of the public will never realize or appreciate the connection between better service and this humane farsighted attitude toward retaining employees. However that may be, the fact will remain that what the Brooklyn Rapid Transit is now doing is just as sure to accrue to the benefit of the public as it is to the benefit of the employees.

NEW BOOKS

Voting Trusts. By H. A. Cushing. 226 pages. Published by the Macmillan Company, New York. Price $1.50.

With the number of railroad companies now in the hands of receivers, the majority of which will presumably be reorganized within the next few years, a comprehensive discussion of voting trusts is of timely interest. The book which H. A. Cushing, of the New York bar, has written on the subject deals with both the legal aspects of what may and may not be done by means of voting trusts, and also with the economic significance of this form of insuring control by a certain group of interests or individuals. In so far as railroads are concerned, a voting trust is a device which has been used many times to insure supervision of operations and management by the interests which underwrote a reorganization plan when the company was taken out of the hands of receivers, and often it has been a device by which creditors of the company continued in control of its affairs after the property had nominally been turned back to stockholders. In the proposed reorganization of the St. Louis & San Francisco one provision from which the Missouri Public Service Commission withheld its approval was the formation of a voting trust.

Mr. Cushing's book is interestingly written and his analysis of the significance of voting trusts to which he devotes the first 35 pages is lucid and well worth while. This is the part of the book which will appeal to the general reader; but if even the general reader wants to make at all a thorough study of voting trusts he will read with interest the other three sections which deal with the Contents of Voting Trusts, the Law of Voting Trusts, Forms Relating to Voting Trusts.

Modern Framed Structures. By J. B. Johnson, C. W. Bryan and F. E. Turneaure, Part Three, Design, rewritten by F. E. Turneaure, dean of the College of Engineering, University of Wisconsin, and W. S. Kinne, associate professor of structural engineering, University of Wisconsin. 486 pages. Illustrated. 6 in. by 9 in. Bound in cloth. Published by John Wiley & Sons, New York. Price $4.

This is the third of a series of three volumes, constituting a complete rewriting of the well-known "Modern Framed Structures," first published in 1893. The earlier volumes of the new edition cover the subject of stresses in simple and complex framed structures. This volume is devoted to detailed design and unit stresses, and is a fuller treatment than that given in the original book. It contains considerable material based on the work of the Committee on Iron and Steel Structures of the American Railway Engineering Association, of which one of the authors is a member. In addition to an analytical treatment comprising the several chapters on stresses and those on riveted joints, plate girder bridges and truss bridges, the book contains a manual for the student and designer which consists of chapters comprising complete outlines of the design of a plate girder bridge, pin connected and riveted truss spans, a highway bridge and a roof truss. Forty-six pages of the book are devoted to appendices, containing the specifications for steel railway bridges of the American Railway Engineering Association, some tables and a treatment of the subject of bending in planes at oblique angles with the principal axes of structural members.

Letters to the Editor

THE DISREGARD OF CAUTION SIGNALS

OTTUMWA, IOWA.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Since writing the letter on the necessity for observance of distant signals which was published in the *Railway Age Gazette* of May 5, under the heading "The Importance of the Distant Signal," I have received a copy of the report on the government's investigation of the accident at Milford, Conn., signed by H. W. Belnap. This is certainly an illuminating document, and I cannot refrain from commenting on its most prominent feature. When an accident of this kind occurs on a first-class railroad with the finest system of signals, etc., it is time to do something. A careful reading of the government report seems to indicate the cause of this collision very clearly and decisively.

The speed diagram drawn by the government inspectors and published in this report indicates that the second train passed a good many of the caution signals when they were indicating caution without decreasing speed, and the chief inspector says, "The evidence seems to justify the conclusion, as is indicated on the diagram, that train No. 5 had been passing without decreasing speed most of the distant signals at caution since leaving tower 75." In other words, according to the investigation, there was a mechanical flagman about every ¾-mile to a mile for several miles east of the point where the accident occurred, and each of these flagmen was saying "caution" to the engineer of the second train, and yet in broad daylight, in clear weather, he absolutely disregarded all of these mechanical flagmen and struck the read end of the preceding train which had been brought to a stop.

How is it, then, that the chief inspector says in substance that he is unable to find the real cause of the accident because "all of those whose testimony would throw any light on the reason why the signals were not observed and obeyed met death in the accident, and any explanation that might be offered would simply be one of conjecture." In the face of what happened and his own observations, why did he not say the cause of the accident was, first, that the trainmen are being allowed or taught to disregard caution signals; second, that high-speed trains are permitted to close up and break down space intervals between running trains by a disregard of the caution signal, which if obeyed would readily space the trains at a proper and safe distance from each other; and, third, that under the peculiar mental process which is unable to conceive of more than one train or more than one block section, it is assumed that greater speed can be made by permitting trains to disregard the caution signal, and the rules are therefore framed to allow this extremely unsafe practice.

The chief inspector, in effect, says that he does not know the real cause of the accident, but at the same time his report indicates very clearly that the operating practice referred to, which is the real cause, was very definitely determined and the recommendations for improvement are very clear. If they were carried out thoroughly, instances of this kind would be very rare, indeed. In view of all of the excellent observations and recommendations by the chief inspector in regard to the operating method in use in this case, the only mystery about this matter is why he did not put his finger on the real cause and give it the prominence it deserves. The series of disasters of this nature during the past five years on first-class railroads with the best known signal systems certainly should make apparent, even to the beginner in railroading, the danger of the practice of disregarding caution signals and framing the rules to permit this.

Even at the present time the American Railway Association's code is fathering this dangerous practice by the recently approved signal rules. The need for an immediate reconsideration of the signal rules, which were recently adopted, and of an immediate going back to first principles is so apparent that it should hardly be necessary to talk about it.

L. R. CLAUSEN.

WHAT ABOUT THE OTHER 82 PER CENT?

HARRISBURG, PA.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The railroads of the United States and part of Canada are now confronted with one of the most serious problems they have ever been called upon to solve and the solution is being awaited with more or less uneasiness by a larger number of workers than were ever before concerned in a similar controversy. The managements of these different railroads are confronted with the task of settling a wage controversy that is recognized as being the greatest demand ever made upon them at any one time in the matter of wages.

The different organizations from which come this demand represent men engaged in train service and known as trainmen. These enginemen, firemen, conductors, flagmen and brakemen have collectively and unitedly presented to the operating officers of their respective railroads, a demand, the contents of which are well known to almost every worker in the United States. The extraordinary increase of wages demanded and which these men hope to receive, if granted to them, will, when compared with the wages of other skilled labor, easily prove them to be the highest paid workers in the world.

When we take into consideration that the wages of the trainmen were so recently and satisfactorily adjusted (they must have been satisfactory because the railroads conceded every demand made, even to the point of establishing a precedent in granting these men back pay, and dating the back pay from the date their demands were first presented until the time when the conditions were agreed upon) the seriousness of the present demand must impress every one of us. Think of a band of men already considered the highest paid workers in the world demanding a basic eight-hour day, which, when stripped of its masquerading cloak, means in reality an increase of 25 per cent on the present wages up to the expiration of the first eight hours and for every hour or portion thereof thereafter an increase of 87½ per cent, and the enormity of the demand will be plain to everybody.

This demand or set of demands is bound to work hardship upon every other wage earner in the country and it is in behalf of one of these other classes of wage earners that this article is written.

Statistics show that only 18 per cent of the railroad employees are trainmen. Only 18 per cent of the railroad employees will thus be favored by the above mentioned demands. To the other 82 per cent of employees the result will be not only unfavorable but harmful, as the writer will endeavor to show.

The first question that presents itself is, "What effort will the railroads make to retrieve this money if the demands are granted?" and any logical-minded man will agree that they will make some effort, because it is not their aim to increase operating expenses but to decrease them and to increase net profits. This being the case let us note the different ways by which they may be disposed to bring back to their treasuries an equivalent for that which they have handed over to the trainmen without receiving the slightest benefit in return.

First; they might, as in the past, appeal to the Interstate Commerce Commission for permission to increase

freight or passenger rates or both, and by such permission endeavor to retrieve an equivalent sum for the money that the trainmen receive. This would be an extortion upon the public and is hardly to be expected in view of what the Interstate Commerce Commission said in reference to such an appeal several years ago before the trainmen received their last increase. At that time the commission said in part: "This Commission certainly could not permit the charging of rates for the purpose of enabling the railroads to pay their laborers extravagant compensation as measured by the general average compensation paid in this country as a whole."

Second, they have at their disposal another method, the availability of which is best attested by the use to which it has been put in the past, as the writer and others can testify. This is the method of cutting down operating expenses in other departments and it acts by reducing the wages of certain employees when this can be done without incurring any danger from such employees, or by the elimination of every last job that it is not indispensably necessary to retain. In this way the work formerly done by the men whose jobs have been eliminated is crowded on to others who are already overworked and receive no increase in pay.

The work in the telegraph, clerical and other departments has steadily increased from year to year owing to legislative action of the different states and of Congress and Interstate Commerce Commission rulings. Chief among these measures and harassing restrictions are:

The requirements of the 8-hour and 16-hour laws, requiring constant checking and much clerical labor.

Two pay days a month, doubling the work in the timekeeping department.

The Interstate Commerce Commission rulings on rate legislation, the handling of livestock and explosives, safety appliance equipment and many other matters of equal importance, obedience to which is swamping the railroads with red tape and almost incalculable clerical work.

All of these have entered into the work of these different departments in recent years and there has been only such an increase in the forces as has been found absolutely necessary.

It is upon this class of employees that the burden of the trainmen's demands will fall, because when 18 per cent of the employees of a railroad receive 28 per cent of the payroll it is very evident that the other 82 per cent of the employees are carrying the load. And when on the top of this, these 18 per cent employees ask for such increases as they have asked for, it is only the more evident that an additional burden is passing to the shoulders of those who are even now carrying the load when these demands serve to increase the percentage of the payrolls in favor of the trainmen—men whose conditions have become more and more favorable each year, men for whose safety the law provides every known protection, and for whose convenience and comfort the companies leave nothing undone; men who have recently had their forces increased by the "full crew" laws, men whose demands upon capital have been favorably acted upon in every instance, men who at the present time do less than one-half of the work once done for one-third of their present pay.

The task of imposing this additional burden upon the shoulders of an overworked and underpaid set of men will be a mighty hard one, as already the rumblings of discontent are becoming louder and louder, and unless the railroad officers are both blind and deaf, they must hear them. These rumblings are the cries of the men upon whom, to a great extent, the prestige and success of a railroad must rest. A canvass of the intellectual ability of this class of men as against that of the trainmen will show the trainmen sadly deficient both as to education and ability, and now as in the past or future these two vital factors are the basis of success in all undertakings.

Can the officers of the companies involved ignore the sounds of discontent coming from the 82 per cent of the employees, the larger part of whom are compelled to work more than eight hours a day, especially when those who work only eight hours and are included in the requirements of the eight-hour law are compelled in most cases to work 365 days a year and on a monthly rate of pay, with deductions for every hour lost?

Leading students of economy and labor agree that the wages of the 82 per cent class have not kept pace with the rapidly advancing cost of living and are at the present time not as near a living wage as in former times.

There are also other conditions, such as pass privileges, enjoyed by the trainmen which never reach the other employees, as well as seniority rights as shown by rosters and many other conditions not affected by wages.

In many cases we find the officer in charge of the trainmen or under whose control they labor, working 12 hours per day or night as the case may be, for a salary far below that of the trainmen, all of which serves to make it harder for him to retain their respect and maintain the discipline so necessary for the successful operation of the railroad.

I repeat, can the railroads ignore the signs of dissatisfaction which are daily finding room and growing in the ranks of the men who are not members of the "Big Four" and invite unto themselves a demand like that of the trainmen, or court indifferent, dissatisfied and unintelligent work from a force of men who are capable of greater efforts and greater work?

When we review the conditions of the trainmen which have so rapidly become so favorable and reached such a high state, and note that these concessions by the companies to the trainmen have had the result of spurring them on to greater demands and more menacing attitudes toward the companies, is it any wonder that the 82 per cent men who have had so little inducement to perform their best, are becoming disloyal, are lending their ears to the insidious influence of the labor agitator, who is now for the first time in the history of the railroads finding a fertile field, entirely unopposed by the men themselves, for his labor agitation?

Men of long years of faithful service, who have shunned unionism with its autocracy in the past, are now, as never before, becoming impressed with its startling value, as encouraged by the railroad companies' readiness to agree to and grant demands and by the public approval of their methods. Soon, very soon indeed, the "Big Four" will have to admit another member and become the "Big Five" or it will have a rival far greater in numbers and well nigh invincible in strength.

Will the railroads refuse the trainmen their demands and favor the deserving employees with better conditions and calm their unrest and dissatisfaction, thereby facing the menace attached to the trainmen's demands, which is, "Refuse us our demands and we will strike"?

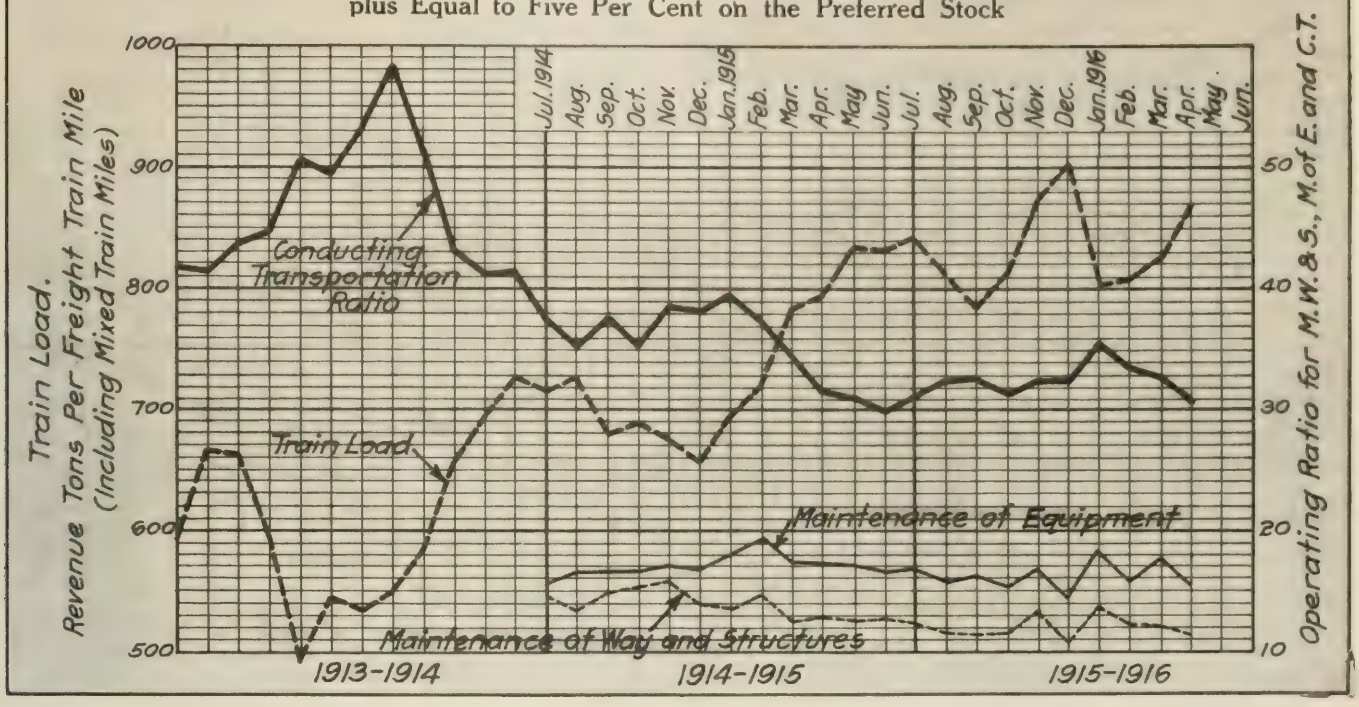
So much has already been said in reference to what a strike of such magnitude would mean, its cost to both the railroads and the public alike, that it is unnecessary to state that grave danger exists, and the outcome of the present controversy will be watched with great interest and much concern to all.

T. H. E. Redding.

Six Months' Tungsten Production. — The tungsten production of the United States during the first six months of 1916 exceeded the production of this or any other country in any previous 12 months. Prices reached more than ten times their ordinary level largely because of the need for high speed steel. The output was equivalent to about 3,290 short tons of concentrates valued at $9,113,000.

Studies in Operation—The Western Maryland

From a Deficit of Nearly Three Millions to a Surplus Equal to Five Per Cent on the Preferred Stock



THE Western Maryland after paying interest charges on its bonds and charging out interest on $13,000,000 notes, which are in default, will have about $500,000 available for dividends on its $10,000,000 preferred stock. In the fiscal year ended June 30, 1914, the company had a deficit, after the charges for interest, of $2,716,000. Gross earnings, of course, have been much higher in 1916 than in 1914, but more important than the increase in gross, has been the fact that whereas the ratio of transportation expenses to gross reached 58 at one time in 1914, it has been at no time in 1916 above 35, and in most months has been in the neighborhood of 32.

Before describing conditions in 1913 and 1914, a brief history of the property will be essential.

In 1905 the Western Maryland operated 544 miles of road, the greater part of which was main line. This main line ran from Baltimore via Hagerstown, Md., and Cumberland to the West Virginia coal fields at Elkins, with various branches extending out from Elkins into the coal region. Originally the road had been built to take lumber out of West Virginia; the last of this lumber is now being cut. Prior to 1900, and for a few years thereafter, the road was owned by Baltimore capitalists. By 1906 the Goulds with the help of Rockefeller capital had acquired control. It was planned to use the Western Maryland as the Atlantic Seaboard outlet for the Pacific to Atlantic railroad system which George Gould attempted to piece together. The Wheeling & Lake Erie was to have been connected with the Western Maryland at one of the Western Maryland's western termini. The scheme fell through. Gould properties one after another went into the hands of receivers, but apparently additional investments were made in Western Maryland, by the Rockefellers.

The Situation in 1913 and 1914

B. F. Bush, who at that time was the joint selection of the Goulds and the Rockefellers, was elected president of the Western Maryland in 1909. Timber was furnishing less and less traffic for the Western Maryland and the Baltimore & Ohio, which parallels the Western Maryland from Cumberland to Baltimore, was making a successful fight for a large proportion of the coal from the West Virginia fields destined for Baltimore, or for points reached by the Philadelphia & Reading. Although the Gould scheme for making the Western Maryland part of a trans-continental system had fallen through, the idea of making the Western Maryland something more than a coal road persisted. Under Mr. Bush's management an extension was planned from Cumberland north to Connellsville, where connection with the Pittsburgh & Lake Erie of the New York Central system could be obtained. This line would parallel the Baltimore & Ohio and be extremely expensive, but it was built, nevertheless.

The line was 90 miles long and cost $13,000,000. It climbed up out of Cumberland northbound with grades of 92 ft. to the mile, reaching an altitude a little south of Deal, Pa., of nearly 2,400 ft. From there it dropped down to Connellsville, with some grades against southbound traffic of 42 ft. to the mile.

A traffic agreement was made with the Pittsburgh & Lake Erie and a good deal of advertising was devoted to the fact that the Western Maryland would give the New York Central lines a Baltimore outlet, and would permit competition with the Baltimore & Ohio on import business from Baltimore for the West. Most of the talking about this, however, was done by the Western Maryland. As a matter of fact, very little business from Baltimore, either of import or of any other nature, developed for movement via the Western Maryland to the New York Central lines. Some business is being given by the Pittsburgh & Lake Erie to the Western Maryland at Connellsville, which is not by any means as much as was expected, and the fact that the New York Central is giving and not receiving is an explanation of the lack

of enthusiasm on the part of the New York Central traffic officers in respect to the "Baltimore outlet."

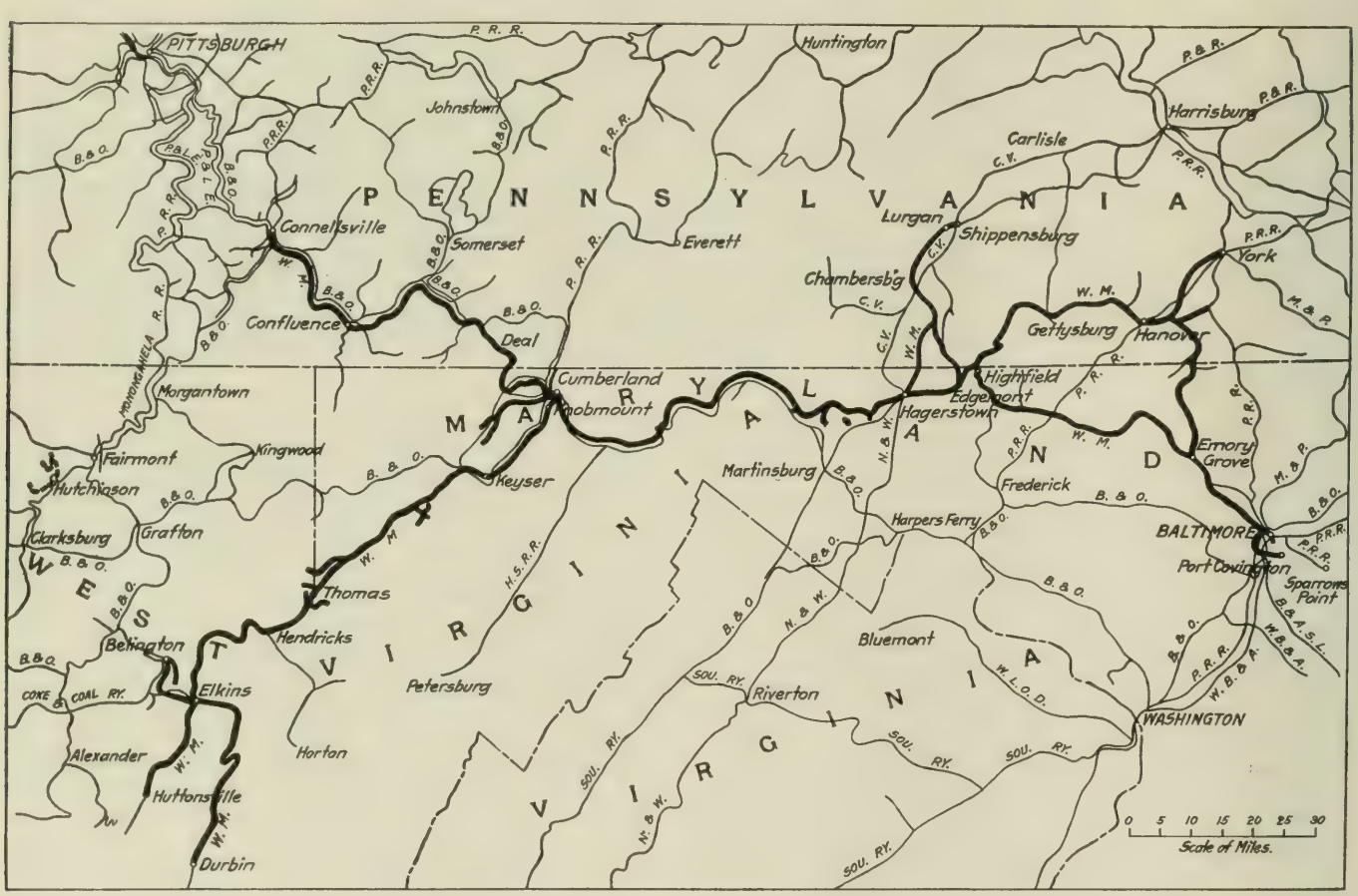
Mr. Bush left the Western Maryland in 1911 to become president of the Missouri Pacific. He was succeeded first by A. Robertson and then by J. M. Fitzgerald. The building of the Connellsville extension had been an unbearably heavy strain on the Western Maryland's credit at the time when it was essential that considerable sums should be spent for heavier locomotives, increased shop facilities, strengthening of bridges and roadway, renewal of ballast, and other improvements which would permit the economical handling of coal and other traffic, much of it low grade—the Western Maryland's average ton-mile rate was 5.24 mills in 1915—in competition with the Baltimore & Ohio.

The need for at once reducing expenses was imperative, and therefore heavy locomotives were ordered, but these orders were placed before track and bridge conditions or shop facilities were adequate to permit of the operation of this heavier power and heavier trains; the result was that expenses climbed up abnormally.

To straighten out conditions required time, courage, confidence, a sureness of touch founded on broad experience and, in addition to this and many other things, two absolutely essential conditions. One of these was a degree of confidence in dealing with the board of directors, and especially with the controlling interest which had become centered in John D. Rockefeller, that only a railroad president with an exceptional reputation would be likely to have. The other was a knowledge of the detailed cost of doing business. Apparently the management in 1913 did not have either of these last two essential qualities in a degree great enough to meet the needs of the situation.

In March, 1914, Carl R. Gray, then president of the Great Northern, was offered the presidency of the Western Maryland and accepted. He brought with him only two men, S. Ennes, who had made an extraordinarily enviable reputation as a superintendent on the Great Northern, and M. C. Byers, who had been chief engineer of operation of the St. Louis & San Franscisco when Mr. Gray was there, and had been made assistant to the president of the Great Northern in March, 1913. Mr. Ennes was made general superintendent and later general manager of the Western Maryland and Mr. Byers assistant to the president. It was generally understood that no other changes were to be made in the organization, if patience, a square deal for everyone and straightforwardness could prevent it. The following table shows the principal figures in the income account for the fiscal years June 30, 1913, and June 30, 1914:

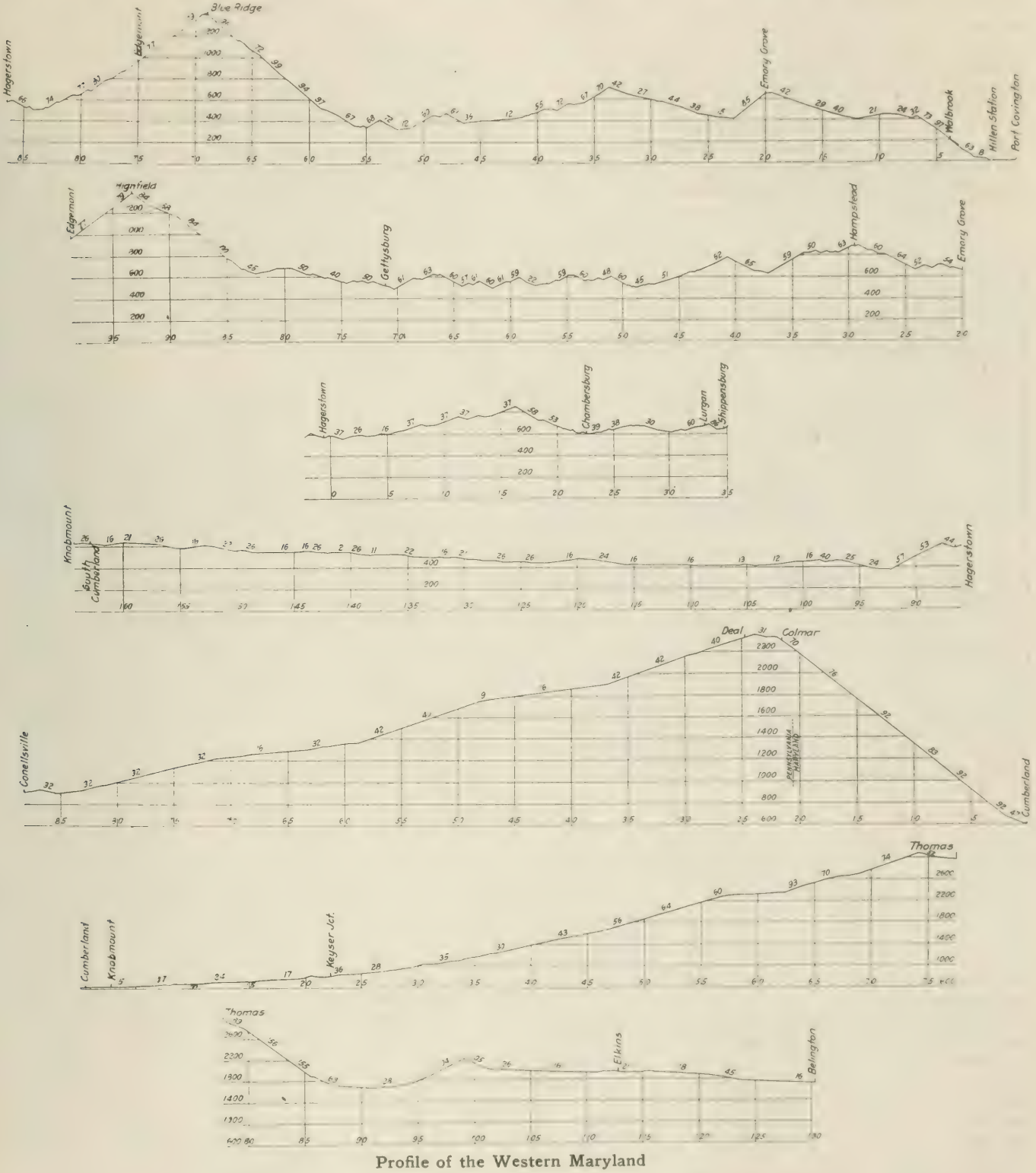
	1913	1914
Mileage operated	543	661
Coal and coke freight revenue	$3,362,307	$3,749,996
Miscellaneous freight revenue	2,912,095	3,127,766
Passenger revenue	996,691	1,021,816
Total operating revenue	7,632,679	8,267,736
Maintenance of way and structures	1,155,972	1,588,476
Maintenance of equipment	1,240,025	1,887,555
Traffic expense	189,602	280,045
Transportation expense	3,271,908	3,825,336
General expense	161,640	267,220
Total operating expense	6,019,147	7,848,631
Taxes	240,000	263,205
Operating income	1,375,873	154,147
Gross income	2,459,923	381,602
Interest and other fixed charges	2,874,896	3,097,267
Deficit	414,973	2,715,665



The Western Maryland

It will be recalled that the new management went to the Western Maryland in March, 1914. The figures for the 1914 fiscal year, therefore, represent about eight months of the old management and the first four months under the new management.

During the first four months the new management devoted its attention almost entirely to two main problems, one a study of the property and organization, with, of course, the traffic and the other to the taking up of deferred maintenance. Nothing which the new management has done since is any surer proof of courage and ability to live up to well-founded convictions than the fact of turning in such an income account to the board of directors as that shown above for 1914. The convictions which led to the policy pursued in the four months ended June 30, 1914, and the faith on the part of the board of directors which did not balk at a frank pursuit of this policy have both been justified in an almost dramatic way.



Profile of the Western Maryland

Description of the Property in 1914

In 1914 the Western Maryland was operating 661 miles of road, the main line extending from Baltimore, with double track to Emory Grove and with two single track lines from there, one via Gettysburg and one via Thurmont to Charmian, Pa., and with a single track line from there to Cumberland; also a single track line from Cumberland to Connellsville northwest and a single track line from Cumberland to Elkins

southeast, with branches from there to Durbin, Huttonville and Belington.

The profile shows the grades on the main lines as they are now. Very little change in grade line has been made since 1914. In 1914 twenty heavy Consolidation locomotives were received and five switching locomotives. The Western Maryland has two principal shops, one at Hagerstown and one at Cumberland. The facilities at neither one of these shops were adequate to take care of the new heavy engines. In the first four months of the fiscal year ended June 30, 1914, 11 locomotives were scrapped and 50 engines were sent to outside shops to be repaired. Engine failures in the early part of 1914 were abnormally high.

Side track maintenance had been so inadequate that in some places it was almost, if not quite, dangerous to take a freight train with a heavy locomotive on to a side track, even when the greatest care was used.

First Steps Toward Rehabilitation

No monthly detailed transportation cost figures were being kept when the new management took the Western Maryland in March, 1914. The installation of a monthly set of reports was at once ordered, showing a complete income account according to the Interstate Commerce Commission's classification, complete maintenance and transportation expenses by car-mile, per freight train mile and per freight engine mile.

The road was divided into six accounting districts, the first extending from Baltimore to Hagerstown, including both the Gettysburg line and the Union Bridge-Thurmont line; the second district, Hagerstown to Shippensburg and Edgemont to Quinsonia; third district, Hagerstown to the east end of Cumberland yard; fourth district, Cumberland to Connellsville; fifth district, Cumberland to west end of Thomas yard; sixth district, everything west of Thomas.

It was found necessary to abolish one of the three operating divisions, that with headquarters at Baltimore. Baltimore is properly a terminal and to combine the operations there with the operations of a part of the main line west thereof is confusing, insofar as cost accounting is concerned. Partly for this reason and partly because of reasons connected directly with the practical operation of the road, which will be gone into more fully in describing the present situation, a third division was not economical. This change gave an opportunity to use a certain discretion in the retention of operating officers, but, as a matter of fact, the officers who are in charge of those sections of the road outside of the third division simply had their authority extended in such a way as to round out their divisions.

Even a superficial inspection of shop facilities showed that the shops at Hagerstown and Cumberland were neither of

FORM C T 180.

THE WESTERN MARYLAND

_____ 19____

Per Cent. of Total Engine Efficiency Unused_____

TONNAGE TRAINS

Sheet No. 1	Rating Haul This Date		Total Ton Miles to Date: This Month	Total Ton Miles to Date: Last Month	Total Cost to Date: This Month	Total Cost to Date: Last Month	Cost Per 1000 Ton Miles to Date: This Month	Cost Per 1000 Ton Miles to Date: Last Month	Cost Per 1000 Ton Miles: This Date	Cost Per 1000 Ton Miles: Last Year	No. of Train Miles: This Date	No. of Train Miles: Last Year	No. of Engine Miles: This Date	No. of Engine Miles: Last Year	Cost Per Train Mile: This Date	Cost Per Train Mile: Last Year
	1st Acctg. Dist.	%														
	2nd " "	%														
	3rd " "	%														
	Eastern Division	%														
	4th Acctg. Dist.	%														
	5th " "	%														
	6th " "	%														
	Western Division	%														
	System	%														

Helper Eng. From To	TRAIN, ETC.: Direction	Conductor	Engineer	Train	Engine	OUT OF TERMINAL: Leaving	Capacity in Tons	Tons Moved	% of Capacity Moved	No. of Cars	Actual Ton Miles Moved	TON MILES OF ENGINE EFFICIENCY LOST (AND CAUSE): Mech'l Defects	Fast Freight	Set Outs and Local Work	Nothing to Move and Car Limit	Weather Conditions	Ton Miles Should Have Moved

Form of Daily Report

primary accounts as prescribed by the Commission showing both the current month, the previous month and the corresponding month in the previous year, as well as the cumulative figures for the fiscal year to date and the corresponding period for the previous year; detailed maintenance and transportation and other expense figures by primary accounts for the month and for the corresponding month of the previous year divided as between freight and passenger for the system and also for each accounting district, and freight statistics by accounting districts for the current month and the corresponding month of the previous year. These freight statistics included each general class of expenses in freight service; each general class of expenses per train-mile, per locomotive-mile and per hundred net ton-miles. The freight statistics sheet also included a statement showing tons one mile, tons one mile per mile of road, tons per loaded car-mile, tons per loaded and empty car-mile, tons per freight train mile, tons per freight engine mile, percentage of switching to total freight engine mileage, percentage of empty to total freight car mileage, percentage of all freight engine mileage to freight train mileage, percentage of helping to freight train mileage, and freight earnings per mile of road, per ton-mile, per loaded

them adequate to make repairs to the locomotives, which were obviously desperately in need of repairs. About 50 engines were sent to outside shops at an aggregate expense of approximately $300,000. There were 538 freight cars, 20 passenger cars and 11 locomotives, none of which were in condition to justify repairs and all of which were scrapped. This was all taken up in operating expenses, except such amounts as had already been accrued in depreciation; from the 1914 balance sheet it would appear that such accrued depreciation, if there was any, must have been very small.

Strengthening of side tracks was imperative. This work came under the head of maintenance and included both tie and rail renewal. Bridge strengthening was also necessary on some parts of the line and tie and ballast renewal was necessary on a good part of the main line. The entire main line had been ballasted at one time or another, and under the Interstate Commerce Commission's rules, therefore, it was proper to charge the cost of ballast to maintenance expenses, although a less liberal interpretation of the commission's rules might have been so made as to permit the charging of a good part of this work to capital account. In the fiscal year ended June 30, 1914, there was $1,588,000 spent for

maintenance of way, an increase of $433,000 as compared with the previous year. Almost all of this increase was during the four months, March to June, inclusive. The amount spent in 1914 for roadway and truck was 52.19 per cent more than in the previous year; for ballast, 61.57 per cent; for ties, 43.35 per cent, and for rails, 27.45 per cent. There was only $13,530 charged to capital account for ballast in 1914 and $2,189 in 1915 and correspondingly small amounts during the year just ended. Nothing was charged to capital account for ties in 1914 and only a few thousand dollars in 1915. The present condition of track, with the exception of less than $50,000 for additional weight of rail and a little over $100,000 for other track material—tie plates, etc.—represents the expenditure for maintenance work and the application of maintenance of way labor to track.

It was decided, despite the temptation to rush matters, to give each section foreman a regular gang of seven men, to let him keep his gang at full strength the entire year, and to do away, except in real emergencies, with extra gangs. The expenditures for additional weight of rail, it will be noticed, are very small. The standard had been 90 lb. and on June 30, 1913, the average weight of rail in main and second track was 82.21 lb. and by June 30, 1914, had been brought up to 83.34 lb. Heavier rail fastenings were needed at a good many places and all new rail was laid on tie plates, the standard adopted by the new management being a large plate slightly thicker at the outside of the rail than at the inner edge, with a smooth under-surface.

Before any expenditures were made for expensive additions and betterments to structures and shop a very careful study of the needs of the property was made. The mere fact that a roundhouse or other structure looked dilapidated was not taken as conclusive evidence that a new structure had to be built. It was nearly two months before plans for new shops were decided on, and then an addition was made to the Hagerstown shop which more than doubled its capacity and rendered it, with the Cumberland shops which also were improved, capable of repairing the equipment now in service. During the latter part of 1914 there was approximately $200,000 spent on shops, enginehouses and terminals, which represented additional capital expenditure, and about an equal amount for shop machinery and tools, which also represented capital expenditures.

Organization

The new management consisted of Carl R. Gray, president and chairman of the board; S. Ennes, general superintendent and later general manager, and M. C. Byers, assistant to the president. There was a departmental form of organization already established, and while the traditions of the president and his assistant and his general manager were such that they probably believed in divisional organization, no change was made. The operating organization was naturally rather demoralized. Trainmen were never sure when they started out with an engine how far they were going to get; maintenance people had been pounded pretty hard to hold down expenses, with the result that they necessarily gave the transportation officers and employees pretty poor material to work with, both in regard to locomotives and cars and condition of roadbed. The showing made in the latter half of the calendar year 1913 and the first month of 1914 looked very bad. As a matter of fact, however, the personnel of the operating officers on the Western Maryland was high. For operating purposes the road is now divided into an eastern and western division; the former is divided into six districts and the latter into five districts. The eastern division has a superintendent, assistant superintendent, two trainmasters, a chief train despatcher and assistant, a road foreman of engines and an assistant road foreman of engines. The western district has a superintendent, three trainmasters, a chief train despatcher and two assistants, and a road foreman of engines. As soon as trainmen and operating officers found that the new management was dead in earnest in trying to help them in every way possible, it was remarkable how quickly they got their shoulders to the wheel. The keynote of the change which has taken place in the Western Maryland organization may be summed up in the one word "confidence." Trainmen, operating officers, mechanical officers and engineering officers recognized that they had a management which thoroughly understood the business of railroading and was ready and able to give any help that was necessary. When the operating organization had been gotten into this frame of mind it became a question of a detailed study and analysis of expenses.

RAILWAY COMPANY. TRANSPORTATION DEPARTMENT—DAILY TRAIN TONNAGE REPORT.

UNIT VALUES — WAY FREIGHT TRAINS

Avg. No. Tons Per Train Mile		Avg. No. Tons Per Engine Mile		Avg. Miles Per Hour		Avg. Cars Per Train		Overtime % of Total Wages		Helper Service % of Cost		% of Crews Paid Local Rate		No. Trains Run		No. Cars Handled		Cost Per Train		Avg. Miles Per Hour		Avg. Cars Per Train		Overtime % of Total Wages	
This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year.	This Date	Last Year

No Tons Coal Consumed	Total Cost of Fuel	Wages of Crews Inc Overtime	Cost of Overtime	Total Cost Labor and Fuel	Miles Run	Hours on Duty	Avg. Miles Per Hour	CARS HANDLED			OVERTIME MADE (AND CAUSE)									Cost of Helpers	Cost Per 1000 T. M.	REMARKS
								Rev Loads	D. H. Loads	Empties	Orders and Trains	Accidents	Eng. Failures	Car Failures	M. W. & S. Work	Waiting for Helper	Sta. Swtg	Term Delay	Total			

Form of Daily Report

Daily Reports of Individual Freight Train Expenses

One of the illustrations shows the blank form which was introduced for daily train tonnage reports. The headings are self-explanatory and all of the figures required to fill in this form are derived from the train despatcher's sheets and from fuel reports. The train despatcher's sheets are, of course, accurate; the fuel reports are not absolutely accurate, since there is no device in use on the Western Maryland for measuring the coal delivered to the locomotive tenders. During the last year, however, much interest has been aroused among offi-

cers and employees in charge of fuel stations in making the estimates of fuel delivered to tenders as accurate as possible and it is believed that the results which are now being obtained are very close approximations to the actual figures. The study of these daily tonnage reports taken in connection with a study of the monthly statements mentioned previously for each accounting district makes a very comprehensive analysis of the cost of doing business on the Western Maryland.

The Results Now Being Obtained

The Western Maryland now operates 661 miles of road. Of this, 292 miles is main line owned, 97 miles is branch lines and spurs owned, 150 miles is leased lines, 50 miles is operated as "operated lines," 68 miles is the Connellsville & State Line Railway, the subsidiary company which built the Connelsville extension, and 3 miles is operated under trackage rights. The proportion of leased line looks large, but as a matter of fact the annual payment for rent of this leased line is only $121,567. Of the total tonnage carried by the Western Maryland in 1915, 70.49 per cent was products of mines, 12.49 per cent manufactures, 9.20 per cent products of forests, 3.86 per cent general merchandise, 2.72 per cent products of agriculture and 1.24 per cent livestock and products of animals. By far the greater part of the Western Maryland's traffic is eastbound. Coal traffic is of first importance, and passenger traffic is but an unimportant part of the total business and is not considered particularly profitable. Of the total revenue for the 11 months ended May 30, 1916, amounting to $9,937,000, only $866,000 was passenger revenue, and the total passenger service revenue, including this $866,000, was but $1,138,000. The determining factor in expenses is the expense of moving coal traffic eastbound; this fact should be kept in mind in an analysis of the figures for revenue and expenses by districts.

The freight that originates west of Cumberland is divided at present in the proportion, approximately, of 175 loads a day from Connellsville and 340 loads from the line that runs from Elkins to Cumberland. The Western Maryland climbs both the Blue Ridge and the Alleghenies, besides which it has some heavy grades on its short line between Hagerstown and Baltimore between the Blue Ridge mountains and Baltimore. Although the line from Edgemont via Gettysburg is 80 miles, as against 55 miles via Thurmont, the longer route is used for eastbound heavy freight traffic. Nearly three-fifths of the coal traffic, however, does not go over either the Thurmont or Gettysburg line; it moves from Hagerstown northeast to Lugan and Shippensburg, where it is delivered to the Philadelphia & Reading. The coal which originates west of Thomas has to be hauled up over the Alleghenies against a grade of 156 ft. to the mile, five miles long. The larger part, however, of the coal comes from Thomas and branch lines east of Thomas and has, therefore, no bad grades, the heaviest being 37 ft. to the mile, except for one short grade just west of Lugan, which is 60 ft. to the mile.

Total operating revenues in the 11 months ended May 31, 1916, amounted to $9,937,000, an increase as compared with the corresponding 11 months of the previous year of $2,098,000. Total operating expenses amounted to $6,453,000, an increase of $744,000. Of this increase $240,000 is accounted for by an increase in the expenses for maintenance of equipment and only $377,000 by an increase in transportation expenses. The earnings and expenses per freight train mile by districts in May, 1915, and May, 1916, gives a fairly good idea of the character of the different accounting districts of the road.

	Expenses		Earnings	
	1916	1915	1916	1915
First district	$3.29	$2.80	$2.95	$2.92
Second district	1.87	1.85	4.47	4.13
Third district	2.54	2.86	6.92	7.35
Fourth district	2.01	2.17	4.15	3.30
Fifth district	2.35	2.39	4.74	4.64
Sixth district	2.63	2.82	1.71	1.77
Entire road	$2.52	$2.49	$4.36	$4.21

It will be seen, therefore, that the second, third, fourth and fifth districts are the ones that are profitable, that is, the Hagerstown-Shippensburg line, Hagerstown-Cumberland line, Cumberland-Connellsville line and the Cumberland-Thomas line.

Taken in connection with a study of the profile, the comparison between earnings per train-mile and per engine-mile by districts is interesting. For the first district it was $2.95 and $2.45 respectively in May, 1916; second district, $4.47 and $3.51; third district, $6.92 and $5.47; fourth district, $4.15 and $2.64; fifth district, $4.74 and $4.40, and sixth district, $1.71 and $1.09. The average cost in cents per hundred ton miles in May, 1916, and May, 1915, by districts was as follows:

	1916	1915
First district	56.30	48.08
Second district	21.16	22.58
Third district	18.52	19.57
Fourth district	24.44	33.16
Fifth district	25.07	25.94
Sixth district	78.03	80.35
Average for system	29.22	29.83

Outlook for the Future

The balance sheet when it is made up for June 30, 1916, will presumably be a considerably better looking statement than that for June 30, 1915, but if taken by itself without consideration of what has been done in the improvement of the operation of the road it will look more like a receiver's balance sheet than that of a company which is being operated by its stockholders. As of June 30, 1915, there was $735,000 cash on hand, with $3,785,000 loans and bills payable and $890,000 interest matured and unpaid; a debit to profit and loss of $3,148,000; $12,735,000 unextinguished discount on stock and $558,000 unextinguished discount on funded debt. The fact of the matter is, of course, as everyone who has followed the situation knows, that in 1914 the Western Maryland was insolvent, but was being carried by its own stockholders. It was a brand snatched from the burning, probably because John D. Rockefeller did not want the name of Rockefeller connected with a railroad failure.

There is every present prospect, however, that, like other ventures with which this name has been connected, it is going to be by no means a failure. The present rate of earnings is higher than it would be under normal conditions were no new developments being carried on to provide for a large increase of traffic. As a matter of fact, however, very important developments are taking place which, unless something unforeseen happens, will not only maintain the present volume of traffic, even were the European war to come suddenly to an end, but will steadily increase traffic. The same interests which control the Western Maryland now have a very large, if not actually, controlling interest in the Consolidation Coal Company. This company was at one time operated in fairly close harmony with the Baltimore & Ohio, but is now working with the Western Maryland. The Western Maryland has just built a short track about a mile long to the new Davis Coal & Coke Company mine at Davis, W. Va., from which it is expected that the daily output will be 1,000 tons. The Western Maryland is also building three miles of track to new Consolidation Coal Company mines in the Somerset district and this work is about 80 per cent. done. From these mines it is expected that there will be 500 tons of coal sent over the Western Maryland a day. The company is also building a 20-mile road with yard connections to connect with the Baltimore & Ohio at Chiefton, W. Va., and to reach, via the Baltimore & Ohio, three new Consolidation

Coal Company mines in the Fairmont district. This work is 50 per cent done and the mines are shipping a small amount of coal now, but it is expected that they will ship within a year 1,000 tons a day over the Western Maryland. These improvements will insure an increase of about 2,500 tons a day, or 900,000 tons a year. This alone ought to make up for any loss of business due to the cessation of the European war.

At Baltimore the Western Maryland has a poorly situated passenger station, known as the Hillen station; to reach it the Western Maryland has either to use the Pennsylvania tracks or the Baltimore & Ohio tracks; at present it is using the Pennsylvania, by the use of whose tracks it gets into the union station, but the rental is fairly high.

Freight facilities at Baltimore are better than almost anyone who has not made a close study of the property even suspects. The Western Maryland has its own right of way through South Baltimore to Port Covington, with a large yard at Port Covington, a large pier and grain elevator, and ample ground for the expansion of these facilities to take care of the greatest development of the port of Baltimore which even the most enthusiastic Baltimorean could hope for. A very good bargain has been made with the United States government by which the Western Maryland gives up a piece of its Port Covington land, necessary to the government to get a straight deepwater channel to the drawbridge which is being built across the estuary which runs from Chesapeake bay at Port Covington, in exchange for the right to extend the present pier head line out several hundred feet. While this bargain was probably advantageous to the government it was certainly a most excellent piece of business for the Western Maryland, giving it a pier head line which will permit a number of the largest grain boats to load alongside the pier at one time. The right of way from the main line to Port Covington is ample for four tracks, so that in this most important particular of terminals the Western Maryland has almost unlimited growing room.

The Western Maryland has also been shrewd and foresighted in getting into industries along the Port Covington waterfront in territory which the Baltimore & Ohio up to a few years ago considered exclusively its own. There are large fertilizer, acid and other manufacturing plants in this territory, many of them affiliated with the Standard Oil interests. Here, then, possibly is the foundation for the westbound business which will mean so much to the Western Maryland both in permitting a lower operating ratio and in bargaining at Connellsville with the New York Central for eastbound business.

The grain elevator and storage tanks at Port Covington are of the most modern construction. The elevator is one of the most economically operated in the country; it was built by the same man who built the grain elevator for the Great Northern at Duluth, but its economy of operation has profited much by the experience gained in building the Duluth elevator. At present new grain storage tanks are being added which will increase the storage capacity by 150 per cent. More than 75 per cent of this work is now completed. An additional yard is being built at Port Covington to accommodate 300 cars, and this work is 25 per cent completed. There are also additional tracks being built at Wagner's Point, South Baltimore, to serve large industrial concerns by car float and this work is 50 per cent completed. In addition, a new engine terminal and car repair facilities have been authorized at Port Covington, but have not yet been started. The land for these, of course, is owned. There are now 200 miles of automatic block signals in operation.

In addition to the improvements which have been mentioned above and those being made in connection with the development of the coal mines of the Davis and Consolidation Coal companies, there is 3.7 miles of second track being built from Pen Mar to Edgemont, which work is about 75 per cent done. There is two miles of second track from Security to Hagerstown freight yard, on which about 25 per cent of the work is done. There is six miles of second track from Clearspring to Big Pool, of which 10 per cent of the work is done. There are also authorized, but not yet begun, seven additional classification tracks at Hagerstown yard and two 125-car departure tracks; a new line from Connellsville to a connection with the Baltimore & Ohio at Fairmont; a new yard with four 100-car tracks; a wye and engine terminal to care for the business from the Fairmont district on which work has just been started, and four 100-car departure tracks at Cumberland for which land has just been bought.

The doubt that arises as to how great the future development of the Western Maryland can be comes from the fact that the road does not get into Washington. It cannot, therefore, make a bid for traffic from the southeastern roads and this lack of westbound traffic is a limiting factor in its development. Apparently the management believes that by developing port facilities at Baltimore this handicap can be overcome. There is, of course, another possibility, and that is for the Western Maryland to acquire a connection to Washington. The Washington, Baltimore & Annapolis electric line has a fairly good right of way from the heart of Baltimore across the Western Maryland tracks leading to Port Covington to the District of Columbia line outside of Washington. Whether or not such an extension as this will be necessary is a question that cannot be answered definitely. The management is going ahead with plans which, if as successful as they hold out prospects of being, would make the Washington connection unnecessary insofar as making a sound, solvent, profitable property out of the Western Maryland.

MACHINE COLLECTION OF TICKETS AND FARES BY SOUTHERN PACIFIC

By William S. Wollner

On account of the large increase in the traffic through its San Francisco ferry depot during the Panama-Pacific International Exposition last year, the Southern Pacific found it advisable to replace the system of manual collection of tickets and cash fares, then in use, by experimenting with ticket and coin-collecting machines, and as the result of their successful operation the machines installed at that time are now a permanent part of the station equipment. In addition to the through travel there is handled through the ferry depot the suburban traffic to the communities on the east shore of San Francisco bay, with a service of 908 trains per day and ferry steamers plying between San Francisco, Oakland and Alameda.

The ticket-collecting machines were first installed and later they were supplemented with a coin-collecting device. A great many single trip tickets were sold through the ticket windows and it was found that the services of the ticket-sellers could be dispensed by requiring payment of the fare at the ticket gate.

A count made on December 15, 1914, before the coin-collecting machines were used, showed that 4,364 single-trip tickets were collected between 4.30 and 6 o'clock in the evening. In addition to these single trips and through fares, about 12,500 monthly commutation tickets are sold and a great many free tickets are used by company employees.

It was formerly the practice for the ticket collector at the ferry depot to take the ticket or coupon from the passenger's hands and cancel it with the usual form of ticket punch. With the use of the ticket-collecting machine the passenger deposits a commutation coupon directly into a receiving chute, from which it drops onto an inspection plate illuminated by an electric light bulb. This gives the

collector, who stands facing the machine, an opportunity of seeing whether the coupon is of the proper date, then by means of a lever placed alongside the inspection chamber the collector tips the inspection plate so that the coupons drop into a compartment below containing rolls for cancelling the tickets. The tipping of the lever starts an electric motor which operates the rolls. No count is kept of the number of tickets deposited or cancelled.

Through tickets, passes and similar forms of transportation, are collected by the gateman and punched as before, but an effort is made to handle all passengers, except suburban passengers, through a separate gate.

Passengers who formerly purchased single-trip tickets at ticket windows and handed them to gatemen for cancellation now deposit the amount of the fare directly into the collection chute. The collector is prohibited from depositing the coin for the passenger. The exact fare being deposited passes over the illuminated inspection plate, and when the collector tips the lever alongside the box it drops into the coin scoop compartment. The tipping of the lever actuates the electrically-driven registering device and all coins are registered in terms of nickels, each 10-cent fare registering as two 5-cent fares, a quarter registering as five fares, etc. After passing through the counting device the coins drop into three separate compartments, for nickels, dimes and quarters. These are accessible to the collector and the money taken from them is used for making change or for transfer to a drawer provided for the purpose. While the machines will only register nickels, dimes and quarters, coins of any denomination may be deposited, the larger coins passing into a locked box from which they are removed in the presence of the collector by the man who checks the register and removes the cancelled coupons. The coin device will accommodate as many as 100 coins per minute and will register as high as $5,000 in nickels.

To assist the gateman in making change for passengers quickly a coin-changing device is suspended in front of the machine and is detachable from it. This device includes four tubes—one for quarters, two for dimes and one for nickels, with a total capacity of $35. The device is operated by four keys marked 10 cents, 25 cents, 50 cents and $1. When a key is depressed the exact amount of change, after deducting the 10-cent fare, is dropped into the operator's hand, and handed by him to the passenger for deposit in the coin-collecting device. During rush hours a man whose sole duty is to make change is stationed in a booth near the ticket gate, thus relieving gatemen of this work.

Each collector, when he reports for work is supplied with his own change-making device and a supply of coin. He takes this with him when he reports at the gate and attaches it to the ticket collecting machine. He then signs his initials on the card of the man he is relieving to check the closing number shown on the register of the machine and fills in this same number on his own card. When he is relieved from duty the collector fills in the closing number on his card and has it O. K.'d in the same manner by the collector who relieves him. He then fills in the number of nickels registered and converts the total into dollars and cents. He also lists on the card the coin turned over to the cashier at the end of the shift, which is signed for by the cashier as received. The card is then sent to the auditor of passenger accounts for his information and records.

The Southern Pacific handles 1,955,000 persons through its gates and has six machines of this type in service at the San Francisco Ferry Depot at a total cost of maintenance of about five dollars per month. As a result of the success of this installation a similar one is to be made by the San Francisco-Oakland Terminal Railways at the San Francisco Ferry Depot. The machine is known as the Volgesong Combination Receipts Machine and is made by the American Coin Registers Company, Oakland, California.

DISASTROUS EXPLOSIONS AT JERSEY CITY

By a fire which was followed by numerous explosions of dynamite and ammunition of various kinds, in cars and on barges, which started at Black Tom Island, so-called, Jersey City, N. J., on the morning of Sunday, July 30, about 1 o'clock, property aggregating in value from $10,000,000 to $20,000,000 was destroyed, and a number of lives were lost. At last accounts, five persons were known to have been killed, including the chief of police of the Lehigh Valley Railroad, and a number of others probably had been drowned with small vessels. Scores were injured. The center of the disaster was on the docks of the National Dock & Storage Company, most of the space on which was leased to the Lehigh Valley Railroad. Of twenty-four big storehouses owned by the Dock Company, thirteen were destroyed, and a number of others were damaged. The six piers occupied by the tracks of the Lehigh Valley were destroyed, and with them eighty or more loaded freight cars. A number of freight cars on floats were also destroyed or sunk. Several barges containing explosives were set adrift, and caused havoc at points where they landed or when they struck other vessels. The first explosion was at 2:08 a. m. It broke hundreds of window glasses in Manhattan, three miles away, and caused similar but less serious damage at points farther off. A half



hour later, another explosion of equal or greater violence occurred; and smaller explosions continued at intervals for several hours afterwards, as the fire reached different cars or boats.

An officer of the Lehigh Valley reported that the fire started in a barge belonging to a towing company which had been moored at the railroad company's dock, contrary to orders and in violation of law. The fire in a short time spread from the barge to cars standing nearby. In one of the warehouses there was about 40,000 tons of raw sugar, valued at approximately, $3,400,000; and large quantities of tobacco, salt and other merchandise were destroyed.

Cases of explosives which had been hurled from burning barges were found floating in New York bay and in the North river five miles away, on Monday and Tuesday, constituting a grave menace to shipping.

According to Frank Hague, commissioner of public safety, of Jersey City, the reason for the tying up to the Lehigh pier of the Johnson barge, which was loaded at the pier of the Central Railroad of New Jersey, was to save $25 in towing charges.

Four men were arrested charged with manslaughter, namely: E. L. McKenzie, president of the National Dock & Storage Company; T. B. Johnson, president of the Johnson Lighterage & Towing Company; Alexander Davidson, superintendent of the National Storage Company piers, and Albert M. Dickman, of Jersey City, agent at the Black Tom piers of the Lehigh Valley Railroad.

Meeting the Federal Headlight Requirements

A Discussion Dealing With Incandescent Electric Equipment, and a List of Publications on Headlight Subjects

By L. C. Porter

THE recent Federal legislation* requirements governing locomotive headlights will unquestionably start an active search for literature, and probably cause tests to be conducted by various railroads in the immediate future, in order to determine the best method of meeting the new specifications. A brief outline of what has been accomplished and references to some of the literature already available, may be of assistance in solving the problem. It is not the intention of the writer to enter into a discussion of the merits or otherwise of the new ruling, but rather to describe equipment, including principles involved in its design and operation, which will comply with the law, and to suggest methods of test and desirable specifications for such equipment.

The primary function of a headlight is to project illumination to a distance. There are two methods of doing this, in common use: One by passing the light generated through a lens and thus concentrating the rays into a beam; the other by reflecting the light rays by use of a reflector of parabolic shape, which accomplishes the same result. With either equipment, if the light could all originate from a point source (a physical impossibility) located at the focal point of a perfect lens or reflector, the resulting beam would be parallel, and, neglecting atmospheric absorption, would reach to infinity. (See Fig. 1). However, all light sources have physical dimensions, and hence the beam from such a source used with a projecting lens or reflector will have a certain amount of spread, depending on the size of the light source, the focal length of the projector, etc. (Fig. 2). Its intensity is assumed to vary inversely as the square of the distance from the projector†.

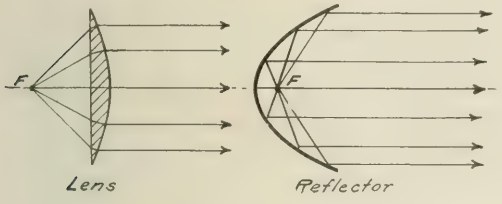


Fig. 1—Diagram Showing Projection of Light Rays from a Point Source Through a Convex Lens and Parabolic Reflector

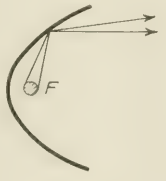


Fig. 2 — Diagram Showing Projection of Light from a Spherical Light Source in a Parabolic Reflector

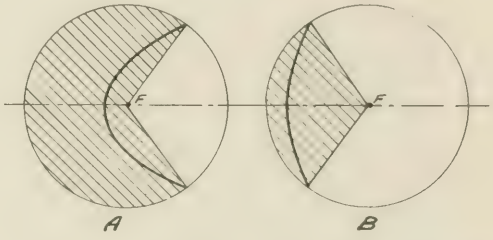


Fig. 3—Diagram Showing Amount of Light Utilized by a Short Focus and Long Focus Parabola of Equal Diameters

It is apparent from Fig. 2 that the size of the light source has a very material effect upon the spread of the beam and, therefore, also upon its intensity. For, assuming that we have the same volume of light to work with, it is obvious that if it is spread out over a large area, as with a beam of large dispersion, the light intensity on this area must be lower than if all of the light were confined to a small area by projecting it as a narrow beam. Thus, the source of light has great influence on the resultant beam.

The most common light sources used for locomotive headlights are the flame of a kerosene oil lamp, the flame of an acetylene burner, the crater of a carbon arc and the filament of an incandescent lamp. Of these the size of the oil flame is the largest; next to this is the acetylene flame and then comes the arc. With the incandescent lamp, the size of the source depends upon how closely the filament is coiled. Especially on low voltage it is possible to secure a light source of very small dimensions. Assuming that we have a light source of constant area, the greater the volume of light emitted by that source—or, in other words, the higher its candlepower—the greater will be the intensity of the resultant beam.

The flame of the oil lamp is relatively of low intrinsic brilliancy—approximately 9 c.p. per sq. in. Hence, to obtain a large volume of light from this source would require a very large flame, and with a large flame as a light source for a headlight the spread would be too great to obtain a powerful beam. Oil headlights in common service today have beam candlepowers in the neighborhood of 2,500. The oil lamp, therefore, is practically eliminated from the possibilities of producing a beam of sufficient intensity to "pick up" a dark object at a distance of 1,000 feet. The acetylene flame is of considerably higher brilliancy.

There are two electrical means of meeting the requirements: the tungsten filament of a gas-filled lamp, operating at about 1,200 c.p. per sq. in., and the crater of the carbon arc, operating at about 84,000 c.p. per sq. in. Headlights of both types are available, giving beam candlepowers up to 1,000,000. Either of these sources will produce sufficient light in a small enough space to be used to good advantage for powerful headlight service.

Having a certain light source to work with, the resultant beam when this source is used in a projector, will also depend somewhat upon the size and design of the lens or reflector used, and also the accuracy with which the light source is located at the exact focal point. In general it might be said that a glass lens or a glass mirror can be ground and polished more accurately than a metal mirror can be spun; hence, where extremely powerful beams are required, such as in navy searchlights, or where a little "spill" or stray light is objectionable, such as in stereopticon work, the glass lens or mirror is usually used. For headlight service, however, neither extremely powerful beams nor ones with no stray light are desirable. In fact, some stray light striking the immediate foreground is highly desirable, enabling the reading of mile posts, whistle signs, etc. For this reason metal reflectors are most common in railroad headlight service. These may be made of polished

* *Railway Age Gazette*, June 16, 1916, page 1358.

†See Transactions of Illuminating Engineering Society, Vol. X, No. 1, 1915, p. 38. "New Developments in the Projection of Light."

aluminum, having a reflection coefficient of about 61 per cent; or of brass, nickel plated, with a reflection coefficient of about 54 per cent; or of brass, silver plated, producing a surface with 86 per cent reflection. The aluminum reflectors have the advantage that they can be buffed up an indefinite number of times, whereas the plating on the others gradually wears off with frequent polishing. Replating, however, is not a very serious problem, and many silver plated reflectors are in service. The reason for the nickel surface is that it does not corrode or tarnish quite so rapidly as silver.

Headlight reflectors are parabolic in shape, but vary as to depth and focal length. With a given diameter a short focus parabola (Fig.3,*A*) will utilize more of the total light flux from a source than a long focus parabola (Fig. 3,*B*).

A description of most reflectors in common locomotive headlight service, including dimensions and photos of the complete headlight, may be found in Circular N, 1913-14, report of the committee on Locomotive Headlights, American Railway Master Mechanics' Association. This report also contains a very complete treatise of the whole headlight situation as it was at that time, and gives in detail tests conducted on the different types of headlights then on the market.

From Fig. 3 it can be seen that a parabolic reflector of short focus is desirable on account of the high percentage of the light flux it will utilize. Where incandescent lamps are used as a light source, care must be taken not to use so short a focus reflector that the lamp bulb will strike the reflector and prevent the filament coming into focus. As focus-type incandescent lamps are generally made in round bulbs with the filament in the center of the bulb, we can state that the focal length of the reflector should not be less than half the diameter of the lamp bulb plus a small clearance space of, say, ¼ in.

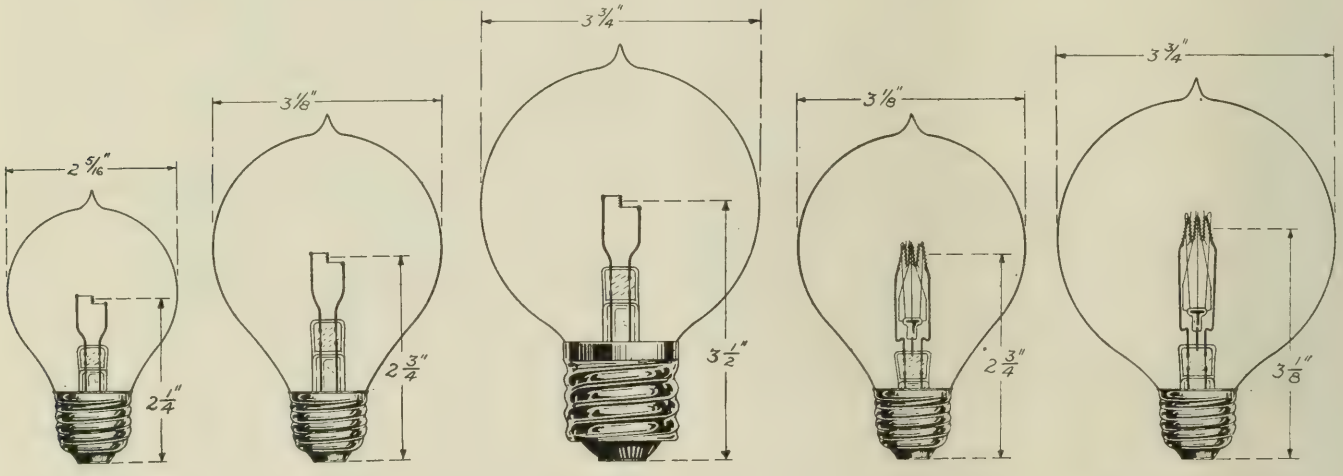
Mention was made above of the importance of actually locating the light source at the focal point of the reflector. It is equally important to retain it at this point, and therein the incandescent lamp is of great advantage. Once it is properly set in place it stays there without further attention, until the lamp fails. When a new lamp is inserted it should be focused, as it is impractical to make all lamps, even of the same type, exactly true. Another advantage of the incandescent light source is that it is absolutely steady, and furthermore, the headlight (except for very high wattage lamps) can be made dust and moisture proof, thus reducing reflector tarnish to a minimum.

The question of how powerful a beam is necessary to "pick up" a dark object the size of a man at 1,000 ft. is one which depends upon several factors; such, for example, as the color of the object, the contrast between the object and its surroundings, the atmospheric conditions, the quality of the headlight beam, etc. As some people see better than others, any observations should be made by several individuals, and precautions taken to insure the approximate representation of average visual power.

It is a curious fact that the quality or color of the beam has considerable to do with the effective pick-up distance. In tests conducted by the Railroad Commission of Wisconsin and reported at the October, 1912, meeting of the Western Railway Club; in tests conducted by the Southern Pacific and reported in the Journal of Electricity, Power & Gas for February 7, 1914, and also in tests conducted by the committee on Locomotive Headlights for the American Railway Master Mechanics' Association, reported in Circular N, 1913-14, it was found that for some reason or other it required a considerably higher beam candlepower where an arc headlight was used than with an incandescent headlight, to pick up a man at the same distance. A curve showing this difference was worked out for equivalent beam candlepowers and reported by the last committee in their circular W, 1914-15.

From data that the writer has been able to collect regarding the Mazda lamp, it would appear that it is necessary to throw an intensity of from .05 to .1 foot-candles on a man in dark clothes, to render him visible at 1,000 ft. on the average railroad track. Formulas and curves for the beam candlepowers necessary, of both arc and incandescent headlights, to pick up men dressed in light, medium and dark clothes have been worked out and reported in a paper entitled "The Locomotive Headlight," given in the Transactions of the Illuminating Engineering Society, Vol. IX, No. 9, 1914, page 909.

It was previously mentioned that the light intensity from a headlight varies inversely as the square of the distance; therefore, taking the writer's maximum figure of .1 foot-candle, the beam candlepower of a projector which would deliver this intensity at 1,000 ft. would be .1 F.C. $\times$ $(1{,}000)^2$ or 100,000. A beam candlepower of this value is very easy to obtain with an incandescent lamp. There are 6-volt 36-watt incandescent headlight lamps, which will more than accomplish this result*. These are available in 36, 72 and 108 watt sizes, as shown in Fig. 4. The last size is the



36 Watts, 5.5 and 6 Volts | 72 Watts, 5.5 and 6 Volts | 108 Watts, 5.5 and 6 Volts | 100-105 Watts, 30-34 Volts | 250 Watts, 30-34 Volts

Fig. 4—Incandescent Lamps for Headlight Service

*"Incandescent Headlights and Projectors," I. E. S. Transactions, Vol. X, No. 3, April 30, 1915, p. 271. The beam candlepower here given is maximum and not average across the beam. A higher wattage lamp is desirable to bring the average up to the 100,000 value.

standard headlight lamp at present used on the Southern Pacific. There are also available 30-34 volt incandescent headlights of 100, 150, 250 and 750-watt capacities, Fig. 4. Due, however, to the higher voltage of these lamps, their filaments are necessarily of finer wire and longer than those of the 6-volt type and, therefore, cannot be concentrated into so small a volume. This necessitates using a higher wattage lamp to obtain the same beam candlepower that is required with the 6-volt type. Many of the 30-34 volt lamps are, however, in service. The beam from the 30-34 volt lamps will also have considerably greater spread than that of the 6-volt lamps. A 150-watt 30-34 volt lamp will be required to equal the beam candlepower of a 36-watt 6-volt lamp.

For practical purposes, it is desirable that the spread of the beam should be at least sufficient to cover the entire width of the track, as obviously a very narrow beam might possibly have sufficient intensity without illuminating the full width. It is, of course, impracticable to provide light



Fig. 5—Adjuster for Converting Oil and Arc Headlights to Incandescent

that would take care of all curves. A reasonable test would take into account the intensity over the full width of a single track. The procedure is to set up the headlight and at a distance of not less than 100 ft. from it draw an arc across a diameter of the beam, having the headlight as its center. This arc should be marked off in feet, and foot-candle intensities measured across it at these points, by means of a portable photometer. The values thus obtained, if averaged and multiplied by the square of the distance from the arc to the headlight, will give the average beam candlepower of the headlight, and from the readings the spread can also be worked out. Detailed instructions for making such tests can be found in the Lighting Journal, Vol. 4, No. 1, January, 1916, in an article entitled "Photometric Measurements of Projectors."

As to the source of current supply for headlights, both storage batteries and turbo-generator outfits are on the market. The latter are coming into increased use and are available for both 6 and 30-34 volt systems. The generators are of sufficient capacity to take care of cab and classification lamps in addition to the headlight, if desired. It is probable that where incandescent lamps are used, the 6-volt 108-watt and the 32-volt 250-watt lamps will be the ones most generally adopted, thus allowing an ample factor of safety in meeting the requirements of the law.

On locomotives at present equipped with arc headlights, the simplicity of control and maintenance of the incandescent lamp may make it desirable to replace the arc. In such cases it will not ordinarily be necessary to discard the old headlight, nor will this be necessary in the case of many oil lamps. The arc mechanism or oil lamp can be removed from the casing and the incandescent substituted. There is on the market an adapter, shown in Fig. 5, which can be used for this purpose. It consists of a Mogul socket mounted in such a manner as to be adjustable in three directions, thus allowing of accurate focusing of the lamp. The adapter can be easily screwed or bolted to the bottom of the headlight casing.

Standard incandescent lamps are available of various wattages, and such lamps are interchangeable, enabling a wide range of choice as to beam candlepower. In addition they possess simplicity of installation and maintenance, ease of dimming, give a constant steady light of satisfactory color, and are low in both initial cost and maintenance.

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HOPPER CARS FOR THE READING

The Pressed Steel Car Company recently completed an order of 1,000 110,000-lb. capacity hopper cars for the Philadelphia & Reading for use in the anthracite coal traffic and the same builders are at present working on a second order which are to be exact duplicates. The general design of these cars is similar to the railroad company's previous standard but is different in a number of detail constructions. A photograph of the car as built is shown herewith.



Philadelphia & Reading Hopper Car of 110,000 lb. Capacity

The general dimensions of these cars are as follows:

Length inside	32 ft. 10¼ in.
Width inside	9 ft. 5⅝ in.
Length over striking plates	34 ft. 7 in.
Width over all	10 ft. 0⅞ in.
Height from rail to top of sides	10 ft. 0 in.
Distance from center to center of trucks	24 ft. 0 in.
Weight	42,900 lb.

The capacity of the car level full is 1,880 cu. ft. The center sills are 15-in. 40-lb. rolled channels, placed with the flanges turned in and to these in front of the body bolsters are spliced ⅜-in. thick pressed steel draft sills. The end sills are 8-in. rolled channels, reinforced at the top with a flanged cover plate ¼-in. thick. The coupler opening is reinforced with a heavy cast steel striking plate. The corners of the car in the underframe are braced with double diagonal bracing made of angles. One set of these braces extends from the end of the draft sills to the end of the body bolster and the other from the corner of the car to the intersection of the center sills and the body bolster. The body bolster is a single plate girder extending from the floor to the bottom of the center sills, reinforced at the top with a plate and at the bottom with angles extending between the center sills and the sides of the car, and with a continuous plate extending underneath the center sills for practically the whole width of the car. The sheets throughout are ¼-in. thick and the sides are reinforced at the top with a 4-in. by 3½-in. by 1½-in. by ⅜-in. bulb angle and a 3-in. by 3-in. by ⅜-in. angle forms the bottom member. Each side is stiffened with nine vertical stakes pressed from ¼-in. plates. The sides of the car are tied together with four angle braces and are further braced at the center by means of an angle tie strut connected to the cross ridge. The end of the car is stiffened at the top with the same bulb angle section as is used on the sides. The corner posts are 4-in. by 4-in. by ⅝-in. angles. The side sill is a short member extending from the end sill to the bolster and consists of an 8-in. rolled channel.

The end construction used on previous Philadelphia & Reading hopper cars consists of a much heavier construction; the rolled channel member is larger and is reinforced with a heavy steel casting and the side sills are heavy channels, extending from end sill to end sill, but it is found that the present construction which gives a considerable saving in weight, meets all the requirements and that very little, if any, is saved in repairs by resorting to the extra heavy construction for these members.

The cars are equipped with Dunham door gear, Westinghouse air brakes, and Gould friction draft gear with Farlow two-key attachment. The trucks are of the rigid pressed steel diamond arch bar type, having 12-in. 35-lb. rolled channel transoms with pressed steel pan-shaped braces at the ends riveted between the top and bottom arch bars and the transom channels. The transoms support the hangers, made of 11-in. by ⅝-in. material, on which the springs rest, supporting a short cast steel truck bolster. The top arch bar is pressed from a ½-in. plate and in addition to forming the compression member of the truck is shaped to form diagonal bracing between transoms and arch bars which keeps the truck square. The bottom arch bars are 7-in. by 1-in. in section and the tie bar is a straight member formed of 7-in. by ⅝-in. material with a spacer between it and the bottom arch bar.

The First Tentative Valuation Reports

Some of the More Important Contentions of the Government and the Attitude of the Carriers Concerning Them

AFTER two and one half years of work the Federal valuation forces have completed tentative reports on the properties of the Texas Midland, the Atlanta, Birmingham & Atlantic, the Norfolk Southern and the Kansas City Southern. The report on the Texas Midland was discussed in a conference between the Federal valuation board, the representatives of the state commissions and the members of the carriers' committees on May 26. The reports on the other three roads were discussed at similar conferences on June 19 to 22 inclusive. At the conclusion of these conferences Director Prouty stated that these and other reports would soon be sent to the Interstate Commerce Commission and that, when they were put into the form approved by the Commission, the carrier would be notified at public hearings which would probably be fixed for some date early in October.

As these tentative reports are the first that have been issued they give the first opportunity to ascertain the attitude of the government on a number of points of vital importance to the railways. For this reason they are of special interest as they forecast to a large extent the position which the government may take on the valuation of the other carriers as this work develops. The President's Conference Committee, representing the railways, is keeping closely in touch with these developments for the carriers, and has prepared memoranda pointing out the more important details in which the roads take issue with the decisions of the government. An abstract of the position of the committee on some of the points follows:

The Texas Midland.

The Texas Midland operates 124.61 miles of line between Paris, Tex., and Ennis, of which 110.64 miles is owned and 13.97 miles is operated under trackage rights. Portions of the line were built in 1882, 1883 and 1884 after which dates various extensions were added until 1896 when it was completed. It is divided physically into two distinct parts by a section operated under trackage rights over the St. Louis Southwestern between Commerce, Tex., and Greenville.

The government has estimated that construction would be undertaken at both ends of the line and at four intermediate points where other lines cross the Texas Midland and that the construction period from the beginning of the reconnaissance surveys to the placing of the road in service would require about 18 months. The western group committee representing the railway points out that the separation of the line into two distinct parts together with the various physical conditions encountered preclude the development of an economical construction program. Also the saving of a thousand dollars in engineering surveys may result in the unnecessary expenditure of large amounts later by the carriers. The committee has carefully prepared a program of construction in which it allows 4 months for the making of the reconnaissance and preliminary surveys and estimates, 8 months for the final location surveys and estimates and 18 months for the actual construction of the line or a total period of 30 months, one year longer than that estimated by the government. In support of this contention the carriers submitted information showing the length of time actually required in the building of eight other lines in the southwest after all surveys were completed by carriers having organizations already in existence, these periods ranging from 15 to 24 months and averaging 19 months. To complete the line within the period of 18 months estimated by the government would require an organization of engineering and construction forces materially greater than would be considered good practice in actual work.

The representatives of the carriers also take exceptions to the unit prices for materials allowed by the government, many of which are contract prices. They call attention to the fact that contract prices as for grading do not reflect the entire unit cost of construction, as they do not cover the extras and miscellaneous items such as the transportation of men, outfits and materials for which allowance must be made. The carriers' committee has gone to considerable expense to ascertain the amount of this figure and submitted data for over 96,000,000 cu. yd. of earth work moved in the construction of lines in northern Texas, western Louisiana and Oklahoma which may be assumed as typical of Texas Midland conditions for which the additional cost above the contract price averaged about 4 cents per cu. yd. or a total for the entire amount of almost $4,000,000.

The government allowed $496 per mile of road or approximately 2.1 per cent of all accounts for engineering expenses. Eliminating items of inspection which should be assigned to individual structures, this percentage is reduced to 1.86. The carriers presented a considerable amount of data in support of their claim for an allowance of 5 per cent, including detailed costs for 14 different lines aggregating over 1,150 miles on which the engineering cost averaged $989 per mile or 4.2 per cent.

It was assumed in the government report that all material for culverts and small bridges was hauled to the site by teams and that their erection was completed in advance of the track laying. Upon this basis the pile trestles were valued at approximately $11.75 per lineal ft., or less than the costs reported by carriers who have constructed similar bridges on lines already in existence where no such hauling was required and where the roads possessed every facility for economical and rapid construction. Attention was called to the fact that the actual cost of replacing a bridge 84 ft. long burned out on an operated line on the Texas Midland in 1915 was $16.55 per lineal ft. Particularly in view of the fact that 78 per cent of the piling on the Texas Midland is bois d'arc and 22 per cent creosoted pine and that 37 per cent of the caps are bois d'arc (a timber no longer obtainable in suitable sizes at any price), it is maintained that unit prices should be applied to the material in these bridges to bring their new value up to at least $16 per lineal ft.

In many other instances the unit prices are claimed to be low. Concrete in foundations was estimated at $11.30 per cu. yd. and in pier work at $9.10. A considerable amount of data was presented by the carriers showing considerably higher average figures in support of their contention that unit prices at not less than $11.00 per yd. should be allowed for culvert work and $15.00 per yd. for concrete in piers. Similarly, burnettized ties were estimated as 56 cents, although they actually cost the company 78 cents delivered. The prices for sand and cinder ballast did not include any costs other than those of loading, and the assumption was made that all cinders originated at Terrell in spite of the fact that in assuming the cost of reproduction new the railway is not supposed to be in existence, and cinders and sand would have to be procured from outside sources at market prices.

The railway uses for transportation purposes 1,862.52 acres of land of a present value of $236,689.65, of which

162.47 acres of urban land represents a value of $113,226.90 and 1,700.05 acres of rural land a value of $123,462.75. The company also owns 75.87 acres of land which it does not use for carrier purposes. The carriers criticize the methods followed by the government forces in arriving at these values, claiming that they did not carry out the requirements of the law. They point out that the methods employed by the land section of the valuation board omit the consideration of damages to the adjoining property, the cost of removal and relocation of buildings, payments for relinquishments of cattle passes and other rights abstracts, arbitrator's fees and expenses in condemnation cases, commissions paid, and other charges properly assignable to this account as a part of the cost of acquisition of the property. They also criticize the methods of the government in not utilizing the experience of the railways in the acquisition of right of way and terminal lines in arriving at their values, and urge co-operation in the securing of data in order that the government may have at its disposal the maximum amount of information to assist it in arriving at the fair value.

The Atlanta, Birmingham & Atlantic

The report of the government forces on the valuation of the property of the Atlanta, Birmingham & Atlantic is similar in general to that on the Texas Midland. However, largely because of different local conditions, the report varies in a number of interesting points.

This road consists of 623.6 miles of line in Georgia and Alabama, and extends from Brunswick, Ga., to Birmingham and Atlanta with several branches. A large portion of its mileage was constructed primarily for the development of the lumber industry and these short lines were later consolidated into the present system. The lines were therefore built to low standards and had not been maintained to a high grade until recent years.

In estimating the cost of reproduction the government assumes a construction period of three years. Because of the rainy season which lasts about four months in each year, with a total annual precipitation of 45 to 55 in., and also as the line lies to a considerable extent in low marshy ground, the carriers maintain that this period is too short and that the time allowed for the completion of the line west of Montezuma should be five years, and east of that point not less than three years.

As it has been agreed that all of the property in existence at the date of valuation shall be inventoried, the carriers call attention to many omissions in this report. Among these are contingencies, proper interest during construction, cost of borrow pits, freight on ties, ballast and other material, assessments for public improvements, etc. Also, although much of the adjacent land has been cleared since the original line was built, the clearing and grubbing estimates were based on the present character of the land adjoining the right of way, thereby ignoring a large amount of this work which it was originally necessary to do.

As in the Texas Midland valuation, the allowance for engineering is considered too low, being placed at 2.5 per cent, while the carriers maintain this should be at least 5 per cent. The allowance for the one tunnel on the line is less than the actual original cost, although the labor at the time the road was built was cheaper than at present.

The Atlanta, Birmingham & Atlantic owns 507.6 miles of telegraph line, which is leased to the Western Union with a provision for the use of a portion of it for railroad purposes. Because this line was leased to the Western Union the government eliminated it from the railway inventory. The carriers maintain that as the railway has made the investment in this line it is entitled to the valuation, particularly as it will probably not be included in the Western Union valuation because not owned by that company.

In a separate report W. G. Brantley, counsel for the southern group of railways, takes issue with the government charges to depreciation, citing numerous examples tending to prove that the true definition of depreciation is a loss in service value, rather than a loss in worth. He argues that the valuation law must be construed in the light of the economic fact that there is a "normal service condition" for every railroad, and that the depreciation required to be shown is the departure from this "normal service condition." Although this property has been depreciated approximately $5,000,000 in the report there is nothing to show that it has lost any of its "capacity for service," or that if it is properly maintained it is not in a condition to perform all the service required of it. The track was estimated by the government to be in 76 per cent. condition and the ties in 57 per cent condition. The life of the rail west of Fitzgerald was assumed to be 18 years, and east of Fitzgerald 25 years, and it was depreciated accordingly. Relay rail was given a normal life of 50 years. Other track materials were found to be in 70 per cent condition.

The Norfolk Southern.

The Norfolk Southern operates 901.8 miles of line, 788.6 miles of which are owned, 107.8 miles leased, and 5.34 miles included in trackage rights. The lines extend from Norfolk south to Beaufort, N. C., and west to Charlotte. Most of them were built between 1881 and 1903 with two additional sections built in 1913 and 1914.

F. L. Nicholson, chief engineer, has taken exception to a number of the rulings in the valuation report in a pamphlet issued by the carriers. He believes that the two years allowed for construction is too short and that this should be not less than four years after the completion of the reconnaissance and location surveys. The government report states that the prices for grading were based on construction costs on this and similar lines for work done several years ago. Since that time labor has risen in cost and teams likewise. As a result, the present cost of this work is materially higher. Also, a number of the contractors who bid on the work on this line handled it at a loss as the actual cost was greater than the amount they received. Likewise, the quantities obtained by measurement were not sufficient to cover the actual amount of material used

The allowance made for loss and waste of track spikes, bolts, nut locks, etc., is considered too low, Mr. Nicholson indicating that an allowance of 10 per cent for spikes, 5 per cent for nut locks, 3 per cent for angle bars, 5 per cent for tie plates and bolts and 1 per cent for rails is closely accurate. As on the Texas Midland, cinder ballast is largely used, and in an estimate of the cost of reproduction it would be necessary to place the cost of this material at least 60 cents per yard, as compared with the allowance of 25 cents per yard fixed by the government. Similar exception was taken to the prices allowed for other ballast material.

In ascertaining the land values representatives of the carriers checked all of the quantities for rural and urban land, in many instances examining the same records as the representatives of the government. In spite of this the government reports 938 less acres of land owned by the road than the representatives of the carriers reported, with a total value of $2,920,007.65.

In treating the interest during construction the Government allows 6 per cent for one-half the construction period, whereas the carriers maintain that this should be allowed for a much longer period as the money must be secured in advance, and it is considered good policy to provide funds for at least one year in advance of the actual work.

In treating depreciation the Government depreciated ties 50 per cent and new rails as much as 56 per cent, figures to which the carrier objects. The road also objects to depreciating track laying and surfacing, allowing only 77 per cent of the total cost for this account.

European and American Tidewater Coal Docks



A Description and Comparison of the Terminals Used Here and Abroad for the Transfer from Cars to Ships

By J. F. Springer

Coal Tips at King's Dock, Swansea, Wales.

THE principal American tidewater terminals for the shipment of coal are located at the harbors of New York, Philadelphia, Baltimore, Hampton Roads and Charleston. All other coal terminals of importance are either mainly for the reception of coal coming in by water (as at Boston) or are located on the fresh water of the Great Lakes. An analysis of the practice of handling coal at these five Atlantic harbors will accordingly suffice when making a comparison of the tidewater coal shipping facilities of America and Europe.

On the European side, there is a limitation on the locations of harbors for coal shipments by the broad consideration that England, Wales and Germany are the only considerable producers. While their combined production is but little more than that of the United States, their total shipments are considerably higher.

The character of the business at the five American harbors varies with the location. At New York, coal delivered to vessels for other than local consumption consists mainly of anthracite going to New England points and of bituminous coal loaded on vessels as bunker coal. The equipment of the harbor is naturally determined by these considerations. Of the 13 ports and 29 coaling plants on the waterfront, only a very few are equipped with modern handling plants. There is, in fact, but little to be learned at New York that may not be learned just as well elsewhere on the Atlantic Coast. A similar remark applies to Philadelphia. It is the southern harbors which already have or are installing notable coal handling apparatus.

Before leaving the older piers, however, it may be well to call attention to a few further details as to their mode of operation; especially since these piers handle a very large percentage of coal. The elevation at the sea end varies from 5 ft. for certain New York piers to 70 ft. for a moderately old pier at Lamberts Point, Hampton Roads. If the deck of the pier is above grade, the cars are placed on it either by locomotives hauling them up an incline or by the use of an inclined cable operated by power. In some cases, the cars are handled onto the pier by means of a locomotive; in others, the deck makes a gentle dip seaward and the cars move along by gravity. Where the local conditions are favorable, these piers would seem to be efficient and economical. When they have decks much above the grade of the railroad, a locomotive incline will of course require space. The power incline enables a steeper grade to be employed and so economizes on room.

Fundamental Requirements

There are three principal movements that usually have to be effected to get coal from the grade of the track into the hold of the vessel. First, there must be longitudinal transportation to points alongside the hatchways. Then there must be a vertical movement to get the coal as high as or higher than the hatchways. Third, there must be an outboard movement to get the coal over the hatch openings. The longitudinal movement is perhaps the most difficult one to secure economically and simply. It is possibly not too much to say that the method adopted controls the general design of nearly the whole equipment. Thus, if it is decided to get the coal out from the face of the pier by a gravity chute, there must be sufficient elevation of the head of the chute above the hatchway to provide for it. This results ordinarily in the requirement for an elevated pier deck. This in turn requires a means for elevating the coal.

The most notable modern coal piers on the Atlantic coast whose design has been thus controlled by the gravity chute are the three big steel structures at Hampton Roads, operated by the Virginian, the Chesapeake & Ohio and the Norfolk & Western, respectively. The pier decks are greatly elevated. That of the Virginian pier is 70 ft. above the water, while the decks of the others are about 90 ft. above sea level. These great heights are needed to provide for gravity dumping from the cars into the pockets or bins in the superstructure and for the gravity delivery by chute out to the hatchway and to positions in the hold. The hatch openings are materially elevated on some vessels, especially when the vessel is in an unloaded condition.

Conveyor Booms Recently Introduced

A departure from the gravity chute method for getting coal outboard from the pier has been used in the new coal

dock of the Southern at Charleston and will be employed in the new Baltimore & Ohio pier at Curtis Bay, Baltimore. At Charleston, the coal is moved outboard by a scraper conveyor carried by a movable curved boom. The coal is shoved along. At Baltimore, a belt conveyor will carry the coal out from the face of the pier. This single change in method permits both piers to be comparatively low structures.

The method of delivering coal to the outboard conveyor affects the design. At Charleston, gravity is depended upon for this, a receiving hopper being placed above the inner end of the conveyor boom. This hopper receives coal from the car dumper which moves along back of the loading tower containing the receiving hopper upon a more elevated track. At Baltimore, the outboard conveyor receives coal which is brought to the loading tower upon another belt conveyor. In the one case we have two movable tower-like structures; in the other but one. Charleston has the only example on the coast of a car dumper moving along on the pier. In all the other cases the dumper is a fixed piece of apparatus. The new Baltimore pier will have two dumpers, both to the rear of the pier.

A point in which there is general agreement in car dumper design along the American coast is that cars are dumped sideways. This seems to be the prevalent American practice.

The object of the car dumper at the southern piers is to get the coal out of the railroad cars preliminary to getting it out onto the pier. The exception is at Charleston. At Hampton Roads, the coal is dumped into other and special cars which are only used on the pier. At Baltimore, the coal passes from the dumper to a short belt conveyor which feeds the main belt conveyor.

As to vertical movement, at Baltimore, there is to be little or none, so this factor is eliminated; at Charleston, there is



Barney Pushing the Loaded Car into Position, Lehigh Valley Dock, Perth Amboy, N. J.

practically none, since the railroad cars are run out onto the pier into the cradle of the dumper by a locomotive; at Hampton Roads it is great. At this harbor, particularly at the Norfolk & Western and the Chesapeake & Ohio piers, the special pier cars, after receiving their loads from the dumpers, go to elevators which lift both the car and load vertically to the pier deck. Getting the horizontal movement out onto the pier is accomplished at Hampton Roads by moving the pier cars under their own power, at Baltimore by a big belt conveyor and at Charleston by an ordinary locomotive.

British Coal Terminals

One of the principal coal fields of the British Isles is located on the northeastern coast of England in the counties of Northumberland and Durham. The rivers Tyne and Wear flow through this district and afford means of contact with salt water transportation, especially at their mouths. Within the last few years, a number of installations of coal handling facilities have been made at Tyne Dock and at Sunderland. Tyne Dock, located on the southern bank of the Tyne river, is owned by the North-Eastern Railway and is one of the greatest coal handling ports in the world. A



Middlesbrough Dock, North-Eastern Railway of England

typical pier is operated about as follows: The loaded railway coal cars are brought to the shore end of the pier and are started down along or near the main axis of the deck under gravity until the sea end is about reached when they return upon a reversed grade. The discharge of the loads is made upon the return, the cars now being on a track near the side. This method is essentially similar to certain American piers on the Atlantic coast in that gravity is relied on to get the cars out onto the pier and back again. At Tyne Dock arrangements were satisfactory enough until the 10-ton coal cars began to be replaced by cars of 20-ton capacity. It was found that in bad or cold weather the incline was insufficient to secure the start with certainty. Accordingly, several years ago two big hoisting engines were installed beneath the tracks of the big piers to provide a means of operating the larger cars. Either one does the work of four capstans.

The amount of handling performed at the four piers of Tyne Dock is enormous, despite the diminutive cars. In the first quarter of 1914, as much as 2,000,000 tons were shipped from this dock. A large day's work occurred on March 27, 1914, when 37,395 tons were shipped. One of the four piers is equipped with electrically operated conveyors with a capacity of 400 to 500 tons per hour each.

A more important matter is the new station which was authorized early in 1914 by the North-Eastern Railway

which will add to the already great capacity of Tyne Dock. Here two fixed hoists are to be installed upon one end of a great quay. The loaded railway cars will be pushed up a grade of 1 in 75 and allowed to make return by gravity to the hoists. Here the coal may be elevated to points 60 and 65 feet above high water, which is 15 feet above low water.

The hoists in British practice usually take the cars up to considerable heights. At Tyne Dock the new hoists are to despatch the empty cars upon their return at high level and they will run off over an elevated viaduct. Here is a point of difference between practice in the two countries. At the



Side View of New Pennsylvania Car Dumper at Philadelphia, in Action

Pennsylvania dock at Philadelphia, the empty car is returned to precisely the same level from which it started. At Tyne Dock, the coal is discharged from the cars through the bottom, the coal passing into a suitable hopper. Thence it travels by the conveyor out to the hatchway.

At Sunderland, on the Wear river, a short distance to the south of the Tyne river and Tyne Dock, a rather remarkable system of coal handling has been introduced. The requirements to be met are severe. It was desired to deliver a very friable soft coal—softer than steam and gas coals—to small coastwise steamers having cargo capacities varying from 250 to 1,500 tons. A very flexible method of delivery was required because of the variations in the width and depth of holds. The desire to avoid breakage was perhaps the hardest condition to meet. The solution took advantage of the fact that the coal cars to be dealt with had capacities of only 10½ and 12 tons. In short, it was decided to handle the car and its load together and to do the dumping in the immediate vicinity of the final resting place in the ship's hold. The cars are run out onto a kind of cradle at the end of the pier. The cradle with its load is swung forward and downward. The car remains horizontal, or nearly so, and a method of braking is employed to stop the movement when the desired position for discharging the load of coal is reached. The coal is then discharged, when the whole contrivance returns to its upper position.

The loaded cars go onto the cradle, when the latter is at the pier-level position, under the influence of gravity. So also, upon their return, the empty cars run off by gravity on a decline of 1 in 30. Car-locks automatically come into play immediately when the loaded car comes upon the cradle to prevent it from running back again. The cradle and cradle locks are protected from the shock of the stoppage of the car by a system of shock absorbers and the deflection of the shock to the fixed framework of the pier.

It will be noted that this handling device normally operates without power. The procedure of discharging the coal from the car from a level immediately over the pile in the hold is a notable advance in connection with the prevention of breakage. If this system is applicable to American conditions, it is probably the best thing in sight. The difficulties of using it here would seem to focus not on the great weight of a loaded American coal car, but upon its bulk relative to the size of the hatch openings.

The British device operating at Sunderland can handle one 10½-ton car per minute. The average speed for an hour is about 500 tons.

The South Wales District

The South Wales coal district is one of the most important in the world. Three of the principal outlets are at Cardiff, Barry and Swansea. Enormous tonnages of coal are transferred from rail to ship at these points.

At Barry docks a group of five coal tips are in process of



One of the Three Fixed Hoists at Barry Dock, South Wales

installation, one of which had been installed last September. They may be taken as representative of advanced British practice. In the first place, the numerous operations are performed hydraulically. It should be said, however, that British practice is going over more and more to electricity. This is doubtless owing to the economy and extreme facility with which electric power may be distributed to widely separated points.

Two out of the five tips are movable along the face of the

dock; the remainder are fixed. The several capacities are about 800 tons per hour each. While the average car carries a load of 10 or 12 tons, the tips are capable of handling cars of 20 tons capacity. The maximum elevation for discharging is about the same as the deck level of the Curtis Bay pier at Baltimore—that is, 59 ft. At Barry, however, the elevation is measured from the land surface. The 800-ton capacity is based on the 59-ft. elevation. Two hydraulic rams are connected with the elevating mechanism, one having a diameter of 16¼ in. and the other of 10¼. Provision is thus made for handling big or little loads without waste of power. The counterbalancing of the weight of the cradle is provided for by still another ram, and it, too, is indirectly connected with the cradle.

The tilting of the tipping table is secured by means of another 14½-in. ram, located on the cradle. When extended to its full stroke, the ram tilts the table and car to an angle of 45 deg.

Two cranes mounted near the top of the tower have booms which reach out about 35 ft. One of these cranes has a capacity of 5 tons and is employed to handle a specially designed type of anti-breakage boxes whose purpose is the careful handling of coal. The other and smaller crane has the duty of lifting small coal from the vessel's deck and discharging it through a hopper into a truck. Both cranes are hydraulically operated.

An apron chute is movably arranged on the front of the tower and when set at the usual angle the apron extends out 20 ft. The angle may be varied, as well as the elevation of the whole chute. Also, it is possible to swing the chute through a horizontal arc of 23 deg. The reach of the chute may be increased by the use of extension pieces. The movements of the chute are effected through four lines attached to the outer and inner pair of corners. These lines are connected to four independent hydraulic engines. The independence of operation of the four provides for the great variety of positions possible for the chute.

American and English Practice Compared

A most notable difference between American and British practice in the design of car tipping or dumping plants relates to the management of the lifting operation. In the United States, the approved practice is to divide the lift into two parts; in British practice, it is left substantially undivided. That is to say, in the American plants, the loaded car is in effect lifted part way by a pushing apparatus—a barney or mule operated by cable pushing the car up an incline. The second step is from the bottom of the dumper to the dumping level and is accomplished of course by the dumper itself. A typical British procedure requires the loaded car to enter the lower part of the hoist and go upon the cradle at the general level. The hoist then elevates to the dumping point at a single operation. There is no cable-operated barney or similar device. When the "empty" descends it may be run off over an elevated track before the cradle gets quite to the bottom.

If the American plant is properly designed, the barney-incline will be so related to the hoisting and dumping arrangements that a cycle of operations with the one will occupy just about the same length of time as a cycle with the other. When this is the case, the joint operation of the two enables the whole plant to handle perhaps half again as many cars as would be the case if the hoist had to perform the whole lift. The hoist is, in fact, operating with a reduced lift. Accordingly, it can handle more cars than with a full lift, provided it is not kept waiting for fresh cars. When the incline arrangements are suitably adjusted, there will be little or no wait. With the British system, the hoist must make a complete lift from the lowest level and return before it is ready to begin with a second car.

SHRINKAGE OF BOX CAR SHEATHING

Several roads which are extensive users of single-sheathed outside steel frame box cars have had difficulty due to the shrinkage of the sheathing after it is placed on the cars and the cars are in service. This was due to insufficient drying of the lumber before application. The slotted holes generally used to take care of adjustments for overcoming the effects of such shrinkage provide only ⅝-in. or ¾-in. which is entirely inadequate when we consider that in one order of automobile cars there was a shrinkage in a height of 10 ft. of from 5½ in. to 7½ in. These cars were built without specification being made as to the dryness of the lumber and in the next order of cars special care was taken to provide well dried lumber. Samples measuring approximately 1½ in. by 5 in. by 12 in. were placed for a period of 96 consecutive hours in a hot cupboard, the temperature being maintained at from 160 deg. F. to 180 deg. F. Any of the tested pieces which showed a reduction in weight of more than 6 per cent were considered improperly dried. It was found, however, that the long period of drying was inconvenient and very short samples of the same lumber were tested in various ways to determine on the shortest practicable time of drying.

As a result of these tests the specifications for dryness required all samples to be taken from the middle portion of the stick. These samples are from ¼ in. to 5/16 in. long and are dried for two hours in a hot cupboard at the temperature previously used. A shrinkage of more than 1/16 in. in a width of 3¼ in. is taken as indication that the lumber is improperly dried. The cars as built under the first method referred to have proved entirely satisfactory, and, while no cars have as yet been built to the second specification, officers of the railway which has developed this method feel confident that it will give as good results as the previous specification.

DETERMINATION OF EFFICIENCY IN THE SUPPLY DEPARTMENT*

By H. C. Pearce

General Purchasing Agent, Seaboard Air Line, Norfolk, Va.

The broad answer to the question of how the efficiency of the supply department can be determined, would be by the results obtained from the operation of the property. This answer is not sufficient, however, for the executive who wants to know whether he is getting the fullest efficiency from this department, or to the officer who is conscientiously striving to place this work on an efficient basis. They must have some way of knowing how their work compares with the work of others.

Few experienced and honest supply officers are satisfied that they are now getting the best results possible, or that they are being properly measured and compared. The trouble will be found rather with the fundamentals than with the details. In order to refine an organization, it must be sound fundamentally. The organization that develops and exposes mistakes is much more to be desired than one that hides them; black shows plainest on white, and the better the organization, the more plainly will the defects be seen and remedied.

The first fundamental principle to understand is the purpose. The purpose of the supply department is primarily to provide material of proper quality when and where it is needed, for the *lowest net cost*. You will notice I mention the lowest net cost, which means that the handling of the salvage should be as much a part of an efficient supply department as the purchase and care of the material.

*A paper read before the Richmond Railroad Club, Richmond, Va., April 10, 1916.

Having the real purpose of the supply department understood, the next in order is the organization. The organization must be broad enough and flexible enough to meet all conditions. What does this mean? Sufficient help and facilities to provide, inspect, care for and account for all unapplied material at all times. The supply department should be required to follow the material from the time its need is determined until its issue for use and the disposal of salvage. This means that the organization must be such that it can determine accurately what is needed before it is bought; purchase at the best market prices; inspect to see that you receive what you buy, and store in such a way that it can be located almost instantly for use or check.

Expensive buildings are not necessary. Plenty of room, protection from the elements and facilities for handling quickly and economically, are much more important.

The question will at once be asked: What will it cost to do all this? The broad answer to this question is, no more than it is now costing, provided it is being done.

What does it cost to provide material (commonly called cost of handling)? I have read in technical papers, and I have heard supply officers state, that it was costing them less than one per cent. Some admit it is costing them five per cent, and many executives actually believe they are making a substantial profit when they supply material to other lines and companies at cost, plus ten per cent.

I recall a personal experience that is a fair example of the lack of knowledge regarding this subject up to a few years ago. The chief operating officer of a system of several thousand miles of railway advised the chief operating officer of the property on which I was employed that the stores department on his system was being operated very satisfactorily at a cost of $1,400 per month. I was requested to accompany our executive's assistant to make an inspection of the organization to learn how it was done. An investigation of the facts on the ground developed that the $1,400 represented the office force and two counter attendants at the general stores. All the balance of the work was being done by employees of other departments at a nominal monthly charge. A check of the men on the ground actually handling material developed the cost of the work to be not less than $10,000 per month, and, when a short time later, a reorganization was effected, and the work was taken over by the supply department, I was advised by the general storekeeper that he had taken over labor from other departments amounting to a little less than $11,000 per month.

Speaking of so-called "Store Expense," or handling charges, which is usually added to bills against other companies, which represents the cost of providing material; years ago I was employed on a railway in the Northwest that had a trackage agreement between two large cities. This agreement was based on a flat rental, the lines using this track paying for the cost of operation on a wheelage basis. One of my duties was to check these bills. They were a marvel of thoroughness of detail. They started in with charging every possible item of labor and material that could be used in the maintenance and operation of this track. To this was added a proportion of the wages of the division roadmaster and the superintendent, and their staffs. To this was added a flat charge of 25 per cent. The man whom I succeeded in checking these bills went to the railway that owned the tracks as the maker of the bills, and I assure you he did not overlook charging anything. He made it his business. It was my business to see that we were not charged with anything we did not get. He had the best of me in that after he had charged everything that he could locate, he then prorated everything which he could not locate and then added a flat 25 per cent for handling charges and what had been overlooked. He afterwards became comptroller of the property, which is one of the largest and best operated in the West, and I shall always consider these bills as models of thoroughness, and more clearly representing the actual cost for materials furnished joint facilities than any I have ever seen since.

Few railroads know what it actually does cost to provide materials, but one thing is certain, it costs less to do a thing well and in a systematic and orderly manner than it does to do it in a haphazard manner by those who are not directly interested or responsible. The cost of buying, inspecting, handling and accounting under a well organized plan is not less than five per cent. This does not include interest on investment, taxes, insurance, company haul, maintenance of buildings and depreciation, and obsolescence of stock. As a matter of fact, the actual cost of handling is the least important item of expense, the real loss being in depreciation, obsolescence and interest on investment. A well-known expert recently compiled some statistics in which he places the loss by depreciation and obsolescence at 12 per cent.

The question really is, how many of our supply departments are doing the work they are organized to do, and how can they determine the result of their work? The following are some of the visible signs:

(1) Perfect system and order at all times, and the material arranged in such a way that an actual inventory by unit of quantity can be taken in one working day. Otherwise, it is not in a safe condition to base a purchase on.

(2) Material carefully inspected and compared by practical men. Otherwise you cannot know that you are receiving what you pay for, or what is most suitable for the purpose for which it is ordered.

(3) Broadening of the market by inviting and encouraging competition. Otherwise you are not getting the lowest market prices.

(4) The material delivered to the workmen in the shops and on the line. Otherwise you cannot know what is needed.

(5) A practical and thorough system of recovery and reclamation of the salvage. Otherwise you do not know what material is not giving its guaranteed service.

(6) Receipt and issue of all material. Otherwise you cannot control your material balance.

The following statistics will, so far as such things can, give a good indication:

CONTROL OF STOCK

(1) An annual classified inventory of *all unapplied material* and salvage on hand, taken by the supply department under the supervision of the accounting department.
(2) Monthly classified statement of material on hand.
(3) Ratio of materials and supplies to labor.
(4) Ratio of materials and supplies to miles of track.
(5) Ratio of materials and supplies to operating expenses.
(6) Ratio of materials and supplies to current assets.

CONTROL OF PURCHASES

(1) Monthly classified statement of purchases.
(2) Monthly percentage of purchases to issues.

If you are doing all these things, and more, you may be fairly certain that the results will be satisfactory, and that the statistics will correctly reflect them.

There are undoubtedly many millions invested in materials and supplies on our railways that should not have been purchased. Some recent tabulations compiled from Interstate Commerce Commission reports as of June 30, 1914, indicate that 1¼ per cent of the total current assets of the railways in the United States is represented by materials and supplies, and that the ratio of stock maintained to operating expense is 12½ per cent.

Under present conditions, it is impossible to determine what the actual amount of unapplied material is on most of our railways, because the stock balances represent only a part of the material on hand. Storekeepers, and others, are commended for reducing their stock balances. Their efforts are therefore naturally concentrated in relieving their stocks of the material, instead of conserving it. A large portion of the material on our railways really originates with maintenance officers. This is particularly true of specialties and

material to protect against possible emergencies and accidents. When this material is received, the storekeeper naturally insists on having it drawn in order to relieve his stock. The officer who is responsible for the requisition is obliged to draw it in order to prevent criticism of himself. Until some thorough plan is installed, having for its purpose the taking of an accurate inventory of every dollar's worth of unapplied material, regardless of whether it has been charged out or not, there can be no honest comparison of stocks.

The plan in effect on some of our railways, of having the accounting department supervise the taking of the annual inventory, is sound. Materials and supplies are as much a part of the current assets of a railway as its cash and bills receivable. One of the causes for the enormous amount of material on our railways is the mistaken policy of always having enough. No individual or corporation can be truly economical or efficient and have everything they want.

I recall the answer of a well-known mechanical officer when his attention was called to a quantity of material that had been on hand for years. He admitted that the material had not moved for ten or fifteen years, and he did not know that it ever would. He hoped they never would need it and said that the company would be making money if they did not. His idea of economy and efficiency consisted merely in the fact that there should always be material enough of every kind on hand to meet every possible emergency or demand, never taking into consideration for a moment that the company's money had been expended for the material, that it had been drawing interest, and that it would eventually become obsolete. The fact that the material had not been charged out to his expense was to him sufficient. This can be stated in a broad way to be the general view of a great many capable and experienced maintenance officers.

It is common practice for master mechanics, shop superintendents, foremen, etc., to hold staff meetings to prepare weekly or monthly lists of material that is delaying work or that they think should be maintained in stock, and it is not unusual for them to go around looking over the material to find something to add to the list. Generally, this is nothing but a fence for excuses.

The policy of encouraging officers and employees to make complaints regarding shortage of material is wrong and has probably done as much as any other one thing to encourage unnecessary investment in materials. Instead of criticism being always aimed at the lack of material, it should rather be aimed at its presence. Instead of men holding meetings to report and complain of shortage of material, their efforts would be better directed towards ways and means of getting along with what they have.

The policy of ordering material long in advance of the actual needs, without taking into consideration all of the things that may happen to postpone, curtail, or even cancel the work, is no doubt the cause of the greatest accumulation and loss of material on our railways. This can only be overcome by a realization and responsibility of our operating and maintenance officers and controlled by the chief executive, by demanding that no material shall be ordered for new work until all the facts have been taken into consideration and the money provided, and he will then require his chief supply officer to so order and arrange the deliveries that as little as possible will be on hand should the plans be changed for any reason; reasoning that it is better to delay work than to have large sums of money tied up in material before it is needed.

What can the supply department hope to accomplish in net results by curtailing its purchases of lantern globes, wicks, cotters and hundreds of similar items of small supplies, and have thousands of dollars tied up in material which may never be used? The saving of pennies will never overcome the loss of dollars.

There still remain the following underlying principles which must be placed on a proper basis before the efficiency of any supply department can be actually determined, or the net results properly measured.

First: The purpose of the organization must be clearly understood and performed.

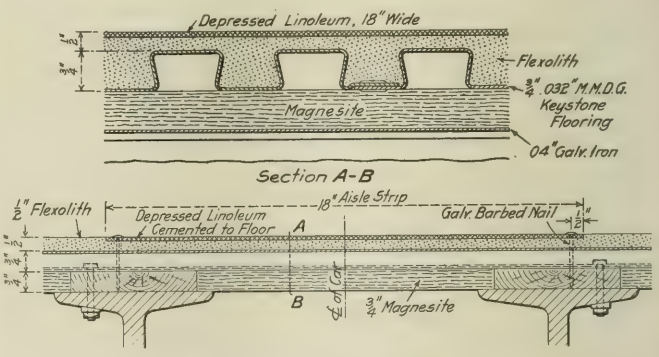
Second: All the work of providing, storing, handling and accounting for material must be done by this department, and the employees carried on its payrolls.

Third: All unapplied material must be carried in the storekeeper's balance, and to ensure its being done, an actual inventory of all material and salvage on hand should be taken annually, and reduced to its current market value, and this work supervised by the accounting department.

The head of the accounting department is responsible to the chief executive for the assets of the company.

DEPRESSED AISLE STRIPS

The Union Pacific is using depressed aisle strips in the floors of its coaches and chair cars. The aisle strip is linoleum, 18 in. wide and set in flush with the top of the Flexolith flooring. It is continuous, extending the full length of the passenger compartment. The linoleum is applied to the flooring with a heavy coat of linseed oil or a suitable cement, and is then securely tacked to the wood stringers over the center sills with small galvanized barbed nails. The linoleum used is 1/8 in. thick, composed of inlaid alternate red and



Aisle Strip for Coaches and Chair Cars

green blocks, 1 13/32 in. square or 2 in. diagonal. The blocks are laid diagonally and the strips are cut along the diagonal center line of the red blocks to form the edges for the sides to match the color of the Flexolith flooring. The use of the strips in this way is sanitary and also tends toward safety, as it prevents passengers from tripping over the edges of the strips.

A maroon coloring matter is mixed with the Flexolith flooring compound, eliminating the frequent necessity of repainting floors.

New Railway in Australia.—Among the railway lines projected in South Australia is the Long Plains-Port Augusta line. This will be 145 miles in length, will cost $6,874,000, of which $358,000 will be for rolling stock. The gage of this line, which will be laid with new 80-lb. rail, will be 5 ft. 3 in.

Women on German State Railways.—According to an official report to the Reichstag, 36,000 women are now employed on the German State Railways, and the number is increasing every week. The same official report says that women are employed as ticket collectors, platform porters, laborers, engine cleaners, and grade crossing tenders. Women have not been employed in the place of signalmen nor is there any intention of admitting them to this department of railway work.

General News Department

The Chicago & Alton has made an increase of 1½ cents an hour in the wages of its car shop employees.

In a fire at Boston, July 25, the Boston & Maine lost a dining car and seven day coaches; estimated total loss $25,000.

An informal business meeting of the executive committee of the Railway Telegraph Superintendents' Association was held on July 26 at the Hotel LaSalle, Chicago.

One of the scale-testing cars of the United States Bureau of Standards arrived in Chicago last week to remain in the vicinity of the city for two or three weeks to test track scales used by the railroads and industries around Chicago.

The Atlantic Coast line, has made an increase, taking effect July 1, of 5 per cent, in the pay of all clerks and other employees at stations who have been in the employ of the company for twelve months or more. About two thousand persons are affected.

It is expected that a portion of the lines of the Southern Pacific of Mexico, which had been taken over by the Mexican authorities, will be returned to the company shortly. The line running from Naco, Ariz., to Cananea, Mex., has already been returned.

The Pennsylvania Railroad reports that, in the first six months of the present year, 92,380,184 passengers were carried on the company's lines without loss of the life of a single one of them in a train accident. This completes two and one-half years in which no passenger has been killed in a train accident on any part of the Pennsylvania System, either east or west of Pittsburgh.

The Baltimore & Ohio, failing to reach an agreement with its telegraphers in conferences over increases in rates of pay and adjustment of working conditions, has joined with J. J. Dermody, fourth vice-president of the telegraphers' brotherhood, in a letter to the United States Board of Mediation, asking its good offices in adjusting the differences. Officers of the road say that the demands of the operators are for a flat increase of 15 per cent, and would mean an increase of approximately $500,000 yearly. They ask also for a reduction from 10 hours to 9 hours for a day's work in one-trick telegraph offices, from 10 and 9 hours to 8 hours in two-trick offices. They demand that all agents receiving between $25 and $125 a month be included in their wage schedule.

Appeal by National Chamber of Commerce

H. A. Wheeler of Chicago, chairman of the National Chamber of Commerce committee on the railroad situation, has sent a letter to President Wilson in part as follows:

"As chairman of the National Chamber committee on the railroad situation, I met in New York with the railway executive advisory committee, Frank Trumbull, chairman, and the national conference committee of railroads, Elisha Lee, chairman, to request from them a definite statement as to the position of the roads when the conference reconvenes to hear the result of the strike vote, which was completed last week.

"There seems to be a prevailing opinion in Washington, and I think rather generally held throughout the country, that no interruption of freight transportation will result and that some means will be found to adjust the differences.

"As a result of the meeting my conviction is deepened that an amicable settlement is remote, and that while other orderly steps are yet to be taken before a final break is reached, yet such a break is inevitable unless strong measures of intervention are speedily introduced.

"On August 8 the joint conference will convene again, the men will announce the result of their strike vote, and the roads will reiterate their proposals, which the brotherhood chiefs have once declined. I am assured that there will be no modification of the attitude of the roads. Neither is it expected that the representatives of the men, with the new power of the strike vote in their hands, will recede from the position which they have heretofore taken.

"The United States Board of Mediation and Conciliation may come into the matter at this point, but without effect, in my judgment, in bringing these contending factions together. Finally, arbitration may be discussed, and the break will come when the roads absolutely refuse to arbitrate only the demands of the men and the men refuse with equal force to admit into the arbitration the contingent proposals of the roads.

"Thus, unless there is intervention as proposed in Senate joint resolution 145, ratified by an almost unanimous vote of the commercial bodies affiliated with the Chamber of Commerce of the United States, or other governmental intervention on behalf of the public, nothing will be left but for the men indefinitely to defer action or exercise the authority conferred upon them by an overwhelming vote to call a strike.

"In the meeting the roads definitely expressed a determination not to recede from their present position no matter from what source an appeal is made, and while I am usually optimistic about finding a way out of difficult situations, I must confess in this situation, after talking most earnestly with both parties to the controversy, I see no ray of light nor any possibility of averting a serious catastrophe."

New York Central Telegraphers' Pay Increased by Arbitrators

The arbitrators, H. K. Daugherty, W. J. Fripp and E. J. Manion, who, since July 6, have been considering the demands of the telegraphers of the New York Central, and the New York, Chicago & St. Louis, for increased pay, have issued their report, granting increases of 8 per cent on the lines west of Buffalo, and 10 per cent on the lines east. Vacations with pay are allowed to operators who have been in the service two years; and west of Buffalo extra pay is allowed for Sunday work. The operators' request to be relieved of outside work, such as attending crossings and running pumps, was denied.

The chairman of the board of arbitrators is a lawyer of Grove City, Pa.; Mr. Fripp is general manager of the New York Central (East), and Mr. Manion is vice-president of the telegraphers' brotherhood. The award is in three parts, dealing respectively with the Central lines east of Buffalo, the Central lines west of that city, and the New York, Chicago & St. Louis.

East of Buffalo.—The request for seven days' vacation for operators working more than nine hours a day, and in the service one year or more was allowed. The request for fourteen days' vacation for those in the service three years was allowed in part; a ten-day vacation was granted. For operators working nine hours or less the request for seven days' vacation for those two years in the service was allowed; the request for longer vacations for those longer in the service was denied.

The award does not say exactly what rate of pay was demanded by the operators, but the increase, 10 per cent, is said to be considerably less than was asked for.

West of Buffalo.—The request for relief from attending pumps, cleaning batteries and lamps, etc., was denied; but certain rules concerning these matters on the Illinois division, formerly the Chicago, Indiana & Southern, continue in force.

The request for overtime on Sundays is granted. This means that the monthly rate now pays an operator for 26 days a month, approximately, instead of 30 or 31 days. The allowances for vacations are the same as those east of Buffalo. Complying with the request of the operators, the arbitrators add to the schedule eight stations not heretofore included. The increase in the monthly rate of pay (8 per cent) is a little more than half the percentage that was asked for.

New York, Chicago & St. Louis.—On the lines of this company the only request was for extra pay for Sunday work; and this is granted.

Mr. Fripp filed a dissenting opinion concerning Sunday work (as to which the operators east of Buffalo made no request).

Prior to the year 1904 the operators on the Lake Shore & Michigan Southern (now the western lines of the New York Central) were paid extra for Sunday work; in that year this rule was abolished, and the monthly rate was increased so as to equal or exceed the total amount theretofore paid for both week days and Sundays. On both roads the rate has included compensation for Sunday work, and the pay has been raised a number of times since 1904, though on the New York, Chicago & St. Louis no operator was required to work more than six hours on Sunday.

Mr. Fripp says: "It is wholly illogical to grant an increase in wages and a more liberal vacation rule, and at the same time provide for extra payment for Sunday work. . . . The effect of this award in converting what has been recognized as a monthly wage for 30 days, into a monthly wage for 26 days, is to create a penalty for employing men on Sundays." He goes on to show that the telegraphers have argued for vacations because of their continuous service; now, that argument is removed, and yet the vacations are granted.

"The record shows that the rate of wages at present paid on the New York Central west of Buffalo, and the New York, Chicago & St. Louis is higher than on all except two out of thirteen railroads which operate in the same territory, and on none of those roads is any allowance made for overtime on account of work performed on Sunday. The net result of this award is an increase in the rate of pay of the employees affected thereby of over 22 per cent, without taking into consideration the extension of the vacation rule. [For example, $75 for a month of approximately 30 days, equals about $2.46 a day. Increasing the monthly rate 8 per cent makes a total of $81; and this is for 26 days, which makes the daily rate about $3.11. Thus the increase, per day, 65 cents, equals 26 per cent advance over the former rate of $2.46.] The wages which the two companies mentioned will be required to pay, under this award, will be greatly in excess of those paid by their competitors for the same services, although the testimony fails to show that there has been any increase in the duties or responsibilities of the telegraphers since the last adjustment of wages was made."

Business Sentiment in Favor of Exclusively Federal Regulation

Business organizations from all over the country have adopted resolutions favoring federal regulation to the exclusion of conflicting state regulation of interstate traffic.

The Railway Business Association suggested this action and put forward the following proposals:

(1) That the national government should, on behalf of the states, regulate instrumentalities of interstate commerce, except in those spheres which are distinctively state.

(2) That Congress, in order to keep regulation close to the people, should create regional sub-commissions, appointed by the President and subordinate to the Interstate Commerce Commission, to conduct administration over areas corresponding to traffic movement.

(3) That Congress, having chosen to leave to private capital the function of providing the people with rail highways, should insure reasonable extensions of such highways into new regions, as well as the improvement of existing roads, by declaring by statute the policy of the government to permit such a system of rates as will yield earnings sufficient to attract investment for new construction.

Bodies from which the Railway Business Association has received resolutions of substantially this tenor are:

National Wholesale Lumber Dealers' Association.
Philadelphia Chamber of Commerce.
American Hardware Manufacturers' Association.
American Supply and Machinery Manufacturers' Association.
National Association of Manufacturers.
Corset Manufacturers' Association.
National Machine Tool Builders' Association.
McKeesport, Pa., Chamber of Commerce.
Southwestern Interstate Coal Operators' Association.
National Leather Shoe Finders' Association.
Southern Pine Association.
American Iron, Steel & Heavy Hardware Association.
Wilmington, Del., Chamber of Commerce.
Wilkes-Barre, Pa., Chamber of Commerce.
New Jersey State Chamber of Commerce.
Hoboken, N. J., Board of Trade.
Wholesale Saddlery Association.
Owego, N. Y., Business Men's League.
Illinois Manufacturers' Association.
New Jersey State Chamber of Commerce.
Manitowoc, Wis., Chamber of Commerce.
Tile Manufacturers' Credit Association.
Nashville, Tenn., Commercial Club.
Ohio Manufacturers' Association.
Manganese Steel Founders' Society.

Signals at Highway Crossings

Pursuant to the action taken at the recent conference in Chicago, reported in the *Railway Age Gazette*, last week, page 157, representatives of the National Association of Railroad Commissioners, and of the American Railway Association, conferred, last week, Friday, in New York City with representatives of the American Automobile Association, in relation to joint action by the three associations concerning the promotion of safety at grade crossings; and it was agreed to ask the American Railway Association to call together a committee of railroad counsel to draft a bill or bills covering the question of regulation of traffic at grade crossings, with a view to the prevention of accidents. These drafts will be submitted to the Public Service Commissions of the several states, and to the Automobile Association, for criticism. Then it is proposed to have a further conference, in Washington, prior to the annual convention of the National Association of Railway Commissioners. The A. R. A. Committee will take the matter up at once, and the members feel that the prospects of securing united action on this matter, in the reasonably near future, are very bright.

The Floods in the South

The floods of July 16 in the western part of North Carolina, the eastern part of Tennessee and in South Carolina, put many miles of railroad out of business for three and four days and the loss of long bridges necessitated the running of important through trains over circuitous detours for fully two weeks. In the meantime local train service was partly restored by the establishment of temporary ferries.

After two weeks of unceasing labor the Southern Railway forces, on Sunday last, completed a temporary bridge across the Catawba river at Belmont, N. C., and on Monday through trains between Washington and Atlanta resumed their trips. On the line between Asheville and Spartanburg the work required several days longer.

The Southern's bridge across the Wateree near Kingville, S. C., west of Sumter, withstood the flood until the 19th, when it was carried away, together with several loaded cars, which had been used to weight it. On the line west from Statesville, N. C., to Asheville, train service was restored for a part of the way on the 24th; but the loss of the bridge at Eufola necessitated the use of the ferry across the Catawba river for an indefinite period. In the mountains a few miles further west, between Old Fort and Ridgecrest, the work of restoring the road bed was expected to take four weeks.

On the line westward from Asheville to Knoxville, Tenn., the most serious damage was between Wolf's Creek and Del Rio. The repairs on this division necessitate the employment of many hundred men for ten days. At last reports eight men supposed to have perished with the destruction of the Belmont bridge in the flood, were still unaccounted for. The body of one man, H. P. Griffin, was found at Belmont and of another, J. N. Gordon, on an island, seven miles down stream.

The Atlantic Coast Line suffered serious interruptions to traffic without great damage to road bed or structures. A portion of the timber trestle across the Wateree River a few miles up stream from Kingville, S. C., was carried away but the trestle has now been repaired. The steel bridges at the channels of the river were not injured. The water rose four feet above base of rail on the trestles which established a new high water record—four feet higher than the great flood of 1908. Traffic between Sumter and Columbia was suspended at 9 p. m., July 18, and resumed August 1.

The water in the Santee at Remini, S. C., rose six feet above the rail on the trestle approaches to the bridge and six inches above the rail on the steel bridge. The trestle and bridge were undamaged although a new high water record was established 2.2 feet above the flood of 1908. Traffic was diverted from this bridge from Tuesday the 18th, at 9 p. m., until Sunday the 23rd, at 8 p. m., trains being run via Yemassee, S. C., and Charleston, S. C.

The water in the Santee at St. Stephens rose six inches above

the top of the rail on the steel viaduct approaches, and attained a height of 3 ft. 6 in. above the great flood of 1908. The water did not get above the rail on the channel spans. Traffic was diverted from 3 p. m., Sunday the 23rd, until 8 a. m. of Wednesday the 26th, trains being run from Charleston via Denmark and Sumter to Florence, S. C.

The A. C. L. through the storm period kept its trains moving in North and South Carolina by diverting traffic from its main lines to its branches, and subsidiaries (and, at times over a part of the Southern Railway) except between Sumter and Columbia, 42 miles. Its lines were also used for much of the traffic for other railways whose lines had been more seriously affected.

The Seaboard Air Line lost several bridges on the East Carolina division. At the Catawba river, on the North Carolina division, the damage to the bridge, with the trestle on both sides of it, left a total opening of about 500 ft. The span carried off at the Wateree river, near Camden, S. C., was 150 ft. long. On the Georgia division four spans of Catawba river bridge were carried off (600 ft.) and the total opening at that point was about 2,100 ft. Temporary repairs were completed at Wateree river, near Camden, S. C., and at Catawba river, near Catawba, S. C., so that regular train service was resumed over these lines on July 28. At the Catawba river, near Mount Holly, N. C., west of Charlotte, a ferry was established, and train service was restored on that line July 22.

The Carolina, Clinchfield & Ohio was badly damaged in the gorge of the Doe river in western North Carolina, and the restoration of the line was expected to require weeks. At last accounts traffic was still suspended between Altapass, N. C., and Marion, 31 miles.

The Carolina & North Western, which lost its bridge over the Catawba, north of Hickory, N. C., was out of business on that section for 10 days or more; but the line from Hickory to Chester, S. C., was reopened on the 24th.

The East Tennessee & Western North Carolina was badly damaged throughout its length, and the lumber mills along its line suffered severe losses.

The Lancaster & Chester, a road running from Chester, S. C., eastward 29 miles to Lancaster, suffered the loss of its Catawba river bridge, also the loss of the Cane Creek trestle, and trains for two weeks or more ran only between Chester and Fort Lawn, 20 miles. Arrangements were finally made for transferring passengers and freight over the Catawba by boat.

The East Tennessee & Western North Carolina was badly damaged throughout its length, and the lumber mills along its line suffered severe losses.

Strike Votes Being Counted

Representatives of the train service brotherhoods from various sections of the country are being quoted in the newspapers as saying that the strike vote which has just been completed is overwhelmingly in favor of a strike, the estimates from various sections ranging from 90 to 99 per cent. The votes are now being counted at the headquarters of the brotherhoods in New York City. The general chairmen for the western roads were expected to reach New York with the votes from their lines not later than August 5, and it is reported that the results will be announced at a meeting in New York on August 6.

Conferences between the National Conference Committee of the Railways and the committee representing the brotherhoods are to be resumed in New York City on Tuesday, August 8, in accordance with an arrangement reached at the conclusion of the conference on July 15. According to press despatches from Washington, William L. Chambers, commissioner of the United States Board of Mediation and Conciliation, has been keeping President Wilson informed on the controversy, and is prepared to offer the services of the board as soon as they may become necessary. Commercial clubs in various parts of the country are passing resolutions or writing letters to their representatives in Congress, urging that some action be taken to compel arbitration or reference of the controversy to the Interstate Commerce Commission. Resolutions adopted by the Nevada Railroad Commission, urging arbitration, were referred to in last week's issue. Similar resolutions have been adopted by the Arizona and New Mexico commissions.

The Transportation Brotherhoods' Publicity Bureau has issued a statement, which is in part as follows:

"The proposition of the railroads to refer the demands of the railway brotherhoods for an 8-hour day to the Interstate Commerce Commission is nothing but a proposition to gain time for the railroads and to waste time for the men.

"The Interstate Commerce Commission is not now equipped to undertake this task. In order to undertake it, the Interstate Commerce Commission act would have to be radically amended by Congress. Such an amendment would require at least a month for passage, and upon its passage several months would be required before the commission could actually begin the work thus imposed upon it.

"Whatever may be the desirability of empowering the Interstate Commerce Commission to handle wage disputes, this is not the time to do it. The commission is overburdened with duties. A bill has been pending before Congress, urgently advocated by the railroads themselves, calling for an increase in the membership of the commission in order to enable it to handle cases already on its docket.

"If authority is conferred on the Interstate Commerce Commission by Congress to fix or exercise any control over wages, it would only apply to employees whose runs are from one state to another.

"Inasmuch as the bulk of trainmen work wholly within a state, it would result in the worst muddle possible—a few employees having their wages fixed by the United States and the rest of them standing just where they are now.

"The claim made by the railroads that, as the Interstate Commerce Commission has authority over freight rates, it should also have authority over rates of pay, is a clever and seemingly plausible argument put forward to secure public sympathy. The Interstate Commerce Commission has always taken cognizance of wages or labor costs in passing upon freight rates.

"Elaborate statistical exhibits in all general rate cases have been presented by the railroads to the commission, which set forth in great detail how many more dollars are paid out in wages and salaries now as compared with former years. As a consequence, the Interstate Commerce Commission has always passed on the question of the relation of wages to freight and passenger rates, and total operating costs."

H. A. Wheeler, vice-president of the Union Trust Company of Chicago, and chairman of the United States Chamber of Commerce special committee on the railroad situation, gave out an interview in Chicago on Monday on the strike prospects, in which he said:

"It is as clear as an open door that events are leading directly to a strike which will tie up the freight service of all the railroads of the country. At the moment there is little prospect that mediation will succeed. The future moves in the wage controversy are now fairly well outlined. The members of the four brotherhoods have voted overwhelmingly in favor of granting authority to their respective chiefs to call a strike in case the demands for an 8-hour day, with time and a half for overtime, are not granted. To be sure, this large vote was made possible by assurances quietly given to the men by the brotherhood officers that there would be no strike. Nevertheless, the brotherhood officials are now vested with the power to order a strike, at any time, without warning. The next step will be a joint conference of the brotherhood representatives and the committee of railroad managers in New York August 8, at which the brotherhood chiefs will announce the result of the strike vote.

"It can be stated positively that the railroads will make the same proposition, without change in any particular, that the men rejected in June. That proposition was to submit all questions at issue to impartial arbitration, including questions raised by the employers. The railroads in this fight have their backs against the wall. They will make no further concessions.

"The brotherhood officers presumably will again refuse to accept this proposal and will threaten interruption of traffic. Then the Federal Board of Mediation and Conciliation will step in, but its efforts will be begun under the most unfavorable conditions. In order to have arbitration the Newlands law requires that both parties shall agree on the subjects to be arbitrated. It is just on this point that the employers and employees have shown themselves unable to agree, for the men have not definitely refused to arbitrate. Next President Wilson will probably take steps personally to avert a strike, as he did in 1915. He will call in the railroad managers and appeal to them to avert such a calamity as a strike would entail. But will he tell the brotherhood chiefs what to do? Hardly; not in a presidential campaign."

The American Association of Railroad Superintendents

The twenty-ninth annual meeting of the American Association of Railroad Superintendents will be held in Memphis, Tenn., August 16, 17 and 18. Through the courtesy of the Illinois Central a special train will be provided, leaving Chicago on the morning of August 15, to convey members and their families to Memphis, and through the courtesy of the St. Louis & San Francisco a special train will be provided to leave Memphis on the morning of August 19 for St. Louis on the return trip. The meetings will be held at the Hotel Chisca. The Committee on Arrangements has arranged for a freight trucking contest, automobile rides for members of families while meetings are in session, a four-hour trip through the city by street cars, including a visit to the Memphis Zoological Gardens, boat rides, and an inspection of the Memphis railroad terminals, including an exhibition of cotton handling by the Memphis Terminal Corporation, one of the largest cotton warehouses in the world.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, 1916, New Orleans, La.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, East St. Louis, Ill. Next meeting, June, 1917, Denver.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, New Willard Hotel, Washington, D. C.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Annual meeting, August 16-18, 1916, Memphis, Tenn.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Denver, Colo.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, 1916, New Orleans, La.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 20-22, 1917, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June, 1917.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago. Annual meeting, August 24-26, 1916, Hotel Sherman, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Annual meeting, May 30, 1917, San Francisco, Cal.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J. Next meeting, May, 1917, Louisville, Ky.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, Soo Line, 112 West Adams St., Chicago.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. F. Conard, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren F. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Annual convention, June 19, 1917, Banff, Alberta.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next meeting, August 15-17, 1916, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago. Next meeting, May, 1917, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, August 29 to September 1, Hotel Sherman, Chicago.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 12-14, 1916, "The Breakers," Atlantic City, N. J.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June, 1917.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago. Next convention, March, 1917, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Annual meeting, December, 1916, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—H. O. Hartzell, B. & O. R. R., Baltimore, Md. Next meeting, November, 1916, Chicago.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Annual meeting, October 3-5, 1916, New York.

RAILWAY REAL ESTATE ASSOCIATION.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 10, 1916, Chicago.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 12-14, 1916, Grand Hotel, Mackinac Island, Mich.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Associations.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Washington, D. C.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next meeting, June 19, 1917, Fresno, Cal.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next meeting, September 5-8, 1916, Hotel Sherman, Chicago.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

Traffic News

The Southern Pacific has announced an embargo, effective on July 28, on east bound freight over its Sunset-Gulf route because of congestion of traffic at Galveston and New Orleans, and a scarcity of vessels to take freight from those ports for the Atlantic seaboard. Westbound freight over the same route is not affected.

Mail Pay to be Decided by Commission

The Post Office Appropriation bill was signed by the President on July 28. It carries appropriations aggregating $322,000,000. The postmaster general is authorized to send second-class matter by fast freight, but no publisher shall be discriminated against or be made to suffer undue delay; and appeals from the rulings of the postmaster general in this matter may be made to the Court of Appeals of the District of Columbia. There is also a clause requiring the postmaster general to have mail matter, other than that of the first class, carried by the railroads the same as express matter, at rates not exceeding those paid by the express companies. He may secure through the Interstate Commerce Commission information as to what the railroads now receive for express matter.

The present basis of pay for transportation of mails by rail is continued, but there is provision for the experimental use of the space rate principle on roads to be selected by the postmaster general, with the approval of the Interstate Commerce Commission; and by another section the Interstate Commerce Commission is authorized and directed, as soon as practicable, to determine fair and reasonable rates to be paid by the government to the railways, and to publish the same. The commission has a free hand, and is authorized to conduct an extended investigation. Provision is also made for appeal either by the postmaster general or by any railway from any rate prescribed by the commission.

In the experimental operation of the space rate principle, the postmaster general is to employ the rates which were prescribed in the committee report made to the last Congress, namely: Not over 21 cents a mile for ordinary post office cars, with terminal rates for each trip, etc.

Transcontinental Rates Adjusted

As briefly noted in last week's issue, the western transcontinental railroads have decided to advance, effective on September 1, freight rates from eastern points to the Pacific coast terminals on which the Interstate Commerce Commission on July 15, 1915, allowed the roads to make special reductions to meet Panama Canal competition, by granting relief from the provisions of the fourth section. On account of the lack of competition through the Panama Canal under present conditions the commission recently issued another order rescinding its previous order, on petition of the Nevada Railroad Commission, and gave the road the option of advancing the rates to the coast or reducing those to intermediate points. With the restoration of the conditions governing prior to July 15, 1915, there will be, so far as eastbound traffic is concerned, a return to the rates in effect prior to the reductions made to meet the canal competition under the commission's order. As to westbound traffic, it will be the purpose of the rail carriers for the present to adjust the rates to the Pacific coast terminal points so as to continue to preserve to the intermediate points the present rates under the percentage relation between intermediate and terminal rates fixed by the commission.

The westbound commodities principally affected are those included in what is known as "Schedule C," which comprises something over 100 articles, on which the water competition was especially keen. Special relief was also granted on a number of commodities moving eastbound. The eastbound rates affected are on asphaltum, beans, lentils, peas, canned goods, barley, dried fruit and wine. The rate on canned goods, which had been reduced to 62½ cents, will be advanced to 85 cents per hundred pounds. The rate on dried fruit in sacks, which was reduced to $1.10, will be restored to $1.30.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Public Utilities Commission of Colorado has filed a petition with the Interstate Commerce Commission for reductions ranging from 25 to 35 per cent in class rates from Denver and other Colorado points to a large number of points throughout the west, and also for a readjustment of rates between Denver and Galveston.

Milling Logs in Transit on Tap Lines

Opinion by Commissioner Harlan:

A request that trunk line carriers generally be required to establish milling-in-transit arrangements on logs in connection with tap lines in the lumber blanket rate territory in the southwest is denied.

The commission notes that the establishment by a trunk line of transit arrangements on logs hauled by it to mills located upon its own lines in the blanket territory would subject to prejudice and disadvantage the mills on the tap lines with which it connects and has joint rates, unless the trunk line offered them a similar and equal arrangement. It also points out the prejudice and disadvantage under such circumstances to mills in the same territory that get their logs in over unincorporated logging roads or by teams over tram roads, or by similar means. (40 I. C. C., 597.)

Applications Under the Panama Canal Act

Maine Central Boat Lines. Opinion by Commissioner Harlan:

The Maine Central is allowed to continue its operation of a steamboat service from its rail end at Mount Desert Ferry, on the eastern coast of Maine, to various points on Mount Desert Island and on the shores of Frenchman's Bay, and also a similar boat service between its terminus at Rockland, in the same state, and various points along the shores of Penobscot Bay. (40 I. C. C., 272.)

Boston & Maine Boat Lines. Opinion by Commissioner Harlan:

The Boston & Maine operates the Mount Washington on Lake Winnepesaukee in New Hampshire from June 20 to September 20, to take care of the summer tourist traffic to the towns and summer cottages on the lake. It also operates the Lady of the Lake (under Canadian registry) from June to October on Lake Memphremagog. The lake is about 30 miles long and partly in Vermont and partly in Quebec. The only point touched in the United States is Newport, Vt. The commission finds that the Boston & Maine does or may compete with its steamers within the meaning of the act, but that the water services in question are operated in the interest of the public, are of advantage to the convenience and commerce of the people, and their continued operation will neither exclude, prevent nor reduce competition, and should be permitted. (40 I. C. C., 565.)

Central Vermont Boat Lines. Opinion by Commissioner Clements:

The Central Vermont is allowed to continue its operation of vessels between New London, Conn., and New York, and to install a similar service between Providence, R. I., and New York. The Central Vermont is owned 70 per cent by the Grand Trunk. It operates a rail line from St. Johns, Quebec and Rouses Point, N. Y., through Vermont, Massachusetts and Connecticut to New London. From the last named point the Central Vermont Transportation Company carries traffic to pier 29, East River, New York City. The Central Vermont is now building a line from Palmer, Mass., to Providence, R. I., known as the Southern New England. The transportation company now operates between New York and New London two freight steamers, and has docked at New London, awaiting the completion of the Palmer-Providence line, two new combination passenger and freight steamers for operation between New York and Providence. (40 I. C. C., 589.)

The New England Milk Case

Opinion by Commissioner McChord.

The commission in this case holds that the Boston & Maine and other carriers in New England have not justified increased rates proposed in September, 1915, on milk and cream, etc., to Boston, Mass. It further finds that the New England or leased-car system under which 75 per cent of the Boston & Maine's fluid milk traffic is carried is unlawful. The carriers are allowed to put into effect a graduated scale of per can rates prescribed by the commission higher than those now in effect for milk in less than carloads in passenger, milk and mixed train service. Milk carried in freight trains in carloads without ice or in less than carloads with ice when necessary shall be charged 75 per cent of this scale. Carload rates will be provided where the shipments are from one consignor to one consignee from one point of origin to one destination to be iced by the shipper at not more than 87½ per cent of the scale. These prescribed rates in each case include the return of the empty containers.

As a result of many informal and formal complaints regarding the regulations and practices of the common carriers engaged in the interstate transportation of milk the commission instituted a general investigation throughout the United States with a view toward the establishment of uniformity. It developed soon after the hearing commenced in Boston that conditions regarding the transportation of milk and cream to Boston and other New England cities were wholly different from those elsewhere. It was therefore determined to dispose of the New England situation in a separate report. The report relates almost entirely to shipments to Boston, although the rates apply between all interstate points in New England. The milk supply of cities outside of the territory around Boston is largely secured from nearby intrastate points.

About 75 per cent of the fluid milk shipped into Boston over the Boston & Maine moves in carload lots, under what is known as the New England, or leased-car, system. Under this system the carrier transports in both directions a milk car for a specified charge per annum. The carrier furnishes the car and warms it when attached to the train in winter. The milk dealer who contracts for the running of the car loads and unloads the milk and cream and provides refrigeration when required. The standard can in New England holds 8½ quarts. The minimum carload is 1,050 8½ quart cans, or 8,925 quarts or the equivalent. Charges in proportion are made for cans in excess of the minimum. The dealer pays the carload rate from starting point of the shipment. It is also provided that milk and cream may be loaded into the car at scheduled stops of the train on the going trip and empty cans unloaded on the return trip. The charge for the car includes carrying the dealer's caretakers in both directions. The method pursued by the milk dealer in originating a leased-car route is to go among the farmers of a given section and contract with them for the delivery at certain railroad stations of an agreed quantity of milk at a given price and for a given period, usually six months. The containers are generally owned and supplied by the dealer, and he cleans and keeps them in repair.

It was proposed to change the charges on the leased cars so that the same charges for passenger and milk train service would apply up to 75 miles; lower charges for distances 76 to 149 miles and increased charges for distances over 165 miles. Of the leased cars, 70 per cent start from points more than 165 miles from Boston, and of this proportion 40 per cent start from more than 200 miles.

Practically no milk is shipped in New England by express, but there is a considerable express traffic in cream.

The carriers contended that the present rates were too low for the service rendered. W. J. Cunningham, professor of transportation at Harvard University, presented an exhibit which was the result of an endeavor to ascertain the relation between the revenue derived by the Boston & Maine from its milk traffic and the share of the expenses which should be apportioned to that traffic. His figures showed that the operating revenues derived from the transportation of milk in passenger trains totaled $469,927 yearly; in freight trains $203,592, or a total from both services of $673.519, and, further, that this traffic was carried at a loss of 2.605 cents per revenue car mile for traffic in both passenger and freight trains, or of 5.22 cents in passenger trains alone. The commission found reason to question some of Mr. Cunningham's conclusions, but agreed that the results could be accepted as indicative that the milk traffic of the Boston & Maine is not, on the whole, remunerative.

The commission found special reason to condemn the New England or leased-car system. It notes in its report that "transportation by leased cars is a unique method in this country. New England carriers are the only ones which have adopted such a system. Its undoubted tendency is to create and perpetuate a monopoly of the milk transportation business in the hands of those who operate leased cars. The greater quantity of milk consumed in metropolitan Boston is shipped to four large dealers. * * * The extent to which the consolidation of the milk business in a few hands has been carried in metropolitan Boston is not approached in any other city as far as our investigation shows."

It notes further that "the leased-car rates are so grouped and adjusted that the user thereof can go long distances from the city and secure his supply of milk and cream. It is an economic waste to haul milk for long distances if it may be secured at shorter distances. No rate adjustment can be successfully defended which deprives any shipper of the natural advantage of proximity to point of consumption."

By section 1 of the act it is made the duty of common carriers to furnish transportation of property upon reasonable request therefor; and transportation is defined to include all services in connection with refrigeration, icing and handling of property transported. Under the leased-car system, New England carriers delegate to private individuals a part of their transportation function. If this may lawfully be done at all, carriers are bound to establish charges and maintain regulations with respect thereto which do not unduly discriminate against any shipper engaged in the same business. The leased-car system is inconsistent with the per can system. The two can not, with justice to all shippers, be maintained contemporaneously by carriers in New England. Inasmuch as the two systems can not be operated at the same time with just and reasonable rates and regulations applicable to each, the one which confers special privileges on particular shippers must give way in the interest of the general shipping public.

In establishing per can rates the commission considered that 75 per cent of the traffic into Boston was transported at very low charges as compared with the other 25 per cent; that a change of rates to a reasonable distance scale means increased charges for the greater volume of the traffic; that much of the work incident to the carrying of the milk was done by the users of leased cars rather than the carriers; that the rates established can not under such conditions be taken as an expression by the commission of what under ordinary circumstances would be reasonable charges elsewhere.

The following scale of maximum rates in cents per can is found reasonable for the interstate transportation over the lines of carriers in New England of milk, in less than carloads, including skim milk, buttermilk and pot cheese, in milk, passenger and mixed freight and passenger trains, in milk or refrigerator cars, heated in winter and iced in summer, including the return of the empty containers:

Miles	8½-quart	10-quart	20-quart	21¼-quart	40-quart	46-quart	50-quart
1 to 20	3.4	3.8	6.3	6.7	11.4	12.8	13.8
21 to 40	4.2	4.7	7.8	8.2	13.9	15.7	17.0
41 to 60	4.9	5.4	9.0	9.4	16.1	18.2	19.6
61 to 80	5.4	6.1	10.0	10.5	18.0	20.3	21.9
81 to 100	6.0	6.7	11.0	11.5	19.7	22.2	24.0
101 to 120	6.4	7.2	11 9	12.5	21.3	24.0	25.9
121 to 140	6.9	7.7	12.7	13.3	22.8	25.7	27.7
141 to 160	7.3	8.2	13.5	14.1	24.2	27.2	29.4
161 to 180	7.7	8.6	14.2	14.9	25.5	28.7	30.9
181 to 200	8.1	9.0	14.9	15.6	26.7	30.1	32.4
201 to 220	8.4	9.4	15.6	16.3	27.9	31.4	33.9
221 to 240	8.8	9.8	16.2	17.0	29.0	32.7	35.3
241 to 260	9.1	10.2	16.8	17.6	30.1	34.0	36.6
261 to 280	9.4	10.5	17.4	18.2	31.2	35.2	37.9
281 to 300	9.7	10.9	18.0	18.8	32.3	36.3	39.1
301 to 320	10.0	11.2	18.5	19.4	33.2	37.4	40.3
321 to 340	10.3	11.5	19.0	20.0	34.1	38.5	41.5
341 to 360	10.6	11.8	19.6	20.5	35.1	39.6	42.6
361 to 380	10.9	12.2	20.1	21.1	36.0	40.6	43.7
381 to 400	11.1	12.5	20.6	21.6	36.9	41.6	44.8
401 to 420	11.4	12.8	21.1	22.1	37.8	42.6	45.9
421 to 440	11.7	13.0	21.5	22.6	38.6	43.5	46.9
441 to 460	11.9	13.3	22.0	23.1	39.4	44.5	47.9
461 to 480	12.2	13.6	22.4	23.6	40.2	45.4	48.9
481 to 500	12.4	13.9	22.9	24.0	41.0	46.3	49.9

Rates on cream should not exceed the rates on milk by more than 25 per cent. Where milk and cream are transported in freight cars in freight trains in carloads without ice and in less than carloads with ice, when necessary, and including the return of the empty containers, the charge should be based on rates not to exceed 75 per cent of those provided in the scale given above. Carload rates should be provided for where the shipments are from one consignor to one consignee from one point of origin

to one destination to be iced by the shipper, at not more than 87½ per cent of the scale, including the return of the empty containers.

Rates on milk and cream in bottles in cases should be established on the present relationship to rates in cans in conformity with the rates found reasonable. Provision should also be made for mixed shipments of milk and cream in carloads; the rates to be made on the basis of the per can rates for each commodity in carloads, subject to the minimum provided for milk.

The carriers should keep a detailed record of receipts and expenditures on account of the milk and cream traffic under the new system and rates for the period of one year. At the end of that time, if it appears that the rates and regulations prescribed are not reasonable, the matter may be called to the commission's attention by the defendants. Commissioner Hall dissents (40 I.C.C. 699).

Commodity Rates from St. Louis to Northeast Texas

Dallas Chamber of Commerce, Freight Bureau Department et al. v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner Meyer:

Certain carload commodity rates from St. Louis to points in northeast Texas are found unreasonable to the extent of 5 cents per 100 lb., and from Kansas City to the same points to the extent that they are not 5 cents per 100 lb. less than the rates from St. Louis.

The average of 87 principal commodity rates complained of shows that the commodity rates from St. Louis to northeast Texas are approximately 50 per cent in excess of the rates on the same commodities to Shreveport. The carriers have not justified so great a difference. Shreveport's proximity to the Mississippi river, together with the difference in distance, cannot be regarded as a justification for the existing spread between Shreveport and northeast Texas in rates from St. Louis and Kansas City for an average difference in distance of approximately 88 miles.

Group rates can be considered just and reasonable only in so far as they do not effect unjust discrimination. Carriers have found it necessary to depart from the Texas common-point adjustment on traffic from Kansas City to the Dallas and Fort Worth group. A like exception should be made in rates from St. Louis and Kansas City to northeast Texas. The rates to northeast Texas are admittedly such as would be considered reasonable for an average haul of from 800 to 825 miles, that being the average haul to Texas common-point territory. Rates so constructed cannot be considered reasonable in so far as they are discriminatory. As to traffic from St. Louis and Kansas City to points in northeast Texas, those points are at a disadvantage as compared with Shreveport, a competing locality, by reason of the shorter distance to Shreveport, and the competitive conditions at that point, but that natural disadvantage ought not to be unduly increased by an artificial rate adjustment.

The principal cities affected by this complaint are Dallas and Fort Worth. They are approximately 696 miles from St. Louis, and 510 miles from Kansas City, via the short lines. The average distance from St. Louis to northeast Texas is probably not far from 650 miles, and the average from Kansas City about 550 miles. It is reasonable to require the carriers to recognize the position of the points in northeast Texas, and to establish from St. Louis to all those points rates which, with certain exceptions, shall be 5 cents per 100 lb. less than the present rates. Points in northeast Texas east of the so-called Dallas and Fort Worth group are practically the same distance from Kansas City and St. Louis, and take the same rates from both points. The rates from Kansas City to such points are unreasonable to the extent that they exceed the rates from St. Louis. Points in the western portion of northeast Texas and included in the Dallas-Fort Worth group are approximately 100 miles nearer to Kansas City than to St. Louis, and take rates from Kansas City from 5 to 8 cents less per 100 lb. than from St. Louis. These rates from Kansas City are unreasonable to the extent that they are not as much as 5 cents per 100 lb. less than from St. Louis.

Commissioners Harlan and Daniels dissent, the latter partly because "the use of rates to Shreveport as a criterion of the intrinsic reasonableness of the rates from these two gateways to northeast Texas is peculiarly inappropriate for the reason that this commission has said, not once but repeatedly, that rates from St. Louis to Shreveport are subnormal." (40 I. C. C., 619.)

Railway Officers

Executive, Financial, Legal and Accounting

V. R. Baldwin, general attorney of the Western Pacific at San Francisco, Cal., has been appointed also vice-president.

W. S. Easton has been appointed auditor of the Riverside, Rialto & Pacific, with headquarters at Riverside, Cal., vice W. C. Scott.

H. C. Abbey, general traveling auditor of the Missouri-Pacific-St. Louis, Iron Mountain & Southern, has been appointed auditor of station accounts.

Edwin Gould, chairman of the board of the St. Louis Southwestern at New York, has been elected also president, to succeed the late F. H. Britton. J. M. Herbert has been elected first vice-president in charge, with headquarters at St. Louis, Mo.

Operating

J. A. Bennett, having resigned as general manager of the Bridgton & Saco River, E. A. Crosby has been appointed acting general manager, with office at Bridgton, Maine.

Robert M. Patterson, special agent in the general manager's department of the Pennsylvania Railroad at Philadelphia, Pa., on July 1 retired under the pension rules of the company.

G. D. Hood has been appointed superintendent of telegraph for the receiver of the Chicago, Rock Island & Pacific, with headquarters at Chicago, Ill., vice C. H. Hubbell, transferred, effective August 1.

M. H. Broughton, whose appointment as superintendent of the Illinois division of the Baltimore & Ohio Southwestern has been announced, was educated at the Albion (Ind.) high school, and entered railway service on April 22, 1886, as oil house man at Garrett, Ind., on the Baltimore & Ohio. He continued in the employ of that road as brakeman, freight conductor and passenger conductor, until 1900, when he was made general yardmaster at Chicago Junction, Ohio. He remained in that position from April 1 to August 1 of that year, when he was transferred as assistant trainmaster to the Newark division. Leaving the Baltimore & Ohio in 1905, he engaged in the hotel business for several years, returning to railroad work in 1909, as superintendent of the L. J. Smith Construction Company, Kansas City, Mo. He was later trainmaster on the Omaha division of the Missouri Pacific, assistant trainmaster of the Cumberland division of the Baltimore & Ohio, trainmaster of the same division, supervisor of transportation, assistant superintendent of the Cleveland division, and assistant superintendent of the Indiana division of the Baltimore & Ohio Southwestern. His appointment as superintendent of the Illinois division was effective on July 10.



M. H. Broughton

E. W. Mason, superintendent of the western division of the Western Pacific, with headquarters at Sacramento, Cal., has been appointed general superintendent, with office at the Mills building, San Francisco, effective August 1.

F. E. Haines, trainmaster of the Chicago, Burlington & Quincy lines east of the Missouri river, at Aurora, Ill., has been appointed assistant superintendent of the Ottumwa division, with headquarters at Burlington, Iowa, vice M. F. MacLaren, promoted.

Henry E. Hart, assistant yardmaster of the Buffalo, Rochester & Pittsburgh, at Lincoln Park, N. Y., has been appointed car accountant, with headquarters at Rochester.

J. P. Quigley, superintendent of transportation and superintendent of telegraph of the Western Pacific at San Francisco, Cal., has been promoted to superintendent of the western division, with office at Sacramento; K. M. Nicoles, trainmaster at Stockton, Cal., has been appointed superintendent of transportation, with office at San Francisco; J. H. Leary has been appointed assistant superintendent of the first and second districts, western division, with office at Stockton.

Traffic

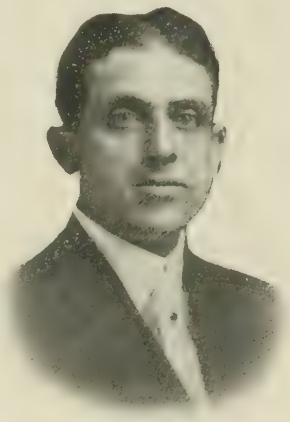
C. G. Randall has been appointed general freight and passenger agent and auditor of the Wabash, Chester & Western, with headquarters at Chester, Ill., in place of W. S. Easton, resigned, and C. E. Kingsbury, deceased.

C. M. Knox, general agent of the Southern Pacific lines at Los Angeles, Cal., has been appointed general agent at Cincinnati, Ohio, vice A. G. Little, transferred to St. Louis, Mo. G. T. Hild, general agent at St. Louis, has been appointed assistant general agent at Chicago, Ill., vice O. P. Bartlett, promoted.

J. T. Hendricks, freight traffic manager of the Western Pacific, has been promoted to traffic manager, with headquarters at San Francisco, Cal. Bode K. Smith, assistant general passenger agent, has been appointed general passenger agent, with office at San Francisco, effective August 1.

F. V. Berry, chief of tariff bureau of the Maine Central, the Bridgton & Saco River and the Sandy River & Rangely Lakes at Portland, Maine, has been appointed assistant general freight agent of the Maine Central and the Portland Terminal Company. Lucien Snow has been appointed chief of tariff bureau, in place of Mr. Berry.

Fred J. Robinson, who has been appointed general passenger agent of the Central of Georgia, with headquarters at Savannah, Ga., as has already been announced in these columns, was born on November 14, 1869, at Micanopy, Fla., and was educated in private schools at Columbus, Ga He began railroad work in 1889 as a clerk in the local freight station of the Central of Georgia, at Columbus; then to 1890 was receiving clerk at that place. From 1890 to 1893 he was station ticket agent at Columbus, then to February, 1894, was traveling passenger agent of the same road. From February to November, 1894, he was assistant station ticket agent at Savannah, Ga., and then to December, 1897, he was city passenger agent of the same road at Atlanta, Ga. On January 1, 1898, he was appointed western passenger agent at Chicago, and from the following April to 1899 represented the same road in the movement of troops in the South during the Spanish-American war. He served as traveling passenger agent at Atlanta, Ga., until July, 1899, and then for two years was chief clerk to the general passenger agent at Savannah. In July, 1901, he was promoted to assistant general passenger agent at Savannah, which position he held at the time of his recent appointment as general passenger agent of the same road, with headquarters at Savannah, as above noted.



Fred J. Robinson

Engineering and Rolling Stock

F. D. Batchellor, district engineer maintenance of way of the Cincinnati, Hamilton & Dayton, with headquarters at Cincinnati, Ohio, has had his jurisdiction extended to include the northwest district of the Baltimore & Ohio Southwestern.

F. E. Starkweather has been appointed assistant signal engineer of the Pere Marquette. J. J. Evans, supervisor of signals at Saginaw, Mich., has resigned to engage in other work, and is succeeded by C. A. Nelson, chief draftsman in the signal department.

E. G. Lane, district engineer maintenance of way of the northwest district of the Baltimore & Ohio Southwestern, has been appointed engineer maintenance of way of the western lines of the Baltimore & Ohio, and of the Cincinnati, Hamilton & Dayton, with headquarters at Cincinnati, Ohio.

T. W. McCarthy, master mechanic of the Kansas division of the Chicago, Rock Island & Pacific, with office at Horton, Kan., has been appointed master mechanic in charge of shops at Horton, reporting to the mechanical superintendent at El Reno, Okla. R. J. McQuade has been appointed master mechanic of the Kansas division, vice T. W. McCarthy, transferred, with headquarters at Herington, Kan. G. W. Cuyler has been appointed master mechanic of the St. Louis and Kansas City terminal divisions, with headquarters at Armourdale, Kan., vice R. J. McQuade, transferred, effective August 1.

OBITUARY

T. Mackrell, division superintendent of the Erie at Huntington, Ind., died at that city on July 24.

John Millen, president and general manager of the Duluth & Northern Minnesota, died at Duluth, Minn., on July 27.

William Wratten, who retired as district master mechanic of the Chicago, Milwaukee & St. Paul at Minneapolis, Minn., in September, 1913, died at that city on July 28.

W. H. Phelps, formerly attorney for the St. Louis & San Francisco, and later for the Missouri Pacific in Missouri, died at Rochester, Minn., on July 26. Mr. Phelps was for many years a prominent representative of railroad interests at Jefferson City, but on January 1, 1909, resigned from railroad service, and had since been conspicuous as an anti-railroad member of the legislature.

James Peabody, statistician of the Atchison, Topeka & Santa Fe, with headquarters at Chicago, Ill., died at Topeka, Kan., on July 25, after undergoing an operation. Mr. Peabody was born at Norwich, Conn., on February 7, 1845, and was educated in the public schools and at Aurora Academy, where he graduated in 1860. He entered railway service in 1873, as general agent of the Missouri, Kansas & Texas, in Texas. From 1873 to 1879, he was commercial agent of the Chicago, Burlington & Quincy at Cincinnati, Ohio; from 1879 to 1880, tariff clerk at Chicago, and from the latter date until 1887, pool commissioner of the same road. For about a year, he was chief clerk in the general freight department of the Chicago, Indianapolis & Louisville. In 1888, he was made editor of the Railway and Engineering Review, resigning in 1897 to become statistician of the Santa Fe.



J. Peabody

United States Steel Trade.—The United States has furnished nearly 80 per cent of Great Britain's imports of semi-finished steel since the war started, whereas previous to the war the United States furnished less than 20 per cent of such imports, and Germany nearly 80 per cent of the total. In the first two months of this year the United States furnished 84 per cent of the British imports of semi-finished steel.—*Iron Age.*

Equipment and Supplies

LOCOMOTIVES

The Boston & Albany has ordered 5 Mallet type locomotives from the American Locomotive Company.

The Houston & Brazos Valley is reported as contemplating the purchase of one ten-wheel freight locomotive.

The Ashland Coal & Iron Company has ordered one locomotive from the American Locomotive Company.

The Northern Railway of Spain, reported in the *Railway Age Gazette* of April 28 as being in the market for locomotives, has ordered 15 locomotives from the American Locomotive Company.

FREIGHT CARS

The French Government has revived its inquiry for 500 to 2,000 box cars.

The Houston & Brazos Valley is reported as contemplating the purchase of a caboose.

The Aliquippa & Southern is expected to place orders shortly for 30 side dump hopper cars.

The American Smelting & Refining Company, New York, has issued inquiries for 50 200,000-lb. capacity gondola cars, with six-wheel trucks.

The Ponca Refining Company, Oklahoma City, Okla., has ordered 40 40-ton steel tank cars from the American Car & Foundry Company.

The Cushing Refining Company, Oklahoma City, Okla., has ordered 40 40-ton steel tank cars from the American Car & Foundry Company.

The Baltimore & Ohio has bought 1,500 100,000 lb. capacity hopper cars from the Jamison Coal & Coke Company, Oliver building, Pittsburgh, Pa.

The Producers' Refining Company, Oklahoma City, Okla., has ordered 40 40-ton and 40 50-ton steel tank cars from the American Car & Foundry Company.

The Russian Government's recent order for 28,000 axles and about 56,000 cast iron wheels was divided about equally between the Pressed Steel Car Company and the American Car & Foundry Company.

PASSENGER CARS

The Duluth, South Shore & Atlantic is inquiring for 2 baggage cars, 2 first-class coaches and 2 second-class coaches.

The Houston & Brazos Valley is reported as contemplating the purchase of 2 passenger cars and 3 industrial passenger cars.

IRON AND STEEL

The Lehigh Valley has ordered 400 tons of steel from the Pennsylvania Steel Company for a bridge at Rochester, N. Y.

The Chicago, Milwaukee & St. Paul has ordered 195 tons of steel from the American Bridge Company for 3 90-ft. turntables.

The Boston & Maine has divided an order for 200 tons of bridge steel between the American Bridge Company and the Fort Pitt Bridge Works.

The Duluth, Missabe & Northern has ordered 201 tons of steel from the American Bridge Company for a bridge over the White Face river at Kelsey, Minn., and 115 tons of steel from the same company for a bridge over the St. Louis river at Forbes, Minn.

SIGNALING

The Baltimore & Ohio will install complete automatic block signals on the Cumberland division, using the Federal Signal Company's type "4," 10-volt d. c. signal mechanisms.

The Cincinnati, Hamilton & Dayton will install 79 automatic block signals on the Toledo division. The signal mechanisms are of the Federal Signal Company's type "4," 10-volt direct current.

The Denver & Rio Grande has let a contract to the Protective Signal Manufacturing Company, Denver, Colo., for a complete installation of 11 highway crossing signals embodying the National wig-wag, oscillators, bells, etc., to be located between Denver and Pueblo. The signals will be operated by 10-volt storage battery.

The Chicago, Indianapois & Louisvile has recently received the 104 model 2A signals and other materials for its d. c. automatic signal installation between Bloomington, Ind., and New Albany. This material is being furnished by the General Railway Signal Company and the installation will be made by railroad company forces.

The Southern has recently received material from the General Railway Signal Company for the installation of the 74 miles, double track automatic block signal system between Orleans, Va., and Amherst. This is a part of the large program of automatic signaling being carried out by the Southern which has been referred to in past issues.

The New York, New Haven & Hartford has recently received from the General Railway Signal Company the material for its electro-mechanical interlocking plant at Rye, N. Y. This plant comprises 32 electric levers (23 working and 9 spare) and 16 mechanical levers (12 working and 4 spare). The machine will be installed by the railroad company's forces.

The Chicago Great Western has placed an order for 79 crossing bells of the locomotive type for installation at street and highway crossings. A check was made of all the dangerous crossings on the system not already protected and the result is the order for the protection of these 79 crossings. Illuminated danger signs for night indications will be installed in connection with the bells at the important street crossings.

The San Pedro, Los Angeles & Salt Lake will install the "Absolute-Permissive" automatic block signal system on 112 miles of its line between Rox, Nev., and Modena, Utah. The signal materials to be used in this installation are 192 Federal type "4," 10-volt d. c. signal mechanisms with arms to be operated in three positions, upper right-hand quadrant; Federal type "F" track and line relays and type "AP" polarized relays.

The Louisville & Nashville is installing two selectively controlled signals to be known as "hold main" signals, being practically the same as "take-siding" signals such as have been in service on the Michigan Central for some time, controlled from train order offices. The materials for these signals are being furnished by the General Railway Signal Co. This road has also received 340 model 2A signals and other d. c. apparatus for the automatic block signal installation between La Follette, Tenn., and Etowah, and between Calera, Ala., and Montgomery, previously mentioned in these columns. This work will be installed by railroad company forces, the materials being furnished by the General Railway Signal Company.

The Lehigh Valley has let a contract to the General Railway Signal Company for the installation of an electric interlocking plant in the Buffalo terminal. This plant will comprise a Model 2 electric interlocking machine having 90 working levers and 14 spaces. The high and dwarf signals will be Model 2A, semaphore type; all switches will be operated by Model 5 switch machines and all track circuits will be operated by alternating current. This road is also installing an electro-mechanical interlocking plant at Port Reading, N. J., for which materials have recently been received from the General Railway Signal Company. The machine is a Model 2C comprising 24 electric levers for signals, 48 spare electric spaces, 16 mechanical levers for switches, 16 mechanical levers for facing point locks and four spare mechanical spaces. There will be 11 high and 13 dwarf signals, both of the Model 2A type; 6 Model 9 semaphore tower indicators, 13 Model 9 disk tower indicators and 3 Model 9 double disk tower indicators.

Supply Trade News

Walter D. Thomas, for many years representative in the southeastern states for the Rodger Ballast Car Company, Chicago, died July 10.

T. F. Flanagan, assistant sales manager of the Pyrene Manufacturing Company, New York, has been appointed general sales and advertising manager.

The Virginia Equipment Company, Toledo, Ohio, makers of the Virginia dust guards, has appointed the Mechanical Specialties Company, Park Row building, New York, its eastern representative.

The American Steam Gage & Valve Manufacturing Company, Boston, Mass., has moved its Chicago office and stock room, Charles C. Kilander, manager, to a new building at 25-27 South Jefferson street.

James A. McIntosh, a member of the contracting firm of McIntosh Brothers, died in Milwaukee July 28, at the age of 71 years. Mr. McIntosh constructed a considerable part of the Pacific Coast extension of the Chicago, Milwaukee & St. Paul.

A. C. Garrison has been elected president of the Corrugated Bar Company, St. Louis, Mo., to succeed his father, D. E. Garrison, deceased. A. L. Johnson has been appointed vice-president and general manager, and W. H. Kennedy, vice-president and treasurer. W. M. Armstrong, vice-president and sales manager, has resigned.

The bridge and construction business heretofore conducted at Steelton, Pa., by the Pennsylvania Steel Company of Delaware, will henceforth be carried on by the Bethlehem Steel Bridge Company of Delaware, a new company, the officers of which are G. H. Blakeley, president; Thomas Earle, vice-president; B. H. Jones, secretary and treasurer, and F. A. Shick, controller.

John I. Mange has been elected vice-president of the J. G. White Management Corporation, New York, N. Y. Mr. Mange has been associated with the J. G. White Management Corporation since 1912, at which time he was elected vice-president of the Associated Gas & Electric Company, a holding company of electric and gas properties in New York, Kentucky, Ohio and Tennessee, managed by the J. G. White Management Corporation.

Charles L. Brown, for many years associated with Manning, Maxwell & Moore, Inc., has been appointed western sales manager, railroad department, of the brass goods division of Manning, Maxwell & Moore, embracing the Ashcroft Manufacturing Company, the Consolidated Safety Valve Company, the Hancock Inspirator Company and the Hayden & Derby Manufacturing Company. Mr. Brown's headquarters will continue, as in the past, to be at the Chicago office of the company, 27-29 North Jefferson street.

The International Oxygen Company, New York, is installing a new plant at College Point, L. I., for the manufacture of oxygen and hydrogen gas. It is expected that the installation will be completed late in August or early in September, after which the company's increasing trade in Brooklyn and vicinity, as well as in Manhattan, will be largely handled from this point. Heretofore this local business has been supplied from the company's Newark works, and the new location will mean larger and better facilities and more prompt service in the supply of gases in cylinders.

The following announcement has been made by the law department of the Union Switch & Signal Company: "The Union Switch & Signal Company, General Railway Signal Company, Federal Signal Company and Hall Switch & Signal Company have entered into a cross-licensing agreement under the several patents, applications for patents and inventions owned by them respectively, copies of which agreement have been filed with the Department of Justice and the Federal Trade Commission. The purpose of the agreement is to end all patent litigation between the several companies and to put each in a position to make the safest and most effective types of signaling and interlocking systems and apparatus. By the production of such systems and apparatus the interests of the manufacturers, railroads and the traveling public will be promoted."

Harry M. Evans has been appointed assistant western sales manager of the Franklin Railway Supply Company, with office in the McCormick building, Chicago. Mr. Evans was born at Meadville, Pa., and was educated in the public schools at that place. He began railroad work as a call boy on the Erie, and served in various positions in the mechanical, transportation and traffic departments of that road. He entered the mechanical department of the Franklin Railway Supply Company October 1, 1908, as traveling representative, which position he held until his recent promotion to the sales department, as noted above.

Frederick C. Gedge, manager of wire mills of the Chicago district of the American Steel & Wire Company, and vice-president of the Gedge Brothers Iron Roofing Company of Anderson, Ind., died at his home in Chicago on July 28. Mr. Gedge associated himself with the American Wire Nail Company at Anderson, Ind., in 1885, and at the time of its purchase by the American Steel & Wire Company in 1898 was its vice-president. He was for some years superintendent of the Waukegan (Ill.) plant of the American Steel & Wire Company, and was later promoted to the position of manager of wire mills of the Chicago district, which he held at the time of his death.

The Page Woven Wire Fence Company, Monessen, Pa., has secured the exclusive right to draw and sell Aristos copperweld wire from rods manufactured by the Copper Clad Steel Company, Pittsburgh, Pa. The Page Woven Wire Fence Company as the pioneer manufacturer of woven wire fencing early found it necessary to erect its own steel and wire mills and to operate chemical and physical laboratories. A new modern building has been installed in connection with this plant, including all the necessary wire drawing machinery to handle this new copperweld to the best advantage. In the same building are located the tinning department to prepare the wire for rubber covering and the straightening and cutting machines used in turning out bond wires, guy wires, etc. After being drawn the wire is tested for breaking strength, for torsion and for elongation. From the time the wire is first broken down from the rod until its final wrapping it is handled with gloves to insure its being absolutely free from dirt and grease.

Contracts for War Munitions Totaling $105,000,000 Awarded Railway Supply Firms

Including the order for $18,000,000 worth of 9.2 in. shells given the American Car & Foundry Company as reported in last week's issue, contracts have been placed with railway supply manufacturers during the past fortnight for something like $105,000,000 worth of shells and fuses. This large total includes the following orders:

Reports say that the Baldwin Locomotive Works has received additional contracts, totaling about $15,000,000, for 6 in. and 12 in. shells.

The American Brake Shoe & Foundry Company has received a contract from the British Government for 9.2-in. shells valued at about $25,000,000.

The New York Air Brake Company has received a contract from the British government for 600,000 fuses for high explosive shells, totaling probably about $1,000,000.

The American Steel Foundries have received an order from the British Government for between 400,000 and 500,000 8-in. shells, totaling about $20,000,000. The Westinghouse Electric & Manufacturing Company will do the machining of the shells.

The American Locomotive Company, reported in last week's issue as having closed a contract valued at about $15,000,000 for 8-in. shells for Great Britain, has received an additional order from the same government for 6-in. shells totaling about $3,000,000, and also an order for 9.2 in. shells, totaling between $6,000,000 and $8,000,000.

TRADE PUBLICATIONS

Rock Island Lines.—The passenger department of the Chicago, Rock Island & Pacific has issued a map of the Mexican border in colors, showing the various points of interest in that region.

Railway Construction

Atlantic Coast Line.—A contract has been given to Wade, Clower & Wade, Jacksonville, Fla., to build the extension of the Haines City branch from the present southern terminus at Sebring, Fla., south via Venus, Palmdale and Hall City to Immokalee, 80 miles, with a branch to Moorehaven, 20 miles. The maximum grade will be 0.4 per cent compensated and the maximum curvature 4 degrees. There will be a drawbridge over the Caloosahatchee river. The company expects to develop a traffic in citrus fruit, vegetables and lumber. (February 11, p. 271.)

Cumberland & Manchester.—According to press reports, the first section of 12 miles, from Barbourville, Ky., north, was recently opened for freight traffic. The line is being built from Barbourville north to Manchester, 24 miles. (March 31, p. 773.)

Edmonton, Dunvegan & British Columbia.—This company has awarded a contract for a line from Spirit River, Alta., to the west province border, 54 miles, to McPherson & Quigley, Adams Block, Edmonton. W. R. Smith, Edmonton, chief engineer.

Florida Central & Gulf.—Application has been made for a charter in Florida with $200,000 to build or acquire and operate a line from Hernando in Citrus county, Fla., north to Rockwell, thence west to Inglis, 34 miles. H. W. Purvis, president, G. Z. Phillips, vice-president and C. A. Carpenter, secretary and treasurer, Jacksonville.

Hillsborough-Interurban.—Incorporated in Florida with $1,000,000 capital, it is said, to build a line from Tampa to Safety Harbor through Hillsborough and Pinellas counties. J. E. Winter, vice-president and treasurer, Tampa.

Illinois Central.—This company has awarded a contract to the Lynch Construction Company, Monmouth, Ill., for raising the tracks at five points on the St. Louis division, totaling about five miles altogether. The work involves about 70,000 cu. yd. of material. Work has been begun on a change of line and grade between Evers, Ill., and Effingham, five miles. The grading contract has been awarded to the Lynch Construction Company, Monmouth, Ill., and involves approximately 100,000 cu. yd. of material.

Lubbock & Great Northern.—Incorporated in Texas, it is said, with $150,000 capital and headquarters at Lubbock, to build a railway between Lubbock, Tex., and Wellington, about 150 miles. The proposed line is to connect at Wellington with the Wichita Falls & Northwestern division of the Missouri, Kansas & Texas and at Lubbock with the converging lines of the Santa Fe system. The plans include the building of general shops at Lubbock. The incorporators include J. M. Elliott, S. S. Houston, and F. V. Leak.

Marlin-Temple Interurban.—This company, which was organized last year, has been incorporated in Texas, it is said, with principal office at Marlin. The plans call for building an electric line between Marlin and Temple, about 35 miles. The incorporators include E. W. Moore, G. Houston, S. D. Hanna, W. Ginmuth and G. W. Glass. (December 10, 1915, p. 1113.)

Medford (Ore.) Line.—The voters of Medford have ratified a contract with the Southern Oregon Traction for the construction of a railroad from Medford, southwest along the Applegate river to the California line, 35 miles. The work involves handling a relatively small amount of material. The line is to have a maximum grade of 3 per cent and a maximum curvature of 22 deg. S. S. Bullis, Medford, Ore. (May 26, p. 1159).

New Jersey Roads.—Residents of Penns Grove, N. J., have projected a line from Deep Water Point, near South Penns Grove, which is being developed on the south side of Penns Grove canal, east via a point near Courses Landing, Sharptown, Woodstown, Pittsgrove, Elmer, and Franklinville, to Winslow Junction, where connection can be made with the Central of New Jersey, about 45 miles. A permanent committee was organized with Judge E. C. Waddington, of Woodstown, chairman; S. H. Wright, Elmer, secretary; S. H. Stafford, Vineland, treasurer; S. P. Leeds, Atlantic City; W. McGrear, Wilmington, Del., and Fred H. Doty, president of Penns Grove Improvement Company, Penns Grove, N. J., are interested.

North Carolina Roads.—The Greenleaf Johnson Lumber Company, Norfolk, Va., has given a contract to the Emporia Concrete & Construction Company, North Emporia, Va., for grading work on an extension of its logging road. The line is being extended south from Vaughan, N. C., to either Spring Hope or to Bunn. It has not yet been definitely decided to which point the line will finally be built. Ira Johnson, general manager, Norfolk.

Pennsylvania Lines West.—A contract has been let for building double track from Columbus, Ohio, to Lewis Center, 15 miles, to the C. R. Cummins Company, Chicago, and the work is now under way.

Pennsylvania Railroad.—The Wheeling Coal Railroad has been incorporated in West Virginia and has adopted a location for a railroad from a point on the Pennsylvania-West Virginia state line near Majorsville to a junction with the Wheeling Terminal Railway at Wheeling, in Wheeling Creek valley. The survey has been made for that part of the line in Pennsylvania, which will extend from a point on the Pennsylvania-West Virginia state line near Majorsville east to Marianna, where a connection is proposed with the Millsboro branch of the Pennsylvania Railroad. The route is along Wheeling Creek, crossing a summit near Old Concord, thence down Ten Mile Run to Marianna. Application has been made for a certificate of public convenience covering the construction of the line in Pennsylvania and after that has been granted a company will be organized and a location for the route adopted.

The Pennsylvania Railroad is contemplating reaching Petty's Island either from the north or south end, but it has not yet been determined from what point the connection will be made. Petty's Island is located in the Delaware river, between Philadelphia and Camden, and is being developed by commercial interests.

Pennsylvania Roads.—Application will be made in Pennsylvania, it is said, to build a line from Modena, Pa., northwest to Coatesville, about 5 miles. H. G. Rambo, J. V. Pennegar, and W. J. Elliott, Coatesville, are interested.

South Florida & Gulf.—This company, which is building a 32-mile line from Kenansville, Fla., south towards Bassenger, has track laid on 25 miles and is carrying out the work on the remaining section with day labor. The work includes putting up a station and warehouse. An extension may be built later southeast via Bassenger to Okeechobee, in all 55 miles. The company now has in operation the first 22 miles from Kenansville to Prairie Ridge and expects to develop a traffic in citrus fruit, vegetables, cattle and fish. (July 21, page 134.)

Tampa & St. Petersburg.—Incorporation has been granted to this company in Florida with $50,000 capital and headquarters at St. Petersburg, it is said, to build from Tampa southwest to St. Petersburg, about 18 miles. The plans include building a bridge across Old Tampa Bay. G. S. Gandy, president; H. W. Fuller, vice-president, and A. L. Gandy, secretary and treasurer, all of St. Petersburg. (See Florida Roads, July 21, p. 133.)

Toxaway Western.—Incorporated in North Carolina with $75,000 capital, it is said, to build from Lake Toxaway, N. C., west to Sapphire, about 4 miles. J. Meltz and E. S. Meltz, Williamsport, Pa.; J. S. Adams and H. C. Jarvis, Asheville, N. C., are interested.

Virginia Roads.—Surveys are reported made for a line to be built from a connection with the Baltimore & Ohio at Winchester, Va., northwest to Gainesboro, thence southwest via Gore to Wardensville, W. Va., and Lost River valley, in Hardy county, about 35 miles. W. B. Cornwell, Romney, W. Va., president of the Lost River Lumber Company, is said to be interested.

Washington, Westminster & Gettysburg.—This company which was organized some time ago to build a railroad in Maryland has recently been granted an extension of time in which to carry out the work. The proposed route is through Prince Georges, Howard and Carroll counties, Maryland. Work was started in 1912 on a section of five miles north of Brentwood, Md.

Wheeling Coal Railroad.—See Pennsylvania Railroad.

RAILWAY STRUCTURES

Bessemer, Ala.—The construction of a freight building at Bessemer by the Alabama Great Southern is in contemplation, but the work has not as yet been authorized.

Cleburne, Tex.—The Gulf, Colorado & Santa Fe is preparing preliminary plans for a two-story passenger station, 338 ft. by 80 ft. The building will have a concrete foundation and frame, terra cotta face, composition roof and concrete columns before the entrance. The station will contain the usual facilities, with a lunch room; and on the second floor there will be rooms for offices.

Clio, S. C.—The Atlantic Coast Line has given a contract to D. J. Rose, Rocky Mount, N. C., for building a brick passenger station to be 28 ft. wide and 72 ft. long, also for building a brick freight station to be 40 ft. wide and 80 ft. long on Society street, at Clio.

Colorado Springs, Colo.—The Atchison, Topeka & Santa Fe has awarded a contract to Sharp & Fellows, Los Angeles, Cal., for the erection of a passenger station, the cost of which is estimated at about $175,000. (May 5, p. 1017.)

Defiance, Ohio.—Work is under way on the elevation of the tracks of the Baltimore & Ohio for a distance of about a mile and one-half. The project involves the laying of second track, closing the last remaining gap on the east end of the Chicago division, the construction of bridges over the Auglaize river and the W. & E. canal, the construction of subways at Jefferson, Wayne, Clinton and Summit streets, and the reconstruction of subways at Washington and Francis streets. New passenger and freight facilities are also being provided. The city is paying its share of the excess cost of the grade separation work in accordance with statutory provisions. The total cost of all improvements is estimated at $530,000. The North American Railway Construction Company, Chicago, has the contract for the subway masonry, grading and paving; the Pittsburgh Construction Company has the contract for the false work in the river, and the Carmichael-Cryder Company, St. Louis, Mo., the contract for the bridge masonry. F. S. Harvey, resident engineer, Defiance, Ohio, is in charge of the work. (March 10, p. 464.)

Dubuque, Iowa.—The Illinois Central is preparing plans for a two-story brick addition to its freight house, 63 ft. by 55 ft., to cost about $16,000.

East St. Louis, Ill.—The Illinois Central is asking for bids on the construction of a brick freight house, 1,050 ft. by 40 ft., 400 ft. of which will have two stories. (June 9, page 1246.)

Jamestown, N. Y.—The Erie Railroad is making plans for a new station to be built at Jamestown.

Joplin, Mo.—The Missouri Pacific expects to begin work within 30 days on the construction of passenger and freight stations. The freight house will be of brick construction and the passenger station will have a stone and brick exterior with a tile roof. The cost of the work is estimated at about $50,000.

McComb, Miss.—The Illinois Central is preparing preliminary plans for a two-story office building, 100 ft. by 30 ft.

Nashua, Iowa.—The Illinois Central is preparing plans for a frame depot on a concrete foundation to cost about $8,500.

New Orleans, La.—The Louisiana Railway & Navigation Company will build a passenger station at Rampart street, New Orleans. It will be 36 ft. high, 50 ft. wide and 250 ft. long of brick and concrete construction with granite front. The work will be started about September 1.

North St. Louis, Mo.—The Terminal Railroad Association of St. Louis has acquired five city blocks of ground and intends to develop a switching yard with about 800 cars capacity, plans for which are now being made.

Secaucus, N. J.—The Erie is carrying out improvements on County road, Secaucus, at a cost of $650,000. The work calls for the construction of a 36-stall roundhouse, to have 115-ft. stalls and a 100-ft. turntable, a machine shop, a power house, a storehouse and a complete engine terminal. The foundations of the buildings will be of concrete. The superstructures of the roundhouse and machine shop will be of frame construction and the power house of tile. The contract for the work has been given to the Robert Grace Contracting Company, Pittsburgh, Pa.

Railway Financial News

Atchison, Topeka & Santa Fe.—A press despatch says that this company has sold the Leavenworth & Topeka, which runs from Leavenworth, Kan., to Topeka, 56 miles, to Kansas City men, who plan to make an electric interurban road of it.

Atlanta, Birmingham & Atlantic.—The Commercial & Financial Chronicle publishes the following:

This company's first and refunding mortgage is dated November 1, 1915, and conveys all its property to the Equitable Trust Company of New York, as trustee, to secure an issue of $15,000,000 of bonds, subject as to the part of said property covered by the Atlanta & Birmingham mortgage, under which $4,090,000 bonds are outstanding. The new bonds are to be dated November 1, 1915, and become due November 1, 1945, to bear interest not to exceed 6 per cent per annum, to be subject to the approval of the railroad commission of Georgia only as follows: (1) To retire the present outstanding 5 per cent bonds of the Atlanta & Birmingham, $4,090,000; (2) for improvements and extensions and the acquisition of additional property under proper restrictions. None of these bonds has as yet been issued.

This company's $5,200,000 15-year 5 per cent income mortgage gold bonds, all of which are outstanding, are secured by a mortgage dated November 1, 1915, to Columbia Trust Company, trustee, subject to the first mortgage of the Atlanta & Birmingham dated January 1, 1904, and to the new first and refunding mortgage. These bonds are dated November 1, 1915, and bear interest, payable semi-annually, at not to exceed 5 per cent per annum, as may from time to time be determined by the board, but such itnerest shall be paid only in case there shall be net income available for that purpose, and non-cumulative.

Balance Sheet, April 30, 1916

Assets—(Total $40,139,611)

Road and equipment	$37,906,360
Miscellaneous investments	24,825
Cash	1,430,534
Material and supplies	335,348
Traffic, etc., accounts receivable	245,143
Deferred assets	3,966
Unadjusted debits	111,665
Equipment under construction	81,769

Liabilities—(Total $40,139,611)

Capital stock	$30,000,000
First mortgage 5s, Atlanta & Birmingham	4,090,000
Fifteen-year 5 per cent income mortgage bonds	5,200,000
Traffic, etc., balances	153,701
Audited vouchers and wages	290,303
Accrued interest and taxes (4 months)	117,206
Miscellaneous	29,380
Accrued depreciation (4 months)	41,148
Reserve for retirement of receivers' obligations	122,394
Other reserves	24,628
Corporate surplus	70,850

Buffalo, Rochester & Pittsburgh.—A semi-annual dividend of 3 per cent has been declared on the $10,500,000 common stock, thus increasing the annual rate from 4 per cent paid since August, 1914, to 6 per cent. Previous to August, 1914, the company had been paying 6 per cent on the common. The regular 3 per cent semi-annual dividend on the preferred has been declared.

Leavenworth & Topeka.—See Atchison, Topeka & Santa Fe.

Virginian Railway.—The National City Bank, New York, is offering a block of first mortgage 5 per cent bonds, series A, of 1912-1962, of which the total authorized issue is $75,000,000 and of which there is $29,500,000 outstanding. The offering price is 98½, yielding 5.10 per cent interest on the investment.

Western Pacific.—Alvin W. Krech, president of the Equitable Trust Company, New York, and chairman of the reorganization committee, has been elected chairman of the new board of directors of the Western Pacific. The new board consists of J. B. Dennis of Blair & Co., William A. Salomon of Wm. Salomon & Co. and A. M. Hunt, all of New York; C. W. Nibley of Salt Lake City; W. T. Smith, William Fries, Joseph G. Hooper, D. H. Dibblee, Warren Olney, Jr., A. R. Baldwin and Charles M. Levey, president of the company, all of San Francisco, and Harris Weinstock of Sacramento, Cal.

[ADVERTISEMENT]

ANNUAL REPORT

BROOKLYN RAPID TRANSIT CO.

85 Clinton Street,
BROOKLYN, N. Y., July 26, 1916.

REPORT OF THE BOARD OF DIRECTORS TO THE STOCKHOLDERS FOR YEAR ENDING JUNE 30, 1916.

The system's passenger revenue for the year ending June 30, 1916, increased $1,599,983.76, or 6.29 per cent. Freight revenue fell off $132,599.92, and other operating revenues (including advertising, station privileges, rents, etc.) increased $60,071.83, making the total operating revenue $1,521,085.15 greater than for the preceding year.

The operating expenses increased $733,526.44, leaving $787,558.71 additional net revenue from operation. The operating ratio was 56.15 per cent as against 56.61 per cent for the preceding year.

In the operating expenses are included $4,993,790.77 of charges on account of maintenance of way and structure and equipment, but this amount was not all expended, and $531,484.34 thereof was set aside for reserves, this being an increase in reserves for depreciation over the preceding year of $275,099.79. Trainmen's wages and other direct expenses in the operation of cars increased $410,707.23, occasioned partly by the increase in traffic and partly by the higher scale of wages which became effective on December 31st last.

The deductions from net revenues were increased by $574,958.53 on account of new rapid transit lines placed in operation during the year, but other interest deductions showed a slight decrease.

The final result of the system's operations was a net income of $5,611,832.18, an increase of $99,271.06 over the figures for the preceding year. Dividends were paid at the rate of six per cent per annum, absorbing $4,467,318.00, and a balance remained for the year of $1,144,514.18. When the company assumed the obligations imposed by the rapid transit contracts with the city, it was expected that during the period of construction, and before the benefits of those contracts would be felt in their effect upon net revenue, pending full operation, there would be a small margin, if any, of surplus earnings over dividend requirements. It seems likely, however, judging from the satisfactory response to such new facilities as have been placed in operation, that the company will be able safely to continue dividends at the present rate during this construction period, and thereafter the margin of surplus ought to be considerably greater.

A summary of the financial results is given in the following table:

COMPARATIVE STATEMENT OF THE RESULTS OF THE OPERATIONS OF THE BROOKLYN RAPID TRANSIT SYSTEM FOR YEARS ENDING JUNE 30, 1916 AND 1915

	1916	1915	Increase or Decrease
Gross Earnings from Operation	$27,948,771.81	$26,427,686.66	+$1,521,085.15
Operating Expenses	15,693,907.81	14,960,381.37	+ 733,526.44
Net Earnings from Operation	12,254,864.00	11,467,305.29	+ 787,558.71
Income from Other Sources.	438,705.88	438,715.01	— 9.13
Total Income	12,693,569.88	11,906,020.30	+ 787,549.58
Less Taxes and Fixed Charges	7,081,737.70	6,393,459.18	+ 688,278.52
Net Income	5,611,832.18	5,512,561.12	+ 99,271.06
Surplus at Beginning of Year	10,621,966.45	9,732,588.50	+ 889,377.95
Total	16,233,798.63	15,245,149.62	+ 988,649.01
Other Credits to Surplus during year	69,958.05	4,131.20	+ 65,826.85
Total	16,303,756.68	15,249,280.82	+ 1,054,475.86
Of this amount there has been appropriated:			
Accounts written off	6,330.75	12,327.56	— 5,996.81
Adjustment of Expenses prior years	8,621.97	35,088.74	— 26,466.77
Supercession and Depreciation	66,247.94	45,062.12	+ 21,185.82
Loss from operation of Employees' Restaurants	2,338.35	9,445.97	— 7,107.62
Loss from operation of Surface Cars over Manhattan Bridge	.....	58,071.98	— 58,071.98
Adjustment of Special Franchise Taxes 1905-1912	183,970.44	.....	+ 183,970.44
Expenses in connection with Thompson Legislative Investigation of Public Service Commission	4,850.00	.....	+ 4,850.00
Allowance to Employees in Military Service	1,425.19	.....	+ 1,425.19
Dividend on B. R. T. Co.'s Stock outstanding	4,467,318.00	4,467,318.00	.....
Total Appropriations	4,741,102.64	4,627,314.37	+ 113,788.27
Balance Sheet Surplus	$11,562,654.04	$10,621,966.45	+ $940,687.59

SALE OF NOTES.

There have been sold during the year $20,000,000 par value 5 per cent Notes, maturing July 1, 1918, and the proceeds were used to purchase a like amount of New York Municipal Railway Corporation 5 per cent Bonds—issued to finance the equipment of Rapid Transit lines and the construction and equipment of additional tracks and extensions, as provided under the contracts of March 19, 1913, between the company and the City of New York. The notes sold were the remainder of the $60,000,000 issue authorized in 1912 and were covered by the option then given to bankers, being disposed of on a 6 per cent basis less 1 per cent commission.

EXPENDITURES UNDER CITY CONTRACTS.

The New York Municipal Railway Corporation's expenditures for construction and equipment to June 30, 1916, under the City contracts, were as follows:

On account of contribution to City-owned lines	$11,148,834.95
On account of equipment of City-owned lines	6,153,119.95
On account of additions, extensions, and improvements of existing railroads	23,532,620.39
Total	$40,834,575.29

RAPID TRANSIT PROGRESS UNDER CITY CONTRACTS.

Attention was called in the last annual report to delay in construction of the new rapid transit lines to be furnished by the city in compliance with our contracts of March 19, 1913, and to the resulting consequences, both to the city and its lessee. It is gratifying to note that considerable progress has been made during the past year, and that contracts have been approved by the Public Service Commission up to June 30, 1916, for all lines to be built by the city and equipped and operated by our system, with the exception of part of the 14th Street-Eastern line, the Nassau-Broad Street line, the small section of the Flatbush Avenue line under the Long Island Railroad station, and the Queensboro Tunnel line under the East River. Approval of contracts awarded by the Commission for the tunnel sections of the 14th Street-Eastern line, however, has been deferred by the Board of Estimate and Apportionment and bids for the Queensboro Tunnel have been opened by the Commission since the close of the fiscal year.

The company on its part has either completed or has under contract practically all of the new lines and improvements which it obligated itself to construct. The conspicuous exception is the lower part of the Fulton Street elevated third-tracking which has been delayed by causes for which the company is not responsible.

The operation of the Fourth Avenue Subway, which was begun between Chambers Street, Manhattan, and 65th Street, Brooklyn, on June 22, 1915, was extended to the terminus of the line at 86th Street on January 15, 1916; operation of the Liberty Avenue elevated extension was begun on September 25; of the third track on the Fulton Street line, between East New York and Nostrand Avenue, on December 27; of the third track on the Broadway elevated line, between Myrtle Avenue and Marcy Avenue, on January 17; and of two tracks of the elevated structure on New Utrecht Avenue as far as 62nd Street, and of one track between 62nd Street and 84th Street, with connection through the new 38th Street cut into the Fourth Avenue subway, on June 24, last.

During the fiscal year 1916-17 it is expected that the following new lines will be ready for operation:

Broadway, Manhattan, Subway (with Canal Street connection) as far north as Union Square, and possibly 34th Street.
Jamaica Avenue elevated extension.
Broadway elevated third track from Myrtle Avenue to East New York.
Remainder of New Utrecht Avenue line to Coney Island.
Third track on Myrtle Avenue between Ridgewood and Broadway.

From the city's point of view particularly, it is desirable that the Broadway subway in Manhattan should be opened for operation at the earliest possible moment. It would be doubtful policy in our judgment to begin operation on only that portion of the line which lies south of Union Square, for the resultant revenue would be small. Extended to 34th Street the operation would yield more than proportionately additional business. Yet the unwelcome situation exists that, although the sections south of 26th Street are substantially completed, the completion of the 34th Street section seems now to be at least a year distant. On account of the absence of crossovers no operation will be possible between Union Square and 34th Street until Sub-section 6 of the 34th Street section (just north of 34th Street) is finished, and the plans for the steel work for this sub-section have not yet been approved, nor has the excavation been completed. So essential to the city and the operator, and to Broadway business interests, is it that operation, when commenced, should at least include the 34th Street Station, that the delay is greatly to be regretted and no energy should be relaxed to progress the work. Otherwise the city's cost will be additionally magnified by interest charges on idle property and the joint revenue will be deprived of considerable earnings.

The results of operation of the new lines have been quite satisfactory. The railroads which have been thus far placed in operation are not those from which material additions to net revenue were expected, except as they furnish better facilities to territory previously supplied with transit, or until, in the case of the outlying lines, the tributary population should increase. None of the new lines from which a considerable net revenue was anticipated has yet been placed in operation, or will be until the latter part of the fiscal year upon which we are now entering. Instead of the entire new system being completed and ready for operation on January 1st next, as was hoped when the contracts were signed, the benefits of operation of the most profitable part of the system will not be enjoyed until about the fiscal year, 1918-19. Notwithstanding this delay it is encouraging to note that the passenger receipts of the operating company, namely, the New York Consolidated Railroad Company, have increased during the last fiscal year by $1,333,380.07, and the net revenue has been sufficient to make good all of the company's first preferential of $3,500,000, and $424,467.61 additional on account of interest and sinking fund upon our investment of new capital in improvements and in contribution to City-built railroads. For the entire period of operations under the city contracts, namely, from August 4, 1913, to June 30, 1916, the net earnings have been sufficient to make good all the company's first preferential of $3,500,000 per year, with the exception of $14,605.41. The table given on p. 13 shows the details of these results, both for the fiscal year and for the entire period of temporary operation. Under the accounting arrangement with the city, as new property of the company is placed in operation, interest and sinking fund allowances on the cost thereof become a charge against revenue but the determination of that cost is left by the contract

to the Chief Engineer of the Public Service Commission, and inasmuch as his determinations have been delayed, the actual amounts shown as charged against revenue for interest and sinking fund are $665,959.45, or $480,000 more than they would have been had we computed our charges upon the costs as formally determined by him. In other words, we have anticipated his determinations so as not to be obliged to take up later any slack in such charges. Our charges under the city contracts are cumulative and are to be made good out of subsequent earnings, but nevertheless we have absorbed them, to the extent indicated, in our combined statement of system operations. The city's charges for its property placed in operation, not being earned, are added under the contracts to the city's cost of construction and should be eventually met by taxation.

As the work contemplated by the Dual System contracts approaches completion, the necessity for close co-operation between the city and the lessee becomes increasingly apparent. Representatives of the Public Service Commission have estimated that the city's costs will be greater by about $22,000,000 than was expected, and this estimate does not include many millions for additional items to be furnished at the city's expense. Up to the present time this great municipal expenditure has not cost the taxpayers a single dollar, for it has all been capitalized (including interest thereon), and most of it has been provided for out of the issues of corporate stock. Obviously, this situation cannot, and will not, long continue. While the contracts determine the items entering into cost, it would be a doubtful policy for the city to encroach too closely upon its debt-incurring capacity, and certain of its charges, like those for deficits during temporary operation, supervision, and a considerable portion of interest during construction (the amount of which has been increased largely by failure properly to synchronize the construction of certain lines so as to expedite operation), should be provided for otherwise than out of the issue of corporate stock. It must be borne in mind that when the city made the decision, as it did about three and a half years ago, to provide transportation facilities which for several years at least would not furnish sufficient net revenue to pay the expense of operation and interest on cost at a five-cent fare and with the high standard of equipment and service exacted, the taxpayers, and not the fare-payers, would have to make up the deficits, and the sooner this situation is realized, the keener should be the desire of the people, their government, and the companies to produce the most profitable results consistent with good service. So far as our contract with the city is concerned, there is every reason to believe that the preferentials of the company will be earned when the entire system is ready for operation, and that within a reasonable number of years thereafter the city will be in receipt of full interest and sinking fund allowance upon its own investment, thereby relieving the taxpayers from burdens and realizing the financial result which both city and company should seek—namely, divisible profits. The speedy completion of new lines, and the avoidance of unnecessary burdens upon operation will expedite this desirable achievement.

RESULT OF OPERATIONS OF NEW YORK CONSOLIDATED RAILROAD COMPANY, LESSEE, UNDER THE PROVISIONS OF CONTRACT NO. 4, DATED MARCH 19, 1913, BETWEEN THE NEW YORK MUNICIPAL RAILWAY CORPORATION AND THE CITY OF NEW YORK.

	Year ending June 30, 1916	For the period August 4, 1913, to June 30, 1916
REVENUE:		
Passenger Revenue	$9,703,384.31	$25,727,144.39
Chartered Cars and Misc. Transp. Revenue	1,005.70	3,355.72
Advertising	82,107.44	211,923.27
Other Car and Station Privileges	54,774.70	151,056.85
Rent of Buildings and Other Property	22,670.71	76,423.49
Rent of Tracks and Terminals	26,433.23	104,099.86
Miscellaneous	13,144.07	21,063.69
Total	$9,903,520.16	$26,295,067.27
DEDUCTIONS:		
Rentals	$64,867.33	$239,346.66
Taxes	432,521.25	1,492,764.53
Operating Expenses, exclusive of Maintenance	3,998,089.07	10,455,086.09
Maintenance Fund	1,186,859.92	3,153,894.35
Depreciation Fund	296,714.98	788,473.54
Company's First Preferential	3,500,000.00	10,180,107.51
Total	$9,479,052.55	$26,309,672.68
Net Over First Preferential	424,467.61	*14,605.41
Company's Second Preferential as per Engineer's Determination of Cost	185,959.45	292,299.60
Reserve in respect of lines in operation—anticipating Chief Engineer's Determination of Cost	480,000.00	480,000.00
DEFICIT* IN COMPANY'S PREFERENTIALS	$241,491.84	$786,905.01
INTEREST† PAID BY CITY ON ITS COST OF CONSTRUCTION OF PROPERTY PLACED IN OPERATION PLUS SINKING FUND AT RATE OF 1 PER CENT PER ANNUM	604,006.18	1,318,728.11
TOTAL DEFICIT	845,498.02	2,105,633.12

*To be made good from future net income before payment of City's interest and Sinking Fund charges.

†Deficits in City's charges during temporary operation to be added to the Cost of Construction of City Owned Lines.

MISCELLANEOUS IMPROVEMENTS, RENEWALS AND REPAIRS.

Among the principal maintenance and construction expenditures during the fiscal year (other than construction expenditures on Rapid Transit Lines referred to above) are the following:

Approximately 12 miles of surface track have been completely renewed, and approximately 10½ miles additional have been overhauled, the latter work consisting of renewing defective ties, repair of joints, installation of tie rods, renewal of concrete foundations, and relaying of pavement with re-cut granite block.

We have repaved city streets to the extent of 95,452 square yards of pavement, divided as follows:

With new granite, 41,081 square yards.
With re-cut granite, 45,957 square yards.
With Medina stone, 4,958 square yards.
With wood, 3,456 square yards.

In addition the city has relaid outside of our outer rails, and at our expense, 14,852 square yards of various kinds of pavement.

On the elevated structure, 98,352 lineal feet of rail were replaced, including complete renewal of elevated tracks on the Brooklyn Bridge.

Other renewals in connection with elevated and surface tracks comprised the replacement of 138 pieces of special work; 38,788 lineal feet of timber guard rail; 31,410 lineal feet of footwalk slatting, and 3,350 lineal feet of steel guard rail.

At 63rd Street Dock the slip between piers was re-dredged, 22,000 cubic yards of material being removed.

In connection with the new tracks on Stillwell Avenue leading to Coney Island, the new double track swing drawbridge over Coney Island Creek was practically completed. This consisted of an electrically operated through truss swing span approximately 250 feet long, carried on circular concrete centre pier and concrete abutments. Two submarine D. C. Cables were installed across the creek.

Repainting of the elevated structure is under way on the Lexington Avenue line from Myrtle Avenue to Throop Avenue, about 50 per cent of which was completed during the fiscal year.

A new surface railroad depot at Fresh Pond Road was nearly completed. This consists of an administration building, providing offices and general operating quarters for men, construction of concrete retaining wall and fence along the northerly property line, and installation of storage tracks with capacity for 258 cars, and a possible increase to 348 cars. This new yard will permit the abandonment of the extensive but inadequate depot facilities at Ridgewood, and the sale of that property.

Franchises were granted during the year by the city for surface railroads as follows:

On Metropolitan Avenue, from Dry Harbor Road to Jamaica Avenue.
On Fresh Pond Road, from Myrtle Avenue to Fresh Pond Terminal.
On Eighth Avenue, from 39th Street to Bay Ridge Avenue.

These call for the construction of 24,740 feet of double track overhead trolley railroad, of which that on Fresh Pond Road is in process of construction; that on Eighth Avenue has been contracted for, and that on Metropolitan Avenue is awaiting decision of the city as to grades and alignment.

Contract has been placed for the erection of a new coal handling plant at the Central Power Station.

Power Houses, Sub-Stations, Shops and Depot buildings have been improved and repaired.

Many changes in buildings have been made in compliance with orders or recommendations of the State Industrial Commission, the Health and Fire Departments, and the Public Service Commission.

Storage tracks in the rear of the Avenue N surface car yard have been extended.

Employees' club rooms and recreation facilities in various depots have been renovated and improved.

Additional equipment purchased or constructed and equipped during the year includes:

16 snow sweepers,
20 air dump cars,
4 cars for transporting rails,
2 electric drilling machines for track work,
1 concrete mixer,
2 track grinders,
2 combination tar and gravel heaters for paving work,
5 automobile trucks and
3 automobiles.

In compliance with orders of the Public Service Commission, 34 complete and 220 partial air brake equipments have been installed on 250 double truck open passenger cars and on 4 miscellaneous cars. This leaves 128 complete and 122 partial equipments to be installed on this class of cars during 1916 and 1917 to complete the equipping of all cars with air brakes as required by the Commission.

Two hundred and three geared hand brakes have been installed on surface passenger and miscellaneous cars.

An experiment was made in the construction of one articulated car unit, made by joining two single truck closed cars.

One hundred and eighty-nine passenger cars were equipped with life guard chains.

Upward of 2,000 cars were overhauled, repaired and repainted.

Important changes were undertaken during the year at the Williamsburg Power Station. Contract was entered into with the Westinghouse Company for one 30,000 K. W. Turbo Unit and Condenser outfit, this to replace one of 7,500 K. W. and increasing the capacity of the station to 112,500 K. W. Order was placed for 30 Taylor stokers and 22 turbine driven blowers for furnishing forced draft for the stokers; the installation of the first six stokers is under way, and two of the blower equipments have been installed. Four air ducts have been installed to deliver forced draft to the Taylor stokers. Contract is about to be entered into for rebuilding the coal and ash downtakes made necessary on account of the installation of new stokers. The rebuilding of the auxiliary steam piping in the boiler room was begun, substituting cast steel valves and fittings for cast iron valves and fittings, made necessary on account of increase in the working steam pressure and substituting superheated steam for saturated steam. Alterations to the original steam main, and the installation of additional pipe to form a Ring Main Steam Header with remote controlled electrically operated emergency valve to isolate sections of the header in case of trouble were contracted for. A new dividing box has been installed to accomplish a more satisfactory division of boiler feed water among the three feed water heaters; with this dividing box a control valve has been installed to automatically maintain a common water level in the three feed water heaters. A storage tank and pump has been installed for consuming boiler feed water in place of city water to seal the glands on the main turbines; this will result in a substantial saving in water. A system has been installed for the purpose of obtaining a more satisfactory control of the compound used in treating the boiler feed water. There was installed in the flues of this station a cinder catcher for 18 boilers, located on the first floor, making a complete installation for the first floor boilers. Material has been purchased for the installation of cinder catchers for 24 boilers on the second floor; in connection with this, three flues have been enlarged and the internal mechanism is about to be installed.

The Hudson Sub-station has been enlarged to provide facilities for furnishing power for the operation of signals in the Broadway-Fourth Avenue Subway; also the switching equipment has been re-arranged to provide for handling the additional power required for the operation of the Broadway-Fourth Avenue Subway.

During the past fiscal year there was removed from the system 8.48 miles of overhead D. C. Feeders; of this amount 6.57 miles was re-installed in other parts of the system where required. A total of 18.72 miles of underground feeders was removed, and 2.78 miles re-installed elsewhere. 107.35 miles of trolley wire were renewed.

There were 392 trolley poles installed; 482 trolley poles removed; 380 trolley poles reset; 274 trolley poles re-inforced, and 2,300 trolley poles repainted.

Seven hundred and seventy feet of conduit line were constructed on South Sixth Street and Berry Street. On the Brooklyn Bridge, 9,221 feet of 1,000,000 C. M. power cables were installed.

EMPLOYES' WELFARE WORK.

The companies of the system expended during the year for welfare work among its employes, and for pensions of men retired from service, $112,840.57. Of this total $17,703.31 was on account of the system's medical bureau; $35,818.07 on account of pensions; $23,920.78 (covering only a portion of the year) for contributions to employes' insurance premium, and the remainder for club house expenses, contributions to baseball league, entertainments, etc.

On January 1, 1916, appeared the first issue of the B. R. T. Monthly, a publication devoted to the interests of the railroad system and its employes.

The Employes' Benefit Association since its inception has paid out $346,543.00 in sick benefits, and $149,999.26 in the case of deaths of members, and its invested funds and cash resources at June 30, 1916, amounted to $49,388.10.

Among the special activities during the year were the following:

Insurance of Lives of Employes.

A substantial addition was made during the year to the welfare interests of the company in the shape of a group insurance plan under which, on June 30, 1916, 5,749 employes were insured for $1,000 each, including 33 employes who have taken out additional insurance in amounts varying from $1,000 to $4,000.

This plan became effective on September 15, 1915, a group contract being entered into between the Brooklyn Rapid Transit Company and the Travelers Insurance Company of Hartford, Conn. The insurance was offered to all employes of the B. R. T. System in service two years or more and a sufficient group responded to secure the insurance in policies of $1,000 without medical examination. Of the 8,000 employes eligible for this insurance, 6,300 took out policies under the B. R. T. plan; 46 death claims have been paid by the Travelers.

The insurance is written on a term basis which secures a very low premium. For employes within the group whose yearly wages do not exceed $3,000, the Brooklyn Rapid Transit Company pays one-half the premium on policies of $1,000, thereby reducing the actual premium paid by the insured employe to a rate lower than that at which similar insurance has ever been obtainable before. For example, employes between the ages of 32 and 40 pay a fraction over eight cents a week; employes 50 years of age pay a fraction over 23 cents a week for $1,000 of insurance.

In addition, the Brooklyn Rapid Transit Company has announced its intention to assume the entire premium on $1,000 of insurance in the case of insured employes retiring pursuant to the Pension Regulations of the system, and in certain other cases calling for special consideration. This has the effect of obtaining the equivalent of paid-up insurance upon retirement at a premium rate which could not purchase one-quarter of the amount of insurance under any individual policy obtainable.

Other important features of the plan protect the insured in the event of leaving service and in the event of total disability.

The Brooklyn Rapid Transit Company will pay approximately $31,000 in the first year of the insurance contract toward the premiums of employes insured thereunder.

The popularity of the group insurance plan resulted in a material increase in the membership of the Employes Benefit Association, inasmuch as membership in that association was made a necessary condition of taking out the insurance. The membership of the Employes Benefit Association increased from 8,912 in June, 1915, to 10,516 in June, 1916; of this increase 1,300 members were brought into the Association directly as the result of their desire to take the group insurance.

Medical Inspection Bureau.

The Medical Inspection Bureau during the past year has completed the task of co-ordinating all of the medical service supplied to employes of the company, which includes:

(a) Physical examination of all candidates for employment in the Transportation Department.

(b) Compulsory Medical Inspection and free medical attendance to all Transportation Department employes, about 10,000 in number.

(c) Free medical attendance for members of the Employes Benefit Association outside of the Transportation Department.

(d) Medical attendance for all employes in whatever department engaged who may be injured in the course of their duties.

(e) The instruction of certain employes in First Aid and supervision of First Aid service rendered by such employes to fellow employes who may be injured.

(f) Periodical re-examination of all motormen.

A staff of six physicians is employed continuously in this work, the scope of which is constantly increasing as the operations of the company expand and as opportunities are afforded for the development of health education.

The number of First Aid cases in use has been increased substantially during the year so that there are now eighty-five of these cases in service and upward of 200 employes qualified by special instruction to administer first aid.

All such employes are re-instructed in first aid twice each year. Lungmotors have been installed to supplement the Schaeffer or prone pressure method of artificial respiration for cases of electric shock.

A system of reports covering both sickness and accident cases has been established which insures not only the prompt treatment of employes injured or sick, but valuable personal records which are essential in dealing with the general problems of hygiene and sanitation involved in providing medical care for so large a body of men.

Safety Campaign.

Through the Central Safety Committee and the various Departmental Safety Committees the attention of all the employes of the system has been continuously directed to the vital importance of safety in the operations of the system. The mechanical safeguarding of dangerous machinery and dangerous places and installation of warning signs at points of particular hazard throughout the system was the beginning of systematic safety work.

Meetings of the employes' committees, receipt and discussion of safety suggestions from employes, the special studies by these committees both of accidents which have actually occurred and of the conditions productive of accidents, the frequent distribution of bulletins dealing with safety—these are some of the measures which have been adopted in the larger and permanent problem of educating the employes themselves.

Classifications for accident statistics more comprehensive and illuminating than those formerly in use have been adopted during the past year in the several departments which have a serious accident hazard.

It is unwise to attempt to draw general conclusions as to results from the comparative statistics of a few years only, but it is at least encouraging to note that charts which have been prepared show the number of car collisions, persons struck and car and vehicle collisions per 10,000 car miles operated and the number of boarding and alighting accidents per 100,000 passengers carried, indicate a downward tendency in the case of persons struck and boarding and alighting accidents.

In the matter of car and vehicle collisions and car collisions, despite an unusually severe winter which greatly increased the hazard of these accidents by producing slippery rails and bringing all classes of vehicular traffic on the car tracks, the charts indicate that the system has at least held its own with the best results of previous years in many of which weather conditions were substantially more favorable to safe operation than they were through the winter of 1915-1916.

The public safety campaign which the company conducts in co-operation with the Brooklyn Institute for Safety and under the approval of the Board of Education of the City of New York, has continued successfully during the year. Forty-three new Safety Patrols have been formed among the boys in the Brooklyn schools with over 1,000 members, and 36 new Careful Clubs among the girls with over 700 members. Taking into account, Safety Patrols and Careful Clubs formed in previous years, it appears that nearly 2,000 boys and more than 1,000 girls in the Brooklyn schools have during the past year been enrolled in these organizations.

As in previous years, stereopticon and moving picture lectures played an important part in the school instruction, safety calendars were provided for every schoolroom in Brooklyn, more than 9,000 in number, and 88 public schools and 29 parochial schools participated in the prize essay contests on safety subjects.

Safety instruction was given in 62 vacation schools and playgrounds during the summer of 1915, and provision has been made for similar instruction during the present summer. Safety meetings have been held for adults in many of the congested districts of Brooklyn in co-operation with public authorities and civic organizations.

The attitude of the public authorities toward this work is one of its most encouraging results. Officers of the Board of Education have recently expressed the conviction of that organization that safety instruction must continue as a permanent feature of public school education. The Police Department of the City, through the extension of traffic regulation in the interest of safety and through the establishment of additional play streets, has co-operated in an important way—even in some instances to the extent of sending uniformed precinct officers into the schools to talk safety to the older boys.

The Health Department, Fire Department and many other branches of the City government have been equally helpful.

It may be concluded, therefore, that the public safety work which was undertaken experimentally in 1913 has made a definite place for itself in the community in which the company operates.

FIRE INSURANCE.

The fire losses during the year aggregated $5,167.63, of which $3,701.19 was paid by the stock companies with which insurance is taken, and the balance out of the earnings of the Insurance Reserve Fund. The companies of the system continue to contribute to the Reserve Fund upon premiums fixed by the trustees, and re-insurance with stock companies was continued during the year by the trustees in the amount of $25,638,895. The Insurance Reserve Fund amounted, on June 30, 1916, to $890,526.35, of which $839,098.08 is invested in stable securities.

RESERVE ACCOUNTS.

There has been added to Reserves during the year the following:

Insurance	$103,086.88
Amortization of Capital, etc.	548,498.89
Employer's Liability	23,364.09
	$674,949.86

but retired property adjustments chargeable to these Reserves aggregating $61,742.56

also payments account of Employer's Liability 29,499.08 $91,241.64

have reduced the year's Gain in Reserves to $583,708.22

INCREASE IN NUMBER OF STOCKHOLDERS.

There has been an addition to the number of stockholders during the year of 205—total number at June 7, 1916, being 9,038 against 8,833 a year ago.

TAXES.

During the last year of Mayor Gaynor's administration the company's representatives agreed with the Law Departments of the State and City, and with the City Comptroller, upon a settlement of special franchise assessments covering the years from 1907 to 1912 inclusive, with the exception of 1909, where the assessment had previously been compromised. Mayor Gaynor's unexpected death prevented his approving the settlement. His successor, Acting Mayor Kline, took no action thereon during the few months that he occupied the office, and the matter was not finally disposed of by Mayor Mitchel until March of the present year. The assessments in litigation covered by the settlement aggregated $191,672,200, on which the original tax was $3,363,427.57. The amount of reductions in valuation procured was $44,982,679, and after paying nearly $400,000 in interest and penalties the saving effected in taxes was $372,670.28. This would have been materially increased had the terms of settlement been more promptly acted upon by the Mayor. The compromise eliminates practically all of the system's liability for taxes prior to the current year—the outstanding assessments being for small amounts where the company has been successful thus far in its litigation, and the special franchise valuation of the Nassau Electric Railroad Company for 1907, most of which has been paid, but a determination of which the city refused to include in its general settlement on account of possible joint liability of the Long Island Railroad Company.

In common with other owners of property the companies of your system have been compelled to pay their share of higher taxes levied for the support of city, state and federal governments. With this we do not find fault, except as tax burdens are inequitably imposed, and except as public officials still find it easy to select public service corporations as the most

fruitful victims for new tax impositions, forgetful that these exactions impair and limit the ability of such corporations to furnish the best facilities, and notwithstanding the fact that, unlike most other producers, transportation companies cannot shift the burden of taxation by increasing the price of their product to consumers. For seventeen years, ever since Governor Roosevelt succeeded in getting the legislature to pass the special franchise tax law, and upon his recommendation as a measure of equity, payments otherwise made by corporations for the enjoyment of franchises have been properly credited upon the taxes assessed for the privilege of occupying public streets and places. During the recent session of the legislature, however, and at the instigation of city officials, this equitable rule was changed so far as concerns the payments of compensation to the city for carrying passengers over the East River Bridges, and such payments can hereafter no longer be so credited. At the same time the State Tax Commission, which fixes the value of special franchises, has eliminated the bridge franchises from assessment, and has increased our other franchise assessments by about $6,000,000 for the year 1916. The result is a two-fold additional burden—namely, not only the increased amount of direct taxes but the addition of about $230,000 a year for the privilege of carrying passengers across the bridges at greater expense and without materially additional revenue. The companies are therefore obliged to face the question whether they will continue such operation, except where it may be required by our rapid transit contracts with the city. In the case of the surface car operation on the Williamsburg Bridge, the Bridge Commissioner has, fortunately for our solution of this question, terminated the contracts with all the surface railroad companies whose cars cross this bridge, and they are continuing operation at the request of the city under temporary permits, the city beginning to realize that there is something more involved in car operation than collection of revenue for the city treasury. Unless therefore some equitable arrangement can be made with the city under which the bridge service can be placed upon a satisfactory basis, both from the point of view of the operator and of its patrons, the present facilities are likely to be seriously curtailed.

The present situation is not new; its tendency and the effects were emphatically alluded to by President E. W. Winter in his report for the year 1908 in which he said:

> "The trackage over the two East River Bridges now in service, while constituting a part of the operating routes of the many lines converging at the Brooklyn termini, is distinguished from the rest of the system by inherent conditions both troublesome and costly to deal with, but from the operation of which no adequate revenue return is derived. The relative importance of this distinctly peculiar feature of your company's situation increases with the opening of new bridges and growth of traffic between Brooklyn and Manhattan. Over 12 per cent of the 73,674,770 total car miles during the last fiscal year, or about 9,000,000 car miles were made on the two bridges. This very considerable part of the total car movement was through a traffic desert, save the comparatively small receipts in half fares from passengers riding between bridge ends. In other words, the Brooklyn system after running its cars to the boundary of its traffic territory adds an average of about 12 per cent actual service at greatly increased relative cost without extra charge to the passenger.
>
> "During the fiscal years 1900 to 1907, inclusive, after crediting the account with all revenue from local bridge traffic the Brooklyn system has paid out nearly $5,000,000 for charges attaching exclusively to bridge maintenance and operation. No charge applying generally to the system as a whole nor of more than $700,000 paid for various fixtures supplied to the bridges to aid in the handling of that business is taken into this account."

Our taxes for the past fiscal year aggregated $1,837,682, a sum equal to about 15 per cent of income from operation—before deducting from such income any interest, rents, taxes or other fixed charges.

BROOKLYN RAPID TRANSIT REFUNDING MORTGAGE FOUR PER CENT. BONDS.

Authenticated to July 1, 1915	$55,061,000.00
Authenticated during year	644,000.00
	$55,705,000.00
Converted into stock	29,619,000.00
Net Authenticated and Outstanding	$26,086,000.00
In hands of the Public	$3,459,000.00
In possession of the B. R. T. System	$22,627,000.00
As follows:	
*Collateral to $60,000,000.00 6 yr. 5 per cent. Notes	$10,000,000.00
Collateral to Bills Payable	3,775,000.00
In Treasury B. R. T.	6,841,000.00
In Treasury N. E. R. R.	1,046,000.00
Deposited with City of New York by The N. E. R. R. Co.	15,000.00
Deposited with Trustee of The Nassau Electric Railroad Consolidated Mortgage	700,000.00
Guaranty Fund Brooklyn City Railroad Lease	250,000.00
	$22,627,000.00

*$2,265,000 par value of these notes have been converted into New York Municipal Railway Corporation's five per cent. first mortgage bonds, as permitted, prior to January 1, 1916, by the terms of the trust agreement.

Respectfully submiited by order of the Board of Directors.

T. S. WILLIAMS,
President.

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The Employees Now Speak for Themselves

Among the great body of railway employees—the more than 80 per cent not included in the four brotherhoods of trainmen who are threatening to tie up all railway operation by striking—there will be found only the heartiest approval of the movement in their behalf of which an account of the inception is given elsewhere. There is one reason for regret and that is that the movement was not inaugurated some weeks ago. The sentiment among those whose rights are not only not being cared for, but are being seriously infringed by the brotherhood demands, was the same then as that which will be expressed in the overwhelming mass of signatures which will be presented to Congress as soon as they can be put on paper. But a leader was needed to crystallize sentiment into action. He has appeared and the action is proceeding. Whether these signatures reach Congress in time to accomplish their purpose or not, or whether in any event they make any impression upon our case-hardened legislators, is a matter of conjecture. In any event, this accumulation of thousands of signatures expressive of disapproval of the rough-shod selfishness of the few powerful brotherhoods, will make an impression upon the public mind. It will go far to correct the widely prevalent view of the public that railway employees are a unit in the attempt to wreck the incipient and perhaps only temporary prosperity of the railways.

Graciousness in the Train Service

Rule 708, in the new train-rule code of the Western Pacific, tells the employees that they should "cultivate a graciousness of manner; not only in dealing with the public, but also with fellow employees." Graciousness implies a high degree of refinement. American railroad officers have been trying to inculcate politeness and courtesy for years, and with special emphasis during the past few years; but it is perhaps appropriate that a new rule book, issued by our newest railroad should set a new and higher standard. According to the dictionaries, a gracious person is one "full of grace or favor: disposed to exercise favor or kindness; beneficent; benignant." Cynical persons will say that American passenger-service standards are already much higher—on paper—than the employees can measure up to; but it is only a question of enforcement, after all. Neglect or non-enforcement of rules, or unsatisfactory quality of the men, is no reason for not having the best possible rules. Why should not every road, everywhere, emulate the Western Pacific? Do we not always inwardly commend the man, of any class, who is seen to be notably successful in dealing with a grouchy or an ignorant passenger? It is a plain duty to imitate the polite and affable ticket-seller or trainman. Telling men to keep their temper when a passenger gets angry or abusive is one of the commonest injunctions; and they are expected to heed it. The lesson of this rule is in the same field. And the rule must be treated as though addressed to the trainmasters. Howsoever well-intentioned the employees may be, the cultivating process is not likely to produce any great degree of satisfaction in the general manager's office unless there is "intensive" cultivation, such as is applied to apples in Idaho; and the trainmaster is the man who must do this.

New York Central Operators' Big Pay

The settlement of the New York Central telegraphers' wages by the arbitrators, reported last week, page 203, is correct in principle, but very unsatisfactory in its application. The officers of the brotherhood may well laud the virtues of arbitration, when they have succeeded in getting the single neutral arbitrator to grant their constituents at a single stroke an increase of wages of over 20 per cent. The trainmen oppose arbitration because of the impossibility of finding outsiders who can appreciate railroad details. Here is an equally serious objection; everybody should oppose leaving important issues to a single individual, as was done in this case. It is getting too far away from the fundamental idea of a jury. The single-judge idea is intolerable in matters which come so near men's hearts as their daily wages. The nominal shortening of the month is the salient feature of this decision. The 26-day month is right and the 31-day month is wrong, and this change to the shorter month will be heralded as a great thing in promoting the health and the moral and spiritual welfare of the telegraphers, but as a matter of fact they—or 99 per cent of them—will simply go on working Sunday, as before, only getting double pay for the time thus

worked. The real problem, that of giving the men the greatest practicable variety in their lives, consistent with economical service, remains unsolved, untouched. But the movement is now started, and it will not be long before we may expect the next step. The Central's lines west of Buffalo are now added to those of the Michigan Central and the Grand Trunk as giving liberal time off, and the New York Central operators east of Buffalo will, no doubt, be the next to apply. Probably they are now kicking themselves for not asking double Sunday pay this time. The trade unions have already secured considerable modifications of the 365-day work year in numerous industries, and the influence of what they have accomplished is pretty sure to affect the railway station service. Railroad managers have a duty to see that the problem is settled on rational grounds.

WAGE CONTROVERSY REFERRED TO MEDIATION

THE attitudes assumed by both the representatives of the railways and the representatives of the train service employees at the conferences in New York this week were entirely consistent with the attitudes assumed by them before the strike vote was taken. The report of the vote showed that, as is always the case, the members of the brotherhoods had voted almost unanimously to authorize their leaders to call a strike if they considered this expedient. The National Conference Committee of the Railways, after hearing the strike vote, stated that, in its opinion, there was no probability of a settlement being reached by further direct negotiations, and asked the representatives of the employees to join with the conference committee in asking for mediation by the federal mediation board. The representatives of the employees refused to join with the railway's committee in making this move. The railways then alone asked for mediation.

The record to date, then, is as follows: The railways have asked the employees to join them in requesting an investigation of the merits of the controversy by the Interstate Commerce Commission, and this the employees have refused. The railways have suggested arbitration under the Newlands act, and this the employees have refused. Having rejected both of these propositions, the employees have taken a strike vote. Then the railways have suggested a joint request for mediation, and this the employees have refused.

In other words, the railways have, up to this time, made every move which has been made in the direction of a peaceful settlement of the controversy; and the employees have just as consistently refused to make any move except in the direction of a strike, with all its direful consequences.

In view of these facts, it is plain that if there is a strike the responsibility for it and its results will rest entirely on the employees. If, on the other hand, there is finally arbitration, the concessions the railways have made in the interest of peace should help them in securing a fair basis for arbitration and a fair method of conducting it. The fair basis, of course, would be one providing for the full consideration of the demands of both sides. The fairest method would be that of full investigation by the body that fixes the rates from which wages must be paid—the Interstate Commerce Commission.

While the employees refused to join in asking for mediation, they accepted it when tendered by the federal board. Both the railways and the employees can make any proposals to the board and through it to each other that they see fit. It may be assumed that the railway committee will present with great force their reasons for desiring that the entire controversy shall be submitted to the Interstate Commerce Commission, the only tribunal that is qualified to give due consideration to all of the important interests involved.

THE MAIL-PAY SETTLEMENT

CONGRESS has decided at last to abandon the archaic theory of fixing the railway mail-pay rates in the annual appropriation bills—a theory which involves a strenuous contest almost every year in the Senate or the House, or in the committees—and has also put a stop, at least temporarily, to the absurd and ill-judged activities of the Post Office department, in cutting down the railways' pay, which have disgraced that department for several years back; two steps in real progress which will elicit from railway officers everywhere an audible sigh of relief. The bill, by which the whole question of rates for transportation of mail by railroad is referred to the Interstate Commerce Commission, is abstracted in another column.

The bill also recognizes the injustice of paying the railways for carrying the mails, including the parcels, on the basis of weights estimated before the parcel post was started; but in very meagre fashion. These are concessions in form without any substance. The railroads on which the parcels have not increased the loads of the mail-cars many times one per cent must be few indeed.

This legislation should become the beginning of a great reform; it will introduce a rational procedure in place of what is about the crudest scheme that was ever thought of. And it is safe to characterize the change as a reform, notwithstanding its deficiencies. The Interstate Commerce Commission, judging from the past, will take many months to study its problem; and, judging again by the past, will pare down the profits of the railways to the lowest basis that could be considered reasonable; but there is no better way. As to the extent to which the injustices of the past will have been cured, everybody must continue in the dark until the Commission decides whether or not to adopt the space-rate rule; for if that rule is used the railways' rights and interests will be subject to the mistakes of judgment and the prejudices of the officers of the post office department, more completely even than now. To secure the prompt service which the public demands, the government, paying for space, would often have to engage more than could be used; but the figures representing money paid for empty space would be always before the mail-service superintendent as indicating a potential waste; and the incentive to scrimp in order to neutralize that expenditure would be a constant detriment to efficient service. The impossible features of the space-rate theory must have been presented very forcefully to Congress; otherwise we should not have been favored with even this conditional check upon it.

However, it is sufficient for the present to congratulate ourselves on the outstanding fact that the Congressional committees and the railroads' representatives have reached an agreement. In view of the difficulties that they had to deal with, and the radical nature of the decision which has now been reached, this is no less than a very unusual accomplishment.

The campaign of the railroads' mail-pay committee, now in its tenth year, evidently is not finished. In a sense the committee's work is just begun. It has accomplished a necessary and almost unique task in arousing the public to the injustices of the law and to the pettiness of the post office department, and through its influence on the public has aroused Congress; but now it must "get down to brass tacks," and put the facts of the situation before the Interstate Commerce Commission. At the very best a pretty broad discretion in administrative details—in fact, very extensive powers—must continue to be entrusted to the Postmaster General and his advisers, and the railroads must make sure that the Commission has all the facts necessary to enable it to lay down the correct principles in the most thorough detail possible. The business of the post office department is a matter

in which the whole public will always take an intimate interest, and its foundations should be of the soundest character.

DEFICIENCY OF EQUIPMENT IN 1915

NOTWITHSTANDING the natural growth in the demand for railway equipment from year to year, there were at the close of the fiscal year 1915 7,342 less freight cars in service and 815 less locomotives than were in service at the close of 1914. These figures are based upon the annual statistical statement of the Interstate Commerce Commission recently issued. In only three other years since 1890, when the Commission's figures began to be sufficiently complete to make them useful for comparison, has the number of freight cars in service shown a reduction from the number in service at the close of the preceding year. In only one year, except 1915, during the same period has the number of locomotives reported shown a falling off from the figures of the preceding year.

In 1895 there were 9,050 less freight cars in service than in 1894; in 1897 there were 157 less than in 1896. These were the dark days of the railway industry. The condition then existing is further reflected by the small increase in number of freight cars reported for 1896, the intervening year, when the increase was only 25,768—the smallest increase except in two of the years of the 25-year period in which there were any increases. In 1909, again, there was a falling off of 15,696 cars, compared with the number in service in 1908. But this apparent showing is modified by the fact that in the three years preceding additions to equipment were made so freely that the period has been characterized as one of over-confidence and over-building. Since 1909 there has been no indication of such a tendency. In fact, in the five years intervening between 1909 and 1915, when decreases in the number of freight cars in service were reported, there was a smaller aggregate addition to the total of freight car equipment than in the two years 1906 and 1907, notwithstanding the fact that operated mileage had increased about 30,000 miles between the periods. The number added to the total equipment in these recent five years was almost 125,000 cars less, also, than the aggregate additions from 1898 to 1902, a five-year period in which the amount of car building was certainly not abnormal. The mileage in the middle year of that five-year period was 60,000 miles less than in the middle year of the recent five-year period with which it is compared.

It is true that there has been no year in which there has been shown a decrease in aggregate freight car capacity as compared with the preceding year. The cars that are retired from service are of smaller capacity individually than the new cars with which they have been replaced. But the Interstate Commerce Commission's statistics of aggregate freight car capacity were not compiled for the years prior to 1904. Since that date only two years show a smaller aggregate increased capacity for the year than 1915. These years are 1909, when the total number of cars was 15,696 less than in the preceding year, and 1912, when the increase in number was only 7,912. In each of the years except those noted, the aggregate increase in capacity varied from nearly two and a quarter million tons to nearly eight million tons. In 1915 the increase in aggregate capacity was slightly over one million tons.

Naturally, the history of locomotive equipment in service has followed a course substantially parallel. Except 1912, there is no year from 1890 to 1915 in which there was a reduction in the number of locomotives. In 1912 there were 51 less locomotives than in 1911. In 1915 there were 815 less than in 1914. Of course, the number of locomotives necessary to be added to the total equipment is influenced by the greater hauling capacity of the locomotives built in recent years. But notwithstanding this fact, a comparison year by year of the figures in the accompanying table shows a substantial parallelism as to fat and lean years between the locomotive column and the freight car columns:

ANNUAL INCREASES IN EQUIPMENT FROM 1890 TO 1915*

	Freight Cars				Locomotives	
Year	Number	Increase in Number	Capacity, tons	Increase in capacity, tons	Number	Increase
1915.....	2,318,305	—7,342	91,982,452	1,005,354	63,945	—815
1914.....	2,325,647	52,083	90,977,098	3,998,953	64,760	1,382
1913.....	2,273,564	70,141	86,978,145	4,012,727	63,378	2,102
1912.....	2,203,423	7,912	82,965,418	888,390	61,276	—51
1911.....	2,195,511	60,390	81,077,028	4,498,293	61,327	2,380
1910.....	2,135,121	61,515	76,578,735	3,441,189	58,947	1,735
1909.....	2,073,606	—15,696	73,137,546	473,881	57,212	479
1908.....	2,089,302	97,745	72,663,665	5,630,341	56,733	1,345
1907.....	1,991,557	153,643	67,033,324	7,974,022	55,388	3,716
1906.....	1,837,914	106,505	59,059,302	5,804,219	51,672	3,315
1905.....	1,731,409	39,215	53,255,083	2,495,850	48,357	1,614
1904.....	1,692,194	38,412	50,759,133	2,228,852	46,743	2,872
1903.....	1,653,782	107,681	48,530,281	.....	43,871	2,646
1902.....	1,546,101	81,773	.....	.....	41,225	1,641
1901.....	1,464,328	98,797	.....	.....	39,584	1,921
1900.....	1,365,531	70,021	.....	.....	37,663	960
1899.....	1,295,510	46,684	.....	.....	36,703	469
1898.....	1,248,826	27,096	.....	.....	36,234	248
1897.....	1,221,730	—157	.....	.....	35,986	36
1896.....	1,221,887	25,768	.....	.....	35,950	251
1895.....	1,196,119	—9,050	.....	.....	35,699	207
1894.....	1,205,169	81,862	.....	.....	35,492	704
1893.....	1,013,307	46,309	.....	.....	34,788	1,652
1892.....	966,998	19,698	.....	.....	33,136	997
1891.....	947,300	28,809	.....	.....	32,139	1,999
1890.....	918,491	.....	.....	.....	30,140	...

*Figures for years 1912 to 1915, inclusive, do not include Class III roads.

Statistics of aggregate tractive power of locomotives have not been kept for a sufficient length of time to make them of use in the present consideration.

There is one source from which a side light is thrown upon the causes of this falling off in 1915 in the supply of needed equipment, so far, certainly, as freight car equipment is concerned. The Interstate Commerce Commission's compilation, in which the total freight car equipment is subdivided into seven classes, shows that there were substantial increases in 1915 over 1914 in the numbers of stock, tank and refrigerator cars, a very small increase (136) in the number of coal cars, and a falling off of 15,222 in the number of box, flat and "other" cars. Tank and refrigerator cars can be used only in the service for which they are intended. The same is true of stock cars, except to a limited extent. A clearly reasonable inference is that the demand for stock, tank and refrigerator cars has been met, so far as possible in straitened financial resources, in order to retain business that would otherwise be lost and that the deficiency has been allowed to fall principally upon the class of cars which can be, and ordinarily are, used for a variety of purposes. The poverty of equipment resources has thus been kept within the organization itself and its effects mitigated so far as possible by the more efficient handling of this general purpose equipment.

Some generalization perhaps is required to show fully the significance of these figures. Statistics of car and locomotive equipment purchased or ordered within a given period are universally taken as an approximately accurate indication either of the condition of the railway business within that period or of its anticipated condition within the immediate future.

These views are theoretically correct. Railway executive officers are in as favorable position as any business men to read correctly the signs of approaching depression or prosperity. Their business is one of the first to feel the effects of either fluctuation. Aside from sporadic cases of activity or depression, it is affected in a greater degree than most other lines of industry. Like the iron and steel busi-

ness, with which it is ordinarily closely associated, it becomes an accurate barometer of the general condition of industry in the country in which its system is situated. The actual fluctuations in the amount of equipment in service at the end of each fiscal year, as reported to the Interstate Commerce Commission and published as a part of its annual statistical report, compared year by year over a considerable period, reflect clearly not only the relative condition of the transportation industry in those years, but also to a marked degree the status of the general industries of the country.

On the theoretical basis before stated, this falling off in equipment in 1915 is a reflection of a condition in support of whose existence no argument is required. Business in transportation lines was slack. But a consideration of the statistics from a practical point of view indicates another reason why missing equipment numbers, at least, have not been filled. The necessary financial resources have not been available. It has not been possible, in view of constantly diminishing income until within the last few months, even to take advantage of slack conditions in the car and locomotive building industry. "Missing numbers" have been supplied to some extent by the varied use of old equipment, some of which would probably otherwise have been retired. The supply of additional equipment to meet probable requirements of a revived industry has been left to the chances of a beneficent future.

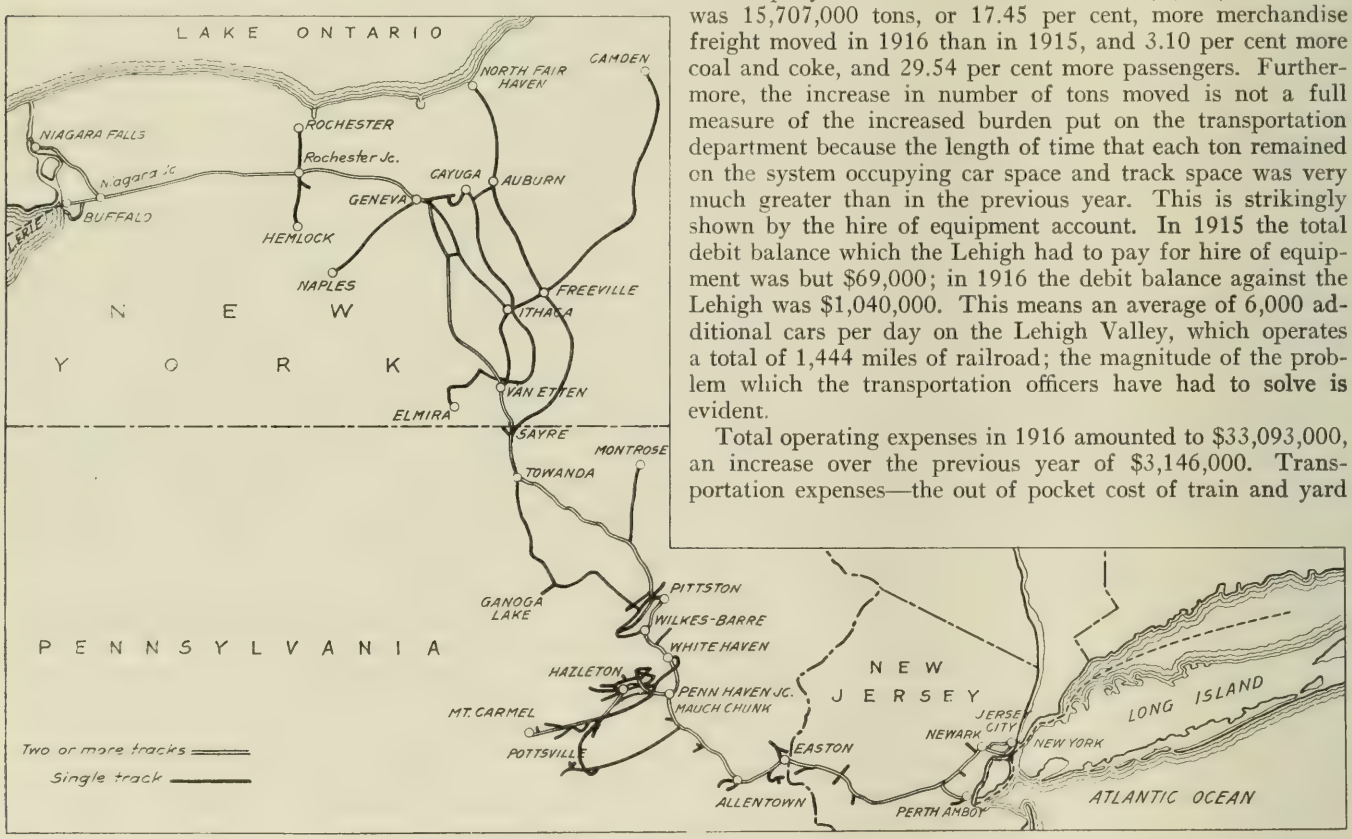
The railways are now enjoying a little prosperity. It may be only temporary. But they have the results of considerable periods of bad business and of ill-advised regulation to make up for. The average rate of dividend on all stock was less in 1915 than in any year since 1905, and the percentage of all stock on which dividends were paid was also less than in any year in the same period. The amount of equipment for handling business is shown by a correspondingly bad record. It will take much longer than the present period of prosperity can be insured to last to bring the equipment supply up to a fair normal for handling a normal business. It will take a longer period, a better system of regulation and some definite means of preventing the looting of incipient prosperity by labor brotherhoods before the railways find themselves on firm ground as to either dividends or equipment.

LEHIGH VALLEY

NEVER have the superintendents of car service, and with them every one concerned with car movement, on the eastern railroads had so hard a job as during the fiscal year just ended. The measure of the difficulty of the task is the amount of per diem which the eastern roads will have to pay. The measure of the success with which the opening organizations were able to cope with the car congestion in most cases will be in the inverse ratio of the percentage of increase of transportation expenses.

The Lehigh Valley in the fiscal year ended June 30, 1915, earned $47,383,000, the largest earnings in the history of the company. The increase over 1915 was $4,857,000. There was 15,707,000 tons, or 17.45 per cent, more merchandise freight moved in 1916 than in 1915, and 3.10 per cent more coal and coke, and 29.54 per cent more passengers. Furthermore, the increase in number of tons moved is not a full measure of the increased burden put on the transportation department because the length of time that each ton remained on the system occupying car space and track space was very much greater than in the previous year. This is strikingly shown by the hire of equipment account. In 1915 the total debit balance which the Lehigh had to pay for hire of equipment was but $69,000; in 1916 the debit balance against the Lehigh was $1,040,000. This means an average of 6,000 additional cars per day on the Lehigh Valley, which operates a total of 1,444 miles of railroad; the magnitude of the problem which the transportation officers have had to solve is evident.

Total operating expenses in 1916 amounted to $33,093,000, an increase over the previous year of $3,146,000. Transportation expenses—the out of pocket cost of train and yard operation—were $17,090,000 in 1916 as against $15,382,000 in 1915, an increase of $1,708,000, or 11.10 per cent. The ratio of transportation expenses to total operating revenues was 36.07 as compared with 36.17 in the previous year. This is a highly creditable showing.



The Lehigh Valley

The Lehigh made large expenditures—$10,643,000—for additions and betterments, many of which presumably necessitated additional charges to the maintenance of way account. During the year 16 steel bridges and 13 concrete steel bridges were built to replace light iron or wooden bridges; 7 wooden bridges were replaced by ballasted floor creosoted timber bridges, and 2 wooden bridges were replaced by fills. Total maintenance of way expenses in 1916 were $4,658,000, or 3.88 per cent more than the expenditures in 1915.

This year of large earnings was availed of by the management to bring up the standard of equipment. Twenty-eight locomotives, 1 passenger car, 1 express car, 1 fruit car, 1,551 freight cars and 161 road service cars were condemned and sold or scrapped. Apparently the accrued depreciation on locomotives was sufficient to almost cover the difference between scrap value and book value. On freight cars, however, there was a charge of $369,000 to retirement expenses, representing the difference between accrued depreciation and scrap value. The Lehigh Valley has been quite liberal in its charges for depreciation, there being a reserve carried on its balance sheet of $9,438,000 against equipment, the book value of which is $56,588,000. The new equipment which was bought and the cost of which, of course, is included in the $10,643,000 spent for additions and betterments, included 25 freight locomotives, 20 switching locomotives, 9 passenger locomotives, 7 locomotive tenders, 20 steel underframe milk cars, 4 steel flat cars, 25 steel underframe eight-wheel cabooses and 7 locomotive cranes. During the year 65 heavy Consolidation freight locomotives and 10 Ten-wheel freight locomotives were rebuilt and equipped with superheaters, new cylinders and Walschaert valve gears. In this connection it is interesting to note that the total locomotive mileage in 1916 was 24,191,000, an increase over 1915 of 1,864,000, or 8.6 per cent. The total expense for fuel for road locomotives was $3,033,000 in 1916, or $19,000 less than in 1915, and for yard locomotives, $542,000, or $51,000 less than in 1915. The cost of fuel per locomotive-mile was 14.98 cents in 1916 as against 16.14 cents in 1915. The fuel used per freight locomotive-mile was 236.6 lb. in 1916 as against 250.1 lb. in 1915; per passenger locomotive-mile, 129.5 lb. as against 131.5 lb.; and per switching and other locomotive-mile, 106.3 lb. as against 110.2 lb.

The Lehigh is carrying out an extensive plan of additions and betterments to its equipment. Orders have been placed for 36 Pacific type locomotives, 55 freight locomotives, 16 locomotive tenders, 1,500 80,000-lb. steel underframe and steel end box cars, 25 steel underframe eight-wheel cabooses, 2 all-steel dining cars and 2 locomotive cranes.

Since the Lehigh increased its stock in 1910 by the sale of 403,338 shares (par value $50 per share), which produced $20,166,900 cash, have been sold in 1913 $10,000,000 general consolidated mortgage bonds, and in 1916, $10,697,000 of these bonds. Since July 1, 1910, the company has retired $20,114,538 of securities held by the public, has spent for additions and betterments $19,977,152, and has spent for additional rolling stock and floating equipment $16,419,838, a total of $56,511,528. This compares with total receipts from the sale of the stock and two issues of bonds of $39,703,445. In other words, the company has spent out of its surplus earnings and current cash funds $16,808,083 for additions and betterments to the property, against which no securities have been issued. At the end of the fiscal year 1916 there was $15,127,000 cash on hand, with no loans and bills payable, and total current liabilities of but $8,846,000.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Mileage operated	1,444	1,442
Coal freight revenue	$18,811,100	$19,195,756
Merchandise freight revenue	20,363,251	16,005,501
Passenger revenue	4,300,183	4,043,799
Total operating revenues	47,382,569	42,525,962
Maintenance of way and structures	4,657,854	4,483,925
Maintenance of equipment	9,364,629	8,207,491
Traffic expenses	996,249	959,830
Transportation expenses	17,090,114	15,382,187
General expenses	984,132	913,955
Total operating expenses	33,092,978	29,947,388
Taxes	1,706,093	1,691,989
Operating income	12,574,714	10,871,803
Total income	15,241,240	12,882,822
Net income	7,666,440	6,322,445
Dividends	6,060,800	6,060,800
Surplus	1,605,640	261,645

BUFFALO, ROCHESTER & PITTSBURGH

A YEAR ago it was predicted in these columns that unless something unforeseeable intervened to prevent, the Buffalo, Rochester & Pittsburgh would make a record showing in the fiscal year ended June 30, 1916. This prediction has been borne out, but only because the operating department made a better performance even than could have been conservatively thought possible.

The Buffalo, Rochester & Pittsburgh had the largest gross in its history, the largest average trainload and the lowest ratio of transportation expenses to gross, notwithstanding the fact that it had the lowest average ton-mile rate in its history, with the exception of 1914 and 1913. Heavier trainloading was, of course, the important factor in the low ratio



Buffalo, Rochester & Pittsburgh

of transportation expenses to gross earnings; but the trainload of 786 tons as compared with 710 tons in 1913, the best previous year, was due not to more favorable traffic conditions but to better carloading and longer trains.

The Buffalo, Rochester & Pittsburgh operates 586 miles of road, the main lines running from Buffalo, N. Y., and Rochester to Ashford; from there south to Ribold Junction, Pa., and from there west to New Castle, Pa., and south to Pittsburgh. The total tonnage of freight transported in 1916 was 14,134,000 tons. Of this 8,905,000 tons was bituminous coal. The coal fields are at the southern end of the line, and while a part of the coal tonnage moves only as far north as Clearfield, Pa., where it is delivered to the New

York Central, a large part moves almost the full length of the line and goes either to Buffalo or Rochester or is shipped across Lake Ontario to Cobourg. At Punxsutawney there is a large iron furnace and ore for this furnace is hauled south almost the length of the line. Nothing, therefore, will be reflected quicker in an increased average trainload than an increase in the tonnage of iron ore. In 1913, which was the best previous year in the Buffalo, Rochester & Pittsburgh's history, the total tonnage of all freight was 12,491,000, comparing with 14,134,000 in 1916; but the tonnage of ore in 1913 was 781,000 tons as against 695,000 tons in 1916. The trainload, as was previously mentioned, was 710 tons in 1913 and 786 tons in 1916. The ratio of transportation expenses to gross earnings was 32.71 in 1913 and 31.91 in 1916. The average ton-mile rate was 4.61 mills in 1913 and 4.64 mills in 1916. In other words, with a ton-mile rate higher by less than one per cent; with the scale of wages materially higher, and with the price of materials as high or higher, the transportation ratio was 31.91 in 1916 as compared with 32.71 in 1913.

It is really more enlightening to compare 1916 with 1913 than with 1915. The latter was an extraordinarily bad year, 1916 an extraordinarily good one; and the contrast between the two, therefore, is striking. Total operating revenues in 1916 were $11,971,000, or $2,491,000 more than in 1915. Operating expenses were $8,649,000 in 1916, an increase of $1,714,000 over 1915. With a slight decrease in interest and rental charges, and helped by an increase of $298,000 in credit balance for hire of equipment, there was $1,293,000 available for dividends in 1916 as against $780,000 available for dividends in 1915. In both years the company paid 4 per cent on its $10,500,000 common stock, but since the close of the year has raised the annual dividend rate to 6 per cent. The earnings in 1916 on the total outstanding stock was 7.84 per cent.

In 1916 the management was liberal in expenditures for maintenance. Expenditures for maintenance of way and structures amounted to $1,653,000 in 1916, an increase over the previous year of $386,000, or 30 per cent. Maintenance of equipment cost $2,754,000, an increase over the previous year of $618,000, or 29 per cent.

The Buffalo, Rochester & Pittsburgh being a north and south road and an originating line, unlike the east and west roads terminating at New York and Boston, was not congested with rolling stock from other railroads but was called upon to furnish cars for shipments to destinations off the home lines. Notwithstanding this fact, however, there was not at any time during the entire fiscal year ended June 30, 1916, a car shortage on the road. It has been a fixed policy of the management to provide amply for the car requirements of the shippers on its lines. There were no additions to locomotives or cars in service, but steel underframes were applied to 1,984 freight cars and 7 locomotives were equipped with superheaters.

There was $574,000 spent for additions and betterments to roadway and buildings, the two largest amounts being $173,000 for yard extensions and sidings and $66,000 for land for a storage warehouse at Rochester. The more important work now in progress is the strengthening of steel bridges, the subway at Saxton street, Rochester, and the replacing of timber bridges, trestles and culverts in permanent form.

As of June 30, there was $512,000 cash on hand and $909,000 demand loans and deposits, comparing with $229,000 cash and $1,181,000 demand loans and deposits at the end of the previous year. There are no loans and bills payable (a few thousand dollars is shown under this head on the balance sheet, complying technically with the requirements of the Interstate Commerce Commission) and total current liabilities on June 30, 1916, were $1,392,000, comparing with $1,245,000 in the previous year.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Mileage operated	586	586
Freight revenue	$10,381,647	$8,022,690
Passenger revenue	1,144,892	1,101,981
Total operating revenue	11,971,019	9,479,936
Maintenance of way and structures	1,652,890	1,267,254
Maintenance of equipment	2,753,623	2,135,354
Traffic expenses	142,839	141,767
Transportation expenses	3,819,911	3,144,598
Miscellaneous expenses	15,282	14,658
General expenses	264,244	231,621
Total operating expenses	8,648,790	6,935,252
Taxes	250,000	230,000
Operating income	3,072,101	2,314,087
Gross income	4,088,200	3,032,733
Net income	1,964,137	921,720
Appropriations (pensions and retirements of equipment trusts)	671,317	132,720
Dividends	780,000	780,000
Surplus	512,820	.....

NEW BOOKS

Scientific Management and Labor. By Robert Franklin Hoxie, associate professor of political economy, University of Chicago. Bound in cloth. 302 pages, 5 in. by 7½ in. Published by D. Appleton & Co., New York. Price $1.50.

Generally speaking, through improvements in industrial processes and elimination of wastes in the expenditure of labor, scientific management is designed to serve the interest of employers and workmen alike, as well as society at large. That in many respects it has accomplished much toward this end cannot be denied. It has standardized facilities and processes, and has brought about co-ordination of effort where little better than confusion existed before. In its methods of dealing with labor, however, it has generally failed to win confidence, either because of the blind prejudice of organized labor or a lack of appreciation of the complexity of the labor problem. With the claims of the advocates of scientific management as to its relation to labor and those of the labor leaders, directly opposed to each other there has been practically no reliable information available from which an unprejudiced opinion on the merits of the controversy could be formed. Primarily to test the validity of these opposing claims as brought out at the hearings on scientific management held by the United States Commission on Industrial Relations in April, 1914, the author was commissioned to conduct a thorough investigation of the relations of labor to scientific management as they have developed in the operation of the three generally recognized systems.

The present volume contains the conclusions of the author based on the results of this investigation. The points at issue were carefully analyzed and a comprehensive study was made of scientific management as it was found in actual operation in 35 shops and other concerns. Care was taken throughout the investigation that it might be entirely impartial and to this end the author was assisted by a representative of employing management and a representative of labor, both of whom have fully approved the author's conclusions. In a number of appendices at the close of the volume are contained detailed statements of the labor claims of the three principal exponents of scientific management and the trade union objections to the system, together with a statement of the vital points at issue. The volume closes with the text of an elaborate questionnaire by the use of which most of the facts were obtained.

This volume is a valuable addition to the literature on scientific management and cannot fail to prove of great interest to all who are in any way concerned in the administration of the system, as well as to shop managers generally. The extravagance of the labor claims which have been made for scientific management is clearly indicated, some of them being inherently opposed to the system employed. It is also evident that there has been a disregard for the human element in all its complexity, throughout the system. Notwithstanding the numerous defects, however, "it is to date the latest word in the sheer mechanics of production and inherently in line with the march of events."

Letters to the Editor

REDUCTION OF OVER, SHORT AND DAMAGED CLAIMS

Detroit, Mich.

To the Editor of the Railway Age Gazette:

Under the above heading, there appeared in your issue of June 23, several very interesting contributions. Railroads all over the country are conducting campaigns looking to the better handling of package freight in an effort to reduce the payment of claims.

Some railroads have made remarkable reductions. It is doubtful, however, if the full measure of results will be obtained as long as the operating, traffic and classification departments are so widely divorced one from the other. The payment of all loss and damage claims is charged to the operating department, yet, except in a few instances, the operating department does not have any direct control over the machinery which contributes most to these payments.

In the handling of locomotives, trains and cars, the operating department directs their every movement. If a car is found to have any defects, affecting safety in the movement, it will not be moved until the defects have been corrected; and in the case of a car offered by a connection, it will not be accepted, or, if it is, the lading will be transferred to a car that is safe to run and the cost of the transfer assessed against the delivering road.

The Bureau of Explosives designates the character of equipment to be used in the transporting of explosives, defines how the cars shall be equipped and how the commodity shall be loaded, braced, etc. It even goes further and restricts the loading of different kinds of explosives and inflammables in the same car, and finally prescribes certain placards that shall be placed on both the sides and ends of cars containing certain commodities.

When we come to the question of handling other freight, we are confronted with a different proposition. The traffic and classification departments say that a shipper is permitted to ship flour in sacks made of paper and muslin, and where the shipments number more than ten bags to any one consignee, it is only necessary that the name of consignee and destination shall be marked on one out of every ten bags. This latter provision not only applies to shipments of flour, but to many other articles. The operating department has no voice in the matter, but is bound, under the terms of the contract as contained in the bill of lading, to handle the shipment of flour to destination and deliver the correct number of bags of the proper brand to the rightful consignee, or pay for it.

The classification provides for the shipment of household effects, with but few restrictions as to crating, packing, etc. A shipper, therefore, can have all of his household and kitchen furniture taken from a steam heated flat, where the glue has been melted out of nearly every article, and tender them to the railroad, destined to a point 400 miles away, necessitating from two to three or more transfers, and demand that the shipment be delivered at destination in as good condition as when taken from his flat, or pay for it.

The classification provides for the acceptance of shipments of electric light bulbs, lamps, fruit jars and other articles packed in fiber cartons. In many instances the glass in the electric light bulbs and small lamps is blown to a thickness of little more than one thirty-second of an inch. It is claimed by the manufacturers that this is done for two reasons, first, to secure as high a refraction power as possible, and, second, to put the cost at such a figure that the 5 and 10 cent stores and others can sell them at an arbitrary price of ten cents each. The glass in many of these articles is so brittle that the shock of throwing down a heavy piece of freight close to one of the shipments on a cement floor has been known to fracture one or more.

The classification permits chairs, rockers and other articles to be shipped, simply wrapped with one thickness of flimsy paper, and frequently not that. The material in many of those chairs and rockers is old, punkey, kiln-dried lumber cut across the grain, and further weakened by the holes drilled almost through the round or runner to accommodate the connecting rung. The slightest jar or fall will break off a leg from a chair, or a runner from a rocker.

The classification provides that shipments of cigars shall be corded and sealed, but is silent as to requirements covering shipments of shoes, clothing, hats, etc., even when packed in second hand recoopered cases; neither is any special protection thrown around the shipment of case goods, such as whiskey, etc., one of the most fruitful sources for claims due to theft, a large percentage of which no doubt is done before shipments are delivered to the railroad.

It would be possible to add to the above scores of other articles which, through the provisions of the classification, railroads are compelled to handle, and on which it is almost impossible to reduce damage claims to a greater extent than is being done at present. It would therefore seem that one of the first, and at the same time one of the most important things to do, is for the freight claim agents throughout the country to compile complete data covering the payment of loss and damage, showing the various items, the character of the retainer and packing, the handling from point of shipment to destination and delivery to consignee and the amount paid out in claims as compared with the revenue received. In this way the Classification Committee will be in a position to take some action and give the railroads the necessary relief.

It will not do for any single railroad to do this, as certainly, in the absence of any general complaint, supported by proper data, the Classification Committee would not be justified in making an arbitrary ruling affecting the entire territory on the simple complaint of one line.

I would like to add, and I say it on the strength of some of the investigations we have made, that I believe the railroads of the country are paying out hundreds of thousands of dollars every year to shippers and consignees, covering both loss and damage, while both are chargeable to either the shipper or consignee, or some of their subordinates, in that the article paid for was never shipped or was broken or damaged before shipment was made, or after its delivery. In such cases all the missionary work done by railroads in their efforts to handle freight carefully, will never put back a pair of shoes or suit of clothes that has never been packed, or mend a dozen plates, cups, saucers, tumblers or high priced vases broken by a careless packer. It is a matter of record that in a shipment of 50 cases of 50 dozen eggs each, made from a point in Russia to Pittsburgh, Pa., a distance of about 9000 miles, not a single egg was broken, although the eggs were simply packed loose in shavings; yet there is hardly a single shipment of casks of crockery or earthenware made in the country, moving a distance of one hundred miles or more, that a claim is not presented for the breakage of from ten to one hundred articles.

There is one very important feature in connection with the payment of claims for shortages I am afraid railroads have overlooked, and that is they are paying out large sums of money annually, not so much because they have actually lost the shipment, but because they have lost their record of it. How many railroad officers realize the number of shipments being moved on free astray billing and delivered to consignee, in many cases even without the collection of any revenue, when at the same time their own road or some

other road has or will pay a claim for the shipment which had checked short months before.

How many railroads are demanding the surrender of the bill of lading or other proof of ownership in the delivery of shipments received on free astray billing?

While we are campaigning along the lines of better loading and more careful handling of L C L freight with the view of reducing our loss and damage payments, let us not lose sight of the fact that there are other avenues for leaks that are equally as important.

JOHN W. CARROLL,
Chief, O. S. & D. Bureau, Michigan Central.

SAFETY ON GERMAN AND AMERICAN RAILWAYS

NEW YORK.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In a communication in your issue of June 30, Wm. Barclay Parsons takes exception to my conclusions as to the comparative safety of German and American railways as set forth in the article, "Where German Efficiency Falls Down," published in your issue of June 16.

With regard to passengers killed, Mr. Parsons shows that *during the 30 years prior to 1910* the German railways were unquestionably safer on a passenger mile basis than were the railways of the United States. I can easily see that if 30 years ago I or anyone else had made a comparison of the German and American railways from a safety standpoint the verdict would have been in favor of Germany.

Mr. Parsons' figures show, however, that the American railways were making continuous improvement throughout that period, and in 1910 were rapidly overhauling the Germans. Both Mr. Parsons' and my figures are correct and, therefore, of course do not and cannot conflict in any way. Mine are more recent, that's all.

Still less effective is Mr. Parsons' argument, based on the number of passengers carried regardless of distance, which, he says, "is not an unfair method of comparison." I shall let Mr. Parsons himself dispose of this point. This he does very nicely on page 26 of his paper on the "General Statistics of the Railways of the World," when, discussing the basis in question, he says, "But this again is not fair to those countries where the passenger journey is long." As the average passenger journey in the United States is nearly two and one-half times as long as in Germany, Mr. Parsons clearly believes that the basis which he has used is not fair to the United States. He further states in the paper referred to that "it would seem as if the proper basis on which to compare the safety to passengers carried is on the number of passenger miles traveled." This is the basis I used.

In regard to injuries to trainmen, Mr. Parsons says that I have included in my German statistics "All employees killed no matter what their occupation, including those in shops, construction, etc., whereas in the United States the number killed are only those killed by train accidents." Here Mr. Parsons misstates the facts. The German official statistics very properly do *not* include those killed is shops, construction, etc. Below is an analysis of the figures for both Germany and the United States:

GERMANY

Employees on duty—	Killed
Without fault of their own:	
In train accidents	24
Through their own carelessness:	
In trains or cars in motion	82
In making up trains	75
In coupling cars	120
While on tracks in way of moving cars or trains	295
Through other forms of carelessness	86
Total	682

UNITED STATES

Employees on duty—	Number killed			
Train accidents:	Trainmen	Trainmen in yards	Yard trainmen	Total
Collisions	128	29	46	203
Derailments	159	9	20	188
Boiler explosions	8	1	..	9
Accidents to trains other than above	1	..	2	3
Total in train accidents	296	39	68	403
Other than train accidents:				
Coupling or uncoupling cars	46	45	72	163
Attending switches and other work	41	24	42	107
Struck by overhead bridges, tunnels, etc.	51	12	18	81
Falling from cars or engines	156	54	130	340
Getting on or off cars or engines	30	15	31	76
Struck or run over at yards or stations	43	69	112	224
Struck or run over at other places	71	..	5	76
Other causes	4	2	1	7
Total other than train accidents	442	221	411	1,074
Grand total	738	260	479	1,477

The above statistics are those of 1912 for Germany and 1914 for the United States. At the time my article was written they represented the latest figures available for each country, but now the figures for 1913 and 1915, respectively, are at hand. The following table, which shows that the situation in Germany was steadily getting worse during the years immediately preceding the war, while in the United States the reverse was true, proves that no injustice was done the Germans by using its figures for 1912 for purposes of comparison.

	Number trainmen killed			Number trainmen killed per 1,000 employed		
	1911	1912	1913	1911	1912	1913
Germany	563	682	747	4.2	5.0	5.7
	1913	1914	1915	1913	1914	1915
United States	1,700	1,477	884	5.1	4.7	3.5

Mr. Parsons' next and last objection is that I took account of fatal accidents only, ignoring non-fatal injuries. My reason for doing this was that the term "injury" is such an elastic one that comparisons are worthless unless the definition of what constitutes an injury is the same for both countries. The term "killed" is pretty definite and conclusive and there can be no difference of opinion about the degree to which a person must be killed to be placed in the "killed" column. Not so in the matter of injuries. In Germany only the more serious injuries are reported, but in the United States so exacting are the requirements of the Interstate Commerce Commission that if a passenger fills the rack over his head with parcels and one falls down and strikes him on the head, the incident is very likely to count at the end of the year in the "passengers injured" column.

If this sounds ridiculous—and it certainly does—it may be enlightening to turn to I. C. C. Accident Bulletin No. 52 for the year ending June 30, 1914. On page 35 appears an "Analysis of accidents to persons," which shows that no fewer than 186 "injuries" were caused during the year by "objects falling from fastenings or racks in coaches or cabooses." Again, "unexpected closing of car doors" accounted for 742 injuries (a large part of the 742 probably representing pinched fingers or bruised noses), and 481 were victims of "window sashes of coaches or cabooses falling on hand or arm."

In Germany few, if any, of the above accidents would ever have been reported at all. Common sense tells one that if, as Mr. Parsons says, German railways injure only 3 persons for every one they kill, while American railroads injure 10 or 20 for every one killed, the conclusion is not inevitable that German accidents are so much more deadly than ours or that we injure so many more persons. The only reasonable deduction is what the evidence above indicates—that American railroads report a great many injuries that German railways would not report at all.

H. W. FAUS.

North Western Pulverized Coal Locomotive

A Description of the Equipment on an Atlantic Type Engine, and Some of the Results of Comparative Tests



Atlantic Type Locomotive Which Burns Pulverized Coal

ON August 8, 1915, the Chicago & North Western placed in service one of its standard high-speed Atlantic type locomotives equipped for burning pulverized coal. This engine was the second in this country to be so equipped and was therefore of a somewhat experimental nature. Regardless of this fact, however, it has never failed in active service and has been used more or less of the time for test purposes. The general dimensions of this locomotive are as follows:

Total weight of engine	180,000 lb.
Weight on driving wheels	96,000 lb.
Tractive effort	21,850 lb.
Cylinders, diameter and stroke	20 in. by 26 in.
Driving wheels, diameter	81 in.
Size of firebox	108⅛ in. by 65¼ in.
Firebox heating surface	170.7 sq. ft.
Total heating surface	2,770.7 sq. ft.
Superheating surface	428 sq. ft.
Steam pressure	185 lb.

The equipment installed on this engine was obtained from the Locomotive Pulverized Fuel Company, New York, and is substantially the same as that described by J. E. Muhlfeld in a paper before the New York Railroad Club last February and abstracted in the *Railway Age Gazette* of February 26, 1916, page 349. On this locomotive, however, the blower fan and the feeding mechanism are driven by electric motors which receive their electrical energy from a Curtis turbogenerator set located on the front of the engine, as shown in the illustration at the head of this article. This, it should be understood, was only a temporary expedient as the variable speed steam turbine now used for driving the feeding mechanism had not been developed sufficiently to be used on this locomotive.

It will be remembered that the pulverized coal is contained in an enclosed tank on the tender. Screw conveyors bring the fuel to the feeders where it commingles with the air from the fan and is blown through the outlets and flexible conduits to the three burners on the locomotive. Fig. 1 shows a front view of the tender with the three passages to the burners. From the flexible conduit the coal and air mixture passes into the nozzle and from there to the mixing chambers, where additional air is automatically admitted by induction, according to the amount of fuel being used, before it reaches the burner outlets. The dampers in the mixing chambers are for the purpose of adjusting the volume and velocity of the induced air supplied at this point, and are run open when the locomotive is using steam and shut when the locomotive is drifting or standing. These dampers are under the direct control of the fireman. The speed at which the screw conveyors in the tank operate is also controlled by the fireman, all the controlling apparatus being conveniently located, as indicated by Fig. 2, the interior view of the cab. From the burner outlets the fuel and air pass into the gasifying chamber, which is formed by a primary arch, as shown in Fig. 3, and thence into the combustion chamber. The products of combustion pass forward and up, over the brick arch, shown in Fig. 4, to the tubes. The brick arch is one brick longer than was previously used on the same engine when hand fired, which increases the flameway and the evaporation efficiency of the backhead of the boiler. The fire door has a machined fit in the door ring and is held closed by three clamps.

In view of the high temperatures obtained in the firebox of this locomotive it was expected that some difficulty would be experienced in the life of the brick work, but due to the action of the flame, which, due to induction, has a rolling rather than a blast action, no undue trouble has been found. On the other hand, it is believed that the firebox is in better condition than it would have been had the locomotive been placed in hand-fired service. The use of this apparatus has increased the capacity at which the boiler may be operated to the extent that three 4-in. safety valves are required to properly relieve the boiler where three 3-in. valves had been found to be satisfactory previously. It has also been found possible to increase the size of the nozzle, which, of course, reduces the back pressure in the cylinders. In addition to these advantages this engine has all the advantages of the oil-burning engines in that the clinker pit delays are eliminated and no grates, ash pans, front end nettings nor firing tools are required. The work of the fireman is greatly reduced and he has a much better opportunity to watch for signals and obstructions on the track. The firing is cinderless and sparkless and the control and elimination of the smoke is accomplished far easier than on hand or stoker-fired engines. The boiler tubes and front end are kept remarkably clean and the evaporative efficiency of the boiler is materially increased.

Of the lessons learned during the experimenting with this locomotive, that of having the coal properly prepared is perhaps the most important. The recommendations of the company supplying the apparatus for the burning of pulverized coal are that the coal shall contain one per cent or less of moisture and shall be pulverized so that 85 per cent of the total will pass through a 200 mesh screen and 95 per cent of the total through a 100 mesh screen. If the coal is too

moist it is liable to honeycomb on the brick work and tube sheet, while if it is not pulverized fine enough it will tend to coke and adhere to the bottom of the brick work under the front of the arch. The firing of the engine must also be watched to prevent any over-production of steam, especially in the service in which this engine is used, and the resultant waste through the safety valves. When on the road the fireman anticipates the manipulation of the throttle by the engineer by shutting off the supply of coal to the firebox some 20 or 30 seconds before the engineer closes the throttle. The performance of the engine on the road is ideal from an operating standpoint, as well as from a fuel consumption standpoint, as will be shown later.

The control of the fire is such that while standing at stations it can be extinguished entirely to prevent the waste of steam through the pops. On one trip to Milwaukee the fire was thus put out 25 minutes before starting time and started only 5 minutes before leaving. At the end of the run there was a layover of 2¾ hours. The fire was extinguished immediately on arrival, the boiler pressure being 175 lb., and

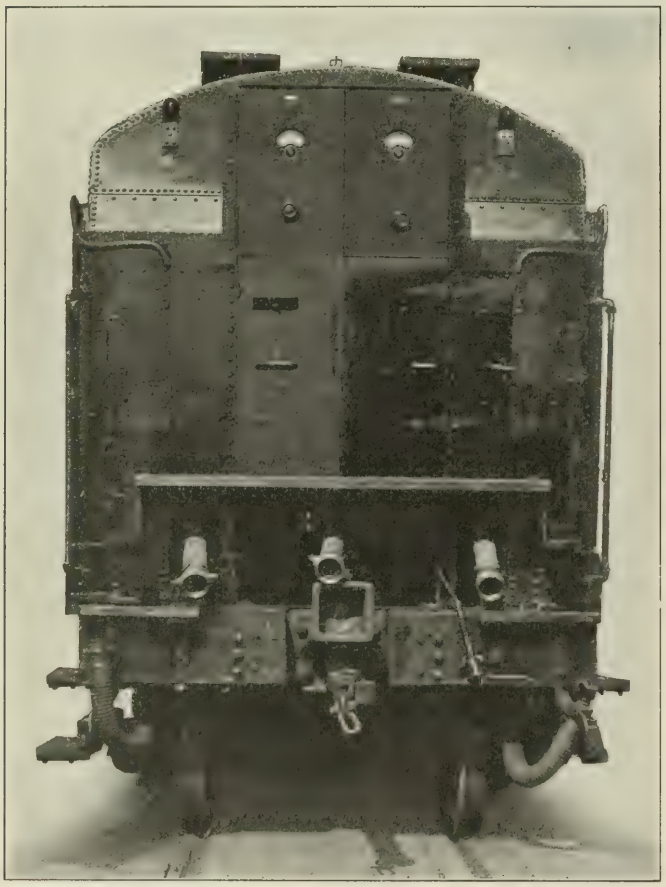


Fig. 1—Front End of the Tender of the North Western Locomotive

the engine taken to the roundhouse. It was started again 1 hr. 55 min. later, the boiler pressure having fallen to 120 lb., 65 lb. below the working pressure. In 12 minutes the pressure was raised to 150 lb. and in 22 minutes to 180 lb. The engine was then taken to the train and the boiler was well filled with water, the fuel supply being reduced during this time. Kentucky unwashed screenings were used on this trip, consisting in pulverized form of:

Moisture	1.9 to 2.8 per cent
Volatile matter	36.00 per cent
Fixed carbon	54.00 per cent
Ash	8.00 per cent
Sulphur	.79 per cent
B. t. u.	13,964

At the completion of the round trip it was estimated that there was about 50 lb. of slag in the pan. The tube sheet was perfectly clean.

The superheat obtained with this engine is very satisfactory, rising gradually on starting and being maintained at 250 deg. while running. The emission of smoke is practically negligible. After the engine has stood for some time with little or no fire there will be some smoke when the fire



Fig. 2—Looking Into the Cab of the North Western Locomotive

is again started. It is of far less density, however, than is obtained on hand-fired engines and as soon as the temperature of the firebox has been raised sufficiently high the smoke will disappear entirely.

This locomotive is fired up with pulverized coal, but in case steam is not available for the operation of the stack blower and turbines, wood may be used in the ordinary manner. Where steam is available it can be easily piped to the engine to drive the feeding apparatus until enough steam has been generated in the locomotive boiler to drive it. About 60 lb. pressure is required. By this method 100 lb. of steam can be obtained from a boiler of cold water in from 40 to 50 minutes. In the comparative tests mentioned below, 1.569 tons of coal was used in firing up, bringing the engine to and from the roundhouse and in supplying fuel to the firebox during all the "dead" time, as compared with 2.775 tons on a similar engine hand-fired. In the firing up alone other tests have shown the full boiler pressure can be obtained with 750 lb. of coal on the pulverized coal engine as compared with 1,700 lb. on the hand-fired engine of the same class. In the latter comparison it must be remembered that in the hand-fired engine there is a bed of fuel on the grates that still possesses considerable heat energy. On the other hand, the pulverized coal engine has much more brick work than the hand-fired engine in which a large amount of heat will be stored during the process of firing up.

Several road tests have been made with this engine as compared with an engine of the same class hand-fired. The tests shown below, which were made in the early part of last April, give a good indication of what this engine has done. The tests were made in passenger service between Chicago and Milwaukee, a distance of about 85 miles. Two separate tests of two round trips were made; one with the pul-

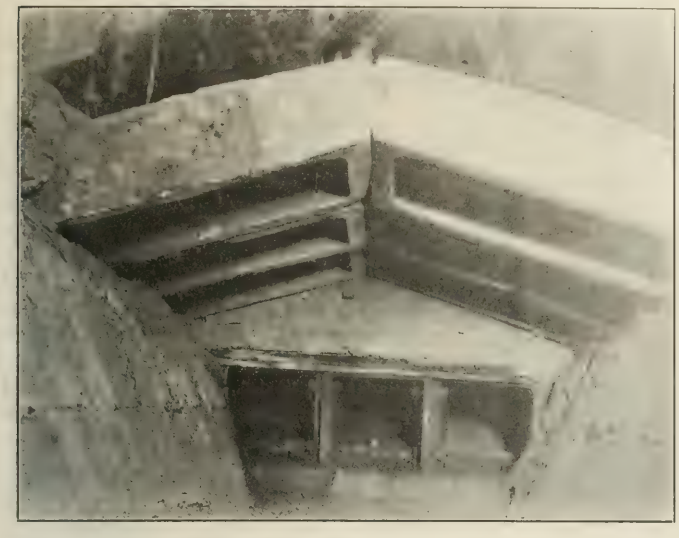


Fig. 3—Looking Toward the Back of the Firebox, Showing the Primary Arch and the Burners

verized coal-burning engine burning pulverized Kentucky unwashed screenings, and one with a hand-fired engine of the same class burning Kentucky lump coal. Both engines were equipped with superheaters and with the Walschaert valve gear. The hand-fired engine was equipped with the Kingan-Ripken valve gear attachment.* A dynamometer



Fig. 4—Looking Forward in the Firebox of the Pulverized Fuel Locomotive

car was used in all of the tests. The following table gives the average results of the tests:

Locomotive number	128	127
Method of firing	Pulverized fuel	Hand
Kind of coal used	Ky. screenings	Ky. lump
Elapsed time (hours)	4.0276	4.0958
Running time (hours)	3.8687	3.9688
Tonnage	291	278
Number of cars	5.8	5.5
Mileage	170.79	170.75
Average drawbar pull (pounds)	2,711	2,527
Horsepower per hour	319.5	290.3
Coal used (tons), running	3.815	3.783
Water used (gallons), running	8,381	7,350
Coal per hp. hr. (pounds)	6.17	6.57
Water per hp. hr. (pounds)	56.48	53.14
Water evaporated per lb. coal (pounds)	9.15	8.09
Coal used for firing up† (tons)	1.569	2.775
Total coal used (tons)	5.384	6.558

*See *Railway Age Gazette*, August 27, 1915, page 399.

†This item includes, in addition to firing up, the amount of coal used in taking the engine to and from the train and the amount used by the engines during the "dead" time.

The interesting items in this table are those showing the evaporation and the total coal burned. In the former there is an increase of 13.1 per cent in favor of the pulverized coal engine and a decrease of 17.9 per cent in the latter item in favor of the same engine notwithstanding the increase of 4.7 per cent in the tonnage hauled, even though the powdered coal was not of the proper dryness for good results. In addition to this saving in the amount of the coal consumed, the fuel used by the powdered coal engine was cheaper in price than that used by the hand-fired engine, it being of the same kind, but of inferior grade.

Three grades of fuel have been experimented with on this locomotive, namely, Illinois and Kentucky screenings and North Dakota lignite. Owing to the experimental nature of

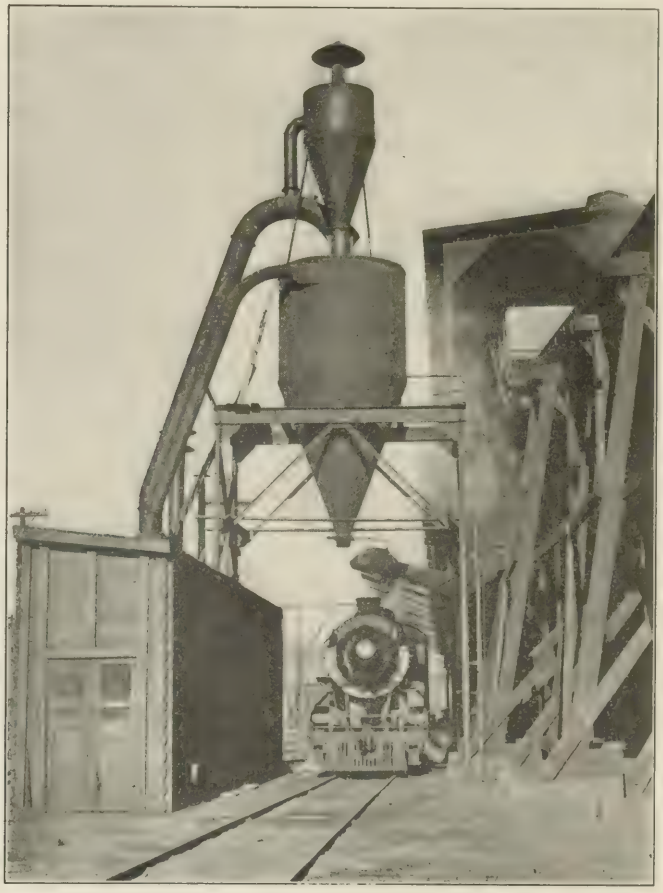


Fig. 5—Pulverizing Shed and Storage Tank at the North Western Coal Chutes

the equipment for preparing the coal it was not possible to get as satisfactory results from the Illinois coal as from the Kentucky, the latter containing much less moisture in its natural state than the former. The lignite coal, which came to the road already prepared proved to be entirely successful. Having 47.25 per cent volatile matter it is especially adaptable to this service.

In the preparation of the fuel it is quite necessary, as stated in the early part of this article, to have it of proper fineness and dryness and to keep it well protected from dampness. The drying and pulverizing plant and the storage tank used on the North Western, but which were not installed by the Locomotive Pulverized Fuel Company, are

shown in Fig. 5. The switches which control the pulverizing machinery are located outside of the building in order to prevent any possibility of a fire being caused by the ignition of the coal dust from the sparks that might be made in the operation of the switches. The storage tank has a capacity of 15 tons. At the right of the tank there will be noticed a chain which is used to operate an agitator on the inside of the tank, thus preventing the coal from arching over as it passes into the tank on the locomotive tenders. A canvas chute attached to the bottom of the storage tank, and extending into the tender tank, is used to convey the coal to the tender tank to prevent the coal from blowing away while the tank is being loaded.

In conclusion, it may be said that the results of the experiments on the Chicago & North Western with the pulverized coal-burning locomotive show that there is a distinct field for this type of locomotive. The regulation of the fuel supply to the locomotive and the ease with which the smoke may be controlled and cinders and sparks eliminated, makes it especially adaptable to switching service in addition to the turn-around runs out of terminals. Of course, the advantages enumerated above are offset to a certain extent by the necessity of installing and maintaining the necessary fuel preparing and disbursing facilities. The problem of storing the pulverized fuel in large quantities is also deserving of consideration, but as the use of such fuel becomes more common on the railroads this question should be readily solved. The experimental work done on this locomotive has been under the direct charge of C. W. Corning, chief smoke inspector of the Chicago & North Western, under directions from the office of the superintendent of motive power and machinery.

NEW REGULATIONS FOR RAILWAY MAIL PAY

The provisions of the act of Congress making appropriations for the Postoffice Department for the fiscal year ending June 30, 1917, were briefly reported in the *Railway Age Gazette* last week, page 207. This law, entitled Public No. 169, makes a pamphlet of 23 pages. Following are the provisions in which railway men are particularly interested.

For inland transportation by railroad routes, $59,185,000. To this is added for railway postoffice car service $4,397,000, making a total of $63,582,000. The appropriation to pay freight or expressage on postal cards, stamped envelopes, etc., and empty mail bags is $645,000. Mail clerks, inspectors and all officers of the Postoffice Department must be carried free on any train. Mail clerks go free when traveling to and from duty. No part of the appropriation for postoffice cars may be used for paying for any car which is not sound in material and construction and is kept in good condition, clean, etc.

The sum of $660,000 is appropriated for transportation of mail by electric and cable cars. The rates for electric car service on routes over 20 miles in length, outside of cities, must not exceed the rates on steam railroads. The appropriation for transportation of foreign mails is $3,800,000.

The appropriation for rural carriers is $53,000,000, and there is a provision that "rural mail delivery shall be extended so as to serve, as nearly as practicable, the entire rural population of the United States." The standard rural route for horse-drawn vehicles is 24 miles long, and for motor vehicles 50 miles.

Section 2 repeals the law of August 24, 1912, forbidding the sending of magazines by freight trains; but no publications are to be sent by freight if such method results in unfair discrimination. An aggrieved publisher must complain to the Postoffice Department, and he will be heard; but pending the examination of his complaint the Postoffice will not change its method of transportation. If the Postoffice Department does not satisfy the applicant, he may, within twenty days, appeal to the Court of Appeals of the District of Columbia, and the jurisdiction of this court shall be exclusive.

Section 3 authorizes the Postmaster general to increase the pay of railway carriers 1 per cent, on account of the increased weight of mails, due to the change which was made in the weight limit of parcel post packages on January 1, 1914, and this increase may be applied from January 1, 1914, to the ends of the contract terms.

Section 4 provides a similar increase of one-half of 1 per cent because of the increase in the limit of weight in the first and second zones on August 15, 1913.

Section 5 authorizes the Postmaster general to readjust the compensation to be paid to railroad companies, beginning from June 30, 1916, or as soon thereafter as may be practicable, and then it goes on to enact the provisions for paying by space instead of by weight, as recommended by the Bourne committee, and reported in the *Railway Age Gazette*, September 4, 1914. A standard postoffice car is 60 ft. long. Apartment cars are either 15 ft. or 30 ft. long, and storage cars 60 ft. Closed pouches are to be paid for according to the linear feet occupied in cars, either 3 ft. or 7 ft. For a full 60-ft. car, the rate is to be 21 cents a mile (all these rates have the proviso "not exceeding"), and for each one-way trip, $4.25 as a combined initial and terminal rate. Apartment cars, 11 cents a mile for 30-ft. and 6 cents a mile for 15-ft., with a terminal rate of $2.75 for 30-ft. and $2 for 15-ft. For closed pouches, 1¼ cents a mile for the 3-ft. length, and 3 cents a mile for the 7-ft. length; terminal rate, 25 cents for 3-ft. and 50 cents for 7-ft. On land grant railroads all payments are to be 80 per cent of the regular rates. The allowance for cars may be varied in accordance with the approximate differences in their respective cost of construction and maintenance. In computing the car miles for postoffice cars the maximum space authorized in either direction of a round trip shall be regarded as the space in both directions, unless otherwise mutually agreed upon; and this rule applies also in the case of storage cars, unless the car is used by the company in the return movement, or otherwise there is a mutual agreement.

The Postmaster general may make special contracts with the railroads, where necessary, at higher rates, but must in such cases report to Congress and give his reasons.

All cars or parts of cars must be approved by the Postmaster general in regard to construction, style, length, etc. No pay shall be allowed for a wooden car which is not fully approved, nor for such a car run between adjoining steel cars, or between the engine and a steel car. From July 1, 1917, no full postoffice car shall be used unless it be of steel or steel underframe; and all full postoffice cars hereafter built must be steel. Until July 1, 1917, the Postmaster general may, if necessary, allow the use of wooden cars, but at a compensation reduced according to their inferior character of construction.

If a railroad company fails or refuses to comply with the Postmaster general's wishes in these matters, it may be fined a reasonable sum. The Postmaster general shall decide upon what trains and in what manner the mail shall be conveyed. Every railroad must carry on any train it operates and with due speed, all mailable matter, equipment and supplies; failure or refusal may be punished by fine. The Postmaster general may make a deduction from the pay for reduction in the service or for infrequency of service, and may impose fines for delinquencies. Where the failure of service is due to a fault of the railroad company, he may impose a fine of three times the value of the service that is omitted.

Where mail is sent by freight it shall be carried at rates not exceeding the usual just freight rates. The Postmaster general shall from time to time request information from the Interstate Commerce Commission as to railroad revenue on express matter, and may arrange for the transportation of

mail matter at such rates; and it shall be the duty of the railroad to carry the mails as thus required. He may apply to the Interstate Commerce Commission for the determination of a carload or a less-than-carload rate for postal matter of the fourth class and periodicals, and it shall be the duty of the railroads to provide and perform the service required at the rates prescribed.

The Postmaster general may despatch third and fourth class mail and periodicals less frequently than other mail matter, if, by so doing, he can secure lower rates, without detriment to the service. Postal cards, stamped envelopes, supplies, etc., may be carried in the mails when there is space which is paid for and is not needed for more important matter.

The Postmaster general may have the mails weighed at such times as he may elect, paying the expense thereof out of the appropriation for inland transportation.

"Pending the decision of the Interstate Commerce Commission, as hereinafter provided for, the existing method and rates of railway mail pay shall remain in effect, except on such routes or systems as the Postmaster general shall select, and to the extent he may find it practicable and necessary to place upon the space system of pay in the manner and at the rates provided in this section, with the consent and approval of the Interstate Commerce Commission, in order to properly present to the Interstate Commerce Commission the matters hereinafter referred thereto: *Provided,* That if the final decision of the Interstate Commerce Commission shall be adverse to the space system, and if the rates established by it under whatever method or system is adopted shall be greater or less than the rates under this section, the Postmaster general shall readjust the compensation of the carriers on such selected routes in accordance therewith, from the dates on which the rates named in this section became effective.

"All railway common carriers are hereby required to transport such mail matter as may be offered for transportation by the United States in the manner, under the conditions, and with the service prescribed by the Postmaster general and shall be entitled to receive fair and reasonable compensation for such transportation and for the service connected therewith.

"The Interstate Commerce Commission is hereby empowered and directed as soon as practicable to fix and determine from time to time the fair and reasonable rates and compensation for the transportation of such mail matter by railway common carriers and the service connected therewith, prescribing the method or methods by weight, or space, or both, or otherwise, for ascertaining such rate or compensation, and to publish the same, and orders so made and published shall continue in force until changed by the commission after due notice and hearing.

"In fixing and determining the fair and reasonable rates for such service the commission shall consider the relation existing between the railroads as public service corporations and the Government, and the nature of such service as distinguished, if there be a distinction, from the ordinary transportation business of the railroads.

"The procedure for the ascertainment of said rates and compensation shall be as follows:

"Within three months from and after the approval of this act, or as soon thereafter as may be practicable, the Postmaster general shall file with the commission a statement showing the transportation required of all railway common carriers, including the number, equipment, size and construction of the cars necessary for the transaction of the business; the character and speed of the trains which are to carry the various kinds of mail; the service, both terminal and en route, which the carriers are to render; and all other information which may be material to the inquiry, but such other information may be filed at any time in the discretion of the commission.

"The Postmaster general is authorized to employ such clerical and other assistance as shall be necessary to carry out the provisions of this section, and to rent quarters in Washington, District of Columbia, if necessary, for the clerical force engaged thereon, and to pay for the same out of the appropriation for inland transportation by railroad routes. The Postmaster general shall file with the commission a comprehensive plan for the transportation of the mails on said railways and shall embody therein what he believes to be the reasonable rate or compensation the said railway carriers should receive.

"Thereupon the commission shall give notice of not less than thirty days to each carrier so required to transport mail and render service, and upon a day to be fixed by the commission, not later than thirty days after the expiration of the notice herein required, each of said carriers shall make answer and the commission shall proceed with the hearing as now provided by law for other hearings between carriers and shippers or associations.

"All the provisions of the law for taking testimony, securing evidence, penalties and procedure are hereby made applicable.

"For the purpose of determining and fixing rates or compensation hereunder the commission is authorized to make such classification of carriers as may be just and reasonable and, where just and equitable, fix general rates applicable to all carriers in the same classification.

"Pending such hearings, and the final determination of the question, if the Interstate Commerce Commission shall determine that it is necessary or advisable, in order to carry out the provisions of this section, to have additional and more frequent weighing of the mails for statistical purposes, the Postmaster general, upon request of the commission, shall provide therefor in the manner now prescribed by law, but such weighing need not be for more than thirty days.

"At the conclusion of the hearing the commission shall establish by order a fair, reasonable rate or compensation to be received, at such stated times as may be named in the order, for the transportation of mail matter and the service connected therewith, and during the continuance of the order the Postmaster general shall pay the carrier from the appropriation herein made such rate or compensation.

"Either the Postmaster general or any such carrier may at any time after the lapse of six months from the entry of the order assailed apply for a re-examination, and thereupon substantially similar proceedings shall be had with respect to the rate or rates for service covered by said application, provided said carrier or carriers have an interest therein.

"For the purposes of this section the Interstate Commerce Commission is hereby vested with all the powers which it is now authorized by law to exercise in the investigation and ascertainment of the justness and reasonableness of freight, passenger and express rates to be paid by private shippers.

"The Interstate Commerce Commission shall allow to land grant railroad companies only 80 per cent of the compensation paid other railroads . . . .

"The existing law for the determination of mail pay, except as herein modified, shall continue in effect until the Interstate Commerce Commission under the provisions hereof fixes the fair, reasonable rate or compensation for such transportation and service.

"That the appropriation for inland transportation by railroad routes and for railway postoffice car service for the fiscal year ending June 30, 1917, are hereby made available for the purposes of this section.

"That it shall be unlawful for any railroad company to refuse to perform mail service at the rates or methods of compensation provided by law when required by the Postmaster general so to do, and for such offense shall be fined $1,000. Each day of refusal shall constitute a separate offense.

"Section 6. If the Postmaster general shall find on experi-

ence that the classification of articles mailable, as well as the weight limit, or the rates of postage, zone or zones, and other conditions of mailability, under Section 8 of the act approved August 24, 1912, or any of them, are such as to prevent the shipment of articles desirable, or to permanently render the cost of the service greater than the receipts of the revenue therefrom, he is hereby authorized to re-form from time to time such classification, weight limit, rates, zone or zones, or conditions, or either, in order to promote the service to the public or to insure the receipt of revenue from such service adequate to pay the cost thereof: *Provided, however,* That before any change is hereafter made in weight limit, rates of postage, or zone or zones, by the Postmaster general, the proposed change shall be approved by the Interstate Commerce Commission after thorough and independent consideration by that body in such manner as it may determine."

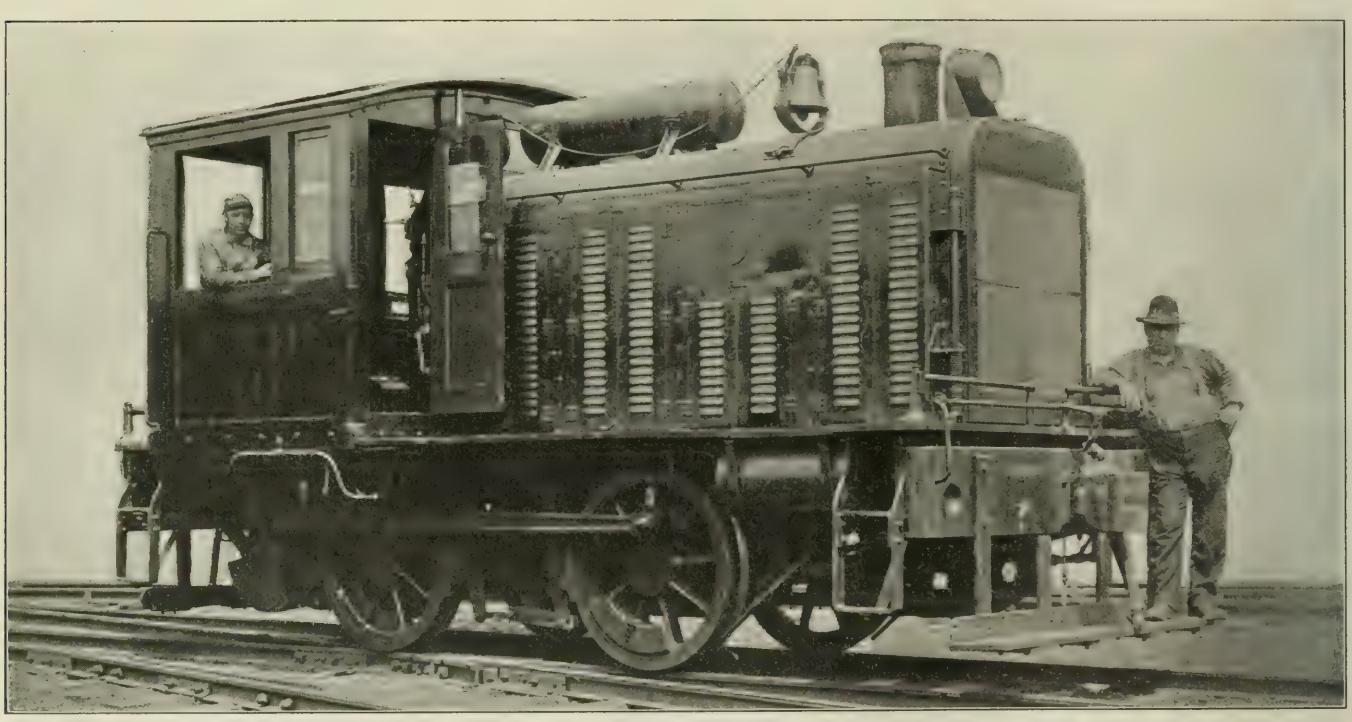
GASOLENE SWITCHING LOCOMOTIVE FOR THE ERIE

The Erie Railroad has adopted a unique plan for taking care of its business in the vicinity of its Erie street freight station in the city of Chicago. This station is located on the north branch of the Chicago river and has no direct rail connection with the freight terminal located on the south branch of the river, at Fourteenth and Clark streets. The cars billed to the Erie street station are placed on barges and towed up the river to that point, which is one of several along the Chicago river, and they are taken from the barge by a gasolene locomotive which has a capacity for hauling 500 tons. This locomotive distributes the cars to the team and house tracks for loading and unloading. Previously the cars were loaded and unloaded directly from the barge, which necessitated considerable rehandling of the freight and greatly reduced the capacity of the station. The team tracks will accommodate 19 cars, the freighthouse 10 cars and the storage tracks 8 cars. There are also provisions made for interchanging cars with both the Chicago, Milwaukee & St. Paul and the Chicago & North Western, which serve industries located in the immediate vicinity of this station. This permits the transferring of cars billed to these industries directly to those roads, and eliminates the delays which were previously caused in interchanging such cars at the Clearing yards and sending them around the Belt to this point. The cars are now delivered on the day of arrival and a whole day is saved thereby.

The engine was built by the Baldwin Locomotive Works, and is of the following general dimensions:

Weight in working order	44,000 lb.
Wheel base, driving	6 ft. 6 in.
Length over all	18 ft. 8 in.
Number of cylinders	4
Cylinders, diameter and stroke	9 in. by 16 in.
Driving wheels, diameter	42 in.

The engine is equipped with the Kingston carburetor. It has both the magneto and battery ignition, has two speeds, 3½ and 8 miles per hour, chain drive, the Hele-Shaw multiple disc type clutches for the main clutch and jaw clutches for the transmission clutch. The capacity of the gasolene tank is 35 gal. The locomotive is supplied with a bell, whistle, electric self-starter, headlight, automatic couplers in front and rear, Westinghouse air brake and the safety appliances prescribed by the Interstate Commerce Commission for switching locomotives, modified to suit the special construction of this engine. The improvement work done at this freight station is to be duplicated at other river stations operated by the Erie company in Chicago.



Gasolene Switching Locomotive Used by the Erie Railroad at a Local Chicago Freight Station

AUSTRALIAN RAILWAY STRIKE.—In the early part of July, owing to a strike by 40 clerks at Port Augusta, 1,450 persons employed on the eastern section of the trans-continental line were idle.

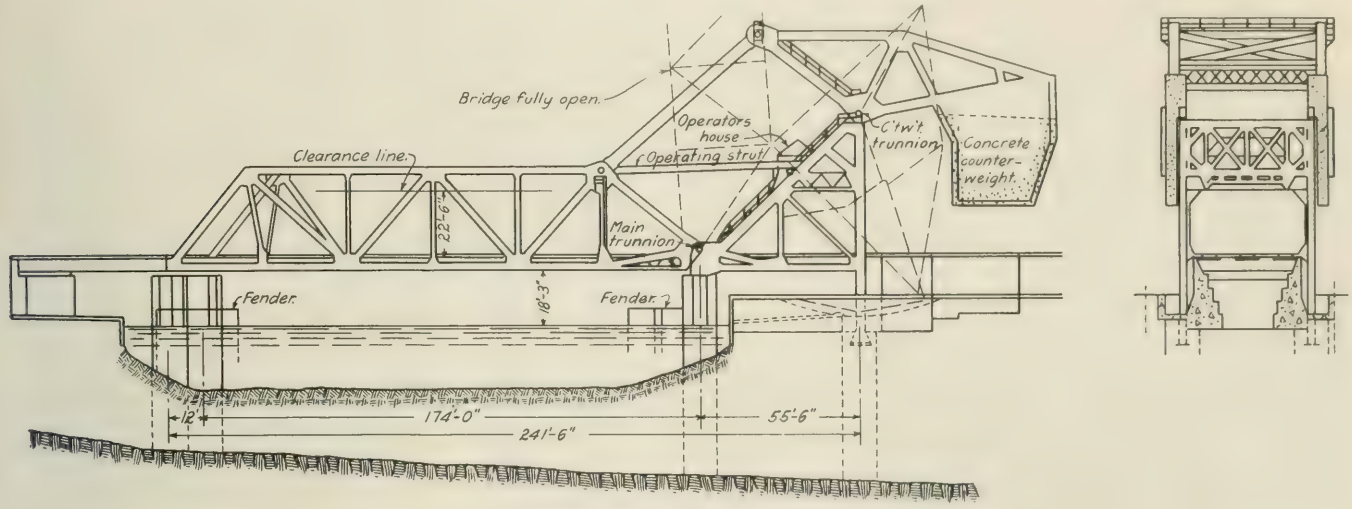
THE CHANNEL TUNNEL.—A meeting of the Channel Tunnel Committee was held on July 12 at the House of Commons. The chairman, Arthur Fell, giving an account of a recent visit to Paris, said that he was assured by M. Sartiaux, the chief engineer of the Northern Railway of France, that, if sanctioned by the British Government, the tunnel would be built in five years. Had it existed during the war they could have transported 30,000 troops and 30,000 tons of material per day.

New Three-Track Bascule Bridge at Chicago

Structure Is Placed in Service According to Program On July 30 When Old Span on Same Site Is Removed

ON Sunday, July 30, the Chicago & North Western placed a three-track Strauss bascule bridge of the heel trunnion type in service over the north branch of the Chicago river, replacing a two-track swing span at the same location. The bridge is on the main line of the Milwaukee division of the North Western and carries a heavy passenger traffic, consisting very largely of "North Shore" suburban trains, the freight traffic being limited to local freight and switching movements.

The new bridge was built to provide more adequately for the increased train loads and to permit the extension of the third main track across the bridge from the north. Previous to the completion of the bridge there were three main tracks between Evanston and the north end of the bridge where crossovers, controlled by the bridge interlocking, provided for the reduction to two main tracks extending across the bridge and ½ mile south to Clybourn Junction. The middle track of the three-track line is used for high-speed traffic, southbound in the morning and northbound in the evening. The disadvantage of this arrangement arose from the fact that the crossovers north of the bridge were so close to the Deering station, just north of the bridge, that local trains stopping at the station stood inside the derails. In consequence a train on the middle track could not cross the bridge while a local train moving in the same direction stood at the station. With the completion of the new structure, the third main track is carried across the bridge with crossover connections to the two-track line a sufficient distance south to avoid this difficulty.



Elevation and End Section



The Bridge in the Closed Position

Although occupying the same site as the old structure, the new bridge was built without interruption to traffic. However, the removal of the old bridge to permit the closing of

the new one and the track changes required to replace a two-track line by a three-track line as well as to provide a raise of grade of 2 ft. across the bridge, proved to be a rather complicated problem and to carry out the changes which this involved required an interruption to the traffic across the bridge for a considerable period. This did not prove a serious matter as all trains running north of Evanston were routed between that point and Clybourn Junction over the Wisconsin division and the Mayfair cutoff, a route used regularly by through freight trains and some through passenger trains. The local traffic for stations between Evanston and Deering is comparatively light on Sunday and the interruption of the direct service did not result in any material inconvenience.

The Superstructure

The crossing is on skew, departing from the perpendicular by 16 deg. The trunnion pier is at a right angle to the track, but the rest pier is parallel to the channel, making the span length for the longer truss 186 ft. between bearings and that of the shorter one 174 ft. The structure conforms to the usual practice as developed for bascule bridges of this type. The span consists of two sub-panel Warren trusses spaced 45 ft. center to center and carrying the three tracks between them, an arrangement that necessitates heavy floor beams. Owing to the greater depth of floor beams required and the necessity of maintaining the same underclearance that was obtained in the old structure, it was necessary to make a 2-ft. raise of grade across the bridge. The counterweight truss is



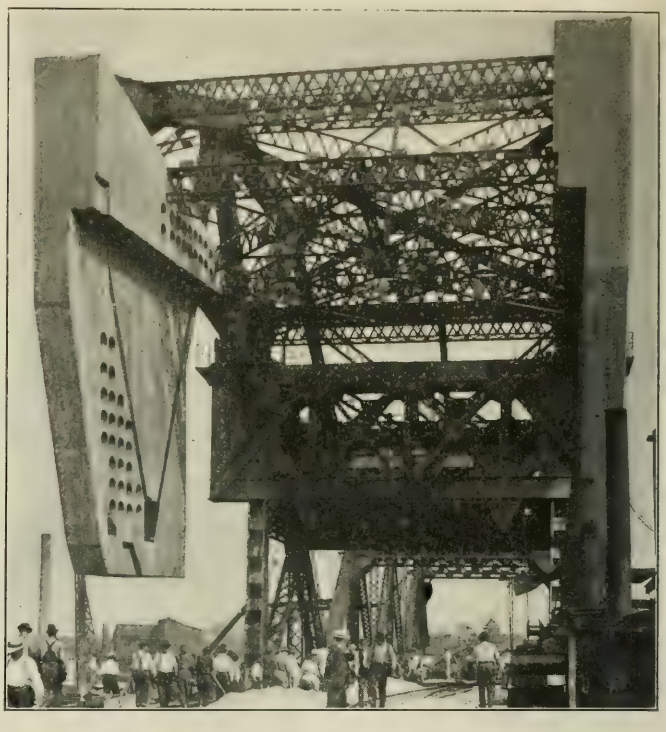
Old Swing Span Cut in Two to Clear Bascule Span

supported on a tower consisting of two triangular frames with the vertical load of the counterweight trunnions supported on columns located 55 ft. 6 in. to the rear of the main trunnions. There is an approach span of 35 ft. at the trunnion or the south end of the bridge, and one of 56 ft. 4 in. at the north end.

The superstructure contains 1,263 tons of structural steel of which 965 tons is in the lift span, the counterweight trusses and links and the operating struts, 380 tons in the counterweight tower, and 80 tons in the north approach. The machinery and trunnions weigh 128 tons. The largest trunnions are those which carry the counterweight trusses and are 26 in. in diameter by 8 ft. 5 in. long.

The bridge is operated by two 150-hp. electric motors, operating in parallel on the same train of gears. The motors will normally be used together, although one motor can be used alone to operate the bridge at a low speed. A 50-hp. gas engine is also installed to serve as an auxiliary source of power in case of a failure of current.

The bridge opens to nearly vertical (87 deg.) and was erected



The Bridge from the Rear Showing Counterweights

in that position. As trains were operated on a two-track line through the counterweight tower without interruption it was necessary to provide counterweights which would not foul the clearance when the bridge is in the open position. In consequence these counterweights were given the form of great leaves, one on each side and of relatively small thickness and were designed to pass entirely outside of the counterweight tower when the bridge is open. The two counterweights contain 14,400 cu. ft. of concrete and weigh 1,180 tons.

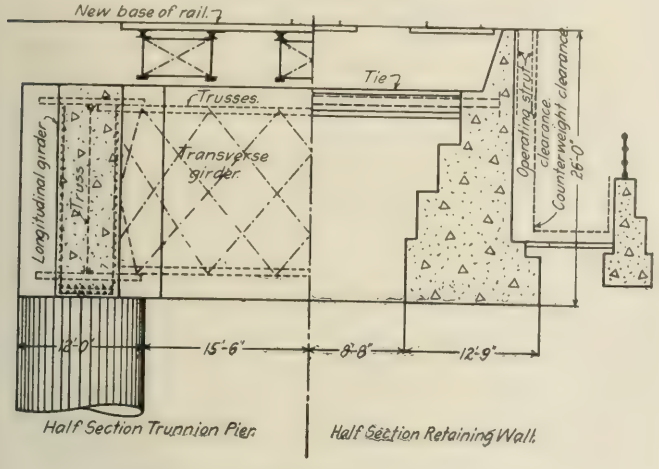
An electric interlocking system controlling the movements of trains over the bridge as well as through the junction of the two-track line with the three-track line, will be provided to take the place of the interlocking plant that was in use in connection with the old bridge. Owing to the extensive track changes, this plant will need to be almost entirely re-built and the work has not yet been completed.

The Substructure

The substructure at the trunnion end of the bridge consists of four concrete cylinders, one under each main trunnion and one each under the columns of the counterweight tower which take the vertical reactions of the counterweight trunnions. These cylinders are united in a rigid frame by two transverse and two longitudinal reinforced concrete girders constructed monolithic with the tops of the cylinders.

The size of these girders is unusual. The one connecting the two cylinders under the main trunnions is 8 ft. wide by 19 ft. 3 in. deep and is reinforced with two lattice trusses

16 ft. deep in addition to a large number of 1¼-in. bars in the bottoms and sides. The two longitudinal girders are 6 ft. wide by 19 ft. 3 in. deep and the rear transverse girder is 6 ft. wide by 21 ft. deep. The rest pier consists of two cylinders united by a reinforced concrete girder of a construction similar to those at the trunnion end of the bridge. The approach span on the north end is supported at its outer end on a simple low abutment set in the embankment. The south approach span has its outer ends supported on an abutment which is located almost in the center of the rectangle formed by the four girders connecting the cylinder piers, this abut-



Cross Sections of the Substructure

ment being built entirely independent of the pier structure.

The cylinder piers are carried to rock which dips from north to south, being about 43 ft. below datum (waterlevel) at the rest piers and about 54 ft. below datum at the trunnion piers. The soil above the rock is largely a stiff clay and the abutments and retaining walls, also forming a part of the substructure, were founded on the clay subsoil at a considerable elevation above the bed of the river.

For a distance of about 47 ft. to the rear of the counterweight trunnion piers, the embankment is supported between retaining walls of a semi-reinforced concrete type, tied together at intervals of 6 ft. by ties, each consisting of two 1¾-in. diameter rods and five ¾-in. reinforcing bars incased in a rib of concrete 1 ft. by 2 ft. in section. As the extreme limits of the counterweights extend about 19 ft. below the base of rail when the bridge is open, it was necessary to provide pits on either side of the substructure to receive the counterweights. Owing to the weight of these counterweights and the great depth necessary because of their relatively small thickness, it was necessary to work with minimum clearances between the counterweights and the rear legs of the tower. For this reason the rear tower columns had to be carried below the level of the bottoms of the counterweight pits incasing them in the concrete of the substructure below the rail level.

The operating struts, which are 70 ft. long, extend below the track level for a considerable distance when the bridge is open. These struts are located in planes so close to the outside tracks that they did not allow room for a walk of a safe width at the points where the struts extended below the track level. This difficulty was overcome by providing a movable walk which drops out of the way when the bridge is being raised.

The six cylinder piers were sunk according to the methods used in the pneumatic process, except that compressed air was not necessary. Cylinders 12 ft. in diameter made of ⅜-in. steel in 8-ft. vertical sections, with 8-ft. working chambers at the bottom and vertical shafts 3 ft. in diameter in the center were sunk by excavation carried on in the working chambers and the weight of the concrete loaded into the cylinders. The steel cylinders were handled and the excavation was removed by means of head frames erected over the site of each pier. The concrete was mixed and hoisted by a floating concrete plant.

Placing the New Bridge in Service

After all erection work that did not interfere with traffic had been finished, there still remained certain definite operations which had to be completed before the new bridge could be placed in service and which could not be carried out without interrupting traffic. These changes may be summarized as follows: the removal of the old span to a sufficient extent to clear the new one, the erection of the approach spans, the erection of those portions of the new span that would have interfered with traffic, and the track changes.

The most important step was the removal of a sufficient portion of the old span to permit closing of the new one, and was accomplished by swinging the old span to the open position and cutting out a sufficient length of the trusses and floor system directly over the pivot pier to clear the new span.

To permit its erection without fouling the old span the new one was located with its south end about 10 ft. south of that of the old span, and in the nearly full open position. In this position it could be erected complete, except for the



Closing the Bridge for the First Time

panel of the floor system nearest the trunnion end and the panel of the lateral bracing at the end of the counterweight. These had to be left off to afford the necessary clearance for the operation of trains during erection.

Because the ends of the new and old spans did not coincide, the approach span at the north end could not be erected until the old span had been eliminated, and while this condition did not interfere with the erection of the approach spans at the south end, they could not be placed in position without interfering with traffic because of the two-foot raise of grade.

The change from two tracks to three tracks with a raise of grade of 2 ft. was an item that required considerable time, and did not permit of very much work in advance, because it was necessary to keep at least one track in operation at the old grade until the time that the change in structures was made. By taking the south track out of service some time in advance it had been possible to put in the new south track on the approaches at the new grade. The center track was

also laid, but could not be lined or surfaced because of interference with the operated west track. The work on the center track therefore had to be delayed until the west track could be thrown to its new position, 6½ ft. further west. No changes could be made in the cross-overs until train service was interrupted.

Work on the change commenced at 12:30 a. m. Sunday, July 31, when the bridge was closed to traffic. The old span was swung out onto to protection piers and blocked up on falsework. Oxy-acetylene flames were then used to cut apart the members which were lifted onto barges by a marine derrick. The two end portions of the span which were clear of the new bridge were left in position on the blocking to be removed later. The obstructing portion was out of the way by 7:45 a. m.

While this work was in progress, derrick cars belonging to the railroad, placed the approach spans and this work being completed, two derrick cars belonging to the steel erection contractor placed the remaining portion of the lateral bracing of the counterweight trusses. When this work was completed at 9:45 a. m. the span was lowered.

The placing of the panel of the floor system and the deck for the same, the lining of the track and the placing of guard rails and tie plates completed the work on the span. The track changes on the approaches involved by far the greatest amount of work and time, and were not completed until shortly before 6 p. m. (Sunday), when the first train was passed over the bridge.

The design and construction of this bridge was under the general direction of W. H. Finley, chief engineer of the Chicago & North Western, with H. M. Spahr as resident engineer, the superstructure being designed by the Strauss Bascule Bridge Company, Chicago. The Great Lakes Dredge & Dock Company, Chicago, had the contract for the substructure and the removal of the old span. The superstructure was fabricated by the American Bridge Company and erected by the Kelley-Atkinson Company, Chicago, except the approach spans, which were erected by the railway company forces.

WESTERN PACIFIC TRAIN RULES

The Western Pacific Railroad Company, successor to the Western Pacific Railway Company, took possession of that property on July 14; and on Sunday, July 16, a revised edition of the standard code of train rules went into effect. The train rules proper—numbers 1 to 108 and 201 to 223 inclusive—contain no radical changes, as compared with the former code or with the American Railway Association's standard; but there are numerous interesting details in which the officers have embodied their individual views. Harry W. Forman, the well-known former train rule examiner of the Nashville, Chattanooga & St. Louis, is now inspector of transportation on the Western Pacific; and evidences of his work appear in numerous places in these rules.

There is a separate chapter relating to the use of the telephone in train despatching, rules 250 to 257. The book contains numbers 605 to 686 of the Standard Interlocking Rules, but no block signal rules. The "General Regulations," so called, are numbers 700 to 932 inclusive.

Under the "General Rules," paragraph F has added a sentence requiring all trains to be fully protected when necesssary. A new paragraph, paragraph I, forbids the reading of books or newspapers by trainmen, enginemen and train despatchers while on duty. The definition of an extra train is amplified to include five different terms. The word "Caution" is among the definitions; it means "the movement of a train under such control that the engineman can stop within his range of vision," and the phrase "under control" is not used in the book.

Rules 2 and 3, relating to watches, are amplified. Watches are inspected in January, April, July and October. Rule 4 is followed by rules 4a and 4b, providing for getting acknowledgments of new tables and describing precautions that are to be taken by men who have been on vacation. A two-page appendix to the book contains a half dozen examples showing the application of Rule 4.

Rule 6 is supplemented by rule 6a which includes signs for day and night offices with and without telephones, etc. Rule 11 makes separate and different provision for red and yellow fusees. Rule 11a contains additional precautions relating to fusees. Rule 14 requires the sound of the whistle to be "accurate." The torpedo rule, No. 15, like that concerning fusees, is amplified by provisions against carelessness. Rules 17 and 24 are amplified in the same way. In the last named rule the flagman is not required to stand on the *end* of the car.

Rule 33 requires the use of green signals at highway crossings to stop traffic on the highway.

Rule 83a requires all trains to have clearance cards, and No. 84a forbids the engineman of a freight train to go through a station without receiving a proceed signal from the rear end, except when weather conditions prevent such signals from being seen. Enginemen are required to obtain a proceed signal from the trainmen after leaving a siding. Rule 86 prescribes a time interval of ten minutes. This rule appears without the confusing clause requiring an inferior train to clear the track for a following superior when the following train is due to leave the next station in the rear. Rules 90a and 90b require the superior train to take the siding when that course will save time. Rule 91a requires the train order signal to be kept at stop for ten minutes after the departure of each train carrying passengers. Rule 98a requires trains to stop before crossing another railroad where there is no interlocking; and if there is not a good view, one of the trainmen must go forward and give the signal to proceed, when it is safe to do so; and then the engineman must sound his whistle before starting. Under rule 99 a flagman "must not allow a train which he must stop to pass him, without having placed one torpedo on the rail."

Rule 104, requiring care in the use of switches, is supplemented by 104a, containing about two pages of additional details concerning this work. At stations agents are responsible for the proper position of the switches. Rule 106a describes in detail the management of trains standing on highway crossings.

One paragraph of rule 104a says that in case a part of the wheels of a car, an engine or a train be run through a rigid split switch, the entire movement must be continued; for to set back would derail some of the wheels.

Rule 206 requires the time to be stated in words and figures, except as otherwise illustrated by the train order examples. In this rule the paragraph referring to the telephone is omitted, a separate code of rules—250 to 257—being provided for use with the telephone. Rules 210 and 211 require each operator to observe the *first* repetition and at once call attention to any discrepancy. Orders on form 31 may be delivered to the engineman by the operator, the conductor or a brakeman. Form 19 may be delivered to the engineman by the conductor or a brakeman.

Following rule 211, there is a note reading:

> The "19" form of train order must not be used to restrict a superior train for an opposing inferior train, nor to meet extras, unless sent to the operator at the meeting or waiting station, and issued for all trains concerned before reaching such station.

When a train order affects a train at his station, an operator must not deliver it until the train has stopped. Clearance cards must be delivered by all operators with all orders, the card to show the number of each order. Each engineman must receive copies of all train orders, but only

the engine by which the train is designated need be referred to in train orders.

Rule 221 requires the train-order signal to be left clear when there are no orders. This rule requires conductors and enginemen, if practicable, to observe train-order signals, even when the operator is absent and the lights are not burning. If, under such circumstances, the signal should indicate stop, the train is to be governed accordingly.

The telephone rules are taken up largely with instructions how to proceed with train orders which have to be relayed for trains that are at points where no operator is on duty. An order on form 31 must not be made complete until the conductor and the engineman of the train addressed have signed their names to it.

The forms of train orders in this book show a dozen changes in detail, as compared with the association standard, including an additional form "Q-a" for use in taking receipts for new time tables. The fourth example under form B reads, "Extra 95 west run ahead of No. 3 B until overtaken"; and the note beneath says that if No. 3 should consist of sections the order is fulfilled when extra 95 is overtaken by the first section.

The clearance card, form A, makes no reference to the reason why the signal is set at stop.

On forms 31 and 19 two lines are allowed for the address.

Rule 663 requires that when, within interlocking limits, a train proceeds on a hand signal, a flagman must be sent ahead, and he must make such inspection as the circumstances require.

The "General Regulations," beginning with No. 700, contain numerous phrases which are suggestive to anyone preparing a code of this kind. "Employees should cultivate a graciousness of manner, not only in dealing with the public but also with fellow employees." Employees who are careless, dishonest, etc., "must not expect" to be retained in the service.

Rule 728.—This rule, providing for the safe movement of trains over defective tracks, says that train orders issued for this purpose must be delivered to trains each trip or daily. The orders should not contain the words "until further notice."

Passenger trainmen are to "frequently look through cars to see if any service is required for the comfort of passengers or warning for their safety." Station agents are not to permit billboards to be erected in such a position as to prevent a clear view of approaching trains.

Rule 804.—Where several operators are on duty at the same time, but one will be permitted to handle train orders and clear trains.

Rule 826 forbids giving hand signals with a red and a white lantern held in the same hand.

A NEW ORE DOCK FOR THE SOO AT ASHLAND, WIS.

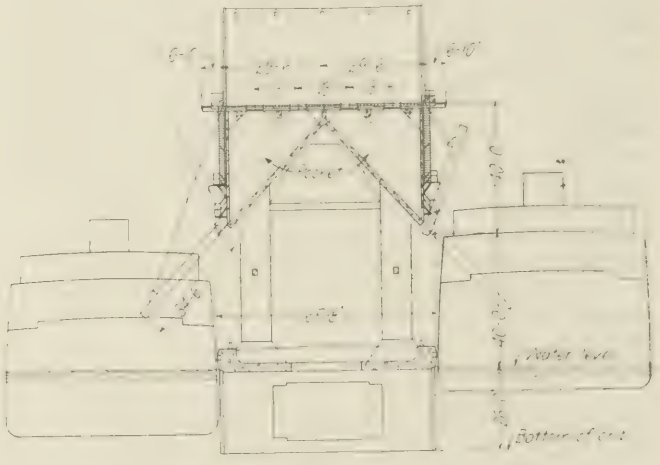
The Minneapolis, St. Paul & Sault Ste. Marie has awarded contracts for a reinforced concrete ore dock to be built at Ashland, Wis., which will have a total capacity of 60,000 tons. The structure will have a storage length of 900 ft. and will carry four tracks at an elevation of 80 ft. above water level. Access to the dock will be by means of a two-track approach consisting of 1,000 ft. of timber trestle and 160 ft. of reinforced concrete viaduct composed of four spans of 40 ft. each. Including a dock head of 75 ft., the reinforced concrete portion of the structure will have a total length of 1,132 ft.

The dock will consist of a concrete trestle of 75 bays of 12 ft. each with bents between each two bays, consisting of two concrete columns 42 ft. 3 in. center to center which will carry a track floor 59 ft. wide and two triangular bins or pockets, each having a capacity of seven cars of ore. The structure will be supported on a continuous concrete footing to be carried on piles enclosed by a timber crib. The present depth of channel at the old dock is 22 ft., but with the new crib, extending 26 ft. below water level, the depth can be increased to 24 ft.

The pockets will have a circular front which, on the Great Northern and Northern Pacific docks were made of steel plates. For this dock they will be made of reinforced concrete. These curved fronts have the advantage of enabling the ore to run more freely than square ones.

Each pocket will have an opening at the lower part, provided with a door of the Dickerson self-closing type, permitting a pocket of ore to be either emptied entirely or cut off at will. To this opening is attached a 34-ft. steel chute of the type first used on the Great Northern dock No. 4 at Allouez bay, and which is raised and lowered by an electric hoist. These hoists are arranged in groups of 10 and connected with a line shaft which in turn is geared to a 25 hp. motor. The speed of the hoist is such that a chute can be lowered or raised in 32 sec. The operator will stand at the outer end of the platform and where he will have full control of the movements of the chutes.

The upper deck will be lighted by 15 rows of 5 200-watt



Cross Section Through the Dock

lights, suspended on wire cables running across the dock between 30-ft. steel poles, so that the deck between cars will be lighted without casting any shadows. Platforms and stairs will be provided on each side to give easy access to the lower platforms at the door openings of the pockets. These will be thoroughly lighted, as well as the pockets.

There are about 30 ore docks on the Great Lakes, all built of timber with the exception of 7, which were constructed of concrete and steel. The new dock to be built at Ashland will differ from the reinforced concrete dock at Marquette, Mich., in that it will be provided with expansion joints at intervals of 120 ft., whereas the dock at Marquette is not provided with expansion joints.

The approximate quantities for the Ashland dock are 280,000 cu. yds. of excavation for the dock and slips; 6,880 piles, 1,850,000 ft. B.M. of lumber for the cribbing, 1,700 tons of structural steel and chutes, and 28,570 cu. yd. of concrete. The dock was designed by the Toltz Engineering Company, consulting engineers, St. Paul, Minn., under the direction of C. N. Kalk, chief engineer of the Minneapolis, St. Paul & Sault Ste. Marie. Foley Brothers, Peppard and Fulton, St. Paul, have the general contract for the substructure and the concrete work, and the Minneapolis Steel & Machinery Company, Minneapolis, has the contract for the structural steel.

HOW I GOT CUSTOMERS TO SEE MY SIDE*

By Edward P. Ripley
President, Atchison, Topeka & Santa Fe

While on an inspection trip over the Santa Fe lines in 1910, I stopped at a small stream in Kansas to examine a bridge. A farmer plowing in a nearby cane field came over to the right-of-way, and we engaged in conversation.

He asked several questions regarding railroad operation, and I answered him frankly. After penciling some notes on the back of an envelope, he remarked: "If railroad men would go to the people with their story, there would be less prejudice against their system of doing business. The people want both sides of every case in which they are interested, but for some reason they have never heard the railroad side of the transportation problem."

This statement quite accurately describes an important phase of the relations between the railroads and some other types of business activities which come equally close to the people's lives, too, and the public. Prejudice against the American railways is due largely to the work of a certain type of politician who has given the people an erronenous impression of the business of transportation. These politicians, like most other ordinary mortals, always have followed the lines of least resistance. Casting about some years ago for a "paramount issue," they fell upon the railroads as the least likely to reply when attacked. And they made a good guess.

It was a sort of unwritten law among railroad men to "decline to be interviewed." The result was that in a short while all classes and conditions of politicians were hammering the railroads from Maine to lower California, and from Portland to Tallahassee.

The smartest politician was the one who could tell the biggest yarn about the railroads, and, as the railroads did not "come back," the people naturally believed that the things told to them were true. Candidates invented the most terrible wrongs on which to ride into office, and once in office of course they had to make good by righting the "wrongs" so vigorously exploited during their campaigns.

It must be admitted that there was a foundation for some of the criticisms, but the railroad business had been conducted on quite as high a plane as that of other interests. The situation went from bad to worse until the railway industry of the country was threatened with annihilation. Receiverships were common, and government ownership was seriously suggested as the solution to the problem. Government ownership, for that matter, still is under discussion, but as people study the subject the sentiment favoring it seems to decline.

About five years ago the men who were responsible for the management of railway properties began to sit up and take notice, however. They saw that the old-fashioned methods of trusting to luck for public sentiment, and relying upon lobbyists to look after their affairs in Congress and in the legislatures, had failed dismally. An effort was made, therefore, to find a new remedy for the trouble.

In the case of the Santa Fe, for example, that farmer I met on the right-of-way when I stopped to inspect the bridge, gave me an idea. Upon my return to Chicago, I called a conference of my fellow officials of the several departments of our railway, and expressed to them the opinion that the hostile public sentiment against transportation corporations would abate to a considerable degree if the people could get a better understanding of the railway situation.

I also expressed the opinion that those of us who manage the railroads did not take sufficient time to familiarize ourselves with the troubles confronting the people. I asked for the co-operation of all departments in the inauguration of a campaign for the purpose of bringing our officials and patrons into a closer relationship, with the view of changing this feeling of hostility into one of friendliness.

As everybody in our official family long had felt the need of measures to overcome the prejudice against our business, the plan I suggested at the conference met with hearty favor. In brief, it required that general managers, general freight and passenger agents, financial and accounting officials, attorneys and others, in addition to the division officers, visit the cities and rural communities along our lines, and get better acquainted with merchants, manufacturers, farmers, stockmen, bankers and every other class of people doing business with the company, and ascertain the causes of their discontent with the railroads. In other words, we would adopt the suggestion of my farmer friend who had discussed conditions with me on the right-of-way that day—tell our story to the people, and also ask them to tell theirs to us.

The plan was put into effect at once, officials working out the details as the needs of the campaign developed. In a few months we had a program in successful operation, and there has been but little change made in it.

One week in every month half a dozen or more officials are drafted for a trip over a division—sometimes two divisions. A short train is made up for the accomodation of the party, and a town-to-town tour conducted, stops being made long enough at every place to enable our people to meet the business men and farmers in a convenient room, usually the commercial club, court house or city hall. The meetings are informal—a sort of hand-shaking affair, with a bit of speech-making occasionally.

In Santa Fe territory such a gathering is known as a "harmony" meeting, a Kansas newspaper reporter having given it the name that sticks. I suppose it was so called because our officials make it plain to the citizens assembled at these meetings that if there is anything out of gear in the community, so far as the Santa Fe is concerned, they want to know it.

The value of meetings of this type is in the heart-to-heart talk indulged in by two elements of the public having mutual interests. Each side sees whatever problems arise from the viewpoint of the other, and often they are able to reach a harmonious settlement of a controversy which otherwise would result in litigation and probable ill-will.

Differences with individual shippers also are adjusted at these "harmony" meetings, and when the railroad men depart for their next stop, and the town and country people return to their respective duties, there is a general feeling that the atmosphere has been cleared, and that the railway company and the community are going to get along better in the future than in the past. Necessarily, these meetings bring out a good many "cranks"—men who think they know more than their neighbors credit them with, and who are very sure that they could operate our road far better than we do.

Necessarily, also, we are sometimes asked to do the impossible or very nearly impossible. But on the whole we are the better for knowing what the people want, and sometimes we can give it to them without too much injury to our own interests.

Our "harmony" parties do not confine their efforts to the adjustment of differences between the company and its patrons, for often there is no trouble of that character. The Santa Fe's several activities for the development of the resources of the territory traversed by its lines usually are of interest locally, and the "harmony" meetings give opportunities for the informal discussion of many industrial and other important problems, in the solution of which the company may be in position to help through one or another of its activities.

The services of departments organized by the company

*From the April issue of System.

to aid in upbuilding Santa Fe territory are free to all communities which can use them. A new policy, which has become popular, is to have our engineering department pass on plans for public work, especially bridge construction and improvements having to do with drainage, when asked to do so by the public officials in charge.

County, city or township officers desiring information of this nature are invited to communicate with the superintendent, who responds promptly. We have been in a position to assist a large number of localities in getting good results for the money they have spent, and they tell us that they appreciate this co-operation.

Our industrial department has been instrumental in bringing into Santa Fe territory many factories which the people wanted, but which were difficult to secure, in many cases because communities needing the industries lacked facilities for getting into touch with them in a reasonable length of time or at a reasonable expense. Our plan is to suggest to the commercial club of a city that it make a survey to ascertain whether there is need of new industries. This survey will result in a sort of balance sheet of the locality's assets and liabilities and usually point out what is needed to make a more favorable showing on the asset side of the account.

When such a need is found, the club enters into correspondence with our industrial commissioner, who is in touch with the demands of industries seeking locations. With the aid of this information, the commissioner often is able to bring the right towns and industries together. As an instance of the work of this bureau, see the five large sugar factories in the Arkansas Valley, the Santa Fe having spent much time and money in demonstrating the fitness of the soil and the climate for the raising of sugar beets and interesting the proper men in using them.

The colonization department of our railway operates with the view of bringing homeseekers and other desirable investors into Santa Fe territory—13 states in the Southwest. Industrial information is compiled by states, and sent to our agents all over the country. Investors, therefore, can find detailed reports about the development of our territory in any Santa Fe office in the United States. The average community needs new people and fresh money in its business, and we do what we can to help it accomplish its purpose.

We maintain an agricultural department whose mission is to carry on experiments the year round, giving the farmers the results. Our agricultural experts, all graduates of agricultural colleges, and with practical experience, keep an eye on the farmers who move into our territory from other parts of the country, to see that they start right.

A new man in a community soon becomes either an asset or a liability—of course the former if he succeeds, the latter if he fails. We want the new-comers to succeed.

The Indiana farmer moving into the Panhandle of Texas, for instance, might think he could employ the same farming methods in the new country that he used in the Hoosier state. It is the work of our agricultural experts to help the new farmer acquire knowledge of the actual climatic and soil conditions, so that his mistakes may be few and his success assured.

The activities I have just mentioned play an important part in our "harmony" meetings. Nearly every town visited is interested in some project which the Santa Fe can help to a greater or lesser degree, and these matters are discussed at the "harmony" meetings.

We have also run many demonstration trains for the purpose of disseminating information in agricultural territory, co-operating with the agricultural colleges of the several states traversed by our lines. The Santa Fe furnishes the train, and the colleges the lecturers.

The subjects discussed vary, but all have to do with farm problems—crops, live stock and farm management. Last summer the Hessian fly attacked the wheat in one of our states. We ran a Hessian-fly special, holding meetings with farmers in 68 localities, experts from the state agricultural college and the United States Department of Agriculture showing farmers how they could beat the Hessian fly next year by scientific soil culture this fall. An investigation, made lately, developed the fact that farmers quite generally followed the careful suggestion of these experts, whose advice was based on actual and detailed tests covering a period of eight years.

On one of our demonstration-train trips, a Santa Fe representative asked the audience of farmers to remain after the departure of the college men from the lecture car. As we had been running these trains for several years, and every body was familiar with the company's object, the railroad man asked the farmers if the information they were receiving was of sufficient value to them to warrant the company in continuing the service. In every case there was an affirmative shout.

Our people always have made it plain that the Santa Fe is not presuming to tell the farmers how to farm; that it is the Santa Fe's policy to co-operate with patrons as a matter of business; and that by giving farmers reliable information which will add to their prosperity the company expects to add to its own prosperity. We find that this is the kind of co-operation the farmers appreciate.

We have done some general educational work as well by contributing information on railroad subjects to colleges and high schools. A number of our officials have been on the programs for students' lecture courses.

As an educational feature, we assembled a train of old and new style equipment, and ran it over our lines to show the development in transportation facilities in 30 years. It is estimated that a million and a half people saw that train. We offered prizes to the larger school children for essays about the train. More than 8,000 compositions were received.

Primarily, of course, the Santa Fe company was organized for the transportation of passengers and freight, and whatever success has been achieved in that direction is attributable to two causes—service and the cordial relationship existing between the company and its patrons—the latter cause being due in the main to the side-line activities which I have described. The friendship of the people living along the line is regarded by the Santa Fe men as one of the company's most valuable assets.

A UNIQUE PASSENGER STATION AT COOPERS TOWN, N. Y.

The Delaware & Hudson recently completed a new passenger station at Cooperstown, N. Y., which, as a consequence of an understanding between the company and the village, was given an architectural treatment that makes it particularly in keeping with the history and character of the place. Cooperstown was the home of James Fenimore Cooper, and as Otsego, its old name, it played an important part in two of the Leatherstocking Tales. The building was dedicated with suitable exercises in which railway officers and prominent citizens participated.

The building has a beautiful setting with a wooded hill for a background on the track side and with ample space on the village side for a considerable stretch of lawn. The building was appropriately given a colonial treatment with a steep sloping roof and characteristic porches on both the front and rear. A large outside-built chimney adds considerable to the exterior appearance and makes possible a large fireplace in the interior. The building is 94 ft. long and about 45 ft. wide. The walls are of native stone used in a most effective manner, with an uncoursed ashlar dado, above

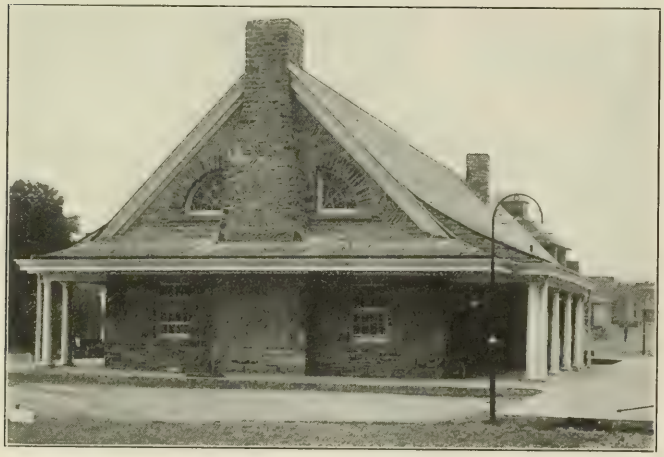
which the treatment consists of flat stones laid in herringbone fashion with larger stones serving as quoins at the corners and the window and door openings. The roof, which is covered with slate, has an appreciable overhang on all sides of the building to form a shelter. On the two opposite sides of the waiting room end of the building this overhang is more pronounced and is treated as a porch with classic col-



The Station as Seen from the Village Side

umns and a cornice of wood, this cornice being continued entirely around the building. Concrete platforms and walks are provided with driveways and footpaths of cinders.

The colonial treatment is also carried out in the interior of the waiting room which is finished in paneled oak. This room is 29 ft. 8 in. by 42 ft. and the large stone fireplace which occupies a considerable portion of one end of the room



Close View of the Station

adds much to the effectiveness of the design. The room is provided with mahogany furniture and the walls are embellished by 19 oil paintings, 15 of which represent scenes from the Leatherstocking Tales, the other four being portraits of Cooper and other well-known men of Cooperstown.

THE ALLOYS IN A ZEPPELIN.—A French chemical journal has published an analysis of the alloys used in the construction of a Zeppelin brought down in France. For the angle brackets it was found that aluminum entered into the composition to the extent of 90.27 per cent with 7.8 per cent of zinc, 0.73 per cent of copper, and small amounts of iron, silicon, manganese and tin. For the channel sections an alloy composed of 88.68 per cent of aluminum, 9.1 of zinc, and about the same quantities of the other elements as for the angle brackets was used. The braces were evidently of commercial aluminum, that element entering into their composition to the extent of 99.07 per cent.

SCIENTIFIC MANAGEMENT APPLIED AT ONE STATION*

By Wm. J. Collins

Freight Agent, Delaware, Lackawanna & Western, Syracuse, N. Y.

About two years ago a careful analysis of our transfer freight was made. As a result of which the cars at the transfer platform were rearranged to give the shortest haul for those cars with the greatest tonnage. Another analysis of tonnage, showing the daily and car average of principal merchandise cars forwarded, enabled us to determine what cars should be provided for with empties in the transfer layout because of such cars not running regularly, and it also enabled us to know with certainty the average number of cars in excess of one car of merchandise per day certain cities would require, providing for the excess cars by selecting a favorable car or number of cars having in the transfer freight a nucleus of tonnage for that city in mind, and thereby avoiding the expense of transfer so long as more than one car was unavoidable. We then found it an appropriate time to correct our empty layout opposite the house from a changeable to a permanent one, and at the same time we changed our instructions on the doors so that when freight was accepted at the doors it would go directly across the floor to cars. In this way we succeeded in reducing to the minimum the longitudinal movement of trucks with transfer freight, and eliminating the longitudinal movement of freight accepted at the doors from city shippers. These changes occurred at a time when we received a small supply of platform trucks, and it was difficult to determine which improvement was the most helpful. The two changes combined served to reduce the total cost from 29 cents per ton to 24.2 cents per ton for the first six months of 1915.

We had no reason, however, to be satisfied. It has been observed that warehousemen are not fast walkers. It has been acknowledged by competent authority that they work continuously and do as much of their kind of work as any class of men drawing pay on the same basis. Notwithstanding these observations, the pace has been a professional one, and unwritten rules prevent one trucker from passing another, so that the slowest becomes the pace maker.

A tryout with a speed contest and records of motion observations in our inbound house, where the conditions were most favorable, appeared in line with greater progress. Two gangs of men were taken, a checker acting as foreman over a loader and three truckers. The truckers in one gang were given two-wheel trucks and those in the other gang four-wheel platform trucks. The checker of the latter gang was urged to force the use of the four-wheel trucks as much as possible and to use two-wheel trucks only at such times as the packages were exceedingly heavy and required too much energy to lift them to platform trucks. A freight office clerk with each trucker travelled with a watch in hand, timing loaded separately from empty movements. With each loader stood a clerk timing the loading, sorting and waiting on the part of the loader. At the car door of each gang stood another clerk, timing the delays to trucker No. 2 while trucker No. 1 was ahead waiting for a load.

Prior to the commencement of the test the men were given a verbal explanation as to what was to be done and how it should be done. It was announced that the earlier they succeeded in getting the necessary tonnage, the sooner they could go home, but that they would be paid for a full afternoon's work. They did not learn how much tonnage we required, but they were told there would be similar contests in different cities throughout the country and that we would naturally dislike to see Syracuse at the bottom of the list. They were

*Received in the contest on The Handling of L. C. L. Freight.

asked not to run and they were cautioned as to the necessity of stowing freight evenly in the house. They understood, however, that we were keeping the results separately for one gang from the other.

The contest had hardly commenced before it was apparent that they would nearly double their ordinary tonnage; that one gang was pitted against the other; that the two-wheel trucks were trying to hold their reputation in a contest with mixed equipment; that civic pride would hold Syracuse pretty close to the top of the list of unnamed cities; that when the loader had his load prepared for the arrival of the two-wheel truck, the loading time was almost immeasurable; that the two-wheel truck will last for a long time for narrow passageways, light loads, quick movements and short distances, and that the platform truck is the draft horse for heavier loads and longer distances and that it was slower in loading and in movement under high pressure, while requiring more room for clearance, although the increased weight of the load lessened the number of trips and in this way shortened the distance.

They did run, but only out of the car across the bridges. Their stowing was watched carefully and found satisfactory. In seeking the results obtained, all the principles of scientific management were employed, even to the extent of having a spirit of contest enter into the affair after the work had been carefully planned to obtain a maximum out-turn under the most favorable conditions, and with a reward increasing with increased performance placed promptly at their command when the work was finished. Before mentioning results it is necessary to state that the ruling commodities at Syracuse average a light load per two-wheel truck, but this handicap had been partly overcome by shortening distances, and making it possible without an incentive other than a flat day wage to truck 24 tons per trucker per 10 hours. This should be reduced 25 per cent any time it is the desire to pool the work of the loader with the truckers.

The mixed trucks handled 96,951 lb. and the straight two-wheel trucks handled 79,616 lb. in the same length of time, 2½ hours, making the difference appear for each trucker on a 10-hour basis as follows:

	Service	Column 1		Column 2
Line 1	Mixed	43	Straight	35
Line 2	Ordinary	24	Ordinary	24
	Increase	19		11

It will be observed by following horizontal line 1 that the mixed service exceeded the two-wheel trucks 8 tons per man, and, by following column 1, that the maximum increase over an ordinary day's work was 19 tons, made possible by working the platform trucks in. It is therefore possible to ascribe 8 tons or 42 per cent of the increased efficiency per man to the use of platform trucks, and the other 11 tons or 58 per cent of the increased efficiency must be ascribed to the reward increasing with the out-turn. Taking 43 tons in 10 hours as the possibility with mixed service averaging 100 ft. round trip trucking distance, and setting a task on this basis for 9 hours, i. e., permitting the gang to go home after having trucked 38.7 or 38 tons per trucker, should, in the form of a shorter day, be sufficient incentive for the checker, loader and truckers, without increasing rates to throw their wages out of proportion to the wages of other warehouse employees and without exposing the time books to the admission of doubtful factors.

It is necessary to state that the average load was 434 lb. against 235 lb. on the straight two-wheel truck. The average load would have been much greater on the platform trucks had they been used for 100 per cent of the freight instead of only 36 per cent by the gang handling them, the freight running heavy and making two-wheel trucks more attractive to load for trucking distances averaging less than 100 ft. for a round trip.

The following exhibit is intended in group 1 to represent the time in seconds used for an average round trip for mixed service (M) and for straight two-wheel trucking service (S); group 2 covers the same results reduced to a percentage basis for a better comparison; while group 3 sets forth the increased utilization of time on a percentage basis for the mixed service made possible by a reduction in the time required for trucking by reason of the heavier load, and by a reduction in waste time.

		Loading			
Group	Trucks	Trucking	Unloading	Waste	Total
1	M	35	68	13	116 seconds
	S	31	23	14	68 seconds
2	M	30%	58%	12%	100%
	S	46%	34%	20%	100%
3	M Incr.	....	24%	....	24%
	M Dec.	16%	....	8%	24%

Therefore in making the round trip with the platform truck in 116 seconds but with a heavier load than the two-wheel trucks carried in the other gang in 68 seconds they succeeded in bringing about a conservation of time of 8 per cent. It must be explained in this connection that while the trucker of the two-wheel truck holds his handles while the truck is being loaded, the four-wheel trucker helps the loader load.

From the foregoing it is clear enough that the distances must be shortened and the loads increased; that two-wheel trucks must be used for heavy freight and for freight likely not to clear overhead when going into a car; that congestion by reason of inadequate facilities makes such a truck indispensable, and that they are the quickest vehicle for short distances and the easiest to load. It is also clear that the platform truck has its proper place where congestion is avoidable and where the run of the freight is easily loaded on such trucks for medium and greater distances. Extreme conditions may require tractors, storage battery trucks and even inclined elevators. Longitudinal and zigzag latitudinal trucking suggests an analysis of tonnage and the tracing of lines following the movements given outbound freight after acceptance at the door.

As stations for improving the handling of l. c. l. freight cannot be established as experimental stations are established in other branches of industry, it seems that the rules for finding the total cost and then separating it into a few principal factors should be standardized. With a proper introduction of units on a scientific basis the subject would be given the prominence it deserves as an operating factor. The least expensive experiment following standardization would be to determine the task for inbound freight and make it adjustable for application to conditions varying somewhat with outbound freight, and then, to take the best results as a standard of efficiency, working to that standard by improving the plant and equipment, shortening distances and increasing the weight of the load, and correcting unprofitable practices long fixed by precedent. The minimum cost should be considered 100 per cent for the present, and any lower accomplishment appear as something less than 100 per cent. This appears to be the most logical suggestion until such a time as inventive genius will aid us by the introduction of carrier platforms to substitute a greater part of the trucking now requiring men to accompany each movement and involving 50 per cent nonproductive service in the return movement, and until such time as we are provided with facilities for chuting (with a dip) a great part of our inbound freight from No. 1 track direct into the house. Latitudinal trucking in the outbound house can be reduced easily by a similar practice, chuting the freight from the point of acceptance to the door of the car on track No. 1.

Loss and Damage

Handling less than carload freight and the subject of loss and damage are dual parts of warehouse operation. During

the first 6 months of 1914 60 claims were presented to us on account of damaged outbound freight from Syracuse as compared with 12 during the first 6 months of 1915. This decrease is due to a great extent to cleaning all car floors to know that they are free from contaminating substances, nails, cleats and other articles, including all kinds of rubbish, and to protect the freight even to the extent of giving it a level base that it may ride better. Our efforts have included frequent conversations with every warehouseman on the pay roll, knowing that the trucker can damage freight oftener than anyone else by careless handling of the freight or of his truck under it. Great effort has been made to slope the loads nicely, working under the belief that we must concede that the handling of cars in yards and trains under the most favorable circumstances requires the very best of stowing.

The increased weight of the contents per car will not increase the damage to freight except when frail articles are loaded first. In the event that there is more than sufficient tonnage for one car to one point, crowding may prevent the use of the second car. It is impracticable to hold many short-haul cars over a second day to increase the tonnage. Whether the tonnage of merchandise cars is increased or not, a separation of the freight is necessary. I am thoroughly convinced from personal observations that certain reductions of the train line pressure will cause freight to move one way or another. If it can, it will go forward; if it cannot move forward, it will either crush or raise up off the car floor. It is, therefore, safe to say that it is better to separate merchandise so that there will be at least two divisions in each end of the car, giving each subdivision a little space in which the freight may move forward, but making it possible for one subdivision to move without the pressure of the entire volume back of the moving articles.

Since January, 1915, we have made a special investigation of every over or short report received against our forwarding, for the purpose of naming our man at fault and letting him carry part of the burden, and also for the purpose of taking such other reports in connection with which we could not name both the man and the cause and probing deeper for at least the reason of our inability. Each instance was covered by a letter written by the agent, numbered and so written that the letters could be scanned hastily and the causes summarized later. As a rule the letter was addressed to the agent who had issued the exception report, and a copy was given to the division superintendent. We followed the practice of naming the man responsible, and we gave that man a copy of the letter after talking with him verbally. No replies were necessary. The men were sensitive and we were satisfied that good results were coming. It was necessary to drop a small number of truckers who had shown their inability to carry the tickets as directed, and before six months had expired we had to part with our oldest checker, whose unreliable work demanded too much inspection and correction.

On the billing desk we insisted on greater accuracy, and placed additional responsibility on our revision clerk. We also required of him a nightly statement showing how many errors in billing he caught on each bill clerk, and making him responsible for errors committed but not detected.

There were 1,138 over and short reports issued against this station during the first six months of 1914, or 7½ per working day. The following year only 270 were issued during the same length of time, or 1.7 per working day. We started out with shipping orders, tickets, loading errors, billing and transfer as the 5 subdivisions of the operation in which errors were located. Under these 5 subdivisions, we numbered 27 causes for over and short reports. After 4 months' active work, we removed 9 of the causes. We distributed the responsibility as direct and associate, direct with the checker, for instance, and associate with the doorman or loader, or both. Eleven other causes were located beyond, either in an error in the face of a clear loading record and finally so accounted, or by making reports against Syracuse instead of some other station. One hundred and nine errors or 40 per cent were located beyond our station; 26 or 10 per cent (mostly freight checked over before the receipt of the billing) were classed as doubtful, and 135 or 50 per cent were located positively at Syracuse—almost one per day, with a daily average loading of approximately 300,000 lb. of merchandise. The errors at Syracuse were divided between warehouse and billing forces as follows:

Warehouse	82 =	62 per cent
Billing clerk	52 =	38 per cent
	135	100 per cent

Considering the warehouse organization as the field, and bearing in mind that the field corrected 42 mistakes by retransferring 100 packages wrongly loaded, this left only the 83 mistakes they made and did not correct in handling 82,500 shipments, which is best evidence that instead of chaos we have an organization handling a large volume of traffic on efficient lines, and that where efficiency is found order prevails; and economy is not only possible but inevitable.

ARMORED CAR FOR THE U. S. ARMY

The first armored car to be constructed for the United States army was recently completed by the Standard Steel Car Company at its Hammond, Ind., plant. It was designed under the direction of the Board of Engineers of the United States army, and the completed car was delivered 27 days after the plans were started. This car consists of a heavy open hearth steel plate structure of sufficient thickness to withstand fire from small arms and is especially designed to guard railroads and depots in time of warfare or during any local uprising. It is not ordinarily to be employed in aggressive movements. In effect, it is a moving block house which may be used at any point along the line, or it may be used as a retreat for troops when necessary. It will also be of service in transporting troops or explosives or other perishable material which might be damaged by fire



Interior of the Armored Car

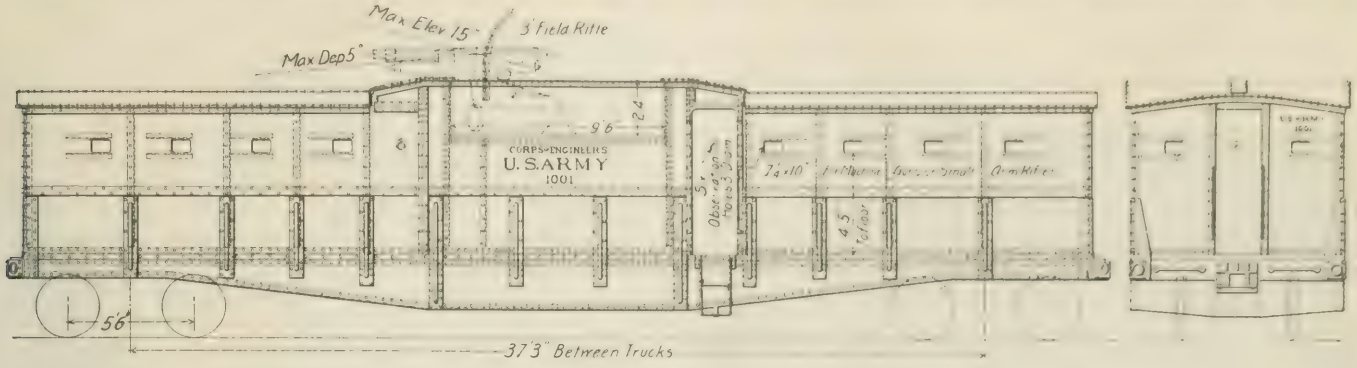
from the enemy, past danger points. The car is known as a light armored car and is to be equipped with a 3-in. rapid fire field gun, having a special recoil mounting which will obviate the necessity of providing out-riggers when the gun is being fired. This gun is located in the gun-well at the top of the car, as indicated in the top view, the gun there shown being a model of a 3-in. field gun. This gun-well may also be used as a fighting top for troops armed with machine guns or rifles. There are 20 port holes measuring 7¼ in. by 10 in., for machine guns or small arms, 8 being located in each side of the car and 2 in each end. Sliding doors of heavy steel cover these openings when they are not in use. There are also 6 peep holes, 2 in each side of the car and 1 in each end. Access to the car is obtained through 4 door openings, 1 on each side and 1 on each end.

The interior of the car is divided into 3 compartments; the end compartments are for the use of troops operating the machine guns and rifles through the port holes, and the center compartment, which is not the full height of the car, is used for storing the ammunition. It is capable of holding a large quantity of ammunition either for small arms or for the rapid-fire gun. The car will accommodate a company of infantry seated on camp stools or on benches. A dry-hopper lavatory and a water tank having a capacity of 300 gal., from which the water is brought to the interior of the car by a hand-pump, has been installed on the car for the convenience of the soldiers. When used in patrol service there will not be more than 12 men in the car, just enough to operate the rapid-fire gun and the machine guns. In the interior view there will be noticed a ladder on the partition of the middle compartment at the left. This leads to an opening to the gun-well at the top of the car, there being a similar entrance on the other side of this compartment. There is a similar opening at each of the other corners of the gun-well through which the ammunition is passed for the rapid-fire gun. These openings are protected by heavy steel sliding doors.

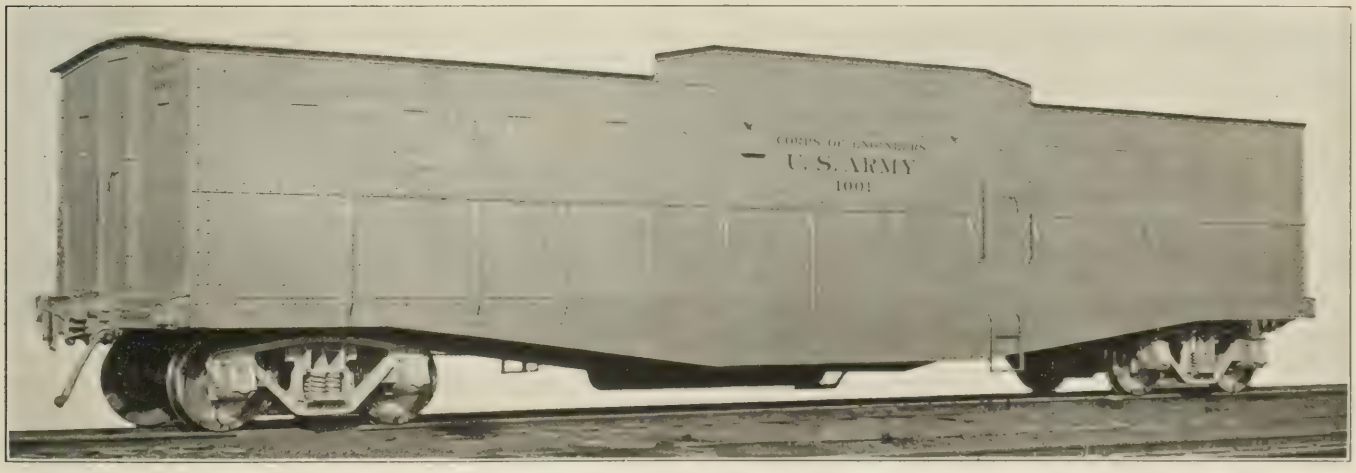
The construction of the car consists of an all-steel high-capacity underframe of standard construction on which is mounted the special steel superstructure. The car weighs 86,200 lb., and has the following general dimensions:

Length over striking plates	48 ft. 4½ in.
Outside width	10 ft.
Top of rail to top of floor	3 ft. 11 in.
Inside length	47 ft.
Inside width	9 ft. 3 in.
Inside height	7 ft.
Distance from center to center of trucks	37 ft. 3 in.
Truck wheel base	5 ft. 6 in.
Size of journals	5½ in. by 10 in.
Wheels, diameter	33 in.

The center sills are of the fishbelly type, being made of two webs of ⅜-in. steel plate, each web being reinforced at the bottom with two 4-in. by 3½-in. by ½-in. angles, and at the top by one 3½-in. by 3-in. by ⅜-in. angle. The two members of the center sills are tied together by a cover plate



Side and End Elevations of the Armored Car for the United States Army

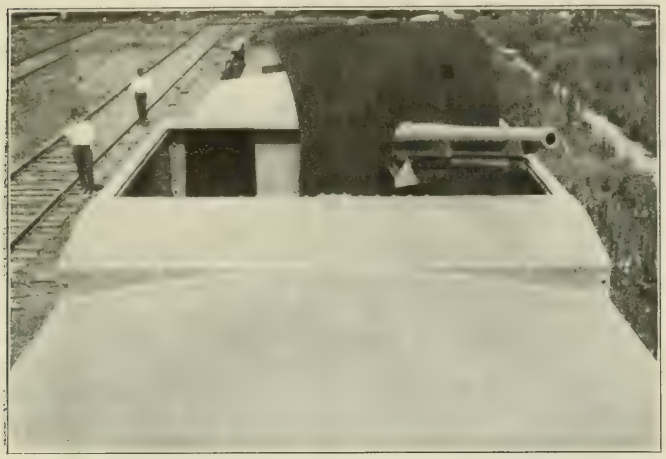


Armored Car for the United States Army

7/16 in. thick by 21¼ in. wide. The center sills run continuously through the body bolster to a distance of 1 ft. 10⅝ in. beyond the center line of the bolster. The depth of the center sill over the angle and at the center is 2 ft. 6 in. The side sill is of the fishbelly type, made of 5/16-in. steel plates reinforced at the top and bottom with 4-in. by 3½-in. by ½-in. angles. The depth of the side sill at the center is 25½ in. The body bolsters are of 5/16-in. pressed steel plate. The top cover plate is 16 in. wide by ½ in. thick, and the bottom tie plate is 15 in. wide by ½ in. thick. The crossbearers and crossties are of the pressed steel type, be-

ing made of ½-in. steel plate. The crossbearer cover and tie plate is 10 in. wide by ⅜ in. thick. The end sills are made up of 10-in., 15-lb. channels, having 7/16-in. cover plates.

The car is equipped with the New York Air Brake Company's schedule K-10-C air brake with a K-2 triple valve. The Miner tandem draft gear with the Sharon M. C. B. type automatic coupler is used with the Imperial uncoupling device. The couplers are fitted with Buckeye cast steel yokes. Vulcan cast steel truck side frames and the Scullin Steel Company's cast steel truck bolsters are used on the trucks.



Top View, Showing the Gun-Well Equipped with a 3-in. Field Piece

The wheels are forged steel. The Miner side truck bearings and the Davis inside hung brake beam are also used on this car. The car is to be shipped to the Sandy Hook Proving Grounds, where it will be equipped and tested by the ordnance department of the United States army. From there it will probably be sent to the Mexican border for service.

WAR PAYMENTS TO THE BRITISH RAILWAYS

By Julius H. Parmelee

Twenty-four hours after the outbreak of war with Germany, August 4, 1914, Great Britain mobilized her railway resources for military purposes. A Railway Executive Committee of 10 general managers was organized, with a member of the government Board of Trade as chairman, while a financial agreement was made whereby the railways were to expedite all military business without reference to cost or details of payment, the government agreeing at the end of the fiscal year to make good all losses in net revenues below the normal level. The only proviso was that if the net revenue of any railway for that part of 1914 just preceding the war (January 1, 1914, to August 4, 1914) showed a decrease as compared with the net revenue of the corresponding period of 1913, the net revenue for the balance of 1913 would be reduced in the same ratio in computing the amount to be paid over by the government to the railways.

The net revenues of the British railways during the first 6 months of 1914 showed a decrease of about 2½ per cent from the net revenues of the corresponding period of 1913. Because of this, the London Statist calls the bargain between the government and the railways an agreement "under which the railways were taken over by the state during the war on a rental of the net earnings of the year 1913, less a percentage allowance of about 2½ per cent."

The agreement has been subjected to a number of modifications. In the first place, railway employees have been active in demanding war bonuses, and several concessions have been made to them by the railways with the concurrence, or even at the instance, of the government. These bonuses at first were wholly borne by the government. In the second place, beginning with January 1, 1915, the government agreed to make up the normal net revenues of the railways, without the proportional reduction of 2½ per cent noted above; the railways, on their side, agreed to bear 25 per cent. of the war bonus, the government carrying the remaining 75 per cent. Still later, the war bonus was increased in amount and scope, and the proportion chargeable to the railways was reduced from 25 to 12½ per cent. "The result of the various arrangements," says the Statist, "is that the government during the period of the war has leased the railways on the basis of their net earnings in 1913 less 12½ per cent of the war bonus granted to the men, and that out of this rental the companies have to meet any addition to their interest charges."

Information is now available as to the way in which this financial arrangement has operated. The fiscal year of the British railways closes on March 31. Returns for the first fiscal year under the war agreement, ended March 31, 1915, have recently been made public in a government White Paper. From August 4, 1914, to March 31, 1915, a period of about 7 months, the government advanced the railways £6,851,957, or about $33,350,000, to offset the reduction of their net revenues. These advances were made monthly to the Railway Executive Committee, for distribution among the individual railways. The amount is subject to adjustment after an audit of the yearly accounts of the railways by a chartered government accountant.

It is difficult, on this side of the Atlantic, to analyze the bargain between the British government and the railways, without having more detailed information regarding railway operations in England than has thus far been vouchsafed. Since the war began, the English railway reports have been shorn of practically all details regarding traffic handled, receipts, and expenses, and it is next to hopeless to attempt an analysis of the situation from the American point of view. At first sight $33,000,000 does not appear a heavy charge to the government for the services of the British railways during the early months of the war. This feeling is amply borne out by the comments of various English journals regarding the situation. The arrangement has been termed a "great bargain for the government," considering the added work and strain placed upon the shoulders of the railway organization. "From the point of view of the companies," says the Statist, "it would have been very much more advantageous to have charged the government for work performed and carried on business as far as possible as usual, for as matters now stand railway profits have appreciably declined, while the profits of practically all other trading companies working for the government have largely increased."

Whatever the underlying causes, the market value of standard British railway stocks have greatly fallen off, and the sole hope of railway investors seems to lie in post-bellum industrial activity that will bring with it added earning power on the part of the roads. Furthermore, the lesson in co-operation which the British railways are now learning cannot fail to have some influence in various ways, and this entirely apart from the problem of government ownership or control, on which war arrangements can throw but little light.

Record Exports of Locomotives.—In the 11 months ended May 31, 1916, 740 locomotives were exported, as compared with 216 and 364 for the like periods in 1915 and 1914, respectively. In 1915 the total number exported was 621, against 269 in 1914 and 491 in 1913. Of the 740 sent abroad in the last 11 months, 209 went to Europe, 209 to Russia in Asia, 103 to Cuba, 39 to Canada and 36 to Mexico. —*Iron Age.*

Wage Controversy Referred to Mediation

National Conference Committee of the Railways Invokes Services of Board of Mediation and Conciliation

The National Conference Committee of the Railways on Wednesday of this week applied to the United States Board of Mediation and Conciliation for its services for the purpose of bringing about an amicable adjustment of the controversy with the four brotherhoods of train service employees that have voted to strike to enforce their demands for an eight-hour basic day and time and one-half for overtime in freight and yard service.

The railroad committee made its request for the services of the board after its proposal that the brotherhoods join in the application had been declined by the presidents of the four organizations at a conference in the Engineering Societies' Building, New York City.

The results of the strike vote taken by the brotherhoods were announced at the conference on Tuesday, after which the brotherhoods asked the railroad committee if it cared to present a definite proposition. An adjournment was taken until Wednesday, when Elisha Lee, chairman of the National Conference Committee of the Railways, presented the following letter proposing a joint application for the services of the board:

"The National Conference Committee of the Railways has again given most careful consideration to the matters in controversy between us and to all that has been said in our various conferences which began on June 1. We have also carefully considered the serious situation presented by the result of the strike vote of employees and the grave responsibility which rests on both parties to the conference to exhaust every honorable means to avoid the public injury which must inevitably result should you decide to exercise the power which the strike vote has placed in your hands.

"After such consideration, it is our judgment that the proposals which the men have supported by their vote involve such extraordinary changes in operating methods and such radical revisions in established bases of compensation as to make it apparent that there is little probability of our being able to harmonize our differences of opinion unless this result can be brought about through the Federal Board of Mediation and Conciliation, which was created to assist the parties in just such circumstances as now confront us.

"The National Conference Committee of the Railways is as sincerely anxious as your committee can be to reach some amicable adjustment of the matters involved in the present controversy, but we are convinced that in the end we shall have to invoke the friendly offices of the Federal Board of Mediation. The unbroken experience of the past ten years sustains us in this view. During that period in practically no large concerted movement has a Conference Committee of Managers and a committee of your representatives ever been able to reach a final and complete adjustment of the matters in controversy between them, until after they had invoked the provisions of the Federal Mediation Law. It seems to us that all the considerations that have existed in former controversies to prevent a settlement being reached by direct negotiations are present in an accentuated form in the present case.

"It is not open to question that whatever we can do by direct negotiations, we can also do just as quickly and as effectively through mediation; and experience has demonstrated that a common ground could be reached through the mediators in cases where the parties have been wholly unable to reach such common ground through direct negotiations.

"Accordingly we propose that you join with us in an application to the United States Board of Mediation and Conciliation and invoke its services for the purpose of bringing about an amicable adjustment of the controversy."

A. B. Garretson, president of the Order of Railway Conductors, who acted as spokesman for the brotherhoods, stated the declination to join in the application, and the presidents of the other three organizations expressed their concurrence in his statement. Mr. Garretson said that personally he did not believe that a better purpose could be served by doing business through mediators than by the parties themselves. He thought a better understanding could be reached directly without the intervention of a third party, and he would prefer to try to reach a settlement without mediation, if possible. However, he said, a request for mediation does not require the concurrence of both sides; if the railroads made the request the mediators would go to the other side, and the brotherhoods would then give their answer as to whether they would take part in the mediation proceedings.

Members of the board, William L. Chambers, commissioner, Judge Martin A. Knapp, and G. W. W. Hanger, were already in the city prepared to render their assistance whenever it should seem necessary. Upon receipt of the letter from the National Conference Committee of the Railways the board immediately sent a letter by messenger to the heads of the brotherhood. After the labor leaders had agreed to accept mediation, the mediators went into conference with the railway officers.

The results of the strike vote as announced on Tuesday, subject to slight corrections, were as follows: Brotherhood of Locomotive Engineers, southeastern district, for a strike, 98.72 per cent; western district, 90.35 per cent; eastern district, 94.64 per cent. Brotherhood of Locomotive Firemen and Enginemen, for a strike, 98.1 per cent; including non-union men, 98.3 per cent; total vote, 70,653. Brotherhood of Railroad Trainmen, for a strike, 129,108, or 97 per cent; against a strike, 4,276. Order of Railway Conductors, for a strike, western district, 84.3 per cent; eastern district, 84.8 per cent; southeastern district, 93.4 per cent.

The brotherhoods were represented by A. B. Garretson, president, and L. E. Sheppard, vice-president, of the Order of Railway Conductors; W. S. Stone, grand chief engineer of the Brotherhood of Locomotive Engineers; W. S. Carter, president, and Timothy Shea, assistant president, of the Brotherhood of Locomotive Firemen and Enginemen; W. G. Lee, president, and T. R. Dodge, assistant president, of the Brotherhood of Railroad Trainmen, and several hundred general chairmen from the different roads.

Elisha Lee, chairman of the National Conference Committee, asked for a statement of the vote by roads, but the officers of the brotherhoods refused to give it in further detail. President Lee, of the trainmen's organization, said he would do so if the railroad committee would give the results of the "vote" taken by certain roads that had asked their employees to sign a statement that they would be loyal to the company. Mr. Lee replied that this was a matter with which the committee had nothing to do.

Mr. Garretson, acting as spokesman for the brotherhoods, then asked the railroads for a proposition.

"Now you know the result of the vote," he said, "and it is up to you to decide whether or not, in the face of this record, there is any desire on your part to proceed toward a settlement by modifying in any way the position you have heretofore maintained. Our demand calls for certain changes in the basic day and also establishes the new principle of

'punitive' overtime, which we consider what might be called the 'enacting clause' of the eight-hour day demand. The fact that we are asking for a penalty against overtime is itself a refutation of the claim that we are merely asking for more money.

"If there is any disposition on the part of the conference committee to make us a proposition we are ready to give consideration to it. If there is no desire on your part to deviate from the attitude you have assumed, that is for you to determine." He added that the railroads had before made certain "contingent" proposals and that he hoped they would now make a definite proposition.

Mr. Lee replied that the conference committee would give no answer until after a discussion by the committee, but that it would give a reply on the following day.

At the opening of the conference Mr. Lee announced the position of certain roads that had declined to give the conference committee authority to represent them. These were, in most cases, separately operated subsidiary companies or local lines. A number of western roads also declined to authorize the committee to represent them in negotiating as to hostlers and some of the southern lines took the same position as to negro firemen, reiterating the statements they had made at the previous conference. The officers of the brotherhoods repeated their previous protests against this attitude, but Mr. Lee stated that the committee must necessarily be governed by its authorizations. W. S. Carter protested, especially against the exclusion of the negro firemen, whom his organization has been trying to displace for several years. W. G. Lee said he wished it understood that his organization was negotiating for the position of brakeman, whether the jobs are held by white men or negroes. W. S. Stone said the engineers' brotherhood would insist on representing the firemen on southern roads on which the firemen have no organization.

President Wilson is reported as having devoted considerable attention to possible means of averting a strike, and on Friday, August 4, conferred with W. L. Chambers, commissioner of the United States Board of Mediation and Conciliation. According to press reports it was decided that the government could do nothing of a formal nature until after the conference between the committees representing the roads and the employees. Commissioner Chambers said that in case of a failure to reach a settlement at the conference the board would tender its services. On Thursday the President appointed G. W. W. Hanger, assistant commissioner of the board, a member of the board.

The Senate Commerce Committee on Friday tabled the resolution introduced in the Senate by Senator Newlands, directing the Interstate Commerce Commission to investigate the entire subject of railway wages, which was proposed by the Chamber of Commerce of the United States. The committee had before it a letter from the brotherhoods, saying: "We believe the committee should remain neutral at least until jointly called upon by the National Conference Committee of the Railways and the representatives of the railroad brotherhoods." The Chamber of Commerce had asked for a hearing. In explanation of the action of the committee, Chairman Newlands said: "The committee deemed it inadvisable, while proceedings were pending under the mediation-arbitration act, to take up the subject of the pay and hours of service of railway employees. It was also deemed inadvisable to add to the present duties of the Interstate Commerce Commission, which, as is well known, is overloaded with work."

The National Conference Committee has published in farm papers an advertisement headed: "A Great Increase in Railroad Wages Means Higher Freight Rates and a Burden on Agricultural Prosperity." The advertisement includes a table, giving the average earnings of three-fourths of the train employees in the United States for 1915, excluding extra men and those who worked only part of the time, as follows:

	Passenger		Freight		Yard	
	Range	Average	Range	Average	Range	Average
Engineers	$1,641 to 3,983	$2,067	$1,455 to 3,505	$1,892	$1,005 to 2,445	$1,526
Conductors	1,543 to 3,004	1,850	1,353 to 2,932	1,719	1,055 to 2,045	1,310
Firemen	943 to 2,078	1,203	648 to 2,059	1,117	406 to 1,633	924
Brakemen	854 to 1,736	1,095	755 to 1,961	1,013	753 to 1,821	1,076

Officers of the train service brotherhoods addressed a mass meeting in New York on Sunday evening. L. E. Sheppard, vice-president of the Order of Railway Conductors, said it "might be necessary to inconvenience the public for 36 or 48 hours." W. G. Lee, president of the Brotherhood of Railroad Trainmen, said "We will not strike if there is any honorable way out. But we must receive the basic eight-hour day." W. S. Stone, grand chief of the engineers' brotherhood; Frank P. Walsh, former chairman of the United States Commission on Industrial Relations, and Dudley Field Malone, collector of the port of New York, also spoke and denounced the railroads.

A committee representing the Switchmen's Union, which presented demands on a number of roads in March for an eight-hour day and time and one-half for overtime, has been in conference in New York for some time with a conference committee representing the railroads concerned, of which Horace Baker, general manager of the Queen & Crescent, is chairman. These roads include the following: New York Central; Michigan Central; Lehigh Valley; New York, Chicago & St. Louis; Pere Marquette; Chicago, Rock Island & Pacific; Chicago & Eastern Illinois; Chicago Great Western; Minneapolis, St. Paul & Sault Ste. Marie; Elgin, Joliet & Eastern; Texas & Pacific; Baltimore & Ohio Chicago Terminal; and the Delaware, Lackawanna & Western.

On Thursday Mr. Baker and S. E. Heberling, vice-president of the Switchmen's Union, joined in a request for the services of the Board of Mediation and Conciliation, saying they had failed to reach an agreement. Commissioner Hanger at once went to New York and began conferences with the two committees. On Monday an agreement was reached to arbitrate the controversy under the terms of the Newlands law.

The Transport of Heavy Guns.—With the size and weight of naval guns railways are only interested in so far as they have to carry them from the factory to the ship. This they are seldom called upon to do, but as the war on land is fast becoming a series of sieges in which the heaviest ordnance is used, this transport from place to place in warfare becomes a vital question. Not only have these huge guns to be shifted along the front, but they have to be moved backward and forward with the line of battle. If the light railways and their rolling stock, which do such good service at and near the front, could possibly be adapted for the purpose nothing more would be required. This is a counsel of perfection and the problem is, it is to be hoped, engaging the attention of all railway engineers. It is a problem that will require to be constantly solved until all the fighting is transferred from the land to the air. Were provision made for carrying these heavy loads on the normal or standard gages it should not be difficult to devise a means of transporting the broad-gage trucks on the narrow and lighter gages—as, indeed, is already done on several lines—and the less shifting these unwieldy monsters would have to undergo the quicker would be the process of bringing them to the places where their destructive powers would be most effective. If such a system could be perfected, light lines might be prepared in all districts, so that only the rails would have to be laid down. —*Railway Gazette, London.*

General News Department

Considerable numbers of Mexicans from the southwestern states are working as track laborers on the Pennsylvania Railroad.

The Southern Pacific has established at San Francisco, a school for station agents. It is under the supervision of E. L. King, superintendent of telegraph, and all station operators are invited to qualify as students. The school is not to teach telegraphy, but its curriculum includes all other branches of station work.

C. H. Ketcham, superintendent of the Stockton division of the Southern Pacific, has presented gold watches to two boys, 11 and 12 years old, respectively, who averted what might have been a serious accident on June 4, when an irrigating canal broke its banks and flooded the railroad tracks near Arena, Cal. The boys saw the danger and flagged the trains.

The Southern Railway sustained severe losses by the recent floods in North Carolina, but, with the desire to see the entire fund contributed by citizens go to relieving actual necessities in the storm-stricken district, will give free transportation of shipments from the State Relief Committee of clothing and other supplies consigned for gratuitous distribution among those who suffered.

For the use of pneumatic tubes for the transmission of mail in the large cities, which has been a subject of a good deal of controversy in Congress, the Post Office appropriation bill for the current year allows $976,000; but it authorizes the continuation of the present contracts only until March 4, 1917; the understanding being that the question will be reopened in Congress before that date.

An extensive system of military telegraph lines is being constructed along the Rio Grande river by army signal corps. The wires will connect the different supply bases with the headquarters and patrol camps that are scattered along the river. From Alpine, Marfa and Marathon the lines run to Shafter, Presidio, Terlingua, Boquillas and other points in the Big Bend region. The lines are of a permanent type of construction, and it is supposed that they will be left to serve any future emergency.

The Southern Pacific has 105 dining cars, 63 buffet cars, four cafe cars and one lunch car. Its dining car mileage last year was 10,832,847, and 3,207,353 persons were fed on the diners. There are in use 65,625 pieces of silver, 131,797 napkins 36,098 tablecloths, 19,425 pieces of glassware and 71,820 pieces of chinaware. Fifteen restaurants served 1,612,293 meals. The chief commissaries are at West Oakland Yards, Northern Lines; Los Angeles, Southern Lines; Ferry Building, San Francisco, for steamers and ferries; Houston for the Sunset Lines; San Francisco, New Orleans, San Antonio, El Paso and Ogden.

The Baltimore & Ohio, to aid in the Ohio state campaign to protect citizens engaged in industrial employment against accidents, has notified Victor T. Noonan, director of safety of the Ohio Industrial Commission that it will tender the use of a passenger coach and will arrange for its transportation. The car will be fitted up with exhibits showing what the manufacturing and industrial concerns are doing to provide for the safety of their workmen. In the windows of the car there will be shown a series of transparency views illustrating some of the things that have been done by this road in the interest of "safety first." It is planned to have the car cover the state, visiting numerous localities which were not reached by the train recently run by the Federal government.

In a trip ending July 29 at 4:10 p. m., an automobile was run from New York City to San Francisco in 137 hours, 40 minutes, this being 40 hours better than the best previous record. The car was a six-cylinder Marmon. The run was managed by Samuel B. Stevens, of Rome, N. Y., chairman of the motor reserve committee of the American Defence Society, and his purpose was to demonstrate the value of the automobile when military forces must be quickly mobilized. The car was kept constantly in motion, as nearly as possible, and Mr. Stevens himself ran it a large part of the way. He had two assistants and when they were running it, he went ahead by railroad. The route was by way of Albany, Utica, Syracuse, Buffalo, Cleveland, South Chicago, Clinton (Iowa), Omaha, Cheyenne, Salt Lake City, Ely (Nev.) Austin and Reno. Mr. Stevens has been across the continent in an automobile several times and he deems this the best route. This is the first time that a run of this kind has been made, westward; other fast runs have been made from West to East. Mr. Stevens lost three hours by a mistake of his pilot, and seven hours because of the loss of a wheel when he came near colliding with an eastbound car at a sharp curve. Mr. Stevens went from Syracuse to Omaha by railroad and says that he arrived only thirteen minutes ahead of the automobile. The distance, through, is said to be 3,390 miles, and the average rate of speed thus was 24.6 miles an hour. The start was made at Columbus Circle, New York, July 24, at 1:30 a. m., making the apparent time 134 hours, 40 minutes. Deducting the nine hours lost by accident the time is only about 18 hours longer than that made by the best schedules of the railroads.

Troop Movements Over the S. P.

The Southern Pacific Lines have been called upon to move troops from Massachusetts, New York, Minnesota and all parts of the United States. In July, on the Texas lines there were handled 98 trains, consisting of 1,452 cars of all classes—Pullman tourist, day coaches and box cars; and a total of 27,127 persons, together with their equipment, motor trucks and stock. One Illinois colonel states it was the best equipment and handling he had experienced on the whole trip! A New York officer was very complimentary, stating it was the only road where he wasn't jerked off his seat and the only line where he found any representatives who knew anything about railroading.—*Southern Pacific Bulletin.*

B., R. & P. Firemen's Convention

The third annual convention of the Buffalo, Rochester & Pittsburgh Railway Fire Department Association was held at Salamanca, N. Y., August 9. There was a parade in which the mayor of Salamanca and city officers participated, and two bands made music. Besides the eighteen fire companies, there were nine first aid teams from various points on the road. There was a first aid contest under the direction of Major Robert U. Patterson, of the American Red Cross, with first, second and third prizes. The Salamanca First Aid Team took first place, and, in addition to winning a medal from the railway company, will be sent at the company's expense to the meeting of the Congress of the National Safety Council, which will be held in Detroit in October. The Cummings team took the second prize, and Dubois car shops third.

The races and contests included a hose race, hub and hub race, coupling contest, 50-yard dash for ladies, 100-yard dash open to members of fire companies, and a tub race for children. In the evening there was dancing, and the visitors went home by special trains.

Safety First on the Pittsburgh & Lake Erie

G. B. Cooley, an employee of the Pittsburgh & Lake Erie, has been awarded a prize of $10, which was offered by the Central Safety Committee of the road for the best paper of not over 500 words on accident prevention, and the paper has been posted on the bulletin boards. Mr. Cooley reminds his fellow employees that the period of a man's education in safety first ought not to continue forever; that, after having been taught, it is the duty of employees to carry out the improved ideas that they have acquired. He says:

"By safeguarding machinery and dangerous locations we may eliminate a large per cent of injuries, but we still have accidents and the system of mechanical protection is only a step toward

the attainment of high efficiency. Safety Committees can impress the necessity of carefulness, and by perservering along this line create improvement; but it is important that this movement have the respect of those for whom it is intended, and all persons engaged or interested should attempt to arouse as much enthusiasm as possible, avoiding spasmodic efforts. The careless should be cautioned regardless of personal feeling or prejudice; for finally, after this period of education, will come a strict enforcement of safety first rules."

Pennsylvania Adopts Green for Proceed

The Pennsylvania Railroad announces that orders have been given for the adoption of the green-yellow-red scheme for the night indications of signals on its lines; and the order includes not only fixed signals but also markers on the rear of trains; switch lamps; markers for track tanks; slow signs; resume speed signs; hand lamps at interlocking and block signal stations; and lights displayed to the public at crossings. Lights at highway crossings will be red instead of green, as at present.

It is expected that the change will require some little time for its accomplishment. The number of glasses to be changed runs into the hundreds of thousands and, because of present industrial conditions, deliveries of material may be slow.

Green for proceed and yellow for caution have been in use on the Pennsylvania terminals, New York City, for six years past.

The "position-light" signals on the main lines of the Pennsylvania, near Philadelphia, are not affected by the new order.

Railway Revenues and Expenses for May, 1916

Net operating income of the railways of the United States for May increased $136 per mile, or 52.6 per cent, as compared with May, 1915, according to the monthly bulletin of the Bureau of Railway Economics. Comparing May, 1916, with the average May of the preceding five years, the increase was 58.0 per cent.

Total operating revenues amounted to $300,092,576, an increase over 1915 of $62,140,838. Operating expenses were $196,731,099, an increase of $29,273,494. Net operating revenue amounted to $103,351,477, an increase of $32,867,344. Taxes were $12,486,868, an increase of $1,117,773. This left $90,787,146 net operating income, available for rentals, interest on bonds, appropriations for improvements and new construction and dividends. Operating revenues per mile averaged $1,307, an increase of 25.2 per cent; operating expenses per mile were $857, an increase of 16.6 per cent; net operating revenue per mile averaged $450, an increase of 45.6 per cent, while net operating income per mile was $395, an increase of 52.6 per cent. Taxes per mile increased 9.0 per cent. Railways operating 229,638 miles of line are covered by this summary, or about 90 per cent of the steam railway mileage in the United States.

Operating revenues of the eastern railways per mile show an increase of 26.6 per cent as compared with May, 1915; operating expenses increased 19.3 per cent, net operating revenue increased 43.4 per cent, and taxes increased 7.0 per cent. Operating income per mile increased 49.4 per cent.

Operating revenues of the southern railways per mile increased 22.9 per cent, operating expenses increased 11.9 per cent, net operating revenue increased 50.1 per cent, and taxes increased 13.0 per cent. Operating income per mile increased 56.7 per cent.

Operating revenues of the western railways per mile show an increase of 24.9 per cent, operating expenses increased 15.6 per cent, net operating revenue increased 47.0 per cent, and taxes increased 9.9 per cent. Operating income per mile increased 55.7 per cent.

The eleven months of the current fiscal year, compared with the corresponding period of the preceding year, show changes per mile of line as follows: Operating revenues increased 16.6 per cent, operating expenses increased 7.9 per cent, net operating revenue increased 37.6 per cent, taxes increased 7.7 per cent and operating income increased 43.3 per cent.

Operating income per mile increased 56.7 per cent in the East, increased 50.8 per cent in the South, and increased 29.7 per cent in the West.

May operating income per mile was 52.6 per cent greater in 1916 than in 1915, 102.3 per cent greater than in 1914, 44.8 per cent greater than in 1913, and 58.4 per cent greater than in 1912.

REVENUES AND EXPENSES OF STEAM ROADS—MAY, 1916

Compiled from monthly returns of the railways to the Interstate Commerce Commission and covering roads of Class I, *i. e.*, roads with annual operating revenues above $1,000,000.

Account.	United States				Eastern District				Southern District				Western District			
	Amount, May, 1916	Per mile of line		Increase over 1915	Amount, May, 1916	Per mile of line		Increase over 1915	Amount, May, 1916	Per mile of line		Increase over 1915	Amount, May, 1916	Per mile of line		Increase over 1915
		1916	1915	Per cent		1916	1915	Per cent		1916	1915	Per cent		1916	1915	Per cent
Total operating revenues	$300,082,576	$1,307	$1,044	25.2	$139,653,016	$2,370	$1,873	26.6	$43,495,636	$1,024	$833	22.9	$116,933,924	$912	$730	24.9
Freight	217,481,579	947	725	30.6	100,016,116	1,698	1,308	29.7	32,882,334	774	612	26.5	84,583,129	659	493	33.7
Passenger	54,253,790	236	218	8.4	24,933,450	423	377	12.4	7,385,236	174	156	11.4	21,935,104	171	165	3.6
Mail	4,992,210	22	21	4.8	1,850,037	31	29	7.3	642,668	15	15	1.7	2,499,505	19	19	4.0
Express	7,447,972	33	26	25.8	3,657,523	62	45	38.9	1,100,873	26	21	21.1	2,689,576	21	18	13.4
All other	15,907,025	69	54	28.2	9,195,890	156	114	37.2	1,484,525	35	29	19.8	5,226,610	42	35	17.7
Total operating expenses	196,731,099	857	735	16.6	92,152,008	1,564	1,311	19.3	28,249,656	665	594	11.9	76,329,435	595	515	15.6
Maintenance of way and structures	38,546,686	168	148	13.3	15,834,545	269	240	12.1	5,404,404	127	120	5.7	17,307,737	135	115	17.3
Maintenance of equipment	49,883,946	217	177	22.6	23,837,526	404	332	21.7	8 039,978	189	149	27.0	18,006.442	141	115	22.5
Traffic	5,280,695	23	22	7.1	1,989,108	34	31	8.7	969,480	23	20	11.6	2,322,107	18	17	4.1
Transportation	94,519,610	412	355	15.9	46,526.580	790	649	21.7	12,575,603	296	280	5.9	35,417 427	276	244	13.1
General	6,844,954	30	28	8.4	2,997,300	51	46	11.4	1,108,278	26	24	10.5	2,739,376	21	20	4.8
All other	1,655,208	7	5	35.8	966,949	16	13	25.8	151,913	4	1	286.7	536,346	4	4	31.6
Net operating revenue	103,351,477	450	309	45.6	47,501,008	806	562	43.4	15,245,980	359	239	50.1	40,604,489	317	215	47.0
Taxes	12,486,868	55	50	9.0	4,976,871	85	79	7.0	1,764,797	41	37	13.0	5,745,200	45	41	9.9
Uncollectible revenue	77,463	*	*	....	22,347	*	*	....	21,837	1	*	....	33,279	*	*	....
Railway operating income	90,787,146	395	259	52.6	42,501,790	721	483	49.4	13,459,346	317	202	56.7	34,826,010	272	174	55.7
Operating ratio—per cent—																
1916		65.6				66.0				64.9				65.3		
1915		70.4				70.0				71.3				70.5		
Average mileage represented—																
1916		229,638				58,916				42,464				128,258		
1915		227,956				58,764				42,049				127,143		

*Less than one dollar. d Decrease.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE, 1916

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Alabama & Vicksburg	143	$87,361	$34,888	$133,418	$16,673	$23,141	$3,807	$48,641	$2,198	$6,028	$99,852	$33,566	$16,041	$16,345	$9,891
Alabama Great Southern	309	375,712	102,717	512,129	17,572	169,405	16,219	130,966	3,102	8,330	343,308	168,821	17,063	151,573	53,856
Arizona Eastern	378	243,446	43,091	307,757	79,391	29,072	2,177	55,671	2,247	10,726	179,589	128,168	19,264	107,729	16,189
Atchison, Topeka & Santa Fe	8,648	7,218,954	2,415,368	10,397,702	1,677,373	1,619,678	192,839	2,782,806	.....	186,773	6,449,497	3,948,205	428,161	3,514,470	753,330
Atlanta & West Point	93	50,097	38,028	107,298	11,261	15,940	5,875	59,626	2,011	4,493	98,476	8,822	9,786	—1,772	—29,404
Atlantic Coast Line	4,706	1,901,301	582,867	2,781,529	305,979	500,028	54,566	912,920	7,440	77,886	1,857,726	923,803	147,831	774,193	371,331
Baltimore & Ohio Chicago Terminal	79	.....	631	174,653	24,110	22,477	1,030	72,566	1,786	12,433	133,454	41,199	16,689	23,198	—8,738
Baltimore, Chesapeake & Atlantic	88	69,253	34,503	109,935	11,979	13,760	2,110	55,494	.....	3,098	86,438	23,496	2,243	21,253	9,669
Bangor & Aroostook	632	231,079	50,082	298,822	56,300	54,015	2,844	85,155	5,018	10,929	214,173	84,649	12,555	71,427	—66,493
Belt. Ry. Co. of Chicago	31	.....	.....	244,568	18,441	29,865	1,557	94,565	.....	6,302	150,730	93,838	15,549	78,289	4,762
Bessemer & Lake Erie	205	1,319,441	31,710	1,370,350	154,761	191,855	12,039	276,695	.....	16,303	637,483	732,867	22,005	710,860	—7,368
Buffalo, Rochester & Pittsburgh	586	908,012	100,435	1,056,363	163,548	262,629	12,252	331,123	1,328	22,658	793,538	262,826	20,000	242,825	—19,503
Canadian Pacific Lines in Maine	234	59,423	16,761	86,717	28,389	11,200	5,308	30,183	.....	4,238	79,317	7,400	309	7,091	10,455
Carolina, Clinchfield & Ohio	283	238,679	21,121	267,236	22,819	45,074	17,982	49,014	.....	13,729	147,556	119,680	4,681	114,998	46,962
Carolina, Clinchfield & Ohio of S. C.	18	9,791	1,115	11,315	786	102	2,532	2,845	.....	1,591	7,777	3,537	600	2,938	1,362
Central New England	301	402,188	41,663	464,281	22,275	43,103	886	243,685	.....	4,548	314,489	149,792	10,642	139,136	29,065
Central of Georgia	1,924	602,358	253,183	959,545	158,226	188,535	36,068	305,108	1,693	38,148	725,563	233,982	54,555	175,966	109,972
Charleston & Western Carolina	341	127,198	25,348	158,410	—5,866	22,133	3,993	49,100	.....	4,418	73,779	84,631	20,122	64,509	32,058
Chesapeake & Ohio Lines	2,386	3,296,029	550,151	4,221,824	472,771	790,224	55,025	1,156,632	29,099	83,298	2,582,797	1,639,027	142,415	1,496,300	416,696
Chicago & Alton	1,052	946,993	413,928	1,471,378	179,623	210,398	41,786	474,016	10,812	31,729	936,882	534,496	60,353	473,925	102,281
Chicago & Eastern Illinois	1,136	951,071	258,416	1,319,058	191,622	225,960	25,598	433,250	7,712	39,214	920,025	399,033	62,500	336,267	294,628
Chicago & Erie	270	577,015	62,454	690,506	64,015	68,833	19,682	238,629	2,295	17,534	410,621	279,884	22,230	257,654	141,526
Chicago & North Western	8,108	5,152,009	2,046,926	8,118,644	1,183,899	1,180,750	113,107	2,659,442	63,369	159,778	5,332,822	2,785,822	446,527	2,338,618	479,742
Chicago Junction	13	.....	.....	203,892	20,888	21,791	1,156	114,853	.....	4,884	163,573	40,320	3,871	36,449	13,362
Chicago, Milwaukee & St. Paul	10,210	6,249,865	1,918,652	9,163,746	1,880,989	1,344,365	191,091	3,146,297	54,351	173,508	6,776,978	2,386,768	492,359	1,888,268	933,567
Chicago, Peoria & St. Louis	255	111,130	23,887	143,353	16,831	26,522	5,681	59,987	.....	5,358	114,380	28,973	7,317	21,656	24,754
Chicago, Rock Island & Gulf	477	171,548	46,535	236,669	45,471	42,052	10,009	85,927	1,156	9,563	194,061	42,608	10,000	32,590	52,021
Chicago, St. Paul, Minn. & Omaha	1,753	975,083	507,899	1,614,545	276,546	152,104	27,581	552,519	14,902	41,474	1,063,677	550,868	85,512	463,808	103,848
Cincinnati, Hamilton & Dayton	622	741,165	103,563	943,359	143,913	176,866	17,715	321,442	3,140	40,908	697,967	245,392	32,060	213,299	160,790
Cincinnati, Indianapolis & Western	322	141,492	46,189	205,908	35,170	18,957	6,098	74,155	552	6,471	141,118	64,790	9,656	55,134	.....
Cincinnati, New Orleans & Tex. Pacific	337	748,313	156,061	971,407	85,578	264,081	24,752	239,956	5,741	24,460	643,669	327,738	32,147	295,528	87,403
Cincinnati Northern	246	139,177	17,140	161,534	27,330	29,195	3,297	47,731	.....	2,689	110,241	51,292	6,000	45,293	28,684
Cleveland, Cincinnati, Chic. & St. Louis	2,384	2,580,609	924,910	3,845,511	422,988	780,762	82,239	1,232,933	24,963	76,571	2,614,099	1,231,411	135,000	1,096,162	646,727
Colorado Midland	338	92,409	19,197	121,281	29,061	26,062	8,510	54,426	1,189	5,020	124,268	—2,988	5,852	—8,839	2,459
Cumberland Valley	168	204,120	56,217	274,212	34,197	7,876	4,310	80,282	1,062	11,630	138,749	135,463	5,960	129,504	28,427
Delaware & Hudson Co. R. R. Dept.	886	1,848,258	249,898	2,231,606	176,832	466,460	36,651	744,821	9,287	78,347	1,512,397	719,209	58,650	660,559	6,368
Delaware, Lackawanna & Western	955	3,210,150	747,331	4,413,932	559,029	637,254	91,006	1,372,420	35,149	108,285	2,800,368	1,613,564	202,500	1,410,781	292,710
Detroit & Mackinac	393	72,556	26,700	105,047	14,420	21,064	2,561	34,556	96	3,621	76,318	28,729	8,024	20,705	7,103
Detroit & Toledo Shore Line	81	114,496	.....	116,570	6,991	5,700	1,498	32,464	.....	3,453	50,107	66,464	6,924	58,346	7,442
Duluth & Iron Range	277	1,003,671	22,049	1,042,942	114,559	82,117	1,317	191,696	2,107	11,415	402,363	640,579	61,654	578,926	141,041
Duluth, Missabe & Northern	411	1,877,821	36,081	1,989,912	226,559	116,352	2,517	279,366	1,263	11,264	637,321	1,352,592	103,900	1,248,692	424,631
Duluth, South Shore & Atlantic	628	214,938	95,771	342,832	78,178	35,899	7,309	100,138	4,058	11,573	237,155	105,677	22,815	82,863	34,994
Duluth, Winnipeg & Pacific	187	111,700	18,890	134,535	14,111	16,348	2,170	44,917	656	6,041	84,244	50,291	6,727	43,564	13,279
El Paso & Southwestern Co.	1,027	820,187	160,701	1,025,990	72,752	88,404	20,083	231,162	6,007	25,075	443,470	582,520	45,711	536,805	243,025
Elgin, Joliet & Eastern	800	1,108,090	5	1,182,637	126,794	324,879	6,610	327,543	.....	21,608	807,090	375,547	39,525	336,022	22,670
Erie	1,988	4,430,629	838,093	5,548,088	571,871	1,312,028	97,790	2,039,791	39,114	129,332	4,184,856	1,663,232	194,147	1,468,953	40,221
Florida East Coast	745	383,283	116,867	565,106	69,850	76,806	12,493	162,763	3,276	18,825	343,034	222,072	38,967	182,970	96,179
Galveston, Harrisburg & San Antonio	1,351	780,366	243,453	1,109,134	152,401	143,256	30,929	404,612	9,810	32,509	761,159	347,975	48,502	298,930	167,465
Galveston Wharf	14	.....	.....	119,026	1,117	3,093	333	27,837	18,700	372	51,452	67,574	19,109	48,424	7,550
Georgia, Southern & Florida	395	119,183	48,480	195,735	19,771	59,805	9,134	63,851	.....	8,634	161,173	34,562	12,229	24,063	5,922
Grand Rapids & Indiana	575	300,811	140,157	480,753	65,576	88,636	12,254	184,243	1,368	15,044	367,120	113,633	24,081	89,541	5,633
Gulf, Colorado & Santa Fe	1,938	745,714	246,472	1,100,332	282,048	184,745	30,305	447,609	.....	52,020	995,447	104,884	65,836	36,915	68,628
Houston, East & West Texas	191	66,977	29,120	104,476	3,871	8,180	2,351	39,113	748	3,226	56,983	47,493	6,608	40,858	31,686
Houston & Texas Central	895	298,393	124,572	465,606	82,987	25,731	18,323	176,021	3,707	19,076	325,243	140,363	31,017	109,195	70,531
Illinois Central	4,767	4,049,386	1,229,507	5,905,514	646,875	1,314,105	109,234	1,762,972	35,344	159,459	4,016,733	1,888,781	397,521	1,489,398	1,008,848
Indiana Harbor Belt	110	.....	.....	378,210	68,699	51,366	2,851	150,683	.....	8,186	281,785	96,425	7,231	89,194	9,776
International & Great Northern	1,159	462,678	164,136	692,005	127,949	180,422	21,988	290,560	4,884	29,362	637,747	54,257	30,000	24,235	33,589
Kanawha & Michigan	177	283,055	31,682	322,642	37,481	79,141	3,034	77,851	44	7,717	205,269	117,373	13,925	103,447	13,328
Kansas City Southern	837	686,378	135,961	911,145	89,925	138,296	33,417	270,010	.....	32,673	561,943	349,202	48,376	300,187	162,036
Lake Erie & Western	900	514,294	59,816	705,483	76,311	82,069	14,399	195,106	.....	13,956	381,842	323,641	25,000	198,599	119,205
Lehigh & Hudson River	97	175,629	3,729	193,252	12,881	22,701	1,526	54,345	.....	6,302	97,754	95,498	6,710	89,288	36,445
Lehigh & New England	296	229,006	1,450	247,651	31,015	39,669	2,812	70,128	.....	7,668	151,248	96,403	8,850	87,582	49,101
Lehigh Valley	1,444	3,495,958	424,492	4,228,744	306,347	918,663	89,370	1,483,912	15,131	128,556	2,939,280	1,289,464	139,593	1,149,360	176,665
Long Island	397	364,564	852,749	1,408,469	138,712	135,005	11,312	509,130	7,167	38,915	838,401	570,068	70,461	498,745	37,554

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE, 1916—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Louisiana & Arkansas	279	$114,488	$17,347	$135,910	$22,634	$18,891	$3,705	$35,237	.....	$4,300	$84,767	$51,142	$7,920	$42,932	$10,527
Louisiana Ry. & Navigation Co.	351	126,534	23,987	163,811	27,561	24,812	6,971	52,425	.....	6,359	118,128	45,683	9,455	36,215	933
Louisiana Western	208	118,867	52,262	186,462	33,587	30,239	6,905	54,598	$1,997	6,250	133,574	52,888	15,383	37,456	5,335
Louisville, Henderson & St. Louis	200	93,885	35,781	138,580	22,629	15,610	4,961	40,855	.....	3,050	87,105	51,475	4,077	47,225	30,117
Maine Central	1,220	694,106	330,936	1,106,184	157,192	128,405	16,828	358,554	3,510	31,249	695,535	410,650	68,047	341,797	88,793
Michigan Central	1,803	2,325,974	1,076,611	3,896,759	503,230	531,642	66,832	1,301,309	57,734	76,471	2,537,218	1,359,541	140,000	1,219,154	203,155
Midland Valley	385	116,416	39,657	164,305	31,674	15,815	2,388	42,451	.....	7,736	99,620	64,685	3,581	60,987	38,838
Minneapolis & St. Louis	3,646	606,450	176,004	832,757	24,782	145,242	18,734	294,417	.....	26,591	509,767	322,990	42,095	280,654	26,970
Missouri & North Arkansas	365	53,466	34,216	95,372	21,384	10,272	3,013	33,931	.....	5,645	74,245	21,127	8,218	12,909	32,424
Missouri, Kansas & Texas System	3,865	1,639,131	778,082	2,644,047	433,669	650,277	58,476	912,563	17,168	109,058	2,181,049	462,998	129,191	330,397	—27,166
Missouri, Oklahoma & Gulf Ry. of Texas	125	15,267	415	15,874	3,548	2,947	1,723	9,311	.....	1,516	19,044	—3,170	361	—3,530	14,954
Mobile & Ohio	1,122	862,688	100,007	1,021,010	85,146	185,707	37,656	340,220	2,540	30,444	635,949	385,062	40,211	344,626	58,293
Monongahela	108	165,945	9,006	178,119	37,273	15,249	1,043	37,689	.....	4,239	95,493	82,625	4,000	78,625	.....
Morgan's La. & Texas R. R. & S. S. Co.	405	239,832	84,482	354,366	58,384	56,453	11,154	115,442	1,974	12,057	255,456	98,911	29,167	69,603	101,407
Nashville, Chattanooga & St. Louis	1,231	693,663	227,972	1,003,101	112,780	174,971	57,064	360,048	12,115	39,180	753,400	249,700	35,251	213,946	65,365
Nevada Northern	165	167,824	12,648	185,279	27,202	14,674	567	33,580	77	4,987	81,086	104,193	6,185	98,009	25,597
New Orleans & North Eastern	204	233,794	47,893	311,963	30,772	41,374	11,901	84,972	7,233	12,867	187,396	124,567	21,701	101,387	28,811
New Orleans, Mobile & Chicago	402	143,064	22,936	173,605	29,829	27,694	4,820	56,458	187	6,292	125,095	48,510	6,499	41,975	12,923
New York Central Railroad	6,093	11,591,845	4,824,546	19,187,721	1,966,701	3,221,094	274,304	6,039,955	254,154	431,909	12,188,117	6,999,604	778,872	6,217,929	842,349
New York, Chicago & St. Louis	570	1,005,280	129,858	1,186,570	106,924	188,752	45,629	448,653	5,016	25,237	820,210	366,360	42,936	323,415	12,955
New York, New Haven & Hartford	2,005	3,421,310	2,639,804	7,080,328	787,682	973,697	62,121	2,665,964	93,114	169,209	4,751,353	2,328,975	197,255	2,130,884	—519,354
New York, Ontario & Western	568	456,371	145,132	726,018	59,940	59,402	10,011	273,391	.....	26,048	428,791	297,227	24,902	272,324	87,107
New York, Philadelphia & Norfolk	112	428,399	40,820	506,569	36,970	85,243	5,027	162,749	4,283	10,986	304,783	201,785	8,405	193,340	69,945
New York, Susquehanna & Western	140	168,327	52,900	266,411	27,759	35,082	2,176	124,209	.....	6,353	195,561	70,850	14,100	56,749	—27,606
Norfolk & Western	2,086	4,313,334	488,053	4,987,886	596,734	853,057	64,632	1,216,850	10,492	78,945	2,811,866	2,176,020	175,000	2,000,653	442,672
Norfolk Southern	908	296,556	94,301	416,212	50,235	53,187	7,347	130,816	151	17,419	259,155	157,057	10,521	146,453	79,609
Northwestern Pacific	507	191,018	211,923	454,992	48,733	32,640	8,929	122,879	986	8,505	221,057	233,935	16,956	216,940	87,289
Oregon-Washington R. R. & Nav. Co.	2,053	1,028,542	434,789	1,614,343	326,746	218,260	45,536	496,354	24,456	72,054	1,172,276	442,066	93,800	347,723	—170,189
Panhandle & Santa Fe	670	311,704	75,905	409,035	61,431	63,938	4,010	113,685	.....	10,383	253,168	155,867	11,050	144,670	74,028
Pennsylvania Company	1,758	5,024,730	1,087,527	6,812,720	863,164	1,174,981	88,261	2,083,742	40,745	147,566	4,397,242	2,415,479	288,311	2,127,110	395,267
Pennsylvania Railroad	4,541	13,582,753	3,932,583	19,384,193	2,331,578	3,696,787	224,535	6,554,471	259,010	451,215	13,517,595	5,866,598	677,841	5,188,755	674,781
Pere Marquette	2,249	1,229,847	359,675	1,781,363	256,537	358,592	40,451	643,049	4,851	40,488	1,343,751	437,612	44,810	392,207	162,766
Philadelphia, Baltimore & Washington	717	1,159,539	780,263	2,143,142	262,909	390,877	31,469	809,591	115	53,017	1,547,977	595,165	59,362	535,803	192,394
Pittsburgh & Lake Erie	225	1,606,115	158,681	1,909,402	181,980	291,637	14,926	463,118	3,834	33,812	989,307	920,095	58,700	861,395	154,393
Pittsburgh, Cincinnati, Chic. & St. L.	1,489	2,777,374	827,688	4,116,924	604,982	863,488	70,267	1,377,757	28,321	107,568	3,050,890	1,066,034	180,470	885,455	200,210
Rutland	468	183,324	100,175	329,621	42,212	51,492	10,851	114,566	1,082	7,496	227,699	101,922	17,217	84,705	12,588
St. Joseph & Grand Island	258	132,017	26,288	172,019	38,709	22,818	4,904	51,376	783	5,776	124,368	47,652	7,962	39,688	15,371
St. Louis, Brownsville & Mexico	548	134,185	63,426	213,281	33,840	26,289	8,320	83,896	.....	32,083	180,618	32,663	9,782	22,878	741
St. Louis Merchants' Bridge Terminal	9	.....	634	178,900	35,985	11,061	784	81,488	.....	7,393	136,711	42,188	7,600	34,571	5,052
St. Louis Southwestern	943	488,427	107,885	639,377	56,669	130,958	31,557	169,016	3,047	24,460	415,444	223,933	42,056	181,718	42,267
San Antonio & Aransas Pass	724	176,285	76,519	272,801	45,751	42,041	8,081	154,637	.....	11,943	262,252	10,549	9,828	526	10,588
San Pedro, Los Angeles & Salt Lake	1,154	700,053	291,549	1,082,144	111,558	136,920	32,472	262,089	21,746	26,677	590,637	491,506	49,269	442,212	121,007
Seaboard	3,449	1,342,728	355,691	1,890,601	239,462	299,320	70,311	646,867	8,613	67,423	1,331,996	558,606	91,708	465,604	.....
Southern	7,027	3,658,236	1,453,926	5,678,124	601,357	958,263	158,245	1,853,046	39,323	172,584	3,755,479	1,922,645	249,848	1,666,255	526,820
Southern Pacific	6,950	7,118,437	2,534,412	10,568,130	1,028,869	1,281,131	175,871	3,299,790	153,804	230,865	6,107,752	4,460,379	448,202	4,008,483	681,839
Staten Island Rapid Transit Co.	11	54,814	30,688	114,756	16,019	10,017	955	40,752	.....	1,972	69,713	45,043	5,500	39,538	—9,568
Tennessee Central	294	96,884	34,921	140,052	18,487	21,846	5,516	47,125	.....	6,821	99,797	40,255	3,307	36,854	9,394
Terminal R. R. Ass'n of St. Louis	37	.....	1,920	265,906	36,279	16,883	876	79,611	.....	6,318	139,967	125,938	27,488	98,450	28,015
Texas & New Orleans	468	264,567	84,698	385,031	55,363	51,672	8,584	119,833	9,938	9,735	254,457	130,574	19,816	110,566	115,719
Texas & Pacific	1,944	943,369	362,938	1,458,835	92,560	279,676	44,497	639,527	7,797	57,576	1,118,360	340,474	72,000	262,994	236,856
Toledo & Ohio Central	436	419,033	49,983	507,250	81,785	133,488	7,404	178,726	1,624	11,405	414,432	92,818	25,831	66,972	—38,815
Toledo, Peoria & Western	248	52,824	33,495	102,362	16,387	18,563	2,608	37,160	.....	4,063	78,782	23,581	6,500	17,080	27,682
Toledo, St. Louis & Western	451	420,442	48,032	496,576	45,661	72,286	17,266	153,615	.....	8,914	296,958	199,617	7,126	189,755	127,724
Union R. R. of Baltimore	8	140,262	23,943	166,247	13,573	.....	.....	5,781	.....	2,187	21,540	144,706	6,017	138,689	56,515
Union R. R. of Pennsylvania	32	.....	.....	569,381	48,149	94,589	113	190,193	.....	4,723	337,589	231,791	8,501	223,291	3,235
Vandalia	917	695,520	222,958	1,041,300	164,760	222,365	27,617	371,419	12,773	29,689	828,624	212,676	40,363	172,235	29,803
Vicksburg, Shreveport & Pacific	171	73,845	38,082	125,247	22,362	32,860	3,614	38,743	2,045	5,967	105,322	19,925	11,185	8,255	1,507
Virginian	505	556,885	37,737	634,583	77,813	96,633	5,609	123,530	12,203	15,057	330,471	304,112	26,900	277,154	97,215
Wabash	2,519	2,094,816	630,659	2,992,061	297,986	491,427	99,834	1,065,157	20,779	69,393	2,625,271	966,790	94,344	872,121	743,764
West Jersey & Seashore	358	196,402	394,850	646,515	100,889	89,950	12,785	252,637	2,556	16,048	474,866	171,649	37,007	134,643	16,772
Western Maryland	689	831,588	86,495	993,162	102,517	158,536	20,936	272,482	9,817	22,758	586,363	406,800	35,240	371,362	103,024
Western Pacific	941	517,076	115,140	672,340	107,877	53,164	21,168	185,123	9,766	18,125	395,223	277,117	31,710	245,304	50,807
Western Ry. of Alabama	133	51,820	33,904	98,936	18,796	20,277	6,277	11,893	1,825	4,897	63,948	34,987	5,341	28,853	27,767
Yazoo & Mississippi Valley	1,382	889,380	187,146	1,134,885	112,372	153,892	21,394	403,056	1,698	33,557	723,880	411,006	71,588	339,348	116,470

"Safety First" Interrogatively

Is there not really a better slogan for Safety First than Safety First? The London Omnibus Company has decided to adopt in its place the suggestive question—IS IT SAFE?

The main idea underlying the words "Is It Safe?" is that if the question be mentally asked of oneself in a perilous moment, it instantly directs attention to the dangers present, wherein the instinct of self-preservation will assert itself, and this is in most cases all that is necessary to induce watchfulness and care. The slogan "IS IT SAFE?" was adopted by the Great Western Railway of England three years ago, and it is thought by the management that it meets with more general and hearty co-operation on the part of employees, than the American slogan "Safety First."—*The Frisco-Man.*

The Jersey City Disaster

Preliminary investigations of the "Black Tom" explosion of July 30, by agents of the Interstate Commerce Commission, have brought out no evidence of any violation of the commission's rules for the transportation and handling of explosives.

The Jersey City commissioners of public safety, dissatisfied with the meagre results of all investigations about the cause of the disaster, notified the railroads on August 1 that no explosives whatever would be allowed to come into the city; and policemen with red flags were stationed on the lines of all the railways at the city limits, to stop freight trains. A number of trains were stopped and the conductors were called upon to show their bills, revealing the contents of every car; but the railroads had voluntarily complied with most of the wishes of the city officers, and the embargo placed by the police had little effect.

On Sunday evening, August 6, one week from the time of the "Black Tom" disaster, a fire in the yards of the Lehigh Valley, not far from "Black Tom," destroyed a number of freight cars which, with their contents and other property, made up a loss said to aggregate $150,000. By the explosion of an empty tank car, which had contained naphtha, the residents in the vicinity were greatly alarmed, the impression being that a repetition of the "Black Tom" disaster was impending.

Ventilated "Side-Door Pullmans" in 1863

James McKenna, of Northampton, Mass., writing to the Springfield Republican, gives some experiences of 53 years ago, which are of interest in connection with recent criticisms of the accommodations afforded the state militiamen on their journeys from the eastern states to Texas. Mr. McKenna says:

I notice what Senator Warren of Wyoming had to say in the Senate regarding his experience, riding in freight cars on the return of his regiment, the 49th Massachusetts, from the Civil War. I knew the senator as a private of Company C, and I was a member of Company I of the same regiment, and recall our journey from New Orleans to Pittsfield.

On the 8th of August, 1863, the term of enlistment having expired, the regiment embarked at Baton Rouge on a steamer for New Orleans, expecting to take a steamer for New York. There it was learned that the expected transportation had been given to another command, and the 49th embarked on the steamer Temple for Cairo, Ill., which was reached on the 16th. Here we waited for cars, which arrived about noon on the 18th, and these, as the senator states, were "stock cars," and clean, with board seats lengthwise of the car; and about six inches of clean, sweet straw covered the car floor. To me the change from the dirty, ill-smelling steamer was very welcome. I sat at the door of the car till darkness came, viewing the country. Then, lying down in the straw, I knew no more till daylight came and we were at Mattoon, Ill., where the loyal, generous people gave us a good breakfast of sandwiches, eggs and coffee. Here about half the regiment were given passenger cars. Many of the "boys" rode on the tops of the cars—the stock cars were best for this—viewing the fields of corn which grew luxuriantly right up to the edges of the railroad. We stopped at dinner-time and were fed by the people. I remember one man coming into the car with a bushel of boiled eggs.

At Terre Haute, Ind., we were supplied with passenger cars—two men to a seat, which I found very cramped after the roomy stock cars. At night many had to be in the aisle to obtain sleep. We had dinner at Indianapolis, supper at Cleveland. Morning found us in Buffalo, N. Y., where breakfast awaited us. We had supper at Utica, and arrived in Albany about midnight. There we had coffee and sandwiches, after which we washed up and changed to our best.

About 6 a. m. of the 22d we crossed on the ferry boat to East Albany, where passenger cars awaited us with two locomotives run by two "Bills"—Horton and Thompson, both of Pittsfield. Arriving in Pittsfield about 10 o'clock a welcome awaited us that requires an abler pen than mine to do justice to.

Pennsylvania Railroad Assists Dependents of Employees in National Guard

Distribution of the funds needed for the relief of the families and dependents of Pennsylvania Railroad employees, who have been called into military service on the Mexican border, commenced July 31. The first instalment of the relief money will cover the month of July. Thereafter, payments will be made semi-monthly, as in the case of wages, and in all instances will be placed directly in the hands of the wife, mother or other beneficiary. The payments will be made out of the fund of $100,000 set aside by the board of directors for this purpose.

To insure the proper distribution of the relief money an individual inquiry under the direction of the division superintendent was made in the case of every one of the more than 800 employees of the Pennsylvania Railroad, who are now at the front. The inquiry showed that about 300 of the men under arms have families or other dependents who will require relief during the absence of the employees from their regular work.

In addition, the railroad is paying the dues of every member of the voluntary relief fund who is at the front, thus fully protecting his disablement and death benefits in his absence.

Several men, whose families will receive relief, had been on the payroll less than a week when their regiments were ordered to camp. One man had worked only three days for the railroad. In a number of other cases the length of service was less than a month. In many instances also, the employees were not members of the national guard, but voluntarily enlisted after the call of the President.

Employees' Movement to Prevent Trainmen's Strike

Within the last two weeks an important movement has been started on behalf of the more than 80 per cent of employees of railways who have no part in the threatened strike of the brotherhoods of train employees. It originated with Robert T. Frazier, Jr., an employee of the valuation department of the Nashville, Chattanooga & St. Louis, and its purposes are expressed in a petition which has already been signed by 5,500 of the 8,000 employees of that road who are outside the trainmen's brotherhoods. Though the movement was at first a local one, starting in the last days of July, it has already spread to northern roads, and is making vigorous headway among several of the larger systems leading out of Chicago. The petition in substance is as follows:

"We, the undersigned citizens of the state of ....., and among those comprising the more than 80 per cent of the employees of the railways of our state and country, being confronted with the possibility of an entire paralyzation of the railways of the country by the proposed general strike of the four orders of trainmen, a group of less than 20 per cent of the entire number of railway employees, and the consequent curtailment of income of us, the more than 80 per cent, to whom such a curtailment would be ruinous, and fully realizing that under this great government where the ruling doctrine is 'the greatest good to the greatest number,' we, the large majority, more than 80 per cent of the people to be directly injured by such destructive methods of the few who happen to be placed in a position where they can use them, have a clear and definite right to be protected (the general public and all other industries seriously endangered also having that right), do earnestly petition you, our senators and representatives individually and as the congress of the nation, and pray that some definite legislative action be taken whereby the vast majority of the people of the country shall be protected from a destructive interruption of interstate commerce due to wholly selfish action of a small group of men, and that all differences which may arise between railway and employee shall be settled by proper arbitration. In this way you would

recognize the fundamental principle of the republic that no small group of men ought to be permitted directly or indirectly to conspire to an end calculated to benefit them only, and directly or indirectly work wrong and loss upon the great majority."

In promoting this movement Mr. Frazier states his own position and that of other employees not included in the brotherhoods of trainmen, as follows:

"The trainmen involved in the present discussion represent only 16 per cent of the total number of the employees of the railways. They receive more than double the average wage of the remainder of us. If a strike is called, it means absolutely that all construction work will cease, all machinists' work in the shops must necessarily be suspended and the large majority of the maintenance and clerical forces also suspended. Sixteen per cent of the employees of one great industry, therefore, are, for selfish motives, threatening to paralyze that industry, thus undermining the source of livelihood of the other 84 per cent, to say nothing of the ruinous injuries to be wrought in all other industries of the country; and the 84 per cent has not been given a hearing.

"I am one of the 84 per cent of railway employees vitally interested in this question and ask for the right due us and the public for such a hearing. We have families depending upon us for support to such extent that our reserve is practically nothing. In other words, we must have an uninterrupted income to avoid acute financial distress. We are dependent upon the railways of America for this uninterrupted income, and if the income of the railways is materially curtailed, as it will be by this proposed strike, we, the 84 per cent, will suffer serious loss.

"We do not presume to say one way or the other whether the demands made by the 16 per cent should be granted or not; but what we do say is that this question so vitally involves the vast majority, the 84 per cent, who stand only to suffer loss as a result of the strike, that in justice to them and the great mass of the public, this question should be settled by arbitration. We should not be made to suffer for the purpose of obtaining an increase of pay (for that is the sum and substance of the demands) of that 16 per cent already receiving wages far in excess of the average received by us, the 84 per cent. We appeal to the sense of justice of the American people of whom we are, and with whom we rest our case, shall this injustice be permitted?"

The movement is confined wholly to employees. Beyond the necessary consent obtained from the managements for the circulation of the petitions, officials have declined to stand sponsor for it. The plan is to place the leadership in the hands of one employee of each road who individually and with the assistance of other employees attends to the circulation of the petition and the explanation of its purpose. It is stated that practically no opposition has been met from any source, so far as the movement has gone, even among relatives of trainmen. Among the 287 employees at one terminal of the N. C. & St. L., the petition was signed by all but two; and of less than 1,400 shop employees, 1,289 signed the petition.

Motor Boat for Inspector of Lighter Service

The inspector of lighter service in New York harbor for the Lehigh Valley Railroad now goes about in a 32-foot gasoline power boat, capable of making 12 miles an hour. The boat is named "The Scout," and the man who runs it has a pilot's license. Lighterage inspectors employed by all of the larger railroads check up the car floats, grain boats, lighters and barges placed in slips and at piers all around the New York and Brooklyn shores. They are men in authority who can solve problems for the boat captains and see that the boats are well managed and that no time is being wasted in loading and unloading. With the boat, this inspector replaces a number of "runners" and for the first time the Lehigh Valley has a daily report on all its boats. The result has been not only a saving financially but a considerable gain in traffic efficiency for the railroad and the shippers.

Freight Traffic Officers

The American Association of Freight Traffic Officers held its twelfth annual meeting at Hot Springs, Va., last week. George A. Blair, assistant freight traffic manager of the Chicago, Milwaukee & St. Paul was elected president of the association for the ensuing year, in place of Brent Arnold.

Railway Signal Association

Final arrangements for the annual convention of the Railway Signal Association to be held at Mackinaw Island, Mich., from September 12 to 14, are rapidly nearing completion. A circular issued by the association contains information concerning transportation to the convention of value to those contemplating the trip. Special accommodations for delegates and their friends on trains from the East, West and South have been arranged.

The subjects which will be presented by the committees for discussion at the convention are as follows:

Harmonizing Committee.—Harmonizing of Specifications. General Provisions of Specifications for Signal Installations. General Electrical Requirements. Detail Provisions.

Committee I.—Signaling Practice. Requisites for Switch Indicators (Revision). Capacity of Single Track (Second Installment). Analysis of the Signal Schemes. Semaphores in the Left-hand Quadrant.

Committee VI.—Standard Designs Standard Drawings (New and Revised).

Committee IX.—Wires and Cables. Definition of Principal Terms Used in Wire and Cable Specifications. Specifications for Aerial Aluminum Cable Steel Reinforced. Specifications for Friction Tape (Revision). Specification for Rubber Insulated Tape (Revision).

Committee X.—Storage Battery and Charging Equipment. Specifications for Lead Type Portable Storage Battery. Specifications for Composite Type Stationary Storage Battery. Standard drawings for use in connection with Storage Batteries, as follows: 1174, Line Charging Panels (Revised). 1175, Hydrometer (New). 1343, Concrete Storage Battery Box (Revised). 1379, Generator Charging Panel for 600 Volts or less (New). 1420, Circuits for Line Charging Panels (New).

Committee VII.—Direct Current Relays. Recommendations as to Resistances in Relays.

Committee VIII.—Electric Railways and A. C. Signaling. Historical Data on A. C. Signal Installations. Specifications for Single-Phase Line Transformers. Specifications for Alternating Current Relays.

Special Committee.—Electrical Testing. Progress Report on Relay Post Marking.

Committee IV.—D. C. Automatic Block Signaling—Low Voltage. Specifications for Capping and Trunking. Specifications for D. C. Automatic Block Signaling. Specifications for Installation of Fibre and Metal Conduit.

Committee II.—Mechanical Interlocking. Specifications for Mechanical Interlocking (Revised). Standard Drawings for Turns in Pipe Lines, etc. Specifications for Electro-Mechanical Interlocking Requirements for Protection of Traffic at Movable Bridges

Committee III.—Power Interlocking. Specifications for Petroleum Asphaltum. Typical Circuit Plans for Electro-Pneumatic Interlocking.

Proposed Amendment to the Constitution.—Article IV, Section 1. Dues.

American Electric Railway Association

The thirty-fifth annual convention of the American Electric Railway Association and its affiliated associations—the American Electric Railway Accountants' Association; the American Electric Railway Engineering Association; the American Electric Railway Claims' Association, and the American Electric Railway Transportation and Traffic Association—will be held at Atlantic City, October 9 to 13, 1916.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, New Orleans, La.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Annual meeting, August 16-18, 1916, Memphis, Tenn.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, New Orleans, La.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago. Annual meeting, August 24-26, 1916, Hotel Sherman, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS. Chas. Warren Hunt, 220 W. 57th St., New York. Regular meteings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next meeting, August 15-17, 1916, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, August 29 to September 1, Hotel Sherman, Chicago.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 12-14, 1916, "The Breakers," Atlantic City, N. J.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Annual meeting, October 3-5, 1916, New York.

RAILWAY REAL ESTATE ASSOCIATION.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 11-13, 1916, Chicago.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 12-14, 1916, Grand Hotel, Mackinac Island, Mich.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Washington, D. C.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEWARK.—Roy S. Bushy, Firemen's Bldg., Newark, N. J. Regular meetings, 1st Monday in month, except July and August, The Washington, 559 Broad St., Newark.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agent, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—W. S. Crilly, 620 South 7th St., St. Louis, Mo. Annual meeting, December 5, 1916, Noonday meetings, October to May.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next meeting, September 5-8, 1916, Hotel Sherman, Chicago.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

WESTERN SOCIETY OF ENGINEERS.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The Cleveland, Cincinnati, Chicago & St. Louis now runs passenger and sleeping cars through between Chicago, Ill., and Cairo.

The total freight passing through the Sault Ste. Marie canals during the month of July was 14,048,404 short tons, of which 2,969,953 tons were westbound, and 11,078,451 eastbound.

The Louisville & Nashville announces that, beginning September 1, it will sell mileage books at two cents a mile. Hitherto the company has accepted only those books of form "Z Z," or the "Penny Script" book, the prices of which are 2.5 cents a mile and 2.4 cents a mile, respectively.

A steamship load of Australian zinc concentrates consigned to the American Steel & Wire Company at Donora, Pa., arrived at San Francisco recently and was transferred into 141 cars and forwarded overland by the Atchison, Topeka & Santa Fe in four solid trains. From Chicago the freight went by the Pittsburgh, Cincinnati, Chicago & St. Louis. It is understood that this steamer will be followed by many others with similar shipments.

The New Zealand Shipping Company has established new steamship service through the Panama Canal, the first passage having been made on July 15 by the passenger steamship "Remuera" on the way from Wellington to London. This company's service has heretofore been around the Cape of Good Hope on the outward voyage from Great Britain, and around Cape Horn on the return voyage, the vessels going completely around the world on each voyage. It was intended to make use of the canal route some time ago, but the disturbance of conditions by the European war and the later closing of the canal had deferred the adoption of this route. The company has reported its intention of building new ships for the canal service.

The government egg car is touring Indiana. This car, in which the United States Department of Agriculture educates the farmers in egg candling, packing and chilling, is now on a tour over the lines of the Chicago, Indianapolis & Louisville in Indiana. The itinerary extends from Borden, August 7, to Sheridan, August 28. The demonstration car is in itself a complete refrigerating plant on wheels, with its own gasoline engine for operating the refrigerating blowers, which in the course of half an hour can lower the temperature of the cold room to 32 degrees. By the aid of models, shippers and railroad men are shown methods of stowing cases in cars so as to minimize damage in transit. Nine per cent of the eggs shipped to New York City alone are now cracked or mashed on the road, an enormous waste which raises the price to the consumer without benefiting the producer in any way. The government has carried out elaborate tests of different methods of stowing, and those that have been found most successful are discussed by the experts in charge. Information is given on the dressing, grading, precooling and packing of poultry.

Continued Congestion on the New Haven

The New York, New Haven & Hartford has notified the New York State Public Service Commission of a temporary increase in the rate of demurrage on freight cars, taking effect July 31 and expiring September 29. After five days the rate is to be $5 per car per day. Taking effect September 6, there will be an increase in the rate of storage on cotton in freight houses. The rate per day for the first 3 days will be five mills per 100 lb., minimum charge 25 cents; for the next five days 1 cent, and after eight days 2 cents per 100 lb.

The New Haven has given notice that the embargo which was placed July 26, for only one week, on freight from the west and south, has been continued until further notice.

EXPORTS TO SOUTH AMERICA DOUBLED.—Exports from the United States to South American countries were more than doubled during the past year.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Chamber of Commerce of Milwaukee has filed a complaint with the Interstate Commerce Commission against increased rates on grain from Milwaukee to Buffalo and eastern points via the Great Lakes Steamship Line for export.

The Interstate Commerce Commission issued special orders on August 1, suspending, until November 29, numerous freight rate increases which were to have become effective on August 2. The suspensions include tariffs of western carriers increasing the minimum carload weight on oats from 30,000 to 40,000 lb., and on wheat flour from 40,000 to 64,800 lb. Other rates suspended include increases ranging from 1 to 3½ cents per hundred pounds on linseed oil products from Minneapolis, Minn., to various destinations, increases from ½ to 3½ cents per hundred pounds on lumber and forest products from Maine and points in Canada to New England and eastern New York, increases from 3 to 7 cents per hundred pounds in class rates from Maryland and Delaware to western lake ports and Minneapolis, and increases on grain from Indianapolis, moving via Cincinnati, by the cancellation of a commodity rate of 6.3 cents per hundred pounds.

Fruits and Vegetables from Texas Points

Opinion by Commissioner Hall:

Following The Ogden Gateway Case, 35 I. C. C., 131, the proposed cancellation of joint carload rates on fruits and vegetables from producing points on the St. Louis, Brownsville & Mexico in connection with the San Antonio, Uvalde & Gulf, International & Great Northern, Texas & Pacific, St. Louis, Iron Mountain & Southern, and Missouri Pacific, through Odem, Tex., is found to have been justified. (40 I. C. C., 673.)

Switching at Louisville, Ky.

Louisville Board of Trade v. Louisville & Nashville. Opinion by Commissioner Clark:

At Louisville, Ky., the Louisville & Nashville refuses to switch traffic for which it competes between connecting lines and industries located only on its tracks. It switches such traffic, however, between those industries and the Chesapeake & Ohio under a contract with the latter carrier:

The commission holds that the proviso in section 3 of the act is intended to protect a carrier's terminals against use by a competing carrier engaged in like business when granting such use would deprive the owning carrier of a road haul which it is prepared to perform, and is not limited to the question of physical entry upon such tracks or facilities of the power, equipment or employees of another carrier. Louisville, Nashville & Central Stock Yards Company, 212 U. S., 132.

It finds, however, that the switching for the Chesapeake & Ohio and the refusal to switch for all other connecting carriers at Louisville is unduly preferential of the former and unduly prejudicial to the latter, their patrons and their traffic.

Commissioners Meyer, Hall and McChord dissent. (40 I. C. C., 679.)

Cars for Meats from Argentina

B. Frankfeld & Co. v. New York Central et al. Opinion by the commission:

The complainants, importers and dealers in beef, mutton, lamb, etc., produced in Argentina and imported through New York, allege that the trunk lines violate the act in that among other things, they fail to furnish suitable cars for the shipment of chilled meats. The meats imported by complainants are fresh, and are either chilled or frozen, the former having a temperature of 29½ to 30½ deg. and the latter from 15 to 20 deg. Fahrenheit. Frozen meats may be piled in vessel or car and offer no peculiar difficulties in transportation, requiring only clean equipment and ordinary refrigeration. Chilled meats cannot be piled, but must be suspended from hooks. The refrigerator cars owned by the larger American meat-packing companies are equipped with hooks which when in use depend from rails which sustain the car lading. Those cars are also provided with racks which prevent the meat, whether frozen or chilled, from coming into contact with the car floors, this or some similar protection being required by governmental regulation. The refrigerator cars owned by the defendant railway companies are not equipped with either rails or hooks, with the exception of about 140 cars owned by the New York Central, which are provided with rails only.

The commission finds that the refusal of defendants to provide cars specially equipped with hooks and racks is not unreasonable. Commissioner McChord dissents. (40 I. C. C., 555.)

Passenger Fares Between St. Louis and Points in Illinois

Business Men's League of St Louis v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner Daniels:

Before the increase of one-half cent per mile in interstate fares and 5 per cent in interstate rates following the Five Per Cent case, 31 I. C. C., 351, the passenger and freight charges between St. Louis and stations in Illinois were substantially the same as between East St. Louis, Ill., and the same Illinois points. A failure to increase correspondingly the intrastate fares and rates in Illinois has resulted in charges between Illinois points and St. Louis and East St. Louis which it is alleged constitutes discrimination. In this case only the passenger fares are considered, freight rates being left for a separate report.

The passenger fares between St. Louis and the Illinois points have been since December 1, 1914, following the Five Per Cent case, generally on a basis of 2½ cents per mile for the distance within Illinois plus a charge of 25 cents for crossing the bridge over the Missouri river at East St. Louis of 35 cents at Granite City. The fares between East St. Louis or Chicago and the same points, on the other hand, are on a basis of 2 cents a mile, which is the maximum prescribed by the legislature of Illinois by act of July 1, 1907. Previous to December 1, 1914, the fares between St. Louis and Illinois points were upon almost the same basis as those from East St. Louis.

The carriers admitted that unlawful discrimination exists, but insisted that the commission is the only body that can authoritatively pass thereon; that they were not responsible for creating it; that they had made repeated and unsuccessful appeals to the legislature, the governor and the people of Illinois to raise the 2 cents a mile maximum passenger fare. They further insisted that their present interstate passenger fares are reasonable and that the discrimination should be removed by an increase in the intrastate fares.

The commission holds that the passenger fares for travel between St. Louis and points in Illinois are reasonable maximum fares where they are not in excess of 2.4 cents per mile, plus the tolls over the Mississippi river bridges. It finds, nevertheless, that the rates from St. Louis are discriminatory and that the maintenance between East St. Louis, Madison, Ill., and Granite City, Ill., and Illinois points by intrastate routes of fares lower than those maintained between St. Louis and the same Illinois points via the same routes by more than the present bridge tolls, gives unreasonable preference to the three Illinois points and subjects St. Louis to undue disadvantage; whereby there is an unreasonable burden on interstate traffic.

Similar findings are made as to the rates between Keokuk, Iowa, and points in Illinois.

It further finds that passenger fares between St. Louis and Keokuk and points in Illinois are discriminatory as against St. Louis and Keokuk and preferential in favor of Chicago to the extent that the fares between St. Louis and Keokuk and the Illinois points exceed the fares between Chicago and those same Illinois points, where the distances are approximately equal, by more than a reasonable bridge toll.

The commission also holds that intrastate fares on the reasonably direct lines intermediate to Chicago, Ill., at the north and St. Louis, Mo., and Keokuk, Iowa, on the south and southwest impose an unlawful burden on interstate commerce in case the basis of such fares per mile is less than the basis per mile for fares for interstate passenger travel between Keokuk, Iowa, and St. Louis, Mo., and Illinois points situate in the general territory first described and reached by reasonably direct routes of defendants herein, bride tolls excepted. (41 I. C. C., 13.)

STATE COMMISSIONS

The New York State Public Service Commission, Second District, has denied the petition of the New York Central for a rehearing on its application for authority to increase passenger fares, recently denied. The commission calls attention to the fact that, in its order, it did not hold reasonable all of the existing fares which the company proposed to change, and that another application, less sweeping, would be entertained.

COURT NEWS

The Union Pacific has filed suit in the United States court at Des Moines, Iowa, asking that the Chicago, Rock Island & Pacific be enjoined from using the Union Pacific tracks from Kansas City, Mo., to Topeka, Kan. The Rock Island acquired this trackage right by the purchase of the old Chicago, Kansas & Nebraska line, which had made an agreement with the Union Pacific for the use of the tracks, providing, according to the Union Pacific's allegation, that passengers should not be taken on between those points. It is stated that now the Rock Island is building a station at Kansas City, Kan., with the intention of handling freight traffic at that point.

Duty Towards Trespassing Live Stock

The Wyoming Supreme Court holds that, while trainmen are held to ordinary care to avoid killing stock, their duty does not arise with reference to trespassing livestock until the perilous condition of the latter is discovered, when they are under the duty merely to avoid unnecessary injury to the stock.—Burlington v. Cash (Wyo.), 157 Pac., 701.

Damages for Delay in Transportation

The Texas Court of Civil Appeals holds that, under the statute requiring a carrier to transport freight destined to or over any connecting railroad under regulations prescribed by the Railroad Commission, and making carriers failing to comply therewith liable for "damages sustained" and a penalty, the commission has no power to prescribe the damages recoverable.—Quanah, Acme & Pacific (Tex.) 184 S. W., 232.

Liability for Flooding

In an action for damages for flooding the plaintiff's property on account of the raising of a railroad embankment, the Arkansas Supreme Court holds that if the gutters, as they existed at the time the embankment was raised, were sufficient to take care of the water, the railroad would not be rendered liable by the fact that they were subsequently allowed to fill up so as to incapacitate them from doing so. There was no duty by the railroad to clean out the gutter in front of the plaintiff's property.—L., N. O. & Tex. (Ark.) 184 S. W., 450.

Land Grant for Limited Term—Compensation

A railroad may accept a conveyance of land on any condition that may lawfully be annexed to an ordinary grant; and when land was granted to the San Francisco & San Jose for a right of way for the term of its incorporation (50 years), and its successor elected to continue its use after the expiration of that time, the California District Court of Appeals, First district, holds that the owner of the estate in reversion was entitled to compensation at that time.—East San Mateo Land Co. v. Southern Pac. (Cal.), 157 Pac., 634.

Relief from Overflow

In injunction proceedings to compel a railroad to abate obstruction of a public drainage ditch by substituting an open span for piles therein, the record did not conclusively show that the railroad could not keep débris from catching on the piles and obstructing the ditch; and the cost of an open span would be $15,000. The Kentucky Court of Appeals directed the court below to retain control of the case until it could be determined whether obstructions could not be prevented by the railroad by other means.—L. & N. v. Franklin (Ky.), 186 S. W., 643.

Injuries on Freight and Mixed Trains

The Springfield Court of Appeals, Missouri, holds that the rule of res ipsa loquitur applies to injuries received by passengers from sudden jerking of freight or mixed trains only when the facts disclose such an extraordinary jerk or jar as would not happen if those in charge had exercised high care, and these facts must be alleged and proved. Travelers on such trains assume the risk of injury from sudden or more or less violent stops, jolts and jars usual in their operation.—Provance v. Missouri Southern (Mo.), 186 S. W., 955.

Overheating Stock in Pen

In an action for damages for hogs condemned by the government inspector, the Springfield Court of Appeals, Missouri, holds that evidence that the hogs were overheated in the railroad's pen before being loaded and shipped, which failed to connect the overheating with the condemnation, was insufficient to sustain a verdict for the plaintiff. There was but one stock train a day, at 8 a. m. It was held that whether the plaintiff's putting the hogs in the pen on the morning of the 18th, with the intention not to ship them until the morning of the 19th, was an unreasonably early time before shipment, relieving the carrier of the relationship of insurer or carrier of freight, was for the jury under the evidence, the temperature ranging between 65 and 70 degrees Fahrenheit.—McSpadden v. Lusk (Mo.), 186 S. W., 731.

Crossing Accident—Licensees

In an action for death from being struck by a fast moving backing engine at a footpath, which was not a public crossing, the Mississippi Supreme Court holds that where pedestrians continued to use a street, though it was discontinued and not used by vehicles, a plank having been placed to facilitate crossing the tracks, the railroad was charged with knowledge of the use of the crossing, and though one using it might only be a licensee, the company owed him the same duty it owes one crossing at a public crossing; and warnings of the approach of trains should be given, though the company was under no statutory duty to do so. At the same time persons crossing the tracks at such a place are bound to look out for trains. It was held that the questions of negligence of the railroad and contributory negligence of the deceased were for the jury. Any contributory negligence of the deceased would, it was held, only diminish the amount of the verdict. The action, by the deceased's widow, was for $25,000, and the jury gave a verdict for $5,000. The amount of the verdict led the court to believe the jury took into consideration the contributory negligence of the deceased, and the judgment was affirmed.—Illinois Central v. Dillon (Miss.), 71 So., 809.

Shipper Presumed Aware of Limitation of Liability

The New Mexico Supreme Court holds that it is not necessary that a bill of lading should bear on its face any freight rate so as to give the shipper notice of a limitation of liability. A shipper is conclusively presumed to know the shipping rate according to the printed and posted tariffs filed with the Interstate Commerce Commission. It is beyond the power of the carrier or the shipper to contract for a different rate, and the rate automatically attaches to each and every shipment. The court quoted Kansas City Southern v. Carl, 227 U. S., 639, as follows: "The valuation the shipper declares determines the legal rate where there are two rates based upon valuation. He must take notice of the rate applicable, and actual want of knowledge is no excuse. The rate, when made out and filed, is notice, and its effect is not lost, although it is not actually posted in the station."—Enderstein v. Atchison, T. & S. F. (N. Mex.), 157 N. W., 670.

Limitation of Liability—Partial Invalidity of Contract

A contract for the interstate transportation of livestock written on the customary printed form contained a provision that no action should be maintained to recover damages unless commenced within six months. It contained, also, a number of provisions by which the carrier sought to limit its liability for loss occasioned by its own negligence which are against public policy and unenforceable. In an action for damages re-

sulting from delay in transportation, the Kansas Supreme Court holds that the contract is not void in toto on the ground that it violates section 20 of the Commerce Act; that the contract should be regarded as divisible in view of its general use by interstate carriers with the approval of the Interstate Commerce Commission, and therefore the plaintiff's failure to commence his action within six months after the loss or injury occurred bars his right to recover.—Miller v. Atchison, T. & S. F. (Kan.) 156 Pac., 780.

Accident on Private Siding

In an action against a railroad for the death of a car trimmer in the employ of a mine, while a car was being placed beneath a tipple at the mine's private track, it appeared that it was the trimmer's duty to be on and about the cars when the railroad's crew approached, but it was not shown that he was required to be on the car while the railroad was engaged in placing cars in proper position under the tipple. It also appeared that he had no duty in connection with the cars which were being removed; and had been ordered to get off the car, and had got off. The Kentucky Court of Appeals held that the train crew had the right to presume that he would stay off, and were not required to anticipate that he would go to the other end of the car, to the brake; or to be on the outlook to see if he did get on the car; and the railroad was not liable for his death by being thrown down from the car when the other cars were pushed against it.—Gibson's Admr. v. L. & N. (Ky.), 186 S. W., 172.

Limited Liability for Acts of Sleeping Car Employees

The employees of a Pullman car are deemed agents of the railroad company only as between the railroad and its passengers, as these employees have no control over the management of the train; and this agency does not exist with respect to trespassers. Two men, wishing to go from Louisville to Nashville, without paying the regular fare, paid a dollar to an employee in the yards at Nashville to "square them through." On his advice, they got on the tender, and thence to the top of a coach, where they rode until the train entered Nashville. When near the station they climbed down from the roof of the rear coach, a Pullman sleeper, to its rear platform. Here they encountered the conductor of the car, who, by threatening to strike them with his lantern, compelled them to jump off while the train was passing over a high trestle. One of them was fatally injured. In an action against the railroad for his death there was nothing to show that he was about to annoy Pullman passengers, or even to enter the car, and the act of the conductor was a purely personal matter of his own. The Supreme Court of Tennessee held that the railroad company was not responsible for the act of the Pullman car conductor, for he was not its agent or servant.—L. & N. v. Marlin (Tenn.), 186 S. W., 595.

Passengers on Freight Trains—Kansas Statute

The Kansas Supreme Court holds that it is within the power of the Legislature to require railroads to carry passengers on freight trains, and to fix the measure of their responsibility for injuries suffered by passengers choosing that mode of travel; and under the provision of the Kansas statute of 1909, providing that on such trains the railroad companies shall only be liable for their gross negligence, one who takes passage on a freight train has no right to expect greater precautions for his safety than slight care, the recognized meaning of "gross negligence" being the failure to exercise slight care. In an action for personal injuries sustained while attempting to board a local freight train, it appeared that the plaintiff could not get a ticket from the agent, who was busy unloading freight until the train started. The brakeman told him to get on, as they were leaving; and the train was moving slowly. He attempted to swing on to the way car as it passed, just after the conductor and brakeman had done so and he claimed the train jerked and he was thrown down and injured. The trial court ignored the statute and instructed the jury on the old theory that the railroad would be liable if it had been guilty of ordinary negligence towards the plaintiff; and the jury gave a verdict for the plaintiff. On appeal, this was held to be erroneous, and the cause was remanded for a new trial.—Jones v. Atchison, T. & S. F. (Kan.), 157 Pac., 399.

Railway Officers

Executive, Financial, Legal and Accounting

K. E. Hamlin has been appointed freight claim agent of the Western Maryland, with headquarters at Baltimore, Md.

R. E. Kimbell, assistant to the president of the St. Louis Southwestern, has been appointed assistant to the first vice-president, with headquarters at St. Louis, Mo., effective August 1.

A. D. Gray, cashier of the Atchison, Topeka & Santa Fe, has been promoted to office assistant to the treasurer to take the place of A. O. Wellman, deceased, with headquarters at Topeka, Kans. H. B. Fink, assistant paymaster, has been promoted to cashier with office also at Topeka.

George W. Oliver, assistant statistician of the Atchison, Topeka & Santa Fe, has been promoted to statistician, with headquarters at Chicago, Ill., to succeed James Peabody, deceased. The department of statistics will become a part of the accounting department, and the statistician will report directly to the general auditor, effective August 1.

James M. Herbert, whose election as first-vice-president of the St. Louis Southwestern has been noted, was born on January 15, 1863, at Delmont, Pa. He was educated in public and high schools of Westmoreland county, Pa. He first entered railway service in 1880, as night telegraph operator of the Wabash, St. Louis & Pacific. Since that time, he has been consecutively station agent, yard clerk, train despatcher, chief train despatcher and trainmaster of the same road; trainmaster of the eastern division of the Grand Trunk, at Island Point, Vt.; trainmaster of the same road at Belleville, Ont.; superintendent of the eastern division of the same road at Montreal; superintendent of the Kansas and Colorado divisions of the Missouri Pacific at Osawatomie, Kan.; general superintendent of the St. Louis, Iron Mountain & Southern; manager of the Pacific system of the Southern Pacific; general manager of the Denver & Rio Grande and the Rio Grande Western; vice-president and general manager of the Colorado & Southern and first vice-president of the same road, and president of the Colorado, Wyoming & Eastern. As first vice-president of the St. Louis Southwestern, he will have headquarters at St. Louis, Mo.

Operating

W. B. Brown has been appointed car service agent of the Canadian Pacific, Atlantic division, with office at St. John, N. B., succeeding E. J. Worth, transferred.

A. A. Zion, superintendent of the Indianapolis Union Railway, who was granted a leave of absence several months ago, has retired on a pension. P. J. Landers, acting superintendent and engineer maintenance of way, has been appointed superintendent, vice Mr. Zion, effective August 1.

C. E. McLaughlin has been appointed superintendent of the Minot division of the Great Northern, with headquarters at Minot, N. D., vice F. D. Kelsey, promoted. R. A. McCandless, division superintendent at Great Falls, Mont., has been transferred to the Dakota division, with headquarters at Grand Forks, N. D., vice C. E. McLaughlin, transferred, effective August 1.

C. A. Vermillion, superintendent of car service and telegraph of the Spokane, Portland & Seattle, Oregon Electric, Oregon Trunk, United Railways, Spokane & Inland Empire, and Pacific and Eastern, has been promoted to superintendent of the Spokane, Portland & Seattle, Oregon Electric, Oregon Trunk and United Railways, with headquarters at Portland, Ore., vice G. E. Votaw, resigned. H. M. Huston has been appointed superintendent of car service and telegraph in place of Mr. Vermillion, promoted, effective August 1.

F. J. Byington has been appointed superintendent of the Peninsula division of the Chicago & North Western, with headquarters at Escanaba, Mich., vice C. E. Andrews, deceased. J. W. Layden has been appointed superintendent of the West Iowa division, at Boone, Iowa, vice Mr. Byington, promoted. A. J. Worthman has been made assistant superintendent of the Madison division,

with office at Baraboo, Wis., vice Mr. Layden. R. J. Hall, chief train despatcher, at Belle Plaine, Iowa, has been appointed trainmaster at Adams, Wis., in place of A. J. Worthman, promoted.

Traffic

Thomas L. Beckwith has been appointed general agent of the Seaboard Air Line at Havana, Cuba, effective July 25.

Orno M. Brown has been appointed general agent of the El Paso & Southwestern System and the Morenci Southern, with headquarters at Cleveland, Ohio.

Warren K. Cundiff, assistant general passenger agent of the Union Pacific at Kansas City, Mo., has been transferred to Denver, Colo., vice R. S. Ruble, deceased.

C. N. Gray, commercial agent of the Gulf Coast Lines with office at Shreveport, La., has been transferred to Oklahoma City, Oklahoma., the Shreveport agency having been abolished.

James P. Dervin has been appointed chief of the tariff bureau of the New York Central, lines east of Buffalo, with headquarters at New York, to succeed N. D. Chapin, resigned to engage in other business.

John C. Haile, whose appointment as passenger traffic manager of the Central of Georgia, with headquarters at Savannah, Ga., has already been announced in these columns, was born at Camden, S. C., and began railroad work in 1875 as a clerk in the general freight office of Richmond & Danville. He remained in that position until November, 1879, when he became chief clerk to the assistant general freight and passenger agent at Columbia, S. C. From October, 1886, to December, 1889, he was agent of the same road at Columbus, Ga., and then to July, 1892, was local and soliciting agent of the Central Railroad of Georgia at Columbus. In July, 1892, he was appointed general passenger agent of the same road, now the Central of Georgia, which position he held at the time of his recent appointment as passenger traffic manager of that road, with headquarters at Savannah, Ga., as above noted.



J. C. Haile

K. A. Moore, commercial agent of the Cleveland, Cincinnati, Chicago & St. Louis at Kansas City, Mo., has been appointed commercial agent of the New York Central Fast Freight Lines, with headquarters at Cincinnati, Ohio, effective August 1. This is a newly created position.

C. E. Veatch, assistant general freight agent of the Missouri & North Arkansas, has been promoted to assistant general freight and passenger agent, with office at Harrison, Ark. M. L. Schultz has been appointed commercial agent, with headquarters at Chicago, Ill. W. L. Monson has been appointed commercial agent, with office at Little Rock, Ark. W. J. McMahon has been appointed commercial agent, with headquarters at New Orleans, La. L. C. Williams has been made commercial agent, with office at Wichita, Kan., effective August 1.

J. O. Goodsell, city passenger agent of the Union Pacific System, at Chicago, Ill., has been promoted to assistant general passenger agent of the Union Pacific, with headquarters at Kansas City, Mo., vice W. K. Cundiff, transferred. Mr. Goodsell is 43 years old, and started his railroad career with the Union Pacific on October 8, 1890. He first entered the passenger department on July 10, 1895, and has remained in that department ever since. During his career he has been stationed successively at Omaha, Neb.; Salt Lake City, Utah; St. Paul, Minn.; Toronto, Can.; Detroit, Mich., and Chicago.

N. R. Markle, commercial agent of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Milwaukee, Wis., has been transferred to Kansas City, Mo., succeeding K. A. Moore, resigned. W. W. Baum has been appointed commercial agent at Milwaukee, succeeding N. R. Markle. T. F. Murphy has been appointed commercial agent, with headquarters at Chicago, Ill. A. C. Braun has been appointed commercial agent, with office at Dayton, Ohio. J. H. Stevenson has been appointed commercial agent, with headquarters at Cairo, Ill., vice L. H. Mussman, transferred, effective August 1.

R. L. Simpson, general freight agent of the Southern Railway at Birmingham, Ala., has been transferred to Atlanta, Ga.; J. W. Hunter, assistant general freight agent at Mobile, Ala., has been appointed general freight agent, with office at Birmingham, Ala., vice Mr. Simpson; J. H. Andrews, division freight agent at Raleigh, N. C., has been appointed assistant general freight agent, with office at Mobile, vice Mr. Hunter; Thomas B. Dixon, commercial agent at Columbus, Ga., has been appointed division freight agent, with office at Columbus, and A. E. Dicks, freight soliciting agent at Raleigh, has been appointed commercial agent at Raleigh.

John T. Hendricks, whose appointment as traffic manager of the Western Pacific has been announced, was born at Shelbyville, Ind., on September 20, 1867, and entered railway service in April, 1886, with the Cincinnati, Hamilton & Dayton. From 1889 to November, 1905, he was, consecutively, traveling freight agent of the Atchison, Topeka & Santa Fe, at Cincinnati, Ohio; general agent of the International & Great Northern; general agent of the same road, the St. Louis, Iron Mountain & Southern and the Texas & Pacific in Texas, and general agent of the Union Pacific at Philadelphia, Pa. He was assistant general freight agent of the Western Maryland at Baltimore, Md., from November, 1905, to January 15, 1906, when he was appointed freight traffic manager. On November 1, 1912, he was made vice-president in charge of traffic of the same road, and on January 1, 1913, left the Western Maryland to become general traffic manager of the Missouri Pacific-St. Louis, Iron Mountain & Southern. In March, 1914, he went to San Francisco to become freight traffic manager of the Western Pacific. His appointment as traffic manager of that road, with headquarters at San Francisco, was effective on August 1.



J. T. Hendricks.

C. E. Hilsabeck has been appointed assistant general freight agent of the El Paso & Southwestern System and the Morenci Southern, with headquarters at El Paso, Tex., effective August 1. Mr. Hilsabeck was born in Woodford county, Ill., on July 5, 1877, and was educated in the public schools of Fairbury, Ill. He first entered railroad service on January 1, 1905, as a clerk in the general freight office of the Chicago, Rock Island & Pacific at Chicago. In December, 1909, he entered the employ of the El Paso & Southwestern as a rate clerk in the general traffic department at Chicago. He was promoted to chief clerk to the assistant general traffic manager at Chicago on January 1, 1914.

Engineering and Rolling Stock

W. R. Elmore has been appointed acting master mechanic of the Nevada Northern, with headquarters at East Ely, Nevada, effective August 1, vice H. Selfridge, resigned.

M. J. McCarthy, superintendent of motive power of the Baltimore & Ohio Southwestern and the Cincinnati, Hamilton & Dayton, at Cincinnati, Ohio, has had his jurisdiction extended over the western lines of the Baltimore & Ohio. A. K. Galloway, master mechanic of the Baltimore & Ohio, at Baltimore, Md.,

has been appointed general master mechanic of the northwest district and the Cincinnati, Hamilton & Dayton. P. H. Reeves, master mechanic of the Baltimore & Ohio Southwestern, at Chillicothe, Ohio, has been appointed general master mechanic of the southwest district. H. E. Greenwood, master mechanic, at Seymour, Ind., succeeds Mr. Reeves, and J. E. Quigley, master mechanic, at Flora, Ill., succeeds Mr. Greenwood. W. F. Harris, general foreman, at Storrs, Ohio, succeeds Mr. Quigley.

A. E. Dales, district master mechanic of the Canadian Pacific, with headquarters at Brandon, Man., has been transferred to the Fourth district, with headquarters at Edmonton, Alta., replacing A. West, transferred to Brandon.

E. J. Correll, division engineer of the Ohio division of the Baltimore & Ohio Southwestern, at Chillicothe, Ohio, has been promoted to district engineer maintenance of way of the southwest district, with headquarters at Cincinnati. C. H. R. Howe, division engineer of the Illinois divison, at Flora, Ill., has been transferred to a similar position on the Ohio division, with headquarters at Chillicothe. C. E. Herth has been advanced from assistant division engineer of the Indiana division, at Seymour, Ind., to division engineer of the Illinois division, at Flora, Ill. R. S. Welch, assistant engineer, at Cincinnati, has been transferred to the Indiana division, at Seymour, as assistant division engineer. R. W. Gabriel, assistant division engineer of the Ohio division, at Chillicothe, has been promoted to assistant engineer in the office of the district engineer maintenance of way, for the southwest district, with headquarters at Cincinnati. W. P. Abbott, assistant supervisor, Ohio division, with headquarters at Leesburg Ohio, has been advanced to assistant division engineer of the Ohio division, located at Chillicothe.

OBITUARY

A. B. Stickney, formerly president and receiver of the Chicago Great Western, died at his home in St. Paul, August 9, following a long illness. He was 76 years of age.

Edward Kent, member of the firm of Chalmers, Kent & Stahl, solicitors for the Santa Fe, Prescott & Phoenix lines of the Atchison, Topeka & Santa Fe, with headquarters at Phoenix, Ariz., died at Chicago on July 30 from a hemorrhage caused by the heat.

Robert S. Towne, president and treasurer of the Mexican Northern and the Potosi & Rio Verde, with office at New York, died on August 3 in that city at the age of 58. Mr. Towne was at the head of several corporations with large interests in Mexico, and was a director in many development enterprises.

Richard L. Preis, general storekeeper of the Texas and Louisiana lines of the Southern Pacific, died at Houston, Tex., on August 1, after an illness of a few hours. Mr. Preis was born at New Orleans, La., on January 29, 1855, and was educated in the grammar and high schools of that city. He first entered railway service on August 9, 1870, in the stores department of Morgan's Louisiana & Texas. From November, 1883, to May, 1907, he was storekeeper at New Orleans of the same road. In May, 1907, he was appointed general storekeeper of the Sunset Central Lines, with headquarters at Houston, Tex. He held this position up to the time of his death.

Harry A. Fabian, formerly from March, 1910, to November, 1915, manager of purchases and supplies of the New York, New Haven & Hartford at Boston, died on August 2 in New York City. He was born on October 16, 1876, at Montreal, Quebec, and began railway work on the Canadian Pacific in July, 1889. He served on that road as a clerk in the dining car department, passenger department and president's office until April, 1893, and then for a year was with the Canadian passenger agent of the Chicago, Rock Island & Pacific at Montreal. Then he was with the Northern Pacific for ten years, rising to the position of clerk to the president. In April, 1904, he entered the service of the New York, New Haven & Hartford as secretary to the president, and in December, 1906, was appointed assistant to president. He remained in that position until March, 1910, when he was appointed manager of purchases and supplies of the same road, and also of the Boston & Maine and the Maine Central.

Equipment and Supplies

LOCOMOTIVES

The Bingham & Garfield will purchase a Mallet type locomotive.

The Canton Railroad will soon purchase 2 switching locomotives.

The Gulf & Ship Island is in the market for a number of locomotives.

The Interstate Railway is inquiring for a number of passenger locomotives.

The Toledo-Detroit is in the market for a number of Consolidation locomotives.

The Duluth, South Shore & Atlantic is inquiring for prices on 1 Pacific and 2 Consolidation locomotives.

The Michigan Central is reported to have ordered 5 Pacific type locomotives from the American Locomotive Company.

The Cleveland, Cincinnati, Chicago & St. Louis has ordered 5 Pacific type locomotives from the American Locomotive Company.

The Russian Government has ordered 9 Mogul locomotives from the American Locomotive Company. These locomotives will have 11 by 16-in. cylinders, 33½-in. driving wheels and a total weight in working order of 37,000 lb.

FREIGHT CARS

The Bingham & Garfield is inquiring for 25 concentrate cars.

The Lehigh Valley has withdrawn its inquiry for 1,500 box car bodies.

The New York Central has issued inquiries for 1,000 box and 1,000 automobile cars.

The Delaware & Hudson has ordered 2 heavy platform cars from the Pressed Steel Car Company.

The Chesapeake & Ohio has given the Western Steel Car & Foundry Company an order to repair 250 box cars.

The Lutcher & Moore Lumber Company, Orange, Tex., has ordered 50 logging cars from the American Car & Foundry Company.

The Columbia Chemical Company, Barberton, Ohio, has ordered 3 40-ton dump cars from the American Car & Foundry Company.

The Diamond Gasoline Company, Kansas City, has ordered 10 10,000-gal. capacity tank cars form the American Car & Foundry Company.

The Sapulpa Refining Company, Sapulpa, Okla., has ordered 160 8,000-gal. capacity tank cars and 40 10,000-gal. capacity tank cars from the General American Tank Car Corporation.

PASSENGER CARS

The New York, New Haven & Hartford has ordered 4 all-steel dining cars from the Pullman Company.

The Philadelphia & Reading is preparing specifications for a number of passenger cars for suburban service.

The Cuba Company has ordered 2 combination mail and express cars and 4 second-class coaches from the American Car & Foundry Company.

The Mississippi River & Bonne Terre, reported in the *Railway Age Gazette* of July 21 as being in the market for passenger cars, has ordered 2 coaches and one baggage and mail car from the American Car & Foundry Company.

IRON AND STEEL

The Baltimore & Ohio has ordered 300 tons of bridge work from the American Bridge Company.

The Canadian Northern has ordered 15,000 tons of rails from the United States Steel Corporation.

The Seaboard Air Line has ordered 2 bridges, 800 tons, from the American Bridge Company to repair flood damage.

The Southern Railway has ordered 8 bridges, 700 tons, from the Virginia Bridge & Iron Company for flood repair work.

The New York Central has ordered 700 tons of steel from the American Bridge Company for a bridge in Youngstown, Ohio.

The Cincinnati, Hamilton & Dayton has ordered 300 tons of bridge work from the American Bridge Company for bridges in Ohio.

The Denver & Rio Grande has ordered 288 tons of bridge steel from the American Bridge Company for bridges in Colorado and Utah.

The St. Louis Southwestern has ordered 267 tons of bridge steel from the American Bridge Company for 2 single track pony truss spans.

MISCELLANEOUS

The New York Central has given an order to the Roberts & Schaefer Company, of Chicago, for the building of an automatic electric fireproof coaling plant at Adrian, Mich.

The Canadian Northern has awarded a contract to the Roberts & Schaefer Company, of Chicago for the rebuilding of a frame constructed automatic coaling plant at Rideau Junction, Ont., recently destroyed by fire.

The Illinois Central has awarded a contract to the Bedford-Nugent Company, North Evansville, Ind., for paving driveways and the Main street team yards adjacent to its tracks at Evansville, at a cost of about $9,000.

The Illinois Central has awarded a contract to A. Kilander & Co., Chicago, Ill., for the installation of a hot blast heating system in the extension to its machine shop at Waterloo, Iowa. The work will cost about $5,000.

The Oregon Short Line has awarded contracts to the Roberts & Schaefer Company, of Chicago, for a large three-track reinforced concrete automatic electric counter-balanced bucket coaling plant with sanding facilities, at Shoshone, Idaho.

Railways and the Wounded.—If the railway history of the present European war is ever written in adequate form, attention will certainly be paid to one aspect which is generally overlooked, even by those writers who realize the essential importance of railways in modern warfare. That is the extent to which the control of a railway system leads to the conservation of the man-power of an army. It is a truism that only a relatively small proportion of the deaths of soldiers in any campaign have taken place in battle. Disease and inability to attend speedily and promptly to wounds have claimed a far greater number. Thanks to the railway the percentage of wounded men who recover, and who can be sent back to the firing line again is continually on the increase. A sufficient and well-organized system of hospital trains, operating from suitable bases, nowadays enables the worst cases to be brought in a few hours from the field to the hospital best suited to the circumstances of the case, and in this way prompt medical attention or surgery has saved and is saving thousands of lives which would have been lost in an earlier period. Much suffering and death is also avoided by the fact that a modern Red Cross train provides one of the most perfect methods of transporting wounded that have as yet been devised. And not only does the railway thus conserve the fighting strength of an army, but it also enables a wounded man to return to the firing line in quicker time. It is pleasing to reflect that in addition to its role as a weapon of offense, the railway also serves as an instrument for the reduction of death and suffering.—*Railway Gazette, London.*

Supply Trade News

J. L. Terry has become associated with the sales department of the Q & C Company, New York. Mr. Terry has been in railway supply work but a comparatively short time. He was formerly on the Denver & Rio Grande. He was later appointed purchasing agent of the Denver, Laramie & Northwestern and subsequently served as superintendent and general manager.

The Pyle-National Company, Chicago, has begun the erection of a new manufacturing plant in the northwestern part of Chicago, adjacent to the tracks of the Chicago & North Western. The plant will cover six acres. The general offices of the company will be at the plant, but it will also maintain an office downtown. The new plant will be equipped with the most modern machinery to make all the company's products, including the Young locomotive valve, the Young valve gear, the Young reverse gear, also its various types of electric headlights. The plant and the ground occupied will cost nearly $500,000.

The Acme Supply Company, Chicago, announces the opening of its own offices in eastern and southeastern territory, effective August 15. William M. Wampler has been appointed eastern sales manager, and Franklin M. Nicholl, eastern and Canadian sales representative, with headquarters at 50 Church street, New York City. F. N. Grigg has been appointed southeastern sales manager, with headquarters in the Virginia Railway & Power building, Richmond, Va. E. S. Sullivan has been appointed sales representative, with headquarters at the Monadnock building, San Francisco, Cal.; W. F. McKenney, sales representative, with headquarters at 54 First street, Portland, Ore., and Bell & Jamison, sales representatives, with headquarters in the Hellman building, Los Angeles, Cal.

TRADE PUBLICATIONS

Air Compressors.—Bulletin 34-N recently issued by the Chicago Pneumatic Tool Company deals with the company's steam and power driven single compressors.

Great Northern and Chicago, Burlington & Quincy.—These companies have issued a 26-page, illustrated booklet describing the scenery of the Glacier National Park, and giving the cost of making a tour through it.

Locomotives.—Record No. 83 recently issued by the Baldwin Locomotive Works deals with Mikado type locomotives. The booklet in its 32 pages discusses the advantages of Mikado locomotives and illustrates and describes 27 locomotives of this type, representing a wide range in weight and capacity.

Colorado & Southern and Chicago, Burlington & Quincy.—These companies have issued a 24-page illustrated booklet describing the scenic attractions of Rocky Mountain National Park and Estes Park in Colorado, and containing the usual information concerning rates and accommodations to travelers.

Carolina, Clinchfield & Ohio.—This company has issued a 32-page booklet describing the attractions of the Blue Ridge and Cumberland mountains. The pamphlet is well illustrated with photographs and contains detailed information with reference to rates and accommodations to vacation seekers.

Storage Batteries.—One of the latest publications of the Electric Storage Battery Company, Philadelphia, bulletin No. 159, deals with the Ironclad-Exide battery for storage battery, mine and industrial locomotives. The booklet describes the batteries themselves and contains a score of views of storage battery locomotives.

Passenger Car Couplers.—The McConway & Torley Company, Pittsburgh, Pa., has recently issued a booklet dealing with its Pitt pivoted passenger coupler. The booklet describes the coupler, particular attention being given to its great flexibility in curving, and contains views of 45 passenger cars of various types, for 16 different roads, on which the Pitt coupler was specified.

Locomotive Stokers.—The Locomotive Stoker Company has recently issued catalogue 14-C, dealing with Street locomotive stoker applications. The book in its 60 pages shows the different types of locomotives to which these stokers have been applied, there being given photographs and specifications of 28 locomotives of different types built for 15 railroads. This is the fourth revision of this catalogue and brings it up to date.

Wood Construction and Fire Losses.—The National Lumber Manufacturers' Association, Chicago, has issued a 15-page booklet pointing out some of the errors in the commonly accepted ideas regarding the large fire losses resulting from timber construction and presenting a large amount of data regarding actual accurate comparisons. This book contains a large amount of information of value to those interested in wood construction from the standpoint of the fire hazard.

Pyrometers.—The Gibb Instrument Company, Pittsburgh, Pa., has issued a folder relative to the "I-Rite" for judging the temperature of metal undergoing treatment. The "I-Rite" is an instrument in appearance much like a pocket flash light. The person using it stands some distance from the furnace, and looks through it at the object the temperature of which is to be measured. A description of it appeared in the May, 1916, Railway Mechanical Engineer, page 262.

Gear Blanks and Miscellaneous Circular Sections.—The Carnegie Steel Company has recently issued a third edition of its booklet dealing with this subject. The booklet contains standard specifications, lists of dimensions, illustrations and drawings of forged and rolled gear blanks, industrial and mine car wheels, street and interurban railway wheels, pipe flanges and shaft couplings, automobile fly wheel blanks, crane track wheel blanks and piston blanks. The piston blanks for the manufacture of solid steel locomotive pistons are illustrated for the first time.

Steam Hammers.—The National Hoisting Engine Company, Harrison, N. J., has issued a 20-page catalog describing the National steam pile hammer. The booklet contains tables giving the dimensions and other characteristics of the five sizes of these hammers and is illustrated with photographs showing the hammers in use on various kinds of construction work. A 12-page pamphlet has also been issued describing the steam hammers No. 6 and No. 7, weighing 650 and 150 lb. respectively, which are designed especially for use in driving wood and steel sheet piling.

Camelogues.—Many of the readers of the *Daily Railway Age Gazette*, when they received their copies of the paper, turned first of all to read of the adventures of the Sheik Kahrdor and his ever faithful Camel Phixture, the railroad wonder. The Camel Company of Chicago has now reprinted the eight advertisements in the *Dailies* in booklet form. The eight pages are presumably the first attempt to adapt the Arabian Nights to railway supply advertising, but their success in drawing the reader's attention to the excellencies of the Camel car door fixture will not be questioned.

Heating and Ventilating Apparatus for Passenger Cars.—This is the title of a 144-page book, 9 by 12 in. in size, which has recently been issued by the Gold Car Heating & Lighting Company, New York. The book gives a complete description of the company's steam, vapor, hot water and electric systems for heating and automatically controlling the temperature of all types of railway cars, and also data concerning its ventilators. The apparatus which is included in the systems is illustrated and described in detail, and drawings are given, many of them in two or more colors, showing the application of each of the various systems.

Car Curtains and Curtain Fixtures.—The Acme Supply Company, Chicago, has issued Bulletin F-6, in which is introduced its new Acme Enclosed Groove F. P. Curtain Fixture No. 100. The interesting point in this fixture is the fact that it cannot be removed from its groove by the passengers. No pinch handles are required, and it can be operated from any point along the bottom of the curtain. Descriptions of the Crown and Gem curtain fixtures for use with open grooves, the Acme friction roller, and the special metal car curtain roller, are also contained in this bulletin as well as curtain fixtures for electric cars and interurban coaches.

Railway Construction

Baltimore & Ohio.—This company has awarded a contract to the Bates & Rogers Construction Company, Chicago, Ill., for grading, tunneling and masonry work on the Long Fork Railroad in northeastern Kentucky, to be built from a junction with the Chesapeake & Ohio at the forks of Beaver creek, in Floyd county, south up the left fork of Beaver creek to Weeksbury, Knott county, 26 miles. The work involves 450,000 yd. of excavation and embankment; the construction of five tunnels, from 140 ft. to 775 ft. in length, and 10,000 yd. of masonry work in connection with bridges and culverts. The maximum curvature is 10 deg. and the maximum grade with the traffic 1.9 per cent. The estimated cost of the work is $500,000. (June 30, page 1609.)

Central Florida Interurban.—Work will be started about September 1, on the first division of this projected electric line. The plans call for building from Melbourne, Fla., west via St. Cloud, to Kissimmee, thence north via Orlando to Sanford, about 100 miles. The company expects to develop a traffic in fruits, produce, lumber and naval stores. W. Hall, secretary, and Wylie & Reynolds, engineers, St. Cloud. (July 14, p. 89.)

Chatham Terminal Company.—Application has been made by this company with $50,000 capital and office at Savannah, Ga., for a charter, it is said, to build a railroad about 3 miles long from a connection with the Central of Georgia to the property of the Savannah Warehouse & Compress Company. The promoters include officers of the Central of Georgia, also T. M. Cunningham, Jr.; J. R. Anderson, O. R. Teague and C. W. Small of Savannah.

Glendale & Montrose.—The Great Western Improvement Company, San Francisco, Cal., has acquired this road and will extend the line to Sunland, La Ganada and Littlelands, about eight miles, if free right of way and sufficient bonus are offered by the unserved district. W. J. Bohon, general manager, Glendale, Cal.

Long Fork Railroad.—See Baltimore & Ohio.

North Carolina Roads.—The Whiteville Lumber Company, Whiteville, N. C., plans to carry out work to complete its line southeast to Reaves Ferry, it is said, and may extend the line 15 miles farther to Shallotte, in the southern part of Brunswick county. The company also has under consideration the question of building a line to connect with the Seaboard Air Line at a point about 12 miles north of Whiteville. Nathan O'Berry, president, Goldsboro, N. C.

Pennsylvania Railroad.—Bids will be asked for in the near future by the Pennsylvania Railroad for the construction of a tunnel under the canal feeder and tracks at Sullivan Way and West State street. The tunnel will be lined with reinforced concrete. The improvements are to be carried out to eliminate grade crossings.

RAILWAY STRUCTURES

Altoona, Pa.—A contract has been let to Philip Stadler, Altoona, for the construction of a three story brick building, 40 ft. by 56 ft., at Eleventh street, Altoona, for the Altoona & Logan Valley Electric Railway. The cost, including the ground for the site, will be $35,000.

Canton, Ohio.—The Wheeling & Lake Erie has commenced the construction of a three-story reinforced concrete and brick freight station, 42 ft. by 360 ft. The Turner Construction Company of Buffalo, N. Y., and Canton, Ohio, has the contract for the work. The building will cost approximately $90,000.

Charlotte, N. C.—The Southern Railway will start work at once rebuilding its bridge over the Catawba river, near Charlotte, destroyed by the recent flood.

Cedar Rapids, Ia.—The Chicago, Milwaukee & St. Paul will make terminal improvements at Cedar Rapids costing approximately $70,000.

Center Grove, Julien and Epworth, Iowa.—The Illinois Central is co-operating with the state and county engineers in the construction of two viaducts, one at Center Grove and the other at Julien, and a subway under the main line at Epworth. The work at Center Grove and at Epworth is now being done by company forces. The cost of these improvements together is estimated at $25,000.

Derry, Pa.—The Pennsylvania Railroad will start work shortly on a 14-stall roundhouse at Derry, costing about $75,000. The structure will be of brick and wood, and will have a wood block floor, wood rolling doors and built up roofing. The work will be carried out by W. F. Trimble & Sons Company, Pittsburgh, Pa.

Edmonton, Alta.—The Canadian Northern commenced the construction of a machine shop and store building in its yards on July 24. The machine shop will be a one-story structure, 61 ft. by 118 ft., with brick walls and concrete foundation, and will cost about $20,000. The store building will be two stories in height, 86 ft. by 48 ft., with brick walls and concrete foundation. It will cost approximately $31,700. The E. M. Nesbitt Company, Edmonton, has the contract for the work. J. Schofield, architect, Winnipeg, Man.

Erie, Pa.—The New York Central, in connection with the Pennsylvania, has commenced this year the elimination of grade crossings at six of the principal streets in the city of Erie. The work will extend over a period of about five years, and in connection therewith a modern passenger station will be constructed.

Indianapolis, Ind.—The Pittsburgh, Cincinnati, Chicago & St. Louis has awarded a contract to Dunn & McCarthy, Chicago, Ill., for the construction of a bridge over Arlington avenue. The bridge will consist of eight solid reinforced balustrades acting as continuous through girders, 37 ft. between the supports. About 80 tons of steel will be required and about 800 cu. yd. of concrete masonry.

Jacksonville, Fla.—Condemnation proceedings to acquire land necessary for the site of the proposed new passenger station and tracks in Jacksonville have been started, it is said, in the Circuit Court by the Jacksonville Terminal Company, Florida. This is the first legal step taken to begin the construction of this $2,000,000 building, plans for which are now being completed by New York architects. Engineers are already on the ground planning the preliminary work, which will begin in about two months. (January 1, 1915, p. 40.)

Kensington, Ill.—The Illinois Central has awarded a contract for the construction of a brick and concrete interlocking tower, 18 ft. by 33 ft., to the Drumm Construction Company, Chicago. The structure will cost about $6,000.

Kinston, N. C.—The Atlantic Coast Line and the Norfolk Southern are entering into an agreement for the construction of a union station at Kinston, N. C. Plans are not yet completed. The Atlantic Coast Line will probably have charge of the erection of the station. (June 9, p. 1246.)

New Haven, Conn.—The New York, New Haven & Hartford will spend about $250,000 in improvements to freight and passenger terminals at New Haven. Definite plans are not yet made.

Ocala, Fla.—A contract has been given to A. M. Walkup Company, Inc., Richmond, Va., it is said, to build the new passenger station in Ocala. The station is to be used jointly by the Seaboard Air Line and the Atlantic Coast Line. (May 19, p. 1114.)

St. Louis, Mo.—The St. Louis & San Francisco has commenced the erection of a one-story brick and concrete roundhouse at Chouteau avenue. The building will cost about $25,000 and the contract was awarded to James Stewart & Co., St. Louis.

San Francisco, Cal.—The Southern Pacific will build a 10-story steel-frame, brick and concrete office building, 275 ft. by 209 ft., on Market street, between Stewart and Spear streets. Over 2,000 115-ft. piles will be driven to furnish a foundation for the building. The eight top floors will be used for general office purposes by the Southern Pacific, and all of the first two floors, except space on the first floor for the district freight agent, will be rented to the public. The cost of the building is estimated at $1,750,000. Bliss & Fayville are the architects. (July 14, page 90.)

Railway Financial News

Chicago, Burlington & Quincy.—The Commercial & Financial Chronicle, in its issue of August 5, prints the following: "We learn officially that of the $13,696,000 4 per cent general mortgage bonds of 1908 approved by the Illinois Public Utilities Commission in July, $10,000,000 are for construction and $3,696,000 to refund prior bonds."

Chicago, Rock Island & Pacific.—William A. Read & Co., New York, have arranged for the extension of the Chicago, Rock Island & Pacific $7,500,000 collateral notes due August 16 to February 16, 1917, at 6 per cent.

Cripple Creek Central.—A quarterly dividend of 1½ per cent has been declared on the common stock, and a quarterly dividend of one per cent on the preferred stock. This is the regular dividend on the preferred, but increases the rate on the common from an annual 4 per cent to an annual 6 per cent. The 4 per cent rate has been paid on the common since 1913.

Lehigh Valley.—See comments in the editorial columns on the annual report.

Minnesota Transfer Railway.—A syndicate, including the Northwestern Trust Company of Minneapolis, is offering $2,105,000 first mortgage 5 per cent bonds of the Minnesota Transfer Railway at 102. Ownership of the stock of the company is divided equally between the Chicago, St. Paul, Minneapolis & Omaha; Chicago, Milwaukee & St. Paul; Great Northern; Northern Pacific; Minneapolis, St. Paul & Sault Ste. Marie; Chicago Great Western; Chicago, Rock Island & Pacific; Minneapolis & St. Louis, and Chicago, Burlington & Quincy. Each company pays an equal portion of the sinking fund and interest on the bonds. The sinking fund is half of one per cent of the total amount of bonds outstanding at any time, bonds purchased to be kept alive and accrued interest added thereto.

St. Louis & San Francisco.—The Old Colony Trust Company, Boston, will sell on August 23 the following collateral securing $2,250,000 5 per cent notes: $2,500,000 St. Louis & San Francisco common stock trust certificates, issued in respect of Chicago & Eastern Illinois common stock; $1,490,000 St. Louis & San Francisco-Kansas City, Ft. Scott & Memphis guaranteed 4 per cent preferred stock certificates; $100,000 St. Louis & San Francisco general lien 5 per cent bonds, due 1927.

A Large Cement Factory for Australia.—A cement factory for Australian Commonwealth purposes is to be erected at Fairy Meadow, near Canberra, at an estimated cost of about $500,000. It is to have an output of 20,000 tons per annum. A deposit of limestone has already been acquired by the Commonwealth, considered to be sufficient for 75 years.

Light Railways on the Eastern Front.—On the eastern front, light railways have been used to a very large extent. Most of these lines have been improvised, and as the track is sent to the front in sections, the work of building has in many instances been extremely rapid. The extent to which these light railways are being used in the Russian campaign may be gaged from the fact that among the booty captured within the last few days by the victorious Russians no fewer than 20 miles of track were taken in the course of a single operation. Exact details are lacking regarding the transport of heavy ordnance in this way, but it may be said that even a very narrow gage light railway affords a better means of conveyance than the apologies for roads in Galicia and Poland, which during winter and spring are seas of the thickest and heaviest mud. As the light railways are not intended for high speed, heavy guns can be carried so long as the individual axle load is kept within bounds, and the distribution of the weight over a number of vehicles is just as feasible on a light railway as on a standard gage line, where heavy artillery is invariably conveyed in such a manner that the weight is spread over a number of wagons forming an articulated whole.—*Railway Gazette, London.*

ANNUAL REPORTS

BUFFALO, ROCHESTER & PITTSBURGH RAILWAY COMPANY—31ST ANNUAL REPORT

The Directors of the Buffalo, Rochester and Pittsburgh Railway Company submit to the Stockholders the following report for the year ending June 30, 1916:

ROAD OPERATED.

	1916. Miles.	1915. Miles.	Increase. Miles.
Owned	367.06	367.06	
Leased	89.90	89.90	
Trackage rights	129.52	129.52	
Total length of road operated	586.48	586.48	
Second track	208.33	208.33	
Sidings	378.14	372.71	5.43
Total miles of tracks, all steel rail	1,172.95	1,167.52	5.43

There was no change in the mileage of road operated. The tracks were increased by 5.43 miles of new sidings.

INCOME.

Operating Income:	1916.	1915.	Increase or Decrease.
Revenues	$11,971,018.75	$9,479,935.75	$2,491,083.00
Expenses	8,648,789.54	6,935,252.30	1,713,537.24
Net revenue	$3,322,229.21	$2,544,683.45	$777,545.76
Tax accruals	250,000.00	230,000.00	20,000.00
Uncollectible revenues	127.94	596.27	—468.33
	$250,127.94	$230,596.27	$19,531.67
Income	$3,072,101.27	$2,314,087.18	$758,014.09
Miscellaneous income		450.48	—450.48
Total operating income	$3,072,101.27	$2,314,537.66	$757,563.61
Non-operating income	1,016,098.72	718,195.23	297,903.49
Gross income	$4,088,199.99	$3,032,732.89	$1,055,467.10
Deductions for interest, rentals, etc.	2,124,062.88	2,120,013.33	4,049.55
Net income	$1,964,137.11	$912,719.56	$1,051,417.55
Appropriations:			
Pension and Fire Insurance Funds	$22,923.35	$21,508.47	$1,414.88
Special appropriations	648,393.60	111,211.09	537,182.51
Total appropriations	$671,316.95	$132,719.56	$538,597.39
Surplus available for dividends.	$1,292,820.16	$780,000.00	$512,820.16
Return on capital stock	7.84%	4.73%	3.11%

Taxes advanced 8.7% to $250,000.00, due to higher assessments on real estate and increased taxes on Net Income.

The increase of $297,903.49 in Non-operating Income is attributable to the favorable balance in Hire of Equipment account.

A special appropriation of $648,393.60 was made from Net Income. Of this amount $125,000.00 was paid into the Sinking Funds under Equipment Agreements Series A, B and C, and including $2,393.60 accrued interest is available for the purchase of new rolling stock; $216,000.00 represents the cost of Equipment Bonds Series D, E and F paid off during the year, less one-half of the principal refunded by 4½% Consolidated Mortgage Bonds; $180,000.00 covers the amount paid into the Sinking Fund to retire bonds under Equipment Agreement Series G; and $125,000.00 is the principal of Series H bonds paid off during the year.

DIVIDENDS.

Dividends in cash were paid on:		1916	1915
Preferred Stock	$6,000,000 6%	$360,000 6%	$360,000
Common Stock	10,500,000 4%	420,000 4%	420,000
Total	$16,500,000	$780,000	$780,000

Since the close of the fiscal year, your Board of Directors has declared semi-annual dividends of three per cent. on the preferred stock and three per cent. on the common stock, payable August 15, 1916.

CAPITAL STOCK.

There has been no change during the year in this account. The total outstanding Capital Stock of the Company amounts to $16,500,000, and consists of $6,000,000 preferred stock and of $10,500,000 common stock.

FUNDED DEBT.

Under the terms of the Sinking Funds for the redemption of Equipment Bonds, $587,000 bonds were retired, as follows: $116,000 Series D; $115,000 Series E; $176,000 Series F, and $180,000 Series G.

Also, the second annual installment of $125,000 Series H bonds was retired, as provided for in the agreement.

The result is a decrease of $712,000 in the bonded debt of the Company outstanding on June 30, 1916, of which $626,000 was held by the public and $86,000 by the Fire Insurance and Pension Funds.

In accordance with the provisions of the Consolidated Mortgage of 1907, the Trustee delivered to the Company $204,000 Consolidated Mortgage 4½% bonds, representing 50% of Equipment Bonds Series D, E and F retired during the year. These bonds added to those in the Treasury of the Company make a total of $1,604,000 held in reserve.

COST OF ROAD.

Capital account has been charged during the year with $573,993.43 for investment in road as follows:

Land for storage warehouse, Rochester, N. Y.	$65,934.76
Other land for transportation purposes	51,968.26
Subway, Saxton St., Rochester, N. Y.	15,375.82
Increased weight of rails, frogs and fastenings	96,087.00
Stone ballast	53,015.83
Improving bridges and culverts	21,309.50
Dock, Buffalo Creek, N. Y.	42,588.79
Fire protection facilities, East Salamanca, N. Y.	15,138.71
Fire protection facilities, Du Bois, Pa.	28,545.99
Shop machinery	10,722.99
Yard extensions, sidings, etc.	173,305.78
Total	$573,993.43

The important expenditures embrace the following completed items:

Land for the new storage warehouse in Rochester, N. Y.

Dock at Buffalo Creek, N. Y., and equipment with facilities for handling pig iron and pulp wood.

Modern facilities for fire protection at the East Salamanca, N. Y., and Du Bois, Pa., shop plants.

Passing sidings, yard and industrial tracks, as business demanded.

Among the important work still in progress may be mentioned the following, referred to in last year's report:

Subway, Saxton Street, Rochester, N. Y.

Strengthening of steel bridges.

Replacing of timber bridges, trestles and culverts in permanent form.

Also the general improvement of the road with stone ballast and heavier type of rail.

COST OF EQUIPMENT.

Expenditures were made for additions to rolling stock as follows:

Two locomotive crane hoists	$17,525.30
Five cabooses built at Company's Shops	3,623.61
Steel underframes applied on nineteen hundred and eighty-four freight cars	123,943.38
Steel side stakes applied on thirteen hundred and twelve freight cars	18,522.20
Sundry other betterments, including re-classification or transfer of twenty passenger cars, one hundred and nine freight cars and two work equipment cars	141,489.03
	$305,103.52

There was credited for equipment sold, transferred or destroyed, the following book values, a part of which, less salvage, was charged to Operating Expenses, and the balance, representing the depreciation since June 30, 1907, charged to Accrued Depreciation account:

Six locomotives	$41,950.66	
Twenty-nine passenger train cars	85,212.00	
One hundred and twenty-two freight train cars	96,435.81	
Sixty-four work equipment cars	58,638.00	
		282,236.47
Making a net increase of		$22,867.05

The total tractive power of engines aggregates 11,493,536 pounds, a decrease of 133,999 pounds from last year.

The average tractive power of each engine increased 258 pounds, being 36,257 pounds as against 35,999 pounds last year.

The total carrying capacity of cars in freight service now amounts to 750,847 net tons, a decrease of 684 tons from last year.

The average carrying capacity or efficiency of each freight car increased .06 ton, being 43.25 tons as against 43.19 tons last year.

Of the cars in passenger service, 44.66 per cent. are of all steel construction, and in the freight service, 89 per cent. of the cars are now all steel or are equipped with steel underframes.

PASSENGER REVENUES.

The gross passenger revenue amounted to $1,144,892.08, an increase of 3.89 per cent., or $42,911.58.

The average rate received per passenger per mile increased .035 cent, being 2.221 cents as compared with 2.186 cents a year ago.

The average distance each passenger was carried increased .22 mile, being 27.16 miles against 26.94 miles last year.

Passengers carried in 1916	1,897,948	
Passengers carried in 1915	1,871,322	
An increase of 1.42 per cent., or		26,626
Passengers carried one mile in 1916	51,546,863	
Passengers carried one mile in 1915	50,415,391	
An increase of 2.24 per cent., or		1,131,472

FREIGHT REVENUES.

The average rate received per ton per mile decreased .13 mill, being 4.64 mills as compared with 4.77 mills last year.

The average distance each ton was hauled increased 4.40 miles, being 158.23 miles, against 153.83 miles a year ago.

The revenue tonnage moved was the largest in the history of the Company, all of the general commodities showing increases, as follows:

	1916.	1915.	Increase.
Bituminous coal	8,905,421	7,107,857	1,797,564
Coke	485,436	362,403	123,033
Iron ore	696,775	417,178	279,577
Pig and bloom iron	426,727	258,461	168,266
Other freight	3,619,529	2,782,136	837,393
Total	14,133,868	10,928,035	
An increase of 29.34 per cent., or			3,205,833
Tons moved one mile in 1916		2,236,342,672	
Tons moved one mile in 1915		1,681,022,418	
An increase of 33.03 per cent., or			555,320,254

The result for the year is a gain of 29.40 per cent., or $2,358,956.90 in gross freight revenue.

EXPENSES.

Operating Expenses increased $1,713,537.24, or 24.71 per cent., in which each primary expense account participated, as follows:

	Increase.	Per Cent.
Maintenance of way	$385,636.43	30.43
Maintenance of equipment	618,269.01	28.95
Traffic	1,072.67	.76
Transportation	675,313.33	21.48
Miscellaneous operations	623.32	4.25
General	32,622.48	14.08
Total	$1,713,537.24	24.71

This increase is due principally to the larger volume of traffic, necessitating proportionate outlays in all departments.

The expenses were further increased by the advances made in wages of employes, the higher cost of materials, and, in continuation of the policy inaugurated several years ago of strengthening certain classes of equipment, by extraordinary expenditures for rebuilding freight cars with steel underframes and bolsters and equipping them with heavy draft gear.

The amount charged this year for depreciation was $474,087.36, an increase of $49,054.85 over the preceding year.

The operating ratio decreased .91 per cent., being 72.25 per cent., against 73.16 per cent. last year.

The percentage of each group of operating expenses to operating revenues for the past five years is as follows:

	1916.	1915.	1914.	1913.	1912.
Maintenance of way	13.81	13.37	13.49	14.23	12.52
Maintenance of equipment	23.00	22.53	20.65	19.74	18.94
Traffic	1.19	1.50	1.40	1.30	1.26
Transportation	31.91	33.17	36.15	32.71	32.88
Miscellaneous operations	.13	.15	.25		
General	2.21	2.44	2.26	2.05	2.14
Total	72.25	73.16	74.20	70.03	67.74

The average cost per ton per mile is 3.28 mills, being .07 mill more than last year.

The average number of revenue tons carried one mile per revenue freight train mile, excluding the mileage of helping engines, increased 78.45 tons, being 785.61 tons, against 707.16 tons a year ago.

The average number of revenue tons carried one mile per revenue freight engine mile, including the mileage of helping engines, increased 25 tons, being 502, against 477 a year ago.

The averages for the past ten years are as follows:

Year.	Train Load.	Engine Load.
1907	543	435
1908	530	371
1909	597	400
1910	638	420
1911	635	430
1912	647	439
1913	710	462
1914	694	454
1915	707	477
1916	786	502

The average number of revenue passengers carried one mile per revenue passenger train mile is 38, being 1 more than last year.

The non-revenue traffic, not included in any of the other figures of this report, is as follows:

	1916.	1915.
Number of passengers	340,607	275,504
Number of passenger carried one mile	13,811,735	11,522,375
Number of tons	1,155,202	867,023
Number of tons carried one mile	106,701,505	83,299,093

FIRE INSURANCE FUND.

The assets of this fund were increased $16,216.96 during the year, and now amounts to $300,192.46 in interest-bearing securities and cash.

PENSION FUND.

The assets of this fund, created July 1, 1903, were increased $17,120.79 during the year, and now amount to $224,320.41 in interest-bearing securities and cash.

There were sixty-five pensioners upon the roll on June 30, 1916, a net increase of four during the year.

GENERAL REMARKS.

The Ontario Car Ferry Company, Limited, paid a dividend of 5% for the year ending December 31, 1915. The sum of $12,485.00 received on the $249,700.00 of this Company's stock was credited to Non-operating Income Account.

The second boat, referred to in last year's report, was delivered and placed in service October 1, 1915. Its cost amounting to $457,718.58, was met from the available funds of the Ferry Company and the proceeds of $225,000.00 short term 6% notes.

Under date of August 30, 1915, the Director of Valuation of the Interstate Commerce Commission served notice that the valuation of this Company's property and subsidiary and leased lines would be made as of July 1, 1917, and in consequence forces have been engaged in the preliminary work required by the Commission, increasing the valuation expense accordingly. The amount expended to date for this work has reached $21,132.83.

In accordance with the terms of the Agreement with the Erie Railroad Company, dated May 1, 1907, trackage rights for a further period of ten years were granted over your line from Clarion Junction, Pa., to Eleanora Junction, Pa., a distance of 49.93 miles.

The acknowledgments of the Board are renewed to the officers and employees for their faithful and efficient services.

By order of the Board.

WILLIAM T. NOONAN,
President.

Rochester, N. Y., July 31, 1916.

PROFIT AND LOSS ACCOUNT.

June 30th, 1916.

CREDIT.

Balance Surplus, June 30, 1915		$3,420,984.94
Credit Balance, transferred from Income Account (page —)		512,820.16
Unrefundable overcharges		1,564.78
Miscellaneous Credits—		
Adjustment of old accounts	$32,183.64	
Unclaimed wages, etc	1,235.37	
Discounts on funded debt retired	2,575.25	
Unreleased premiums on funded debt retired	3.63	
Withdrawn from Pension Fund	1,336.76	
Miscellaneous credits	1.00	
		37,335.65
Total		$3,972,705.53

DEBIT.

Premium on funded debt retired	$4,440.25	
Loss on retired road	2,476.30	
Miscellaneous Debits—		
Adjustment of old accounts	$13.80	
Abandoned surveys	21.17	
	34.97	
Total		6,951.52
By Balance Surplus, June 30, 1916		$3,965,754.01

COMPARATIVE INCOME ACCOUNT.

OPERATING REVENUES.

Freight—	1916.	1915.	Increase or Decrease.
Coal	$6,417,975.38	$5,040,100.92	$1,377,874.46
Coke	442,139.78	318,637.93	123,501.85
Merchandise	3,521,531.86	2,663,951.27	857,580.59
Total	$10,381,647.02	$8,022,690.12	$2,358,956.90
Passenger	1,144,892.08	1,101,980.50	42,911.58

OTHER TRANSPORTATION—			
Excess baggage	9,092.17	9,907.05	—814.88
Parlor and chair car	11,534.10	10,983.75	550.35
Mail	53,092.65	52,956.47	136.18
Express	100,000.00	100,237.62	—237.62
Other passenger train	4,190.97	5,128.79	—937.82
Milk	22,102.06	21,352.80	749.26
Switching	115,462.00	88,437.02	27,024.98
Special service	1,715.62	.....	1,715.62
Total	$317,189.57	$289,003.50	$28,186.07
INCIDENTAL			
Dining and buffet	11,370.75	9,755.03	1,615.72
Station, train and boat privileges	4,254.16	4,066.17	187.99
Demurrage	36,845.00	10,439.55	26,405.45
Ganson St. Docks	69,032.10	38,251.00	30,781.10
Sundry sources	5,788.07	3,749.88	2,038.19
Total	$127,290.08	$66,261.63	$61,028.45
TOTAL OPERATING REVENUES	$11,971,018.75	$9,479,935.75	$2,491,083.00

OPERATING EXPENSES.

Maintenance of way and structures	$1,652,890.37	$1,267,253.94	$385,636.43
Maintenance of equipment	2,753,623.19	2,135,354.18	618,269.01
Traffic	142,839.43	141,766.76	1,072.67
Transportation	3,819,911.25	3,144,597.92	675,313.33
Miscellaneous operations	15,281.57	14,658.25	623.32
General	264,243.73	231,621.25	32,622.48
TOTAL OPERATING EXPENSES	$8,648,789.54	$6,935,252.30	$1,713,537.24
NET OPERATING REVENUE	$3,322,229.21	$2,544,683.45	$777,545.76
TAX ACCRUALS	250,000.00	230,000.00	20,000.00
UNCOLLECTIBLE REVENUES	127.94	596.27	—468.33
OPERATING INCOME	$3,072,101.27	$2,314,087.18	$758,014.09
MISCELLANEOUS OPERATING INCOME	.....	$450.48	—$450.48
NON-OPERATING INCOME—			
Hire of freight cars	$757,069.87	446,058.22	311,011.65
Rent from other rolling stock	16,353.42	11,131.46	5,221.96
Rents—Joint facilities	151,387.70	156,280.94	—4,893.24
" —Miscellaneous	14,199.78	11,175.15	3,024.63
Dividends on stocks owned	12,485.00	12,485.00	.....
Income from securities, loans and accounts	57,010.27	71,972.89	—14,962.62
Release of premium on funded debt	7,320.08	9,018.57	—1,698.49
Miscellaneous	272.60	73.00	199.60
TOTAL NON-OPERATING INCOME	$1,016,098.72	$718,195.23	$297,903.49
GROSS INCOME	$4,088,199.99	$3,032,732.89	$1,055,467.10

DEDUCTIONS FROM GROSS INCOME.

RENTS—FOR LEASED ROADS—			
Allegheny & Western Railway	$272,000.00	$272,000.00	.....
Clearfield & Mahoning Railway	86,500.00	86,500.00	.....
Mahoning Valley Railroad	15,000.00	15,000.00	.....
	$373,500.00	$373,500.00	.....
For rolling stock other than freight cars	974.24	707.42	$266.82
Joint facilities	314,086.54	289,917.11	24,169.43
Miscellaneous	17,032.00	16,898.70	133.30
Total rents	$705,592.78	$681,023.23	$24,569.55
INTEREST ON FUNDED DEBT—			
First Mortgage Bonds—Roch. & Pitts. Rd.	78,000.00	78,000.00	.....
Consol. Mort. Bonds—Roch. & Pitts. Rd.	235,200.00	235,200.00	.....
General Mort. Bonds—B., R. & P. Ry.	221,350.00	221,350.00	.....
Consol. Mort. Bonds—B., R. & P. Ry.	437,040.00	431,177.50	5,862.50
First Mort. Bonds—L., P. & C. Rd.	17,500.00	17,500.00	.....
Equipment Agreements	423,087.37	454,350.49	—31,263.12
Total	$1,412,177.37	$1,437,577.99	—$25,400.62
INTEREST ON UNFUNDED DEBT	3,396.72	1,412.11	1,984.61
Miscellaneous	2,896.01	.....	2,896.01
TOTAL DEDUCTIONS FROM GROSS INCOME	$2,124,062.88	$2,120,013.33	$4,049.55
NET INCOME	$1,964,137.11	$912,719.56	$1,051,417.55

DISPOSITION OF NET INCOME.

APPROPRIATIONS—			
Pension Fund	$9,691.51	$9,459.45	$232.06
Insurance Fund	13,231.84	12,049.02	1,182.82
New Equipment	127,393.60	65,413.83	61,979.77
Retirement of Equipment bonds	521,000.00	45,797.26	475,202.74
DIVIDENDS—			
PREFERRED STOCK—			
(No. 44) 3% on $6,000,000, payable Aug. 15, 1915	180,000.00	180,000.00	
(No. 45) 3% on $6,000,000, payable Feb. 15, 1916	180,000.00	180,000.00	
COMMON STOCK—			
(No. 31) 2% on $10,500,000, payable Aug. 15, 1916	210,000.00	210,000.00	
(No. 32) 2% on $10,500,000, payable Feb. 15, 1916	210,000.00	210,000.00	
Total Appropriation of Income	$1,451,316.95	$912,719.56	$538,597.39
INCOME BALANCE TRANSFERRED TO PROFIT AND LOSS	$512,820.16	.....	$512,820.16

STATISTICS.

TRAIN MILEAGE	1916.	1915.	1914.	1913.	1912.	1911.
Mileage of revenue passenger trains	1,343,973	1,343,611	1,366,584	1,378,199	1,317,794	1,269,744
Mileage of revenue mixed trains	33,042	32,920	38,400	36,944	28,796	34,724
Mileage of revenue freight trains	2,824,173	2,344,221	2,816,276	2,836,626	2,603,712	2,470,974
Mileage of revenue special trains	483	.....	607	227	62	1,303
Total mileage of revenue trains	4,201,671	3,720,752	4,221,867	4,251,996	3,950,364	3,776,745
Mileage of non-revenue trains	205,613	127,219	288,366	304,703	212,102	267,319
Grand total train mileage	4,407,284	3,847,971	4,510,233	4,556,699	4,162,466	4,044,064
CAR MILEAGE.						
Mileage of passenger train cars	4,645,987	4,543,012	4,878,143	4,802,546	4,704,937	4,358,824
Mileage of loaded freight cars	61,218,725	47,444,553	55,399,960	58,953,427	51,373,857	48,662,123
Mileage of empty freight cars	40,804,806	33,562,944	36,955,115	36,873,190	35,575,498	33,464,206
Mileage of caboose cars	2,809,963	2,334,314	2,795,467	2,848,046	2,609,481	2,449,629
Total mileage of freight train cars	104,833,494	83,341,811	95,150,542	98,674,663	89,558,836	84,575,958
AVERAGES.						
Number of cars in passenger trains	3	3	3	3	3	3
Number of passengers per train mile	38	37	40	39	38	40
Number of loaded cars in freight trains	21.50	19.96	19.41	20.52	19.52	19.42
Number of empty cars in freight trains (including caboose cars)	15.32	15.10	13.92	13.82	14.50	14.33
Number of cars in freight trains	36.82	35.06	33.33	34.34	34.02	33.75
Number of tons of freight per train mile	785.61	707.16	693.60	710.04	647.41	634.69
Number of tons of freight per loaded car	36.53	35.43	35.74	34.61	33.17	32.68
Percentage of loaded cars in freight trains	58.39	56.93	58.24	59.76	57.35	57.54

LEHIGH VALLEY RAILROAD COMPANY—SIXTY-SECOND ANNUAL REPORT

PHILADELPHIA, August 1, 1916.

To the Stockholders of the

LEHIGH VALLEY RAILROAD COMPANY.

The Board of Directors herewith submit the annual report of the business and condition of your Company for the fiscal year ended June 30, 1916.

MILEAGE

The first track mileage owned or controlled and operated by the Lehigh Valley Railroad Company, the main line of which is double track, extending from Jersey City, N. J., to Buffalo and Suspension Bridge, N. Y., is as follows:—

	Miles
Lehigh Valley Railroad Company	316.71
Controlled by ownership of entire capital stock	938.28
Controlled by ownership of majority of capital stock and lease	115.37
Operated under lease	27.63
Total mileage operated (owned or controlled)	1,397.99
Trackage rights over railroads owned by other companies	45.82
Total first track mileage	1,443.81

In addition to the above there are 596.47 miles, or 41.31 per cent., of second track, 99.51 miles of third track, 44.84 miles of fourth track and 1,270.19 miles of yard tracks and sidings, a total of 3,454.82 miles of track in operation at the close of the year. A detailed statement of track mileage is shown on pages 47 to 49. The average number of miles of railway operated for the year was 1,443.69, upon which the mileage statistics in certain tables submitted in this report are based.

The total increase of 57.49 track miles compared with the preceding year is due almost entirely to the construction of additional yard tracks and sidings to take care of increased business.

OPERATING REVENUES AND EXPENSES

The following statement sets forth the total revenues and expenses and net revenue from operation for the fiscal year, compared with similar figures for the fiscal year 1915. The complete income account appears on page 24.

OPERATING REVENUES

From	1916	1915	Increase or Decrease
Coal freight	$18,811,099.51	$19,195,755.50	—$384,655.99
Merchandise freight	20,363,250.65	16,005,501.45	4,357,749.20
Passenger	4,300,182.81	4,043,799.00	256,383.81
Mail	194,214.71	195,124.81	—910.10
Express	673,962.09	449,622.82	224,339.27
Other transportation	2,231,881.61	2,022,230.85	209,650.76
Incidental	807,978.10	613,927.59	194,050.51
Total operating revenues	$47,382,569.48	$42,525,962.02	$4,856,607.46

OPERATING EXPENSES

	1916	1915	Increase or Decrease
Maintenance of way and structures	$4,657,854.14	$4,483,924.72	$173,929.42
Maintenance of equipment	9,364,628.69	8,207,491.18	1,157,137.51
Traffic expenses	996,249.39	959,830.08	36,419.31
Transportation expenses	17,090,113.67	15,382,186.83	1,707,926.84
General expenses	984,131.72	913,954.73	70,176.99
Total operating expenses	$33,092,977.61	$29,947,387.54	$3,145,590.07
NET OPERATING REVENUE	$14,289,591.87	$12,578,574.48	$1,711,017.39
Ratio of operating expenses to operating revenues	69.84%	70.42%	—.58%

OPERATING REVENUES

COAL FREIGHT

The revenue derived from the transportation of coal and coke amounted to $18,811,099.51, a decrease of $384,655.99, or 2.00 per cent., as compared with the preceding twelve months. This decrease is due to the reduced revenue received from transportation of anthracite coal because of the lower rates ordered by the Interstate Commerce Commission effective April 1, 1916, and a decreased tonnage of that commodity as a result of the unsettled labor situation in the anthracite region during negotiations for a new contract between the miners and the operating coal companies.

The percentage of coal freight revenue to total operating revenues was 39.70 per cent., a decrease of 5.44 per cent.

The coal and coke transported, excluding the Company's supply coal, was 17,418,333 tons, an increase of 523,403 tons, or 3.10 per cent.

This class of tonnage was 52.58 per cent. of the total tonnage hauled during the year, a decrease of 3.24 per cent.

MERCHANDISE FREIGHT

The transportation of merchandise freight produced a revenue of $20,363,250.65, an increase of $4,357,749.20, or 27.23 per cent., as compared with the preceding year.

The revenue derived from the transportation of merchandise freight was 42.98 per cent. of the total operating revenues, an increase of 5.34 per cent.

The tonnage moved, excluding Company's material, was 15,706,852 tons, an increase of 17.45 per cent.

GENERAL FREIGHT

The total revenue derived from both coal and merchandise freight was $39,174,350.16, an increase of $3,973,093.21, or 11.29 per cent., as compared with the preceding twelve months.

The entire freight traffic amounted to 33,125,185 tons, an increase of 2,856,484 tons, or 9.44 per cent.

The number of tons carried one mile was 5,990,465,278, an increase of 664,136,376 ton miles, or 12.47 per cent.

The average haul was 180.84 miles, an increase of 4.87 miles, or 2.77 per cent.

The average revenue per ton was 118.262 cents, as compared with 116.296 cents last year, an increase of 1.966 cents, or 1.69 per cent.

Company's freight, not included in the above, amounted to 3,223,604 tons, an increase of 149,944 tons, or 4.88 per cent.

The total freight train mileage was 9,381,833 miles, an increase of 457,485 miles, or 5.13 per cent.

The revenue received per freight train mile was $4.18, an increase of $0.24, or 6.09 per cent.

The average trainload of revenue freight was 638.52 tons, an increase of 41.69 tons, or 6.99 per cent. Including Company's freight, the average trainload was 660.87 tons, an increase of 42.02 tons, or 6.79 per cent.

PASSENGER

The earnings received from passenger traffic amounted to $4,300,182.81, an increase of $256,383.81, or 6.34 per cent., compared with the preceding year.

The total number of passengers carried was 6,745,086, an increase of 1,538,114, or 29.54 per cent.

The number of passengers carried one mile increased 12,605,714, or 5.84 per cent.

The average distance traveled by each passenger was 33.84 miles, a decrease of 7.58 miles, or 18.30 per cent.

The average revenue per passenger was 63.753 cents, a decrease of 13.908 cents, or 17.91 per cent.

The average revenue per passenger per mile was 1.884 cents, an increase of .009 cent, or .48 per cent.

Passenger train mileage was 4,258,978, an increase of 34,791 miles, or .82 per cent., as compared with an increase in this revenue of 6.34 per cent.

The average revenue from passengers per passenger train mile was 100.97 cents, an increase of 5.24 cents, or 5.47 per cent.

MAIL

The sum of $194,214.71 was received from the Federal Government for the transportation of United States mail, a decrease of $910.10.

EXPRESS

The revenue from this class of business amounted to $673,962.09, an increase of $224,339.27.

OTHER TRANSPORTATION

The earnings derived from transportation other than shown under the preceding headings were $2,231,881.61, an increase of $209,650.76.

INCIDENTAL

Incidental revenue amounted to $807,978.10, an increase of $194,050.51.

OPERATING EXPENSES

MAINTENANCE OF WAY AND STRUCTURES

The sum of $4,657,854.14 was expended for the maintenance of way and structures, an increase of $173,929.42, or 3.88 per cent., as compared with the preceding year.

During the year sixteen steel bridges and thirteen concrete-steel bridges, replacing light iron or wooden bridges, were constructed. One new iron and one new wooden bridge were placed under new sidings to industrial plants and one iron bridge was built replacing a pipe culvert. One iron and six wooden bridges were replaced by pipe culverts and seven iron bridges were strengthened. Seven wooden bridges were replaced by ballasted floor creosoted timber bridges and two wooden bridges were abandoned and openings filled. One wooden bridge was replaced by a reinforced concrete box culvert and one new wooden lift bridge with pile trestle approach was built in connection with additional yard facilities.

2,037 tons of 136-pound rail, 1,608 tons of 110-pound rail, 10,311 tons of 100-pound rail and 11 tons of 90-pound rail, together with necessary frogs, switches, etc., were placed in the track.

1,040,219 tie plates and 151,969 anti-rail creepers were used.

1,079,157 cross ties, 2,360,231 feet B. M. switch ties, 1,343,407 feet B. M. bridge ties and lumber amounting to 4,096,998 feet B. M. were used.

663,683 of the cross ties, 1,700,293 feet B. M. of switch ties and 1,309,457 feet B. M. of bridge ties were treated with creosote.

96,120 cubic yards of crushed stone were used in ballasting track. 65,527 feet of drain tile were placed in the roadbed.

746.30 miles of copper and 238.15 miles of iron wire were used in extending and renewing the telephone, telegraph and signal wires on the system.

MAINTENANCE OF EQUIPMENT

The expenditures for the maintenance of equipment amounted to $9,364,628.69, an increase of $1,157,137.51, or 14.10 per cent., as compared with the preceding twelve months. Included therein is a charge of $1,446,123.02 for the depreciation of equipment, as required by the accounting rules of the Interstate Commerce Commission.

Twenty-eight worn-out locomotives, one passenger car, one express car, one fruit car, 1,551 freight equipment cars and 161 road service cars were condemned and either sold or destroyed during the year and their value written off the books by appropriate charges through operating expenses.

Five passenger cars, fourteen express cars, two fruit cars, two combined passenger and baggage cars and two cafe cars were converted into workmen's cars. 193 produce cars were converted into ice cars. Three locomotive tenders were converted into water cars and together with 101 freight equipment cars were transferred to road service.

Thirty-two locomotives have been equipped with additional air pumps and eighty-nine with bull's-eye lubricators, to meet the requirements of the Interstate Commerce Commission.

In addition to the above, thirty-one locomotives were equipped with brick arches and stokers, thirteen with brick arches only and twenty-six with straight air.

Seventy-one locomotives had new fire boxes applied, one hundred and thirty-four locomotives were equipped with new cylinders and seventy-one locomotives had new boilers applied.

321 passenger equipment cars were painted and varnished and eleven equipped with electric lighting apparatus. Two dining cars were equipped with steel underframes.

Steel underframes were applied to 535 wooden freight and coal cars, making a total of 15,193 cars so equipped during the last eight years. Five 8-wheel cabooses were equipped with steel underframes. 2,982 wooden freight cars were equipped with metal draft arms. 4,970 freight equipment cars and 117 road service cars were equipped with safety appliances to conform to the requirements of the Interstate Commerce Commission.

The total number of locomotives on hand at the close of the year was 971, with a tractive power of 32,344,767 pounds. The total number of freight equipment cars was 43,836 with a capacity of 1,647,955 tons.

TRAFFIC EXPENSES

The expenditures under this heading amounted to $996,249.39, an increase of $36,419.31, as compared with the preceding twelve months.

TRANSPORTATION EXPENSES

The cost of conducting transportation was $17,090,113.67, an increase of $1,707,926.84, or 11.10 per cent., as compared with the preceding year.

The ratio of transportation expenses to total operating revenues was 36.07 per cent., a decrease of .10 per cent., as compared with the preceding year.

GENERAL EXPENSES

This class of expenses amounted to $984,131.72, or 2.08 per cent., of the total operating revenues.

TAXES

The taxes accrued on your property, capital and business during the year amounted to $1,806,620.29, an increase of $6,361.13 over the preceding year.

ADDITIONS AND BETTERMENTS

The sum of $10,642,896.12 was expended during the year for the improvement and development of existing property and for the acquisition of new property, which amount has been charged to the appropriate Capital Accounts, as required by the Interstate Commerce Commission. A classified statement of these expenditures appears on page 44. Specific mention is made of the more important expenditures, viz.:—

The new equipment purchased and added to the property during the year is as follows: Twenty-five freight locomotives, twenty switching locomotives, nine passenger locomotives, seven locomotive tenders, twenty steel underframe milk cars, four steel flat cars, twenty-five steel underframe 8-wheel cabooses, one service flat car, seven locomotive cranes, one motor insnection car and two workmen's cars. A portion of this equipment is covered by Equipment Trust, Series O, referred to in full under the heading "Financial."

In addition to the foregoing, orders have been placed for thirty-six Pacific type passenger locomotives, fifty-five freight locomotives, sixteen locomotive tenders, fifteen hundred 80,000-pound capacity box cars equipped with steel underframes and steel ends, twenty-five steel underframe 8-wheel cabooses, two all-steel dining cars and two locomotive cranes.

During the past fiscal year sixty-five heavy Consolidation type freight locomotives and ten 10-wheel freight locomotives were rebuilt and equipped with superheaters, new cylinders and Walschaert valve gears, which increases their efficiency and reduces the fuel consumption.

The new passenger station and train sheds at Buffalo, mentioned in the previous annual report, are nearing completion and will be placed in service about October 1, 1916. The freight terminal and yard were completed and put in operation in December, 1915.

The new ore pier at Constable Hook is well advanced and will be ready for the installation of machinery in September and for service early in the year 1917. Pier 8, North River, New York, has been completed and put in service. The substructure for Pier 44, East River, has been completed and contracts awarded for all other work in connection with a two-story pier and bulkhead shed. These facilities will be ready for service early this fall.

The modern steel and concrete coal handling plant at Tifft Farm, Buffalo, for handling coal from cars to boats, referred to in the last annual report, was completed and placed in service since the close of the fiscal year.

Work is under way in connection with the construction of a new engine terminal at Manchester, consisting of a 30-stall fireproof enginehouse with a 100-foot electrically operated turntable, together with machine shop and power plant. At Suspension Bridge a new 15-stall fireproof enginehouse with a 100-foot electrically operated turntable and necessary shop and power buildings is under construction. These improvements will greatly facilitate the making of minor repairs to locomotives and the prompt handling of the same. The new 50-stall fireproof enginehouse at Sayre was completed and put in service during the past winter.

To permit of the use of heavier power, the necessary work of strengthening forty-two bridges between Sayre and Manchester is now in progress, and in connection therewith sixteen passing sidings on the Seneca Division are being extended for a total distance of 9.73 miles.

293,779 feet, or 55.64 miles, of Company's sidings, and 19,219 feet, or 3.64 miles, of industrial sidings, were constructed during the year.

Owing to the unprecedented movement of eastbound traffic last fall and winter and the consequent congestion, it was necessary to enlarge the yards at Claremont, Oak Island, Perth Amboy, South Plainfield, Florence, South Bethlehem and Manchester to the extent of a total increased car capacity of 3,467 cars. Team delivery tracks were constructed at Canastota and Seneca Falls, providing additional room for nineteen and twelve cars, respectively. A freight sub-station with necessary sidings and driveways was constructed at Auburn.

A new 46-foot track scale and an auto-truck scale were installed at Suspension Bridge and Grand Street, Jersey City, respectively. Wagon scales were installed at Pier 34, New York, Corfu and Phelps.

Coaling plants, operated by air furnished from the locomotives taking coal, were constructed at Ithaca and Geneva.

Thirty-eight new gasoline motor cars for use of section, bridge, signal and telegraph gangs and two for the use of car inspectors, were purchased during the year, making a total of 149 now in service.

The improvement of the water supply system at Lehighton and Packerton, referred to in last year's report, has been completed. The water softening plants at Stafford, Maxwells and Rochester Junction have been remodelled and rebuilt, the improvements at the last mentioned point including a new 500,000-gallon reservoir. Steel tanks with capacities of 50,000 and 70,000 gallons, respectively, were erected at Perth Amboy and Stafford. A 30,000-gallon concrete reservoir was built at Stevenson.

Automatic disc signals between Penn Haven Junction and Wilkes-Barre, a distance of 48.09 miles, were replaced with automatic signals of the two-position, lower-quadrant type. Automatic signals of the three-position, upper-quadrant type were installed between Lodi and Pittsburgh and Lehigh Junction, a distance of 71.07 miles, replacing signals of the two-position, lower-quadrant type. Similar signals were installed between Ashmore and Jeddo Tunnel, a distance of 1.54 miles. All automatic signals of the three-position, upper-quadrant type installed during the year were equipped with electric lights. Similar installations were also made on the automatic signals between Conway and Fairview, a distance of 11.35 miles, and on the Mountain Cut-off between Gracedale and Pittston Junction, a distance of 20.39 miles. An all-electric interlocking plant, together with the necessary outlying automatic signals, was erected at Ashmore, protecting the junctions of the Highland and Hays Creek Branches with the main line of the Mahanoy and Hazleton Division. An electro-mechanical interlocking plant was installed at Port Reading Junction, replacing a mechanical plant. Extensive improvements were made to the interlocking plants at Union Street, Allentown, Lehighton, Gracedale and Van Etten Junction.

Visible and audible crossing signals were placed at Dryden, Shed's Corners, Hinman, Beebe's Crossing, Victor and Lost Creek. Visible crossing signals were installed at Berwick and Northumberland Streets, White Haven, and South and Spring Streets, Groton.

A new trunk telephone line was erected between South Bethlehem and Sayre, a distance of 182.40 miles, to relieve congestion on the old line and to form part of a through line to Buffalo, to be erected later. In addition to this, new telegraph and telephone lines were erected for a distance of 1.75 miles on the New Jersey and Lehigh Division; 1.25 miles on the Mahanoy and Hazleton Division; .90 mile on the Wyoming Division, and .25 mile on the Buffalo Division. Telegraph and telephone pole lines were rebuilt for a distance of 2.60 miles on the New Jersey and Lehigh Division; 1.50 miles on the Mahanoy and Hazleton Division; 64.95 miles on the Wyoming Division; 2 miles on the Seneca Division; 3 miles on the Auburn Division, and 6 miles on the Buffalo Divrsion. Poles were reset for a distance of .50 mile on the New Jersey and Lehigh Division, 9.60 miles on the Mahanoy and Hazleton Division; 28.50 miles on the Wyoming Division, and 48.70 miles on the Auburn Division.

FINANCIAL

To make adequate provision for acquiring additional terminal lands and facilities, the purchase of equipment and other contemplated expenditures for improvements to the property, your Company issued under its General Consolidated Mortgage, dated September 30, 1903, $11,697,000 Four and One-half Per Cent. Gold Bonds maturing May 1, 2003. Of these bonds $1,000,000 were placed in the treasury and $10,697,000 were sold, the proceeds of which either have been or will be used for the above purposes.

The only new capital obligations incurred by your Company since the increase in the capital stock in 1910 (at which time 403,338 shares were sold to the stockholders at par, producing funds of $20,166,900), are the $10,000,000 General Consolidated Mortgage Bonds sold in 1913, and the $10,697,000 of similar bonds sold during the past year. Since July 1, 1910, capital expenditures (referred to in the annual reports) have been made for the retirement of securities in possession of the public, acquisition of new property and improvements to existing property, as follows:—

Securities held by public, retired		$20,114,537.66
New construction and additions and betterments chargeable to Capital Accounts of Lehigh Valley Railroad and subsidiary companies		19,977,152.15
Rolling stock and floating equipment		16,419,838.27
Total, July 1, 1910, to June 30, 1916, inclusive		$56,511,528.08
Proceeds of increase in capital stock in 1910.	$20,166,900.00	
Proceeds of sale of $20,697,000 General Consolidated Mortgage 4½% Bonds as follows:—		
$10,000,000 sold December, 1913	9,000,000	
10,697,000 sold April, 1916.	10,536,545	
	$19,536,545.00	
		39,703,445.00
Excess of capital expenditures over proceeds of sale of capital obligations		$16,808,083.08

It will be observed from the foregoing that to the close of the past fiscal year there has been expended by your Company $16,808,083.08 in excess of the amount realized by the increase in capital stock and the sale of bonds, which has been provided out of the Company's current cash resources.

The following obligations of your Company matured and were retired during the year:—

DESCRIPTION	INTEREST RATE	MATURITY	AMOUNT
Collateral Trust Bonds	4%	Feb. and Aug.	$1,000,000
Equipment Trust, Series I, Certificates.	4%	September	400,000
Equipment Trust, Series J, Certificates.	4½%	Mar. and Sept.	500,000
Equipment Trust, Series K, Certificates.	4%	Mar. and Sept.	300,000
Equipment Trust, Series L, Certificates.	4½%	April and Oct.	400,000
Equipment Trust, Series M, Certificates.	4½%	March	200,000
Total			$2,800,000

The Lehigh-Buffalo Terminal Railway Corporation, under authority of the Public Service Commission of New York State, issued to your Company $50,000 of its capital stock and $3,740,000 Fifty-Year Five Per Cent. Debenture Bonds to repay advances made for the construction of the new freight and passenger terminals at Buffalo, which are now nearing completion. These debenture bonds will remain in your treasury until permanent financing can be arranged by the Terminal Company.

A new company has been incorporated, known as the Lehigh Valley Harbor Terminal Railway Company, to take title to such real estate as may be purchased for the purpose of providing additional terminal facilities at the Jersey City water front and to make such expenditures in connection with these facilities as may be authorized from time to time. That corporation has issued to your Company $100,000 of its capital stock and also its notes, bearing interest at the rate of five per cent. per annum, aggregating $2,976,336.05 on account of advances already made. The notes have been placed in the treasury pending further provision for the financing of this project.

An Equipment Trust, designated Series O, was created during the year under which will be issued $3,000,000 Four and One-half Per Cent. Certificates, maturing in annual installments of $500,000 September 1st of each year, the final maturity being September 1, 1922. These certificates will be a lien upon forty freight locomotives, fifteen switching locomotives and fifteen hundred box cars, now under contract with the builders. A portion of this equipment has been delivered and upon receipt of the remainder the certificates will be issued and placed in the treasury.

An additional Equipment Trust, to be known as Series R, has also been authorized. This trust will cover an issue of $2,400,000 Four and One-half Per Cent. Certificates, maturing in semi-annual installments of $200,000 March 1st and September 1st of each year, the last installment falling due September 1, 1922. Under this arrangement the Company will acquire seventy locomotives of the latest design. Forty of these, known as the Santa Fe, or 2-10-2, type, will be used exclusively in freight service

and thirty, of the Pacific type, although primarily for use in fast freight service, will be so equipped as to make them available for passenger service also. This equipment is now under contract and will be delivered in the near future at which time the certificates will be issued and placed in the treasury.

The advances made by the Lehigh Valley Railroad Company to subsidiary companies, of which it owns the entire capital stock, were reimbursed by issues of Fifty-Year Five Per-Cent. Gold Debenture Bonds, as follows:—

The Lehigh Valley Rail Way Company	$1,100,000
Lehigh Valley Railroad Company of New Jersey	585,000
Pennsylvania and New York Canal and Railroad Company	445,000

These securities have been deposited with the Trustee, as required by the terms of the General Consolidated Mortgage.

There have also been received and placed in the Company's treasury $60,000 Wyoming Valley Water Supply Company First Mortgage Five Per Cent. Bonds in repayment of advances made to that company for capital expenditures.

The book value of the capital stock of Coxe Brothers & Company, Incorporated, has been reduced by the sum of $1,000,000 and Profit and Loss charged with that amount, as has been the practice in preceding years.

There has been a further reduction in the par value of the capital stock of the Temple Iron Company, resulting from the liquidation of the anthracite business of that company, mention of which was made in last year's annual report. There has also been a reduction in the par value of the capital stock of the Philadelphia Grain Elevator Company.

Material and Supplies on hand at the close of the year amounted to $3,371,895.07, an increase of $465,887.44. This increase is principally due to the accumulation of large stocks of locomotive supply coal last winter, in anticipation of a possible suspension of mining in the bituminous regions pending negotiations for a new agreement between the coal operators and their employees. This coal is now being used and the stock on hand will be reduced to normal within the next few months.

Current Assets are $13,351,729.16 in excess of Current Liabilities.

Four quarterly dividends of two and one-half per cent. each on the preferred and common capital stocks of the Company were declared and paid during the year.

The cash and security balances of the Company for the year have been verified by certified public accountants, and a copy of their certificate as to the correctness of the same is given on page 19.

GENERAL REMARKS

The revenues of your Company for the year under review are the greatest in its history and show a substantial increase over the preceding year. A large portion of the increased earnings has been devoted to a very liberal expenditure for the maintenance of property, particularly in the case of equipment. Your Company has for years pursued the policy of discarding its old wooden freight cars as fast as they reached a condition to require heavy repairs and has condemned a great many of the same during the year. On such equipment of this type as is still serviceable, heavy expenditures have been made for steel underframes, a practice which has been pursued aggressively in the past and to a greater extent during the year just closed, as the demand for equipment increased. With the work that has been done and the work now under way, your Company will have within the next few months practically no freight equipment that is not either all-steel or steel underframe. Very substantial charges to expenses have also been made for the condemnation of old locomotives too light for economical operation and for the remodelling of such engines as were still serviceable but not of the proper degree of efficiency. The expense for maintenance of way and structures has likewise increased, the earnings for the year having permitted of a liberal policy in this respect also.

With the improvement in general business and the encouraging outlook for a continuation of the heavy volume of traffic, and as well that your Company may be in a position to handle the increased business as efficiently as possible, heavy expenditures for additional facilities have been authorized during the year. These improvements have either been completed (as set forth under the heading "Additions and Betterments") or are now under way. The more important are extensive terminal developments, the purchase of additional rolling stock and floating equipment, the more rapid replacement of various bridges with stronger structures thereby permitting the use of the heaviest type of power and greater trainloads, extensions of tracks and sidings, and the construction of additional roundhouses with facilities for making prompt repairs to locomotives.

It will be noted that the item "Hire of Equipment" for the year shows a debit balance of $1,040,296.86. This is due entirely to the unusual conditions which confronted practically all those railroads terminating at the eastern seaboard which were called upon to deliver to the European-bound vessels the vastly increased exports due to the war abroad. Harbor facilities generally had not been built to take care of such a volume of traffic as resulted. Emergency measures at increased expense were necessary to relieve the congested conditions, which at one time were very serious. This resulted in a large accumulation of the cars of other railroads, particularly those from western points, the lading of which, destined to foreign-going steamships, your Company was unable to unload with any degree of promptness. Under the general railroad rules, per diem is paid to other companies for their equipment while on the lines of your Company and vice versa. This unusual condition, which existed practically throughout the year and which your Company was powerless to prevent, caused the large debit for rental of equipment above mentioned. This congestion also added very materially to the expense of handling freight, without any corresponding increase in revenue. Then, too, the demand for raw products used largely in the manufacture of commodities going abroad, caused increases in the prices of all materials and supplies required in railroad operation and added considerably to the cost of operation, a condition which still exists.

The Interstate Commerce Commission ordered a substantial reduction in the rates for the transportation of anthracite coal, effective April 1, 1916, which has caused a corresponding reduction in the revenues derived from the movement of that commodity. This investigation was ordered by the Commission upon its own initiative and was under review for over three years.

The Interstate Commerce Commission notified your Company that the Federal valuation of your property would be made as of July 1, 1917. The field and office work preparatory to making a detailed inventory is well under way, thirty-three men being engaged in the preparation of the necessary data. The cost to your Company of this work since July 1, 1913, the date the revised classification issued by the Commission provided for the separation of this class of expense, amounts to $132,429.25.

Six new covered barges, one gasoline derrick barge and one motor boat were received during the year and added to the floating equipment of the Lehigh Valley Transportation Company, the entire capital stock of which is owned by your Company. In addition to the foregoing, orders have been placed for one steel tug, one steel steam lighter, four 90-foot wooden barges, one 120-foot wooden barge, three steel 8-car floats, and four steel 12-car floats. One wooden sea-going barge, fully covered by insurance, was lost at sea. Two car floats, one tug, one grain boat and nine coal barges, which, on account of age and small capacity, became undesirable for further service, were condemned and sold. The floating equipment used by your Company and its affiliated companies is shown in detail on page 46.

Although the decision of the Interstate Commerce Commission, referred to in the last annual report, prohibited the Lehigh Valley Transportation Company from operating after December 1, 1915, its six vessels on the Great Lakes, used for the transportation of freight between Buffalo and points west, they are being operated during the present season of navigation through an injunction obtained from the courts. This matter is still in litigation, as final determination has not yet been reached.

The operation of the Lehigh and New York Railroad, which property is leased and operated by your Company under an agreement made in 1895, has resulted in a loss of $223,061.75 for the year.

Sixty-one new industries were located on the system during the year, of which fifty-one have direct track connections with your Company's lines.

The total payments direct to labor for the year amounted to $19,256,182.78, or 58.19 per cent. of the total operating expenses, the same having been distributed among an average of 23,815 employees.

The contribution made by your Company to its Employees' Relief Fund amounted to $54,815.00. This fund was started in 1878, and with one exception is the oldest relief fund in the United States. Since its establishment and up to the close of the year ended June 30, 1916, the payments made by it have amounted to $2,169,702.29. Of this the employees subscribed one-half, while your Company contributed the other portion.

Mr. Samuel T. Bodine, of Philadelphia, was elected a Director, to fill the vacancy caused by the resignation of Mr. Abram Nesbitt.

Acknowledgment is made of the faithful and efficient services rendered by the employees of your Company during the year.

E. B. THOMAS,
President.

COMPARATIVE INCOME ACCOUNT FOR THE YEARS ENDED JUNE 30, 1916 AND 1915

	1916	1915	Increase or Decrease
OPERATING REVENUES:—			
Coal freight revenue	$18,811,099.51	$19,195,755.50	—$384,655.99
Merchandise freight revenue	20,363,250.65	16,005,501.45	4,357,749.20
Passenger revenue	4,300,182.81	4,043,799.00	256,383.81
Mail revenue	194,214.71	195,124.81	—910.10
Express revenue	673,962.09	449,622.82	224,339.27
Other transportation revenue	2,231,881.61	2,022,230.85	209,650.76
Incidental revenue	807,978.10	613,927.59	194,050.51
Total operating revenues	$47,382,569.48	$42,525,962.02	$4,856,607.46
OPERATING EXPENSES:—			
Maintenance of way and structures	$4,657,854.14	$4,483,924.72	$173,929.42
Maintenance of equipment	9,364,628.69	8,207,491.18	1,157,137.51
Traffic expenses	996,249.39	959,830.08	36,419.31
Transportation expenses	17,090,113.67	15,382,186.83	1,707,926.84
General expenses	984,131.72	913,954.73	70,176.99
Total operating expenses	$33,092,977.61	$29,947,387.54	$3,145,590.07
Ratio of operating expenses to operating revenues	69.84%	70.42%	—.58%
Net operating revenue	$14,289,591.87	$12,578,574.48	$1,711,017.39
RAILWAY TAX ACCRUALS	$1,706,092.64	$1,691,989.33	$14,103.31
UNCOLLECTIBLE RAILWAY REVENUES	8,785.37	14,781.88	—5,996.51
Total tax accruals, etc.	$1,714,878.01	$1,706,771.21	$8,106.80
OPERATING INCOME	$12,574,713.86	$10,871,803.27	$1,702,910.59
OTHER INCOME:			
Joint facility rent income	$254,530.78	$325,579.07	—$71,048.29
Dividend income	903,312.76	712,998.77	190,313.99
Income from funded securities	431,190.01	428,027.08	3,162.93
Miscellaneous income	1,077,492.47	544,414.27	533,078.20
Total other income	$2,666,526.02	$2,011,019.19	$655,506.83
TOTAL INCOME	$15,241,239.88	$12,882,822.46	$2,358,417.42
DEDUCTIONS FROM INCOME:			
Hire of equipment—Debit balance	$1,040,296.86	$68,807.74	$971,489.12
Interest on funded debt	3,500,436.65	3,459,738.48	40,698.17
Rent for leased roads	2,142,589.24	2,142,589.24	.....
Joint facility rents	212,625.23	208,613.37	4,011.86
Miscellaneous rents	536,031.56	513,310.98	22,720.58
Miscellaneous tax accruals	100,527.65	108,269.83	—7,742.18
Miscellaneous deductions	42,292.78	59,047.86	—16,755.08
Total deductions from income	$7,574,799.97	$6,560,377.50	$1,014,422.47
NET INCOME	$7,666,439.91	$6,322,444.96	$1,343,994.95

GENERAL BALANCE SHEET, JUNE 30, 1916

Dr. ASSETS			*Cr.* LIABILITIES		
Investment in Road and Equipment:—			Capital Stock:—		
Investment in road	$24,713,339.85		1,210,034 shares common stock, par $50	$60,501,700.00	
Investment in equipment	56,587,605.78		2,126 shares preferred stock, par $50	106,300.00	
	$81,300,945.63				$60,608,000.00
Less reserve for accrued depreciation	9,437,840.57		Funded Debt:—		
		$71,863,105.06	Mortgage bonds	$89,336,000.00	
Investment in Miscellaneous Physical Property		2,030,270.66	Collateral trust bonds	10,000,000.00	
Investments in Affiliated Companies:—			Equipment trust obligations	4,400,000.00	
Stocks	$46,082,986.52		Mortgage on real estate	1,669.18	
Bonds	32,745,926.00			$103,737,669.18	
Notes	3,190,086.05		Less securities held in treasury of the Company	18,706,000.00	
Advances	200,474.65				85,031,669.18
		82,219,473.22	Current Liabilities:—		
Other Investments:—			Traffic and car-service balances payable	$457,921.39	
Stocks	$259,869.00		Audited accounts and wages payable	4,595,329.66	
Bonds	34,000.00		Miscellaneous accounts payable	239,172.86	
Miscellaneous	307,279.00		Interest matured unpaid	403,365.00	
		601,148.00	Dividends matured unpaid	6,791.00	
Current Assets:—			Funded debt matured unpaid	17,000.00	
Cash	$15,126,594.94		Unmatured dividends declared	1,515,200.00	
Net balance receivable from agents and conductors	1,694,305.37		Unmatured interest accrued	615,745.97	
Miscellaneous accounts receivable	1,522,844.62		Unmatured rents accrued	350,806.01	
Material and supplies	3,371,895.07		Other current liabilities	644,301.97	
Interest and dividends receivable	220,361.17				8,845,633.86
Other current assets	261,361.85		Deferred Liabilities		1,568,280.04
		22,197,363.02	Unadjusted Credits:—		
Deferred Assets		1,536,524.52	Tax liability	$503,367.20	
Unadjusted Debits:—			Other unadjusted credits	1,554,077.02	
Rents and insurance premiums paid in advance	$146,727.52				2,057,444.22
Other unadjusted debits	1,478,278.23		Profit and Loss		23,961,862.93
		1,625,005.75			
Total Assets		$182,072,890.23	Total Liabilities		$182,072,890.23

THE LEHIGH VALLEY COAL COMPANY

REPORT OF OPERATIONS

Philadelphia, August 4, 1916.

The annual report of the operations conducted by The Lehigh Valley Coal Company for the fiscal year ended June 30, 1916, and statements indicating its financial condition at the close of the year, are herewith submitted.

The total net income of the Company from all sources, after deducting charges for royalties, sinking funds, depreciation of the property and interest on the funded debt, amounted to $1,094,922.41, an increase of $72,107.50, as compared with the preceding year. While the results generally may be considered satisfactory, the net revenues have nevertheless been somewhat curtailed by the unusual labor conditions which existed throughout the year, there having been a general shortage in the number of men necessary to properly conduct the operations, and the very substantial increases in the prices of all materials and supplies, particularly powder and steel.

The production of anthracite coal from the lands owned and leased by your Company, including that mined by tenants, was 8,103,187 gross tons, an increase of 14,286 tons as compared with the preceding year.

The percentage of sizes above pea produced by the mining operations of the Company was 65.60 per cent., an increase of .19 per cent.

The number of breaker hours worked was 45,693, an increase of 3,608 hours.

The bituminous coal mined from the Snow Shoe lands, located in Centre County, Pennsylvania, amounted to 261,004 gross tons, an increase of 2,799 tons.

The property of the Company was fully maintained during the year and $274,544 was expended for additions and betterments.

Negotiations for a new wage agreement were conducted between the miners and the producing companies extending over a period of about six weeks, during which time the miners generally remained at work. The matter was finally concluded by granting the men an eight hour working day and a substantial increase in wages, the agreement to run for a period of four years from April 1, 1916.

An underground electric haulage system was installed at William A. Colliery, for the purpose of conveying coal in mine cars from the workings to the breaker. This arrangement has proven much more satisfactory than the old method of dumping the coal into railroad cars.

The alterations to Packer No. 4 Colliery and the concentration of the underground pumping at that point, referred to in the preceding annual report, have been completed, and a gunboat hoist is being installed to permit of more efficient handling of coal between the mines and the breaker.

Development work preparatory to mining coal from the Broadwell lands is now under way, the prospecting done on that property having indicated that there is sufficient coal there to justify the same.

The provings on the bituminous coal land at Snow Shoe, Centre County, Pennsylvania, are progressing favorably. The introduction of electric power for hauling, pumping and the coal cutting machines, which was recently completed, will make it possible to produce an increased tonnage with much greater efficiency.

The operations at Prospect Colliery were seriously handicapped in December, 1915, as a result of an extensive cave-in at the abandoned workings of the Hillman Colliery, which carried with it the bed of Mill Creek. In order to restore conditions to normal, it was necessary to relocate the stream by means of large flumes and to fill in an immense cave, all of which was satisfactorily accomplished.

Under date of December 7, 1915, the Company leased the coal under the Pettebone property, which contains about 470 acres, between Maltby and Westmoreland Collieries.

By virtue of an Act of the Pennsylvania State Legislature, approved June 2, 1915, and effective on and after January 1, 1916, known as the "Workmen's Compensation Act," the Company is required to compensate all employees injured, and the families of all employees killed, while in service. To carry out the spirit of this law, the Company has organized a very extensive Compensation and Welfare Department for the work connected with the compilation and distribution of the compensation and for the care of the injured. This Department includes a large staff of surgeons, nurses and others, whose services are rendered without expense to the employees.

The Roney Act, under which a special tax of two and one-half per cent of the value of coal mined was levied by the State of Pennsylvania, mention of which was made in the preceding annual report, has been declared unconstitutional. The amount collected from customers on account of this tax either has been refunded or is in process of adjustment. A new law, known as the Dawson Act, requiring the payment of a similar tax, became effective June 1, 1915, and it is expected that the constitutionality of this law will also be tested in the courts.

No new capital obligations were issued during the year. In fact, the funded debt of the Company was reduced by the purchase and cancellation through the sinking fund of $204,000 Delano Land Company First Mortgage Five Per Cent Bonds.

Payments amounting to $114,282 were made to the sinking funds of the various mortgages on the Company's property.

The increase in the item "Property and Plant" is due in the main to the purchase of additional property, including the land on which the Calumet Coal Storage Plant, South Chicago, is located, and to improvements to existing property.

Current Assets are $4,301,002 in excess of Current Liabilities.

The books and accounts of the Company have been verified by certified public accountants, and a copy of their certificate as to the correctness thereof appears in the report.

F. M. CHASE,
Vice President and General Manager.

GENERAL BALANCE SHEET, JUNE 30, 1916

Dr. ASSETS			
Property and Plant			$25,943,880.41
Securities Owned			200,000.00
Advances for Coal Mining Rights			4,378,968.50
Sinking Funds in Hands of Trustees			2,600,387.26
Insurance Fund			144,531.98
Current Assets:—			
Cash	$4,491,004.57		
Materials and supplies	407,756.36		
Notes receivable	4,000.00		
Due from individuals and companies	1,889,101.97		
			6,791,862.90
Deferred and Suspended Assets			422,812.08
Total Assets			$40,482,443.13
LIABILITIES			*Cr.*
Capital Stock			$1,965,000.00
Funded Debt			19,688,000.00
Current Liabilities:—			
Audited vouchers	$630,071.62		
Wages due and unpaid	570,755.69		
Due to individuals and companies	108,153.40		
Royalties on coal mined, due lessors	30,106.64		
Interest on funded debt, due July 1, 1916	298,700.00		
Interest on funded debt, accrued, not due	100,000.00		
Interest due on funded debt, unclaimed	2,705.00		
Taxes due and accrued	750,368.71		
			2,490,861.06
Deferred and Suspended Liabilities:—			
Deferred real estate payments	$500,000.00		
Miscellaneous	551,480.01		
			1,051,480.01
Reserve Accounts:—			
Depreciation and other reserves			9,292,215.66
Profit and Loss			5,994,886.40
Total Liabilities			$40,482,443.13

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An Outside Point of View

The points made in the address published elsewhere in this issue, which was delivered by Paul H. King, operating receiver of the Pere Marquette, before the Association of American Railway Accounting Officers, are of especial interest because, as Mr. King says, he is a combination of the layman and the railroad man. Mr. King was in general law practice previous to his appointment as receiver of the Pere Marquette. He is able to observe from an outside point and to state freshly things that have impressed nearly every thinking railroad officer and yet things which most railroad officers have accepted as inevitable. The greatness of the capital outlay and the need of continually attending to it is something that has ceased almost to be a matter of concern to railroad men because so familiar, and yet it is a vital question as to where the necessary investment funds are coming from. We are made to feel somehow in Mr. King's address that this flow of investment funds will not go on inevitably unless a change takes place in the attitude of those states which look upon regulation only as synonymous with repression. Mr. King realizes, as men who have been close to railroad work their entire lives cannot realize, how little the problems of the railroads, despite the efforts that have been made in the past few years to put them before the public, are really understood by the average voter.

The President, the Brotherhoods and the Railways

At the time this editorial is written conferences are in progress at Washington between President Wilson and the representatives of the railways and the labor brotherhoods in an effort to effect a settlement of the railway wage dispute without a strike. The exact propositions the President has presented to the two sides have not been made public, but there are persistent reports from Washington, that he is urging the railways to grant the demand of the brotherhoods for an eight hour basic day and the brotherhoods to agree to arbitrate their demand for time and a half for overtime. The *Railway Age Gazette* refuses to believe that the President of the United States has suggested any such basis of settlement, for such a settlement would mean simply that the railways would give the brotherhoods the entire dog except the tail on condition that the brotherhoods would arbitrate whether the railways should also give them the tail. It is to be hoped that if the President has made any such proposal the managers of the railways will have the courage to refuse it. The railways have been fighting for a sound principle, the principle of the settlement of labor disputes by the fair and peaceable means of arbitration. The brotherhoods have been fighting for a false principle and one the triumph of which threatens the peace and prosperity of America, the principle that such disputes should be settled by force, regardless of the effects on the public welfare. When such a clear cut issue is presented can there be any question as to the attitude which the President of the United States should assume? The matters in the controversy have become comparatively a minor matter which can be settled by arbitration. The main issue is whether such controversies as the present one are to be settled by arbitration or by force. If the President causes or even asks the railways to grant the so-called eight-hour demand without arbitration he will do what he will find it very difficult to explain to a large majority of the American people.

Vanished into Thin Air

The New York World, in an editorial commenting on the suit which minority stockholders of the New York, New Haven & Hartford have brought to recover $102,000,000 from former New Haven directors, ends its remarks with the following: "They don't believe their money vanished into thin air. Why should they?" If the New Haven situation was caused by elements other than bad judgment of the management, unfortunate and unavoidable conditions, and other factors which do not reflect on the integrity of the directors, the suit which the minority stockholders are prosecuting should disclose these facts. But it is safe to say even now before the suit has been brought to trial that by far the greater part of the money, if not all of the money, which was lost in the New Haven has not vanished into thin air; neither has it gone into the pockets of insiders, but it has been spent on assets which are not capable of earning the interest on their cost. To vanish into thin air and to go into the cost of an asset which is neither salable nor has adequate earning power is a difference not only in language but of substance, although the results to the stockholders may be the same. Business men are continually taking chances in the conduct of their affairs; but most businesses have two safeguards which the railroad business entirely lacks: Either the man in another

business can try out an investment along a certain line step by step and be reasonably sure of what the results will be before the sum total of his investment along this particular line is made, or, if he must in the nature of the business make a very large initial expenditure it is for materials which are usable for other purposes, so that if his judgment is mistaken his assets will still have a sale value. The fact that an investment in railroad property is an investment in a permanent plant, capable of use for no other purpose but that of transportation, has been emphasized over and over again, but whenever a railway company in this country gets into financial difficulties the cry is always raised, "It is impossible for this amount of money to have been spent honestly and not bring any returns." Nothing of the kind. A great deal more money can be lost in the railroad industry by poor business judgment than the shrewdest and biggest thief would have any chance of stealing, and this fact is one well worth keeping in mind when the question of government ownership of railroads is discussed.

CAN A RAILROAD PROFIT BY PSYCHOLOGY?

THOSE who advocate the application of psychotechnics to that important class of problems in transportation, manufacturing and commerce which involve the human element define it as a means for "selecting the very best conditions and placing therein the very best men, to the end not only of increasing returns to the employer, but also of insuring health and happiness to the employee." Assuredly both of these objects are worthy, but can they be accomplished? The answer to this question will have to be supplied largely by the practical men who are asking it. There is no doubt about the advances that have been made in formulating the principles of this comparatively new science dealing with the human equation. The question is whether practical men are ready to give the necessary co-operation to determine what the value of an application of these principles will be.

Psychologists have rendered important service in the past in the matter of determining the best color for signal lights and other problems involved in the interpretation of roadside signals by an engineer. An article published elsewhere in this issue describes an extensive series of tests along this line, bringing out some interesting points and advocating the use of such tests for the selection and rating of enginemen. In view of the importance of this matter and the arguments in favor of such a selection it would seem worth while to give the plan a trial in service to develop its good and bad features and to suggest modifications that might lead to better results.

The psychologists can suggest a great number of lines along which similar work could be done to the advantage of the roads, such as the conducting of efficiency tests, the selection of train despatchers, taking testimony after an accident, and adjusting or preventing trouble with groups of employees. Possibly these things and others may be put in the hands of practical psychologists in the future, but this will depend largely on the results of the work now under way and proposed. Only by trying out the practical value of this theory and continuing the study in its relation to railroad operation can a final decision as to its value be reached.

The organization before which the paper referred to above was presented—The Economic Psychology Association—has been formed to bring the leading psychologists of the country in touch with the practical problems pressing for solution and business men in touch with psychological data that will assist them. This association is creating a committee on railroad problems, and it is to be hoped that sufficient support can be secured to enable this committee to give the plan a fair trial. With such support there is promise that a real service can be performed for the transportation industry. The Pennsylvania is already an active member of this association, and other roads will do well to consider joining it.

STATE DISCRIMINATION AGAINST INTERSTATE COMMERCE

THE decision issued last week by the Interstate Commerce Commission in the Business Men's League case, together with the recent decision in the Missouri river-Nebraska case, furnish additional conspicuous examples of a serious defect in our system of railroad regulation. Both illustrate the improvement which could be made by centralizing the authority now divided between the federal commission and the various state commissions. The Newlands joint congressional committee, which has just been appointed to make an investigation of the entire subject of railroad regulation, will undoubtedly find in both cases some interesting material for its study.

The condition with which the commission had to deal in both cases, as in the previous Shreveport case, was the discrimination against interstate commerce resulting from the reduction of intrastate rates by state action. In the Nebraska case the discrimination was caused by a 20 per cent reduction of state freight rates ordered by the Nebraska State Railway Commission. In the Business Men's League case a reduction in the Illinois passenger fares to 2 cents a mile made by the state legislature was involved. On December 1, 1914, the Interstate Commerce Committee allowed the eastern roads to advance their interstate passenger fares to a basis of 2½ cents a mile, which resulted in an increase in the fare from Chicago, Ill., to St. Louis, Mo., although the fares within the state of Illinois could not be advanced because of the state 2-cent fare law. The commission also in the five per cent case, allowed an increase in the interstate freight rates which affected St. Louis, while the Illinois Public Utilities Commission suspended a corresponding increase in the Illinois intrastate rates. The Business Men's League of St. Louis then filed a complaint with the Interstate Commerce Commission asking the removal of the discrimination against St. Louis and in favor of Illinois points, notably East St. Louis.

The commission has just issued its opinion as to the passenger fare situation, reserving the issues relating to freight rates for a subsequent report. It finds that passenger fares between St. Louis and Illinois points are unreasonable, in so far as they exceed 2.4 cents a mile, the rate fixed by the commission in the western passenger fare case, plus a reasonable bridge toll. It also finds that the present fares subject St. Louis to undue and unreasonable prejudice and disadvantage, which it orders removed, but it also indicates just how the discrimination shall be removed by saying that the intrastate fares "impose an unlawful burden on interstate commerce to the extent that the basis per mile of said fares is less than the basis per mile for fares for interstate travel."

The Nebraska State Railway Commission on September 6, 1914, issued an order prescribing a new schedule of class rates applicable to Nebraska intrastate traffic, approximately 20 per cent lower than the rates formerly in effect. As a result substantial changes were brought about in a long-standing relation of rates from and to the principal distributing centers on the Missouri river and in interior Nebraska, which compete for the trade of the state of Nebraska. The commercial clubs of Sioux City and Council Bluffs, Iowa, St. Joseph and Kansas City, Mo., and Atchison, Kan., filed complaints with the Interstate Commerce Commission, asking the removal of the discrimination against them, and in favor of Omaha, Lincoln and other cities in Nebraska. They also complained because of the discrimination in favor of Nebraska, resulting from certain ratings in Nebraska Classification No. 1, which are lower than those of the Western Classification governing interstate traffic.

The railroad defendants answered that the Nebraska intrastate rates were not made by them voluntarily, but were

published under protest and by order of the Nebraska commission, and that they considered them so unreasonable that they had appealed to the supreme court of the state from the commission's order.

The Interstate Commerce Commission, in its decision reported in the *Railway Age Gazette* of July 21, page 126, held that the commission-made state rates were "too low for application as reasonable maximum interstate rates between the Missouri river cities and points in Nebraska, and, therefore, too low to form the measure by which the unjust discrimination found to exist should be removed." It therefore prescribed a scale of class rates to apply between Sioux City, Council Bluffs, St. Joseph, Kansas City and Atchison, and points in Nebraska, based mainly on the present interstate rates, and ordered the roads "to cease and desist from giving any undue preference or advantage" in rates or classification ratings to the Nebraska points on traffic to or from Nebraska, and from subjecting the interstate shippers in the complaining cities "to undue and unreasonable prejudice or disadvantage with respect to said rates."

The carriers will, therefore, proceed to advance the state rates in both cases to the level of the new scale prescribed by the Interstate Commerce Commission; the commission will, in effect, have prescribed intrastate rates, and after a great deal of tinkering the rates in course of time will probably be satisfactorily adjusted. A more cumbersome method of regulating rates could hardly be devised. How much better it would have been for all concerned if one authority had had the power to deal with the entire situation from the first without the long and tedious process of repeated investigations and controversies which has probably not yet been completed.

First, the Nebraska commission conducted an elaborate and protracted inquiry which involved a large expense not only to the state, but to the shippers and the railroads. Then a schedule of rates which, it was estimated, effected a reduction in the revenues of the carriers of from $1,200,000 to $1,400,000 a year, and which the Interstate Commerce Commission now says is too low, remained in effect for two years while the interstate shippers who were competing for trade in Nebraska lost business on account of the discrimination against them. A somewhat similar situation existed as to the Illinois case. Finally, the Interstate Commerce Commission has spent nearly a year making its investigation and findings, and a great deal more work will be required before the roads will be able to readjust their rates from Nebraska to the new scale from points outside the state fixed by the commission's decision. The adjustment of the Texas rates involved in the Shreveport case has not yet been completed, after three or four years of litigation.

The federal commission credits the Nebraska commission with good intentions and with having made an "earnest endeavor to deal with the complex problem of rate-making with justice to all parties before it." The Nebraska commission apparently did not, however, consider the interests of the parties which were not before it, the shippers just over the state line, who were just as specifically affected by its decision as were the Nebraska shippers, and who are entitled to use the facilities of the railroads on as favorable terms as the Nebraska shippers.

It is not necessarily a reflection on the Nebraska commission or any other state commission to say that the possibility of the existence of such a situation as this demands an extension of federal authority over rate-making. There may be cases where the state commissions are right and the federal commission is wrong; but where they differ both of them cannot be right and one must prevail unless our rate structure is to be thrown into a worse chaos than that which prevailed before regulation. Interstate railroads and commerce which know no state line cannot be adequately regulated under a system which is limited by state lines, especially in combination with another system in which such restrictions play no part.

THE MENACE OF A BAD CAR SHORTAGE

THE statistics regarding the freight car situation on August 1, which were issued by the American Railway Association this week, are the most ominous for that date that ever were compiled. They indicate clearly that unless there is some unexpected and radical change in commercial, industrial and transportation conditions the railways and the shipping public will have to deal this fall and winter with one of the worst shortages of freight cars in the history of the United States. The car shortage in the fall and winter of 1906 is believed to have been the largest ever experienced, but no statistics on the subject were compiled before 1907. The gross shortage reported on August 1, 1916, is the largest, the gross surplus is the smallest and the net surplus is the smallest ever reported on that date since statistics regarding these matters have been kept. The net surplus was only 10,616 cars. The smallest net surplus previously reported on August 1 was that of 1907, which was 27,836 cars, and in the fall of that year there was a severe car shortage, the net shortage rising on October 30, 1907, to 86,800 cars.

Past experience seems to indicate that whenever the net surplus in the early part of August is less than 100,000 cars there is pretty sure to be a net shortage beginning in October or the early part of November. There were only three years from 1907 to 1915, inclusive, when the net surplus on August 1 was less than this. These were 1907, 1912 and 1913, and in every one of them there was a car shortage in the late fall and early winter. The figures regarding car shortages and surpluses on August 1 for the last 10 years are as follows:

FREIGHT SHORTAGES AND SURPLUSES ON AUGUST 1 FOR TEN YEARS

August 1	Shortage	Surplus	Net Surplus
1916	37,292	47,908	10,616
1915	888	265,131	264,243
1914	2,333	198,998	196,665
1913	11,261	69,716	58,455
1912	9,394	65,904	56,510
1911	2,045	130,136	128,091
1910	2,783	105,564	102,781
1909	169	207,173	207,004
1908	635	281,621	280,986
1907	18,814	46,650	27,836

In view of the serious condition which these statistics indicate will exist within the next few months unless heroic treatment is applied, it behooves the managers of the railways and the large shippers of the country to take steps at once toward the adoption of some plan of co-operation which will result in the car supply of the country being utilized in the most efficient manner possible. There are enough cars to transport the country's business if only they shall be handled with care and efficiency. The statistics plainly indicate that unless they are thus handled there is going to be serious trouble. Past experience has shown that a bad car situation may be made much less bad than it otherwise would be by the exercise of foresight and energy by the railways and the shippers, and by prompt and friendly co-operation.

NEW BOOKS

Structural Timber Hand Book on Pacific Coast Woods. By O. P. M. Goss, consulting timber engineer. 290 pages, 5½ in. by 8 in. Bound in leather. Published by the West Coast Lumberman's Association, 1016 White building, Seattle, Wash. Price $1.

Until within the last few years there has been little accurate information concerning the four principal woods produced on the Western coast—Douglas fir, Western red cedar, Western hemlock and Sitka spruce. With the increasing use of these materials in construction work, not only in the Western states but throughout the entire United States, there has arisen a demand for accurate information concerning these timbers. In this book is collected a large amount of original data and that compiled from other sources which should be of value to the engineer using these classes of timber. The book contains a large amount of tabular data regarding the size, weights and strength of these timbers and also much information concerning the special qualities of these timbers and the work for which they are suited.

Letters to the Editor

CURTAINS FOR CROSSINGS

QUOGUE, N. Y.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

A correspondent of the New York Evening Post, who evidently takes a rational view of the automobile peril, proposes that, as the rather frail gate-bars at railroad crossings do not appear to do much toward the prevention of automobile accidents, there should be substituted a curtain of some light opaque material, stiffened and weighted a little with sharp spikes projecting toward the road; this to be raised or lowered between gate posts. An automobile driver, not being able to see ahead and knowing that a collision with the spiked curtain would damage him a good deal, would be pretty certain to stop until the curtain was raised.

This is an admirable idea. The only improvement on it that I could suggest—and this suggestion naturally rises to one's mind who lives on Long Island and who reads the war news from France—would be a curtain of fire, like those which the contending armies use to protect themselves from each other in the valley of the Somme.

L. I. SPEONK.

ONLY THE RICH CAN BE ECONOMICAL

BALTIMORE, Md.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The paper by M. K. Barnum, superintendent of motive power of the Baltimore & Ohio, on the life of steel cars, in your issue of March 3, is of great interest. One had been looking for information on this point, as steel cars in large quantities have now been in service long enough to give a line on their average life.

It is gathered from the information supplied that the life of steel cars depends to some extent on the nature of the service in which they are employed, but that as a general proposition 16 years is an outside limit, thus calling for a 5 per cent rate of depreciation on a price of $1,000 per car. If the price rises say to $1,200, the rate of depreciation must also rise, and for $1,200 in 16 years it must be no less than 6.33 per cent, since the life of a car unfortunately does not increase with its price.

The broaching of this subject offers the opportunity of considering the whole question of car purchases and the provision of funds for replacement. It is, of course, well known that the car trust method of purchasing cars is very widely practiced, but it is apparently not so generally recognized that this is a very extravagant way to maintain or develop a company's equipment. It means the payment of large amounts of interest, so that the contract price by no means represents the actual cost of the equipment. Moreover, while charges for depreciation cannot now be avoided under the law, these too often amount to mere bookkeeping entries, funds ostensibly reserved for replacement being diverted for other expenditures which may or may not increase the revnues. As a consequence when replacement is required new car trusts have to be formed and it may be necessary to form them at times when money is scarce and both money and prices are high. Thus the process of interest paying goes on with no end in sight. In other words, companies remain everlastingly behind their equipment instead of getting and keeping in front of it. Let us enforce the position by a few figures.

Assume the purchase of 1,000 steel cars under the car trust method. Let their contract price be $1,200 each and the terms of payment $200,000 down and the balance in ten years by car trust notes of $50,000 each, payable semi-annually with interest at 4 per cent. The total payment under this arrangement will be:

Cash	$200,000
Notes—Principal	1,000,000
Interest	210,000
	$1,410,000

making the cost of the average car $1,410 against the contract price of $1,200. The depreciation to be provided would be the contract price of the cars less scrap value, which Mr. Barnum gives as $200 per car, or $200,000 for the 1,000, so that the annual depreciation requirement for the sixteen years' life of the cars would be $62,500. Therefore the annual burden on the revenue during the first ten years, or five-eighths of the life of the cars, would be:

Two notes at $60,500	$121,000
Depreciation to realize $1,000,000 in 16 years	62,500
Annual charge for ten years	$183,500

Such is the condition when a company remains behind its equipment.

Now let us contrast with this the condition when a company gets, so to speak, in front of its equipment, and by this we mean when a company not only has the money to pay out-of-hand for what it proposes to buy, but is also in a position to set up a genuine bona-fide cash reserve accumulating at compound interest against the falling in of the cars. The operation in respect of the reserve is of the nature of a sinking fund operation, and, in order to provide against disappointments in investments and unused funds, we will use the low rate of 3 per cent for the accumulation.

On this basis, the amount required being $1,000,000 and the time sixteen years, the annual cash appropriation will be $49,600, or for the sixteen years a total of $793,600, and this is all that need be charged into the expenses for depreciation to comply with the full spirit of the law.

Summarizing the whole situation under the significant headings "Behind" and "Before," we have:

Behind		Before	
Cash	$200,000	Cash	$1,200,000
Notes—Principal	1,000,000	Reserve or Depreciation Fund	793,600
Interest	210,000		
Depreciation	1,000,000		
	$2,410,000		$1,993,600

showing a difference in favor of "Before" of $416,400 per 1,000 cars.

Now it is all very well to point out ideal conditions, but not of much practical utility unless some indication is given of how these conditions are to be attained. With the object of supplying this missing link let us consider what burden would be placed on the earnings of 1,000 steel cars in order to provide $793,600 in sixteen years, or $49,600 annually.

Assuming an average carload as weighing 45 tons and a rate per ton per mile of 3 mills, we have a car mile value of 18 cents.

Assuming an average daily movement of 30 miles, the 1,000 cars would accumulate 10,950,000 miles, of which assume 40 per cent empty, leaving 6,570,000 loaded. 6,570,000 loaded miles at 18 cents realizes a gross revenue of $1,182,600, and this sum divided into $49,600 gives a percentage of 4.194.

In the judgment of the writer there is no more important element in the multiform question of the relations between the legislatures, the commissions, the public and the railroads than the securing of economical methods of maintaining the appliances with which the railroads perform their transportation service. The foregoing figures show that the car trust

method of maintaining equipment is very essentially extravagant, yet on the present basis of rates there is no prospect of permanently getting away from it even after allowing for the added revenues from such increased rates as have been recently allowed.

The freight carried in all steel equipment is largely of those classes on which increased rates have not been allowed. Were a 5 per cent increase allowed with the understanding that the returns from such increase are to be devoted to the establishment of genuine renewal funds for the equipment, at one sweep a gigantic move would be made towards stabilizing the investment value of railroad securities and an enormity of anxiety cleared from the minds of devoted railroad men.

There should be but little more difficulty about managing a renewal fund than a car trust. If the funds of a bank can be managed to realize anywhere from 6 to 50 per cent for its stockholders, the funds of a renewal fund ought, it would seem, to be easily made to realize a modest 3 per cent as above set out.

It is not because I consider in the slightest degree this proposition of getting before the equipment a misshapen mythical or mysterious plan, but because I am looking to the welfare of unborn generations, that I sign myself,

A Railroad Futurist.

IMPROVING THE CLERK'S OPPORTUNITIES

Edmonton, Canada.

To the Editor of the Railway Age Gazette:

Referring to the letter signed "Another Clerk," in your issue of July 14, page 54, I do not know in what department the writer of the letter referred to is employed, but I will express my views from the standpoint of one engaged in the operating department, in a district superintendent's office.

Ambition beyond question is the essential factor to success, but in my opinion opportunity plays an equally important part, and constitutes the missing link. By opportunity I mean being so favorably located that those in a position to appreciate one's ambitions can observe the inclinations and exalt the ambitious clerk to the position his devotion to his duties entitles him.

Let me cite an actual case which now occurs to me, of what opportunity did for a young friend of mine. About four years ago I was surprised to learn that he was not a stenographer. He was only about eighteen years of age, but had been working in the office in which I was working for about three years, and apparently had no intention of taking up stenography. I pointed out the importance of so doing and after a while succeeded in persuading him to take it up seriously, personally instructing him in the art, being myself a qualified teacher. After a brief space of time a vacancy occurred in the office, that of secretary to the superintendent, and as he was my pupil, and feeling if given a fair trial he could handle the position satisfactorily, I recommended him to the chief clerk, who appointed him to the position. Since that time we have both been transferred to different points, he writing for general superintendents; today he occupies the enviable position of secretary to the senior vice-president. It is from such positions the higher officials our friend refers to have risen. Of course they have had to work hard, but what an incentive, when one is working for the man at the wheel. There are hundreds of us who are working just as hard, if not harder, but who have not the good fortune to be under the personal observation of such a personage. We get a periodical glimpse of the higher officials, but that is all.

I hope to outline a system which, if adopted by the railways, will give everyone an equal chance to display his best abilities. There is a great deal of good material in the clerical forces which, owing to lack of opportunity, is never revealed, whereas under a proper system all clerks would at least be given a trial, and, if incapable, would have to give way to their more capable fellow workers—the survival of the fittest.

It is a great incentive to know that the reward for faithful duty, coupled with ability, will be the next highest position in the office in which one is working, or its equivalent in another office, when such a vacancy occurs. Of course, as far as my experience goes, this system has been followed in the individual offices, but there is a limit, and that is when the position of assistant chief clerk or assistant accountant has been reached. It is at that point that the system, which I shall now outline, would commernce its duties.

1. A set scale of salaries for different positions in the same class of office.

2. Periodical recommendations for promotion should be made from the chief clerks, assistant chief clerks, accountants and assistant accountants, to fill positions such as yardmaster, assistant yardmaster, chief clerk, etc.

3. All vacancies on the entire railway system, superior to those of the assistant chief clerk, or assistant accountant, to be bulletined, and those desiring to make application for same to do so and appointments to be made from the applications received, the position being awarded according to length of service coupled with ability.

The adoption of such a system would not only eliminate dissatisfaction, but would secure a standard of efficiency such as has not yet been enjoyed, and would be beneficial from an educational point of view, making the successful clerks familiar with new territories, until eventually they would be conversant with the entire system, which knowledge could not be other than advantageous to the company which employs them.

The second part of the system I have outlined is in use by the company for which I am working, but I would like to see it generally adopted in full and to apply to the whole railway system, instead of the particular division on which one is working.

It is a good policy, and one which I follow, to get out on the road in one's spare time, and get acquainted with actual conditions. One is thus able to understand technical terms and handle to a greater degree of satisfaction the correspondence requiring practical knowledge. Insignificant though the clerk's position may appear, he can, by following the aforementioned procedure, become a valuable asset to the district officers, and handle correspondence as satisfactorily as if it received personal attention; in fact, in an officer's absence it is occasionally necessary to give a decision regarding different matters which could not possibly be given without the practical knowledge so gained.

There may be some readers who will criticize my views, concluding that the adoption of such a system would be but the thin edge of the wedge towards a railway clerks' union. Let me here emphatically state that such is not my intention. I am firmly convinced that a railway clerks' union is a mistaken and impracticable idea. A trades union always creates a certain amount of antagonism between employer and employed, and as staffs in superintendents', general superintendents' and general managers' offices are handling matters of a confidential nature, oftentimes affecting other organizations, it would be impossible to be a member of a union without sooner or later betraying the confidence reposed in one. Let me appeal to the advocates of a railway clerks' union to view the matter from that point of view, and they will see the fallacy of their opinions. However, when we consider that men engaged in maintenance of way work, a large percentage of which are foreigners, and whose education has cost practically nothing, are recognized by the various railway companies, it is surely obvious to all reasonable thinkers that the clerical forces are entitled to some consideration, and I am convinced that if railway companies will adopt the system I have outlined, their clerical staffs

will be satisfied, and the death blow to the agitation, which arises periodically, for a railway clerks' union will have been dealt. BOBS.

CONCRETE AND ASPHALT ROADS TO PROMOTE FREIGHT TRAFFIC

PHILADELPHIA, PA.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Allow me to call your attention to the question of good roads (highways). Congress is going to give the states and municipalities many millions of dollars for this purpose and the railways should stir themselves to get their share of the benefits. The money to be expended should not all go for pleasure roads or lines parallel to railroads; feeders, to facilitate the movement of farm produce to country stations, are needed everywhere. In a good-roads pamphlet published some years ago by the Pennsylvania Railroad, it was stated that millions of tons of the freight hauled over the company's lines were moved in wagons either before or after the rail journey, and that there were more than 400,000 miles of public roads in the states through which the Pennsylvania system operates. Years ago millions of dollars were invested in the building of railroads through lands only potentially valuable before the roads were constructed, and time has demonstrated the wisdom of this far-sighted policy. If it was profitable to do this, would it not be even more profitable to seek greatly multiplied produce shipments from a thickly populated district by removing the one serious obstacle—the bad road? Furthermore, the produce that does reach the railroads over bad roads is hauled at excessive cost. Government figures fix the loss or excess cost at $250,000,000 a year.

The highest prices for produce prevail when the roads are impassable and prices decline during the brief time the roads are in good condition. Bad roads curtail shipments during the greater period of the year and cause congestion of traffic during favorable periods. The farmer who lives 9½ miles from the railroad pays more to haul a bushel of wheat that distance than it costs to ship it from New York to Liverpool. It costs six cents more today to haul a ton of produce one mile over the old Cumberland Pike than it cost the farmer of 70 years ago.

Every mile of highway passing through productive land is or should be a branch of the nearest railroad—a branch road that should be passable at all seasons. Many roads that are not main roads now would become such were they improved, and in so far as the railroad is concerned these back-country roads would be immensely more profitable than roads paralleling railroads.

Macadam roads are regarded as an obsolete type where motor traffic prevails, and the cost of maintenance of such roads is in excess of that of any other type. The nearest approach to the ideal farmers' road appears to be the type adopted by the taxpayers of Monroe county, Michigan. This road has a 5-in. concrete foundation with 6-in. concrete curbs cast with the base. Between the curbs is placed 2 in. of natural asphalt macadam so as to insure a resilient wearing surface suitable for both horse and motor traffic. The first contract let called for the construction of some 14 miles at a cost less than $12,000 a mile. This is a remarkably low figure and below the price some states are paying for water-bound macadam roads. The concrete foundations may be increased or diminished in thickness to meet varying traffic requirements.

Old stone or macadam roads thoroughly compacted by years of travel, make excellent foundations and can be cheaply resurfaced with asphalt-bound stone. While costs differ in different localities, from $6,000 to $7,000 per mile for 16-ft. roads is a fair average. Such old roads must be resurfaced in any event if kept in good condition, so the real investment is in a permanent binding material. Durable roads are not beyond the resources of farming communities, and if railroads were to give the matter of highway improvement special attention, as they do other ways of increasing shipments, they would find it profitable. D. T. P.

TO KEEP TRAIN MEN VIGILANT

JACKSONVILLE, FLA.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The Safety First Committee of our road, of which I am a member, has recently had before it a record of 1,600 train accidents of which over 50 per cent were due to some fault or weakness in the human element. This fact, which is similar to other well-known statements familiar to the reader, is a reminder that the problem of the personnel is still the biggest thing with which we have to deal. My service on this committee and in the locomotive cab for 25 years convinces me that something must be done to keep men from getting into ruts. The practice of having members of the same engine crews work together year after year ought to be stopped. I do not mean to say that all men shirk their work, but many of them do. All the members of a crew are well acquainted; and where they have worked together in the same cab or caboose for two or three years it is not strange if there is a gradual letting down of the standard of work. The conductor and the engineman more and more delegate duties to the men below them, and after a time the work is not done as it was intended to be done. This spells inefficiency. As a remedy, why not at regular periods shift the members of the crews around?

My regular fireman, a man that I have trained to fire as I want the work done, burns two tons of coal less per trip than any of the extra men that I have had now and then. With the inefficient men it is difficult, sometimes, to keep a sufficient supply of coal from one coaling station to another. With the proper shifting about of the men, the incompetent firemen would be exposed and a suitable remedy would be applied.

Take again the case of a conductor and an engineman who have worked together for years. Probably they have become fast friends. Naturally, these friends will trust each other; but one of the principles of train-running, in the interest of safety, is that these two men shall *not* trust each other. Each should be a check upon the other. Any railroad man of experience will recall instances of where an engineman has overlooked an order to meet a train and where the conductor should have detected the fault, but was trusting the engineman. Having a man of known and reliable habits on the front end of the train he relaxes his vigilance. But the best of men fail at times; and when the engineman makes a mistake it cannot be rubbed out. On one occasion when I returned to my regular train after a short layoff, the conductor told me of his gratification at my return, and said that he had to watch the extra men all the time. This may have been an unpleasant thing for him to do; but it really is a normal thing. I, as a runner, may forget some safeguard; and I desire to have my conductor, in the interest of my job, and of preserving my life, watch me and help me to do my duty in the best possible manner.

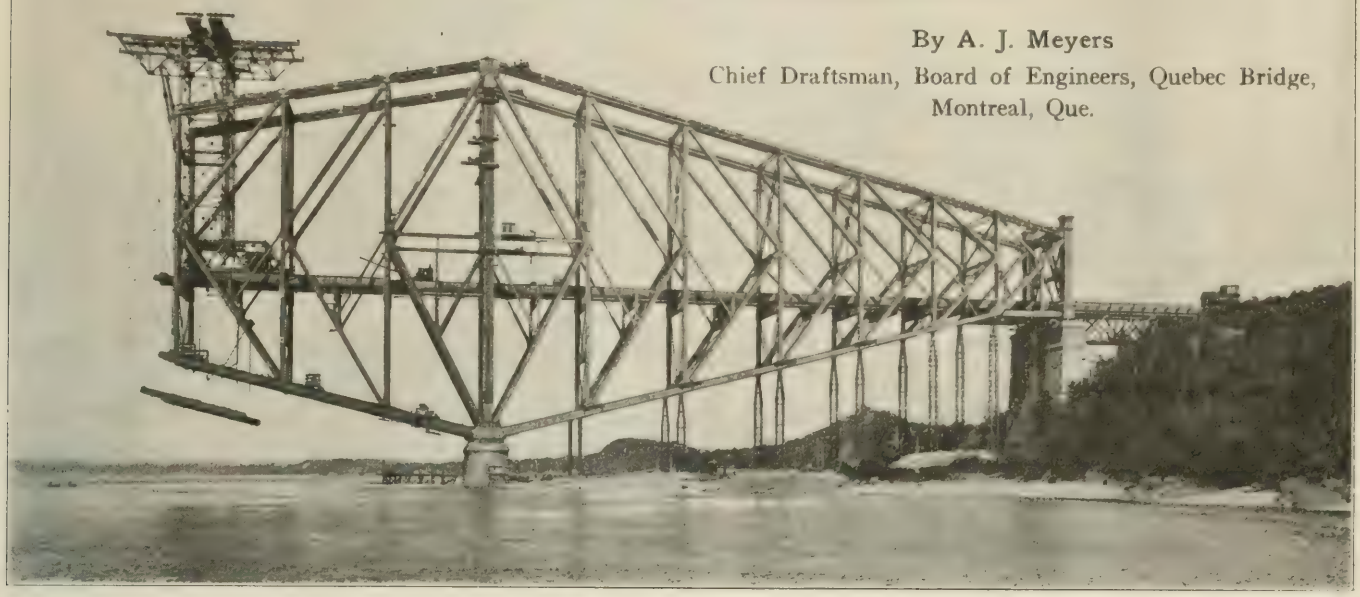
Efficiency and safety both demand that each person in the railroad service shall do the utmost that he can to perform the duties for which he is employed; and in such a critical business the co-operation which I have advocated is, consequently, necessary. WM. BAILEY THOMAS.

AUSTRALIAN RAILWAY STRIKE ENDED.—At the request of a majority of the general workers employed on the eastern section of the Transcontinental Railway line, the 40 clerks who were lately on strike at Port Augusta have resumed work, and the trouble has come to an end.

Erection Progress on the Quebec Bridge

The South Cantilever Was Completed on July 28. The Two Great Arms Are Now Ready for the Suspended Span

By A. J. Meyers
Chief Draftsman, Board of Engineers, Quebec Bridge, Montreal, Que.



South Cantilever on June 12, 1916

THE material for the new Quebec bridge erected on the south bank of the St. Lawrence river during the season of 1915, amounted to approximately 17,000 tons of bridge material and 3,000 tons of falsework. This steel was placed by one traveler in about five months' working time, and consisted of the inside falsework carrying the anchor arm floor and traveler tracks, the outside staging carrying the anchor arm truss material, sway and lateral bracing, and the south anchor arm including the main post and the links at the top of the main post, which connect the top chords of the cantilever and anchor arms.

At the close of the working period of 1915, the traveler was standing over the south main pier, prepared to begin the erection of the south cantilever arm as soon as the working season of 1916 opened. This involved 13,000 tons of steel and was started about April 1, 1916, after the traveler machinery and tackle had been thoroughly overhauled and put in working condition.

As illustrated in a drawing and a photograph, the bottom chords of the cantilever arm were erected by means of an erection bridge which temporarily supported the different parts of the chords until they were properly alined, the splices were riveted up, and the pins connecting the chords to the web members of the truss were driven. The bottom chords throughout the cantilever arm are made up of four vertical plate girder webs, laced together longitudinally in three horizontal planes. They are built entirely of nickel steel. The largest section in the first main panel adjacent to the main pier has a cross-sectional area of 1,630 sq. in. The outside dimensions are 84 in. deep by 124 in. wide. Each main panel of the bottom chord was divided into two half-panel sections, the members being fully spliced at this half panel point both as to material and rivets, as well as being accurately faced to as nearly a perfect bearing as modern shop equipment and machinery could make possible. Each half section was again divided vertically along its longitudinal center line. The members were shipped and handled in these sections, the heaviest section weighing 160,000 lb.

Each section was handled by means of specially designed and tested hitches, bolted to the top flanges, two sets of hitches to each section. The sections were lifted from the cars in pairs at the same time, one section for the east truss and the corresponding section for the west truss, all four of the 55-ton hoists of the two traveler cranes being used, one hoist of each crane to a section. The traveler therefore lifted and placed at one time approximately 320,000 lb. of steel. The sections after leaving the cars were fleeted apart until they hung vertically over their final positions in the bridge, when they were lowered into place on the erection bridge.

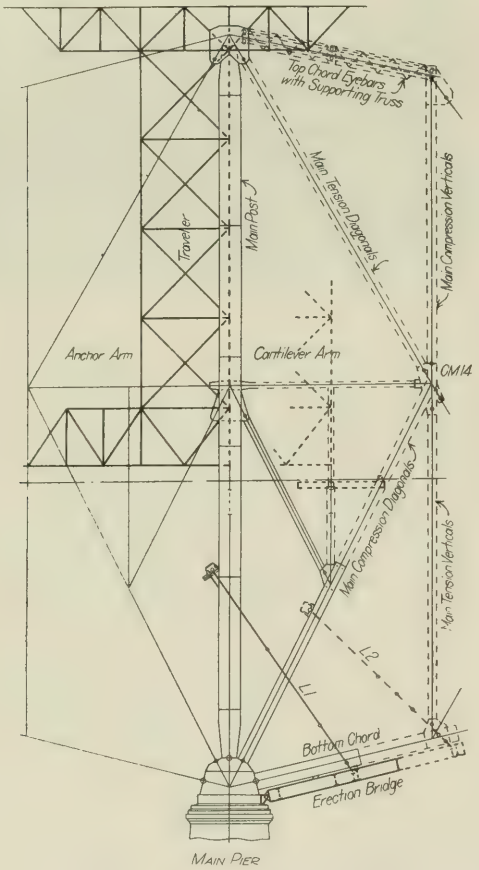
The erection bridge was a complete erection unit and was handled as such. It was made up of four longitudinal plate girder webs of a length equal to the longest main panel of the cantilever arm. These webs were placed together in pairs under each cantilever arm chord. The pairs of webs were braced together by two transverse plate girder webs with a lateral system of their own. These transverse plate girders were used to support the bottom lateral members until they were connected up to the chords. The two girders of each pair were connected together by a bottom lateral system and cross girders which served as seats for the jacks which were used for alining the chords to make the splices and for jacking up the completely riveted chord to make the pin connections to the web members above.

The main compression diagonals are built-up members with an arrangement of cross section similar to that of the bottom chord members, but of much smaller area. They were spliced, shipped and handled in a manner similar to that for the bottom chord members. Those in the panels next to the main pier, where the weight of the member has very little influence on the stresses in the remainder of the bridge, are made of carbon steel. In all the other panels of the cantilever arm these diagonals are of nickel steel. They were supported and adjusted, while their splices and end connections were being made, by means of tackle leading from the sub and main panel points of the diagonals to the bridge members in the panels already completed.

The main tension diagonals are built up of four plate girder webs; the webs are connected and riveted together in

pairs by means of lattice bars and tie plates; the pairs are connected together by means of spacer tie plates. The largest of these tension diagonals, in the panel next to the main pier, is 150 ft. 6⅛ in. long center to center of end-connecting pins. For this member each pair of webs was shipped to the bridge site in three sections making up the total length of the completed member. Before erection, these sections were assembled together on the floor of the bridge between the bridge trusses and the traveler. The splices were there completely riveted; each pair of webs was then hoisted into position separately by the traveler in one piece. These main tension diagonals were all of nickel steel, except those in the panel next to the main pier.

The pin holes at the lower end of the main tension diagonals, and at the upper end of the main tension verticals were slotted ¼ in. on the side remote from the bearing surface to facilitate the driving of the last connecting pins. The main

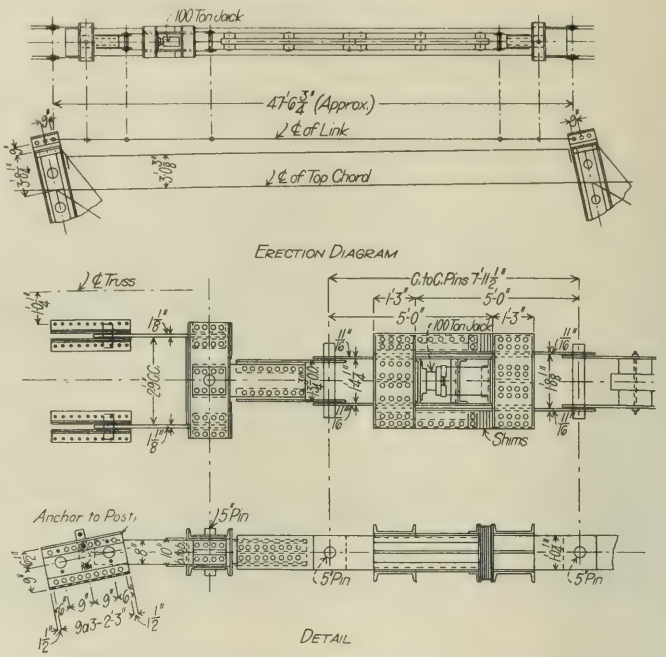


Erection Diagram of First Panel of Cantilever Arm

tension verticals were all built of nickel steel and are of a design similar to the main tension diagonals. They were spliced, shipped and handled in a similar manner. All the main compression verticals are similar in construction to the main compression diagonals, and were handled in the same way.

The main panel top chords in the cantilever and anchor arms are composed of two lines of eye-bars, spaced 3 ft. 6 in. center to center vertically, one above the other. Each panel of eye-bars in all panels over 50 ft. in length is made up of two lengths of eye-bars per panel, pin-connected to each other at the middle point of each panel where the weight of the pins and one-half the weight of the eye-bars is taken by a pair of supporting trusses. The eye-bars were assembled with the supporting trusses in the storage yard and the middle pins put into place. They were then taken out on the bridge and hoisted into position, one-half the bars in each panel being placed at one time.

As soon as the eye-bars and supporting trusses were erected, the adjusting links, illustrated in one of the drawings, were placed in position. The top chord eye-bars had the pin holes at the end of each panel slotted ¼ in. on the side remote from the bearing surface, and these adjusting



Adjustment Link for Erection of Top Chords

links were used to draw the top chord main panel points together so that the top chord pins could be easily driven into the elongated pin holes of the eye-bars. These top chord links also took care of any erection stress in the top chord



Traveler Erecting Material for the First Main Panel of Cantilever Arm

panel until the eye-bar pins at each end of the panel were driven.

The erection of the first main panel of the south cantilever arm was completed by April 28, 1916. The time actually worked was 22½ days of 10 hours, only 2½ days having been lost on account of high winds and rainy weather. The

amount of steel erected during this time was approximately 3,100 tons, and included the placing of the largest, longest and heaviest members of the cantilever arm. An average of 200 men for each working day was employed on the work, including from six to eight gangs of riveters.

The material in the second main panel weighed in the neighborhood of 2,650 tons, and was erected by May 26—in 18 working days. The 1,960 tons in the third main panel was placed by June 12—in 13 working days. As the traveler progressed towards the end of the cantilever arm, the members handled were lighter and the field splices fewer and smaller; the rate of progress was therefore greatly increased. By July 10, 1916, the traveler was standing at panel point 4, having completed the erection of six main panels. The fourth, fifth and sixth main panels were erected in 22 working days, the total weight of steel placed in this time amounting to approximately 3,600 tons.

The traveler was moved to its last position at the end of the seventh main panel on July 20. The last two main panels



Erection Bridge Placed in Position to Receive Bottom Chords

were erected in 18 working days, the amount of steel placed being about 1,280 tons.

The erection of the south cantilever arm was completed by July 28, 1916. The total weight of steel placed was about 13,000 tons; the actual number of days worked was 92, about 27 days being lost from inclement weather, Sundays and legal holidays. This cantilever arm was completed in over 25 per cent less working time than was taken for the north cantilever arm, and over a month ahead of schedule time. With the completion of the south cantilever the bridge is in readiness for the floating in and hoisting of the suspended span. This span, which is 640 ft. long, 88 ft. wide, and weighs in the floating in condition approximately 5,000 tons, was described in the *Railway Age Gazette* on May 26, page 1143. Its erection has proceeded simultaneously with that of the south cantilever arm and it is expected that it will be placed in its final position in the bridge during the early part of September, 1916.

The work is being carried out under the supervision of the Board of Engineers, Quebec Bridge, consisting of C. N. Monsarrat (chairman and chief engineer), Ralph Modjeski and H. P. Borden. The St. Lawrence Bridge Company is the contractor for the superstructure, George F. Porter being engineer of construction, W. B. Fortune superintendent and S. P. Mitchell consulting engineer of erection.

THE PROPOSED CLEARANCE LAW

The so-called "safe clearance" bill, H. R. 16681, has been reported to the House from the Committee on Interstate and Foreign Commerce and is now on the House calendar awaiting action. In reporting the bill the committee made several important changes from the original form in which the measure was introduced by Congressman Decker last June. As the bill now stands, it may be summarized as follows:

The clearance between engines and cars and all structures or obstructions hereafter erected is to be not less than 36 in., and the clearance between cars, on which men may have to be, and overhead obstructions hereafter erected, is to be not less than 6 ft. The bill specifically states that these limitations shall not apply to platforms rising not more than 4 ft. from the top of the rail, and that the clearance for mail catching or receiving devices may be reduced to 24 in. while the device is in position for operation.

One year after the passage of the act the clearance between trains and switch stands, mail cranes, water cranes, poles, stock pens, standpipes and hog drenchers now existing, shall be not less than 36 in., and the clearance between cars, etc., and overhead obstructions, except bridges, viaducts and tunnels built before the passage of the act, shall not be less than 6 ft. The provision relating to devices for catching mail, above mentioned, is made applicable to this section.

Twenty-four inches is the amount of clearance required between trains on parallel tracks, the requirement dating from one year after passage of the act.

The Interstate Commerce Commission is empowered, upon investigation and hearing, to allow a clearance less than that prescribed, provided that compliance with the law would "prevent or substantially impair the ability of the carrier to perform its duty to the public." The Interstate Commerce Commission is allowed to extend the period within which any railroad may comply with the provisions of the law.

No railroad is allowed to permit the space between those of its tracks which ordinarily are used by employees to be obstructed by obstacles which will interfere with the work of the employees or subject them to unnecessary hazard.

Penalties ranging between $100 and $500 are provided for each and every violation; and each time that any locomotive or car is used in violation constitutes a separate offense.

The proposed law is not to render inoperative State legislation governing the use of telltales for overhead obstructions (approaching bridges or tunnels).

Roundhouses and other structures, including construction and repair shops, are excepted. Electric street railways and electric interurban railways are also excepted.

The last section of this bill amends the original safety appliance act so as to except from the requirement relating to automatic brakes all trains used exclusively for hauling sugar in Porto Rico.

The report on the bill, No. 979, explains the principal provision, sets forth the reasons for the bill, and concludes with a mass of statistics supplied wholly by the railroad brotherhoods showing casualties arising from employees coming in contact with overhead and side obstructions, together with statistics showing the cost to the railroad brotherhoods on account of such casualties.

The committee dismisses the item of cost to the railroads of complying with this law as "comparatively slight" and declares that it will be distributed over a period of time so that "the burden will not be onerous. The bill as recommended," it is declared, "meets the principal objections made by the carriers to the bill which was first introduced, and their interests are fully guarded."

The House may take up the bill almost any day and pass it with little or no debate. But in the Senate the congested condition of the calendar may cause such delay that consideration at this session will be out of the question.

A. B. STICKNEY

A. B. Stickney, formerly president of the Chicago Great Western, died at his home in St. Paul on August 9, as was announced in our news columns last week. In 1892 A. B. Stickney, who since 1884 had been president first of the Minnesota & Northwestern and then of the company with which it was consolidated—the Chicago, St. Paul & Kansas City—reorganized the company under the name of the Chicago Great Western. The Chicago Great Western was made a company under this reorganization plan without a funded debt. Cash necessary to rehabilitate the property was estimated at $3,500,000 and it was then expected to obtain this cash from assessments on the common stockholders and income bondholders of the Chicago, St. Paul & Kansas City and from the sale of $2,000,000 4 per cent debenture stock. Only about $1,300,000, however, was realized in this way, and by the end of February, 1894, there was a floating debt of $1,023,000. Eventually this floating debt, which grew to amount to $10,653,000 by January, 1908, was too much for the company and a receiver was appointed on January 8, 1908. A large part of the Chicago Great Western's securities were held abroad. The theory on which the 1892 reorganization took place was that it ought to be possible for the stockholders to own their railroad and to run it so as to return a profit to themselves; moreover, if no part of the property were mortgaged the stockholders would have a first claim on surplus earnings and this would give the stock an actual value as an investment which stock junior to a more or less heavy mortgage would not have. This theory of railroad financing has been successful in England, but did not prove to be a success in the United States. There were two factors which worked against this: The earning power of the Chicago Great Western did not increase as time went on as rapidly as it had been estimated and investors abroad did not come forward as readily to buy American railroad securities unsecured by a mortgage as had been expected. The Stickney plan of a bankruptcy-proof railroad company failed and it was found that general creditors of a railroad company could put it into the hands of receivers just as effectively as could holders of bonds secured by a mortgage.



A. B. Stickney

In the actual management of the operations of the Chicago Great Western certain unusual methods were adopted. On the theory that statistics if analyzed sufficiently would not only record events that had taken place, but would give the basis for the formulation of a policy to be pursued in the future, elaborate fixed methods of operation were worked out and then imposed on the operating and maintenance officers. It was theoretically scientific railroading carried well toward the theoretic conclusion.

There is a difference of opinion yet among railroad men who had occasion to keep closely in touch with Chicago Great Western affairs during the Stickney regime as to how successful these operating methods were. The Chicago Great Western is exposed to the severest sort of competition. The company is still having, even after the reorganization in 1908, a hard time, and it may well be that both the Stickney method of financing a railroad and of operating one, if applied under more favorable conditions, would have been eminently successful.

A. B. Stickney built the Minnesota Central and his name will always be connected with the development of the Iowa corn belt. He believed in the country itself, induced settlers to come into it and induced the investment of eastern and European capital in the country. This was a service which cannot be lightly estimated.

Alpheus Beede Stickney was born at Wilton, Maine, June 27, 1840. In 1871 he became connected with the St. Paul, Stillwater & Taylor Falls, now part of the Chicago, St. Paul, Minneapolis & Omaha, as attorney, general manager and later vice-president. In 1880 he became superintendent of the St. Paul, Minneapolis & Manitoba, now part of the Great Northern. A year later he was made general superintendent on the Canadian Pacific and in 1882 was elected vice-president of the Minneapolis & St. Louis. It was during the years prior to 1882 that he built the Minnesota Central. In 1884 Mr. Stickney was elected president of the Minnesota & Northwestern, and when this was consolidated with the Chicago, St. Paul & Kansas City he became president of the consolidated company. It was under his auspices that the Chicago Great Western was formed and he was chairman of the board of directors from 1892 to 1908 and was president of the company from 1894 to 1900. When bankruptcy came in January, 1908, Mr. Stickney was made receiver.

RAILWAY EXTENSION IN NORWAY.—At a recent conference, attended by government, municipal, railway and other interests, the subject of a new railway line between the south coast of Norway and Christiana was discussed. The proposal is that the line should run from Christiana to Kristianssand in the south and connect by steamship service in Denmark. The Danish port suggested is Hirtshels on the west coast of Jylland. At present Hirtshels does not possess the requisite port accommodation and facilities, and it also lacks adequate inland communications, but as the Danish government shows an interest in the scheme, it is not thought that there will be any serious obstacle to the provision of all that may be necessary. With passenger boats capable of 16 knots, the distance from Kristianssand to Hirtshels could be traversed in five hours. The route would reduce the journey from Christiania to Paris by four hours, and the journey from Christiania to London would be reduced from 46¾ hours via Bergen to 41¼ hours via Kristianssand. Apart from foreign communication, the proposed railway would be of great benefit to southern Norway, which greatly needs improved communications.

Efficiency Testing on the Pennsylvania

Some of the Results of the Outdoor Work of 29 Inspectors of Train Service on the Schuylkill Division

EFFICIENCY testing in the train service—the careful and methodical inspection of the work and the conduct of enginemen, firemen, conductors, brakemen, station agents, operators and section foremen—under a permanent plan, is now generally recognized as an essential element in safe railroading; and the feeling which prevailed in former years that—except in occasional instances—the superintendent could depend on the men, if they had been well brought up, to discipline themselves, is seen to be a very superficial and inadequate view.

Efficiency testing is important everywhere, on large roads and on small. Indeed, the adoption of systematic testing in the railway service is only following the lessons of centuries of experience with the armies of the world. In the railway service it is peculiarly necessary because large numbers of men are trusted to perform duties of the weightiest importance while they are far from the eye of their master.

An illustration of the value of tests on a small road was given in the *Railway Age Gazette* of July 28, in the article by H. E. Haanel, of the Canadian Pacific. The Canadian Pacific is not to be classed among the small roads; but it is like them, on large sections of its lines, in that the number of trains in operation and of men in service is small in proportion to the extent of territory.

The present article deals with a road of dense traffic, the Pennsylvania. The large table, headed 686 c, "Summary of Failures" deals with the whole of the Pennsylvania Railroad proper and the whole of the Philadelphia, Baltimore & Washington and the West Jersey & Seashore; and the same is true of forms 686 A and 686 B; but the rest of the data has to do with the Schuylkill division alone. For the whole of these roads, in February, 1916, the record shows, for the eleven classes (Form 686 A, columns 1 to 11) 3,792 tests, with 43 failures; or a record of 98.8 per cent; and for the 38 classes of "observations" (Columns 1-38, form 686 B) 420,530 observations with 221 failures; or a record of 99.9 per cent. The tests shown on form 686 A have to do mostly with enginemen, but not entirely so. The February report of failures shows infractions of rules under these tests by signalmen, telegraphers and conductors.

Form 686 c is laid before the reader not as a record of bad service, nor even as a list of lessons in regard to good service; for the facts shown are of but small value, in either of those respects, without the collateral information which is shown in the detailed reports and which, of course, would be too voluminous for our present purpose. As a practical matter, data of this kind has its value limited also, except for the superintendent immediately interested, by what is known of the previous records of the same forces of men. The record is shown here simply as an illustration of the way of doing these things which prevails on the Pennsylvania; of the variety of matters that demand the attention of the inspector of train service, and of the different kinds of punishment imposed.

The meaning of the numbers in the second column ("Nature of Test") will be understood by reference to forms 686 A and 686 B. For example: Philadelphia Terminal division, the seventh item, "6" refers to distant switch signals, column 6, form 686 A; fifth item, "34" refers to observations of trains running through crossovers, column 34, form 686 B.

The large tables shown in facsimile are reproduced mainly for the purpose of illustrating the magnitude of the work that is done and the extent of detail which it requires. Comparisons between one division and another, or of the failures in one class as related to those in another (though they have their value for officers of the road, acquainted with all of the qualifying conditions) would be neither practicable nor useful with the data here available. For example, see item No. 4, form 686 B, where the number of observations on the Pittsburgh division was 5,790, while on the Tyrone division it was five. These two divisions, however, are not only widely different in the matter of size, but also in the relative importance of different kinds of traffic and in other conditions.

All of the tables shown are for the month of February, 1916. The salient feature of the record is table 686 c, as above indicated. This shows the failures detected in a month by several hundred inspectors, among thousands of employees, performing millions of operations. Preliminary to this record we have forms 686 A and 686 B which classify the data on which is based the record of efficiency and of failure.

The facsimiles of forms 686 A and 686 B are partial; in their complete form they are too large for reproduction in these pages. From these incomplete reproductions the reader can get an idea of the character of the reports, while for the substance of the data contained in them, for the month under consideration (February, 1916), reference is had to the end of this article, where further explanations are given.

The Schuylkill Division

Turning now from the broader aspect of this work to the more detailed study of a single division we find that in a typical month (not February) observations were made by 29 men, as shown below. Mr. Strebig, the one first named in the list made 64 tests (48 by day and 16 by night) of the classes recorded on form 686 A. All of the rest of the figures represent "observations." Of these observations, 11,771 by day and 3,230 by night (see totals of columns in table) were of the classes recorded on form 686 B, while 7,081 by day and 2,928 by night had to do with matters of lesser importance. These less important subjects of observation are enumerated in a list headed "Miscellaneous Efficiency Observations" which will be given in a second article.

The 25,064 observations (which number includes the 64 tests by the inspector of passenger service first above-mentioned) are reported to the superintendent in detail with all necessary data concerning time and place and whatever may be necessary to provide a satisfactory record for inclusion in form 686 c.

Efficiency Tests and Observations, Schuylkill Division, June, 1916

Occupation	Day		Night			Failures
	Form 686B	Misc.	Form 686B	Misc.	Total	
Mr. S—Inspector Pass. Service	3,166	2,385	1,113	720	7,448	5
Mr. A—Asst. Train Master	100	...	694	402	1,196	5
Mr. B—Train Despatcher	65	18			83	0
Mr. C—Train Despatcher	236	36			272	0
Mr. D—Engine House Foreman	8	19			27	0
Mr. E—Asst. Train Master	58	82			140	0
Mr. F—Asst. Yard Master	1,684				1,684	0
Mr. G—Asst. Train Master	1,047	714	3	643	1,907	0
Mr. H—Yard Master	221	...	27		248	0
Mr. I—Division Operator	86	126	21	4	237	0
Mr. J—Asst. Yard Master	73	...	...	...	73	0
Mr. K—Ex. Train Despatcher	124	355	14	3	496	0
Mr. L—Ex. Asst. Yard Master	770	...	...	...	770	0
Mr. M—Ex. Train Despatcher	239	33	...	...	272	0
Mr. N—Train Despatcher	78	43	...	...	121	0
Mr. O—Supervising Agent	1,069	1,020	873	529	3,591	0
Mr. P—Asst. Train Master	310	1,147	6	...	1,463	0
Mr. Q—Train Despatcher	130	118	...	...	248	0
Mr. R—Train Despatcher	152	36	...	...	188	0
Mr. S—Train Despatcher	84	42	...	...	126	0
Mr. T—Asst. Yard Master	1,219	...	...	325	1,544	0

EFFICIENCY TESTS AND OBSERVATIONS, SCHUYLKILL DIVISION, JUNE, 1916—CONTINUED

Occupation	Day Form 686B	Day Misc.	Night Form 686B	Night Misc.	Total	Failures
Mr. U—Asst. Road Foreman of E.	276	145	143	29	593	0
Mr. V—Supervisor	92	240	...	...	332	1
Mr. W—Asst. Yard Master	15	21	...	...	36	0
Mr. X—Traveling Engineman	95	37	151	28	311	0
Mr. Y—Ex. Train Despatcher	374	47	244	70	735	0
Mr. Z—Engine House Foreman	...	...	20	8	28	0
Mr. AA—Asst. R. F. E.	200	127	11	3	341	0
Mr. BB—Master Mechanic	...	290	...	164	454	0
Totals	11,771	7,081	3,220	2,928	25,064	5

The Schuylkill division consists of 111 miles of road, of which 66 miles is single track. There is a superintendent, one trainmaster, six assistant trainmasters, one road foreman of engines, two assistant road foremen, a traveling engineman and an inspector of transportation.

The train forces consist of 86 enginemen (23 passenger and 63 freight), 87 firemen, 67 conductors (23 passenger and 44 freight), 25 baggageman, and 236 brakemen.

Tests with fixed signals on this division are made by or under the direction of Ira I. Strebig. They are made from time to time on such enginemen as are selected by him. A list is kept of the names of all of the runners, passenger, freight and switching, and the inspector must see that none are overlooked. With manual block signals, the inspector first gives the signalman a written notice to hold a certain signal in the stop position for a certain train. After a train has been brought to a full stop, he allows it to proceed. The inspector in the meantime has placed himself in a position to see whether or not the signal is overrun. If it should be overrun, he immediately calls the engineman's attention to the situation and notes the exact distance.

With automatic signals, the inspector puts the signal in the stop position. Tests with distant switch signals are made by having a signal maintainer place the signal in the caution position, removing the switch lamp by day or extinguishing the light in the lamp at night. The inspector places himself in a position to see exactly what the passing engineman does. If a distant switch signal wrongfully shows caution, the engineman must stop and note the condition of the switch, the switch lock and the switch lamp; and must make a suitable report to the superintendent at the first convenient point.

Tests with fusees are usually made at the approach to a curve; but if a test is made on a curve, or if, in foggy weather, one is made either on a curve or on a straight line, torpedoes are put down some distance in the rear so as to give the engineman time to slacken speed before he sees the fusee. The engineman must stop and pick up the fusee, and then proceed with caution; and if a fusee is found between the two main tracks, he must stop and pick it up and place it on the other track. Where an engineman is tested with torpedoes, the inspector notes if he closes his throttle and makes a visible reduction of speed.

Block signal operators and trainmen are tested by removing one of the markers from the rear end of a train. The inspector notes what block stations and trains are passed by such a train and then calls on the train despatcher to see

FORM 876B—PENNSYLVANIA RAILROAD, SCHUYLKILL DIVISION—EMPLOYEES' REGISTER

The undersigned certify they have been off duty the number of hours as required by law, and during that time have taken the proper amount of rest and are now in condition for duty

Date	Train or Crew	Time Ordered for or Time Required to Register	ENGINEMAN	Time Registered	Last General Order Signed	Witness	FIREMAN	Time Registered	Witness	REMARKS
6/19/16	SL86	10.00a	R.M. Grieves	9:50a	W&H	Nagle	A.R. Beaver	9:50a	Nagle	

FORM 686A—PENNSYLVANIA RAILROAD; SUMMARY OF EFFICIENCY TESTS FOR MONTH OF FEBRUARY, 1916.

DIVISION	(1) Home or Advance Signal at Stop and Distant Signal at Caution		(2) Home or Advance Signal at Stop (No Distant Signal).		(3) Automatic Signal at Stop.		(4) All other Stop Signals.		(5) Signal Lights not Lighted.		(6) Distant Switch Signal at Caution		(7) Permissive Aspect Displayed to Trains that should not accept it		(SEE NOTE)		TOTAL			
	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Percent. Effy.	
Manhattan	4	-	-	-	6	-	-	-	3	-	-	-	-	-			90	-	100	
New York	10	-	2	-	59	-	25	-	4	-	2	-	-	-			139	-	100	
Trenton	20	-	22	-	6	-	6	-	10	-	18	-	14	-			181	-	100	
W. J. & S.	20	-	36	-	6	-	19	-	4	-	4	-	-	-			112	-	100	
Philadelphia Term.	15	-	7	-	18	-	40	-	19	1	1	-	1	-			128	5	96.1	
Philadelphia	27	-	3	-	36	-	38	-	8	-	7	2	-	-			145	2	98.6	
Cresson	-	-	34	-	-	-	-	-	15	-	4	-	8	-			142	-	100	
Middle	53	-	3	-	32	-	33	-	10	8	10	1	6	-			170	10	94.1	
Schuylkill	11	-	-	-	5	-	-	-	5	-	2	-	-	-			36	-	100	
Bellwood	9	-	7	-	-	-	1	-	7	-	1	-	2	-			45	-	100	
Bedford	-	-	12	-	-	-	-	-	10	-	2	-	3	-			45	-	100	
Tyrone	5	-	34	-	-	-	-	-	19	-	9	1	-	-			93	1	98.9	
Pittsburgh	105	-	38	-	240	3	48	-	18	1	26	-	16	-			714	11	98.5	
Conemaugh	41	-	44	-	21	-	12	-	4	-	13	-	2	-			188	-	100	
Monongahela	59	-	12	-	24	-	-	-	21	3	7	-	6	-			149	3	98.0	

Note.—In place of the eighth column which here is shown blank, the statement contains four columns, namely: Fusee; Torpedo; Absence of Markers; Blue Signal.

FORM 686B—PENNSYLVANIA RAILROAD; SUMMARY OF EFFICIENCY TESTS FOR MONTH OF FEBRUARY, 1916—(See Explanations in Text)

DIVISION	(1) Engineman's observance of Flagman's signal		(2) Flagman's performance		(3) Prompt return of hand signal to stop for passage of train		(4) Conformity to regulations as to explosives and Inflammables		(5) Leaving or arriving at designated time		(6) Whistling to call attention to signals carried		(7) Car doors not properly closed		(8) Display of train order signal		(9) Conformity to special regulations		(10) Rule 3 Comparing watches with standard time.		(11) Rule 7 Signal appliances in good order and ready for immediate use		(12) Rule 9 Night signals displayed from sunset to sunrise and during fog or storm or when weather conditions obscure day signals		(13) Rules 10, 11, 12 and 22—Proper use of signals		(14) Rule 14 Display of white lights on rear of yard engines	
	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures	Number made	Failures
Manhattan	11	-	21	-	85	-	1410	6	170	-	-	-	1210	-	-	-	4	-	80	-	85	-	768	-	710	-	62	-
New York	3	-	301	1	12	-	26	-	200	-	-	-	2806	-	-	-	173	-	9	-	43	-	75	-	14	-	3	-
Trenton	25	-	258	-	871	1	110	5	534	-	27	-	1176	4	54	-	217	-	17	-	25	-	100	-	18	-	11	-
W. J. & S. R. R. and Cam. Term.	12	-	106	-	199	-	-	-	12	-	-	-	2137	-	14	-	104	-	8	-	49	-	41	-	121	-	14	-
Philadelphia Terminal	2	-	7	-	216	-	135	-	365	-	-	-	1473	-	8	-	95	1	152	-	36	-	135	-	750	-	157	-
Philadelphia	15	-	239	1	39	-	268	-	1109	-	-	-	6767	-	9	-	137	4	166	-	74	-	127	-	150	-	3	-
Cresson	36	-	171	-	182	-	13	-	186	-	24	-	377	-	17	-	78	-	102	-	297	-	87	-	578	-	3	-
Middle	9	-	125	3	57	-	88	1	960	-	-	-	1212	-	12	-	1566	-	186	-	236	-	171	-	968	-	180	-
Schuylkill	388	-	921	-	2459	-	99	-	819	-	-	-	3041	-	146	-	385	-	185	-	250	-	757	-	1163	-	95	-
Bellwood	11	-	24	-	208	-	4	-	256	-	-	-	222	-	13	-	11	-	30	-	18	-	89	-	40	-	3	-
Bedford	11	-	75	-	58	-	3	-	202	-	-	-	84	-	18	-	85	1	22	-	40	-	28	-	318	-	-	-
Tyrone	27	-	53	-	74	-	5	-	56	-	-	-	2001	-	47	-	15	-	72	-	37	-	19	-	13	-	26	-
Pittsburgh	1085	-	3325	4	731	-	5790	-	3754	-	-	-	103605	4	340	-	2664	1	316	-	4400	-	10606	2	20741	4	66	-

if all of the signalmen and trainmen have reported the absence of the marker.

And so on through the whole list. The modus operandi of most or all of the other tests is sufficiently indicated by the titles, as given below. The quality and the usefulness of any test must depend, of course, on the personality of the officer making it; and by way of throwing light on this aspect of the problem we have asked the inspector of passenger service on the Schuylkill division, I. I. Strebig, to write a brief sketch of his experiences; and this will be given in our second article. Suffice it to say, for the present, that the officers of the road believe that the number and character of the tests made are such as to warrant the conclusion that their essential purpose, that of keeping the men alert, is accomplished. This is the point at issue in any operations of this kind, on any railroad. Tests made infrequently or without due care are pretty likely to be ineffective. To have them made, on the other hand, in sufficient frequency and variety to provide a complete check—as a piecework inspector would do in a machine shop or a shirt factory—is out of the question. The golden mean is attained when all has been done that can be done to educate and stimulate the intelligence and the consciences of the individual employees. We have said that the men are kept alert—that this is the desideratum. More accurately it should be said that the object is to have men who will be alert and will constantly desire to be alert. Men, in any line of work, who are kept alert by fear—or who feel any unfriendliness toward the supervisor or inspector—are not reliable except while they are under the superior's eye; and in the train service such surveillance is, of course, out of the question.

Inspector Strebig keeps in constant touch with the trainmen, especially the enginemen, and recently has noted the answers of the runners to the direct question how they liked the tests; whether they looked upon them as a good thing for themselves; and he records 92 per cent of the answers as favorable.

One of the things employed to keep trainmen alert and efficient is a register, always in charge of a competent representative of the trainmaster or the division master mechanic, on which each conductor, brakeman, engineman and fireman must sign his name when he begins his day's or night's work. A sample page of the register for enginemen and firemen is shown herewith (form 876 B).

Another element in the means employed for promoting carefulness is the posting of bulletins explaining briefly the causes of accidents, large and small. Following are two examples of these bulletins:

READING, PA., April 20, 1916.

NOTICE

Brakeman's toes broken and foot contused, due to conductor failing to assure himself that switches were properly set for movement, resulting in brakeman's foot being caught between engine step and rail in track when engine derailed at derail.

G. R. SINNICKSON,
Superintendent.

READING, PA., May 6, 1916.

NOTICE

Conductor assumed position between two cars and, also, between cars and transfer platform, instead of on opposite side of track, where there was sufficient clearance, with the result that he was injured, due to being caught between cars and platform when draft moved.

J. J. RHOADS,
Superintendent.

FORM 686A

Form 686 A, the smaller of the two reports shown in facsimile, contains data from 25 divisions of the road. The fifteenth, shown in the illustration, the Monongahela, is followed by the Renovo, the Williamsport, the Sunbury, the Baltimore, the Elmira, the Buffalo, the Allegheny, the Maryland, the Media and the Delaware divisions. There are eleven tests which are covered by this form, but the last

FORM 686c PENNSYLVANIA RAILROAD SUMMARY OF EFFICIENCY TEST FAILURES, FEBRUARY 1916

Division	Nature of test (See Forms 686A, 686B)	Tests: Number made	Tests: Failures	Observed in service: Number made	Observed in service: Failures	Nature of failure or irregularity	Discipline imposed
Manhattan	4	..	..	1,410	6	Lack of information on waybills	Clerks cautioned.
New York	2	..	..	301	1	Improper flagging	Flagman's attention called
New York	15	..	..	489	4	Markers improperly displayed	One conductor and two flagmen reprimanded; top light defective; repairs made
New York	33	..	..	1,379	2	Not properly calling signal indications	Two firemen instructed
New York	34	..	..	15	1	Exceeded speed 11.7 m. p. h	Engineman reprimanded
New York	26	..	..	152	2	Defects found after regular inspection	Inspector suspended one day
Trenton	3	..	..	871	1	Failed to return signal to normal position at once	Signalman reprimanded.
Trenton	4	..	..	110	5	Not properly placarded, endorsed and sealed	Five agents reprimanded.
Trenton	7	..	..	1,176	4	Freight car doors open enroute	Four conductors' attention called.
Trenton	36	..	..	214	32	Defects of minor character. Repairs made before being put in service.	None recommended.
Phila. Term	5	19	1	...	..	Failed to recognize imperfectly displayed signal	Engineman suspended seven days
Phila. Term	8	4	1	...	..	Failed to observe fusee	.....
Phila. Term	10	8	3	...	..	Failed to notice absence of markers	Three towermen's attention called.
Phila. Term	9	..	..	95	1	Exceeded speed	Engineman's attention called.
Phila. Term	34	..	..	96	2	Exceeded speed	Two enginemen's attention called.
Phila. Term	37	..	..	37	2	Exceeded speed	Two enginemen reprimanded.
Philadelphia	6	7	2	...	..	Failed to stop and examine switch. Failed to see position of switch. Failed to stop and examine switch.	One engineman suspended four days; one engineman suspended two days; one fireman suspended two days.
Philadelphia	2	..	..	239	1	Failed to properly protect train	One flagman suspended two days
Philadelphia	9	..	..	137	4	Exceeded speed limit 12, 9.4, 9 and 9 m. p. h	Three enginemen reprimanded. one engineman suspended two days
Philadelphia	27	..	..	82	1	Failed to lower gates	Watchman suspended one day
Philadelphia	37	..	..	39	3	Exceeded speed 15 and 10 m. p. h	One engineman reprimanded. two enginemen cautioned.
Middle	5	10	8	...	..	Failing to comply with Time Table Rule 223	Five enginemen cautioned, one engineman suspended two days, one engineman suspended one round trip, one conductor reprimanded.
Middle	6	10	1	...	..	Losing time unnecessarily	Engineman reprimanded.
Middle	8	8	1	...	0	Failing to comply with Time Table Rule 111	Engineman reprimanded.
Middle	2	..	..	125	3	Failing to have train properly protected. Failing to properly protect train.	One conductor reprimanded, one flagman suspended one week and warned; one flagman reprimanded
Middle	4	..	..	88	1	Having car in train improperly carded	One conductor reprimanded.
Schuylkill	32	..	..	620	5	First aid equipment not in proper condition	Attention called.
Bellwood	27	..	..	25	1	Allowed unauthorized persons in watch house	Watchman reprimanded.
Bellwood	28	..	..	99	1	Walking with current of traffic on double track	Track walker reprimanded.
Bellwood	36	..	..	519	2	Failed to make proper repairs	Employees suspended two days each.
Bedford	9	..	..	85	1	Exceeded speed limit	One engineman and one conductor reprimanded.
Tyrone	6	9	1	...	..	Failure to observe distant switch signal at caution and target removed from switch stand.	Freight engineman reprimanded and warned.
Pittsburgh	3	240	3	...	..	Ran past signal in the stop position	Three enginemen suspended two days each.
Pittsburgh	5	18	1	...	..	Ran past signal with light obscured	One engineman suspended 14 days.
Pittsburgh	8	56	1	...	..	Overran fusee signal	One engineman suspended two days
Pittsburgh	9	132	6	...	..	Disregarded torpedo signals	Three enginemen cautioned, three censured.
Pittsburgh	2	..	..	3,325	4	Failed to protect trains	One conductor suspended 14 days, one brakeman and flagman suspended four days each, one flagman suspended six days and one flagman suspended two days.
Pittsburgh	7	..	..	103,605	4	Car doors open while passing over road	Two conductors cautioned
Pittsburgh	9	..	..	2,684	1	Exceeded minimum running time between stations	One engineman cautioned.
Pittsburgh	12	..	..	10,606	2	Headlights burning in daylight	One engineman cautioned and one censured.
Pittsburgh	13	..	..	20,741	4	Failed to sound whistle for road crossing	Four enginemen censured.
Pittsburgh	15	..	..	9,402	2	Failed to display decklight at night	Two flagmen cautioned.
Pittsburgh	25	..	..	930	5	Failed to conform to code prescribed in current time table.	Four conductors censured; one conductor cautioned.
Pittsburgh	26	..	..	9,317	2	Marked up time of registering incorrectly	One brakeman censured, one conductor cautioned.
Pittsburgh	31	..	..	8,253	1	Failed to make road air brake test after taking water	One conductor suspended two days
Pittsburgh	34	..	..	249	3	Exceeded speed 8.3 m.p.h.; 2 exceeded speed 10 m.p.h.	Two enginemen cautioned. one engineman suspended two days.
Conemaugh	9	..	..	29	4	Exceeded speed 6 m. p. h	Four enginemen cautioned
Conemaugh	36	..	..	143	2	Improper inspection	Two car inspectors cautioned.
Monongahela	5	21	3	...	..	Did not observe absence of signal light	One freight engineman suspended two days, two passenger enginemen suspended one week each.
Monongahela	2	..	..	114	3	Three freights insufficiently protected	Two flagmen cautioned, one flagman censured.
Monongahela	4	..	..	26	3	Three cars of explosives in improper position in train.	Two conductors censured; one conductor cautioned.
Monongahela	7	..	..	1,807	28	Four conductors had 28 car doors open in trains	Four conductors cautioned
Monongahela	9	..	..	53	1	Freight extra made excessive speed, derailing car	Engineman suspended one week
Monongahela	12	..	..	164	1	Switch light not burning, due to being defective	Corrected.
Monongahela	15	..	..	208	2	Two freight extras had improper rear ends	Two flagmen cautioned.
Monongahela	16	..	..	21	2	Did not have blue flags in position	Two piecework inspectors cautioned.
Monongahela	33	..	..	496	1	Fireman failed to call signals	Fireman cautioned.
Monongahela	36	..	..	9,233	12	Two improper wording on cards. Five wrong repairs made. Wrong price and wrong extension on card. Tools not in order and scrap lying in yard. Wasting steam, connection loose.	Piecework inspector cautioned; three car repairers cautioned; clerk and piecework inspector cautioned; two gang leaders cautioned; boiler washer cautioned
Monongahela	37	..	..	196	1	Exceeded speed limit on curve	Engineman cautioned.
Renovo	2	..	..	272	2	Flagman went back but 5 car lengths, from which point his view was obstructed by curve. Flagman failed to go back promptly after train stopped.	Flagman suspended two weeks; flagman suspended one week.
Renovo	29	..	..	53	1	Passed stop signal	Passenger conductor reprimanded.
Renovo	37	..	..	23	1	Exceeded speed 15 m. p. h	Engineman's attention called
Williamsport	5	18	2	...	..	Failed to report absence of switch light	Two enginemen suspended two days each.
Williamsport	6	10	2	...	..	Failed to stop and examine switch	Two enginemen suspended two days each.
Williamsport	35	..	..	40	2	Exceeded speed	Two enginemen suspended two days each.
Sunbury	2	14	1	...	..	Overrunning stop signal	One freight engineman suspended 30 days.
Sunbury	5	48	1	...	..	Block signal light not burning and train in block which required protection.	One telegraph operator suspended four days.
Sunbury	10	8	4	...	..	Failure to note passenger train without markers	One telegraph operator reprimanded; one suspended one day; one reprimanded.
Sunbury	2	..	..	1,794	1	Failure to protect light engine	One freight engineman suspended four days.
Sunbury	3	..	..	581	2	Failure to return fixed signal to stop	One telegraph operator reprimanded; one suspended two days.
Sunbury	4	..	..	46	1	Hauling car cement, placarded "Acid"	One freight conductor cautioned
Sunbury	7	..	..	2,591	1	Box car door open	One freight conductor attention called.
Sunbury	8	..	..	81	3	Failure to display train order signal when required. Improper display of signal.	One telegraph operator suspended five days; two telegraph operators reprimanded.
Sunbury	8	..	..	82	1	Exceeding speed in city limits	One passenger conductor suspended one day.
Sunbury	12	..	..	44	1	Failure to display night signals when weather conditions required it.	One freight conductor reprimanded; one freight flagman reprimanded

Sunbury	15	..	..	4,304	9	Failure to ring bell passing trains. Failure to sound road crossing signal. Unnecessary whistling.	One passenger engineman reprimanded; one passenger fireman reprimanded; two passenger enginemen's attention called; one freight engineman reprimanded, one cautioned; three attention called.
Sunbury	15	..	..	595	2	Failure to properly display markers	One freight engineman suspended two days; one freight flagman reprimanded.
Sunbury	16	..	..	110	3	Failure to display blue signal	Three car inspectors suspended one day each.
Sunbury	22	..	..	144	1	Failure to return switch to normal after use	One freight brakeman reprimanded.
Sunbury	26	..	..	96	1	Failure to sign promptly for general order	One freight conductor and five freight enginemen suspended two days each.
Sunbury	30	..	..	618	4	Imperfect freight car inspection	Seven car inspectors reprimanded; one boilermaker reprimanded.
Baltimore	10	12	1	...	..	Failed to observe absence of markers from train on adjacent track.	Freight engineman and conductor admonished.
Baltimore	7	..	..	1,997	6	Box car doors open	Taken up for correction.
Maryland	..	..	..	485	4	Improper flagging	One flagman suspended two weeks; two flagmen suspended one week; one flagman suspended two days.
Delaware	28	..	..	345	1	Track laborer failed to clear track promptly upon approach of train in accordance with instructions of assistant foreman.	One laborer reprimanded.

four are omitted from the facsimile. The complete list is as follows:

1. Home or Advance Signal at Stop and Distant Signal at Caution.
2. Home or Advance Signal at Stop (No Distant Signal).
3. Automatic Signal at Stop.
4. All other Stop Signals.
5. Signal Lights not Lighted.
6. Distant Switch Signal at Caution.
7. Permissive Aspect Displayed to Trains that should not accept it.
8. Fusee.
9. Torpedo.
10. Absence of Markers.
11. Blue Signal.

The totals of these columns in the February report are as follows: (1) 566—0; (2) 471—1; (3) 559—3; (4) 287—0; (5) 312—16; (6) 175—6; (7) 118—0; (8) 253—3; (9) 556—6; (10) 164—8; (11) 385—0. The total number of tests made was 3,792 and the total number of failures, 43; percentage of efficiency, 98.8. Of the 25 divisions, 16 were recorded as 100 per cent efficient.

Form 686B

Form 686B provides for 25 divisions, the same as the form previously mentioned, only thirteen of which, however, are shown in the facsimile. The "observations" provided for in this list differ from the "tests" shown on form 686A in that they have to do only with what is seen by the inspectors during the course of actual operation. The "tests," on the other hand, usually require the manipulation of some mechanical device or appliance whereby the testing officer duplicates actual service conditions.

Form 686B provides for observations under 38 different heads, of which 14 are shown. The other 22 are as follows:

(15) Rules 19, 19A, 19B, 20 to 24A.—Proper display of markers and classification signals.
(16) Rule 26—Proper display of blue signal.
(17) Rules 83 and 83A. Trains before leaving initial starting points ascertaining first whether all superior trains due have arrived or left.
(18) Positive identification of trains at meeting points.
(19) Rule 100—Brakeman taking the place of flagman when latter goes back to protect train.
(20) Rule 102—When cars are pushed by an engine, a trainman to take conspicuous position on front of leading car.
(21) Rule 102A—When shifting over unprotected crossings, trainmen to be stationed on crossing to warn persons using same.
(22) Rule 104—Switches left in proper position after having been used.
(23) Rule 104A—All switches of any cross-over to be secured in the normal position when trains are waiting to cross.
(24) Rules 152 and 503F—Protecting before crossing over or obstructing tracks and seeing that all switches of cross-over are open before making cross-over movement.
(25) Rules 316 and 416—Proper use of communicating code.
(26) Regs. 703 and 718—Examination of Bulletin Boards by conductor and enginemen.
(27) Reg. 731—Crossing watchmen; observance of regulations governing.
(28) Reg. 728—Men working on or about tracks; observance of regulations governing.
(29) Reg. 703—Conductor comparing time with engineman and ascertaining if he has copy of latest time table before starting trip.
(30) Reg. 707—When shifts are to be made, conductor notifying all persons in vicinity of cars of such intention.
(31) Rule——Road and Terminal air-brake test.
(32) First aid equipment properly distributed and in proper condition.
(33) Regs. 718 and 719. Enginemen and Firemen calling indication of fixed signals and protecting when necessary.
(34) Speed of trains over cross-overs (exclusive of other observations as to speed, reported on C. T. 685).
(35) Speed under permissive signal (exclusive of other observations as to speed, reported on C. T. 685).
(36) Locomotive; Passenger and Freight equipment inspection.
(37) Speed of trains around curves (exclusive of other observations as to speed, reported on C. T. 685).
(38) Obstructions of track without proper protection when renewing ties, rails, splices, frogs and switches and when gaging and raising track.

The totals of the 38 columns in the report on observations for the month of February are as follows:

Column	Observations	Failures	Column	Observations	Failures
1	2,790	0	21	1,963	0
2	10,517	19	22	5,030	1
3	9,131	3	23	1,490	0
4	10,839	16	24	1,388	0
5	13,004	0	25	3,891	5
6	488	0	26	12,297	3
7	143,532	43	27	5,942	2
8	1,714	3	28	42,048	2
9	7,540	13	29	1,612	1
10	2,474	0	30	583	0
11	7,014	0	31	13,231	1
12	15,171	4	32	3,697	5
13	33,750	13	33	23,032	3
14	1,003	0	34	2,250	6
15	18,809	10	35	510	2
16	3,105	5	36	13,874	54
17	1,055	0	37	2,893	7
18	514	0	38	233	0
19	292	0			
20	3,824	0	Total	420,530	221

In a second article there will be given the paper above referred to, by Mr. Strebig, and also one by Mr. Klingeman, a traveling engineman; and also a supplementary list of different features of the train service which inspectors are to keep in mind when making observation trips.

IS IT TO BE COOPERATION IN THE FUTURE?*

By Paul H. King
Operating Receiver, Pere Marquette

I do not speak entirely from the railroad man's standpoint, nor altogether from that of the layman, but rather from a combination of the two. Before my connection with the railroad, I of course knew in a general way about our great system of transportation, the greatest in the world, but I knew practically nothing of the details incident to it. Now I have come to appreciate some of the difficulties with which railroad men contend. I feel particularly fortunate in thus being able to view the situation from a double viewpoint. I have striven to retain the one while acquiring the other, and the impressions I have received are, therefore, to me the more valuable.

I have been impressed in the first place with the magnitude of the railroad industry and the fact that it touches the lives and interests of nearly everyone in this great nation of ours. As President Elliott, of the New Haven, so well pointed out in his masterly address before the National Chamber of Commerce at Washington not long ago, the greater part of our population is either directly or indirectly concerned in the welfare of the railroad. There are approximately 1,800,000 railroad employees. Assuming that there are on an average four other persons dependent upon each

*From an address delivered at the annual convention of the Association of American Railroad Accounting Officers at Detroit.

employee, we have 9,000,000 people who are directly concerned. To these must be added the 1,000,000 employees of industries which furnish materials and supplies, which turn out steel rails, which operate coal mines, etc., and those who are dependent upon them. This increases the number by 5,000,000, or a total of 14,000,000 people, whose daily bread and butter depends upon the welfare of the railroad. In addition to these, there are 1,500,000 security holders and those who are dependent upon them, which makes 7,500,000 who are more or less directly concerned. Then we come to those who are indirectly interested, the 11,000,000 depositors in the savings banks of the country which have invested in railroad securities about $800,000,000, and the 30,000,000 policyholders of the insurance companies whose investments total $1,500,000,000. This makes 41,000,000 more people, or a total of 62,500,000, the major portion of our population, to say nothing of the other millions who are affected by the service which is rendered.

I am impressed by the fact that there is scarcely anything that we eat, drink or wear, or the materials for our habitations, which have not at some time or other been transported by the railroad. Railroads are the arteries of transportation through which flow the never ending streams of commerce. When they are prosperous, other industries prosper. When they are in difficulty, all business is detrimentally affected.

I am impressed by the fact that railroad expansion has, for the time being, at least practically ceased; that last year there were constructed in the United States less than 1,000 miles of new track, a less amount than in any other year since the Civil War and in any year since 1848, with the exception of three years during the war. Take our own commonwealth of Michigan. There were but 21½ miles of new main line track built in the whole state during the year 1915—truly not a great development for so prosperous a state as Michigan.

I am also impressed by the fact that during the year 1915 there were more miles of railroad in the hands of receivers than ever before, with the exception of the year 1893, which was a panic year, practically one-sixth of the railroad mileage in the country being administered by the courts. I realize, of course, that during the present year there is apparently an unusual degree of prosperity, and that railroad earnings have shown a marked improvement. I think we will all agree, however, that conditions are abnormal and that it is unsafe to build any hopes or to make any plans on them. We are glad of the increased earnings and, of course, hope that they may continue, but what is going to happen when the war comes to an end no one pretends to know.

I have been impressed by a recent statement of the fact that notwithstanding the railroads of the country last year carried a tonnage exceeding that of eight years ago by 66,000,000,000 ton miles, and additional passengers to the extent of 4,000,000,000 passengers one mile, and that they have increased their investment by $4,800,000,000, the net receipts for 1915 as compared with 1907 were $21,000,000 less. Surely this is a perplexing situation. There are some people who will say that it is due to financial manipulation and mismanagement. These, I am convinced, have given but little serious thought to the matter. At least, I judge so from my experience with the Pere Marquette, with whose affairs you are doubtless somewhat familiar. Perhaps nine out of ten people whom I meet give as the reasons for its condition those which I have named, and while I am convinced that their views are erroneous, I must at the same time concede that in most cases they are sincere. It has been my desire to do what I could to eradicate these beliefs, because they are unjust and work an injury to the railroad. The real reason for the condition of the Pere Marquette today is the fact that it has been trying to operate in a section of the country where the average rate per ton per mile is less than in any other part of the United States, and has been trying to furnish service at rates which are grossly inadequate. Summed up in a word, the trouble is due to comparatively light traffic density and to low rates, coupled with the fact that while rates have remained practically stationary operating costs have advanced tremendously. Since the Pere Marquette was organized sixteen years ago its average rate per ton per mile has decreased more than 30 per cent and the legal rate for the carrying of passengers has been reduced by the same percentage, while taxes and the cost of labor and materials and supplies have increased many fold. While I cannot speak for the other railroads of the country, I apprehend that their situations are not vastly different from ours.

I am a firm believer in regulation. I think it is a good thing for the railroad as well as for the user of railroad facilities. But I have wondered if in the zeal for regulation the pendulum has not been swung too far. The railroad is today the most regulated of industries. There is hardly a phase of operation, accounting or finance, that is not most minutely governed. There is not a rate which is not passed upon not only by a governing board, but by in most cases several governmental bodies. Our railroad, for instance, reports to five state and provincial boards as well as to the Interstate Commerce Commission. There are those who will say that the railroads have brought this condition upon themselves. Whether this be true or untrue, the hope for the future, it seems to me, is in the awakening sense of the people as a whole that regulation is being overdone, and that the ill effects are reacting upon the public generally. It goes without saying that service can be furnished only out of income, and when operation and earning power are regulated to so fine a point that there is not enough margin between income and outgo to encourage the man with money to invest further in railroad securities, and the development of the industry for that reason practically ceases, it is time in the public interest, if for no other, to call a halt.

It is up to you and to me in our several stations to do all within our power to overcome this condition; as accounting officers your part in this work is most important. I was much interested in reading an extract from a letter of Commissioner Harlan to the president of your association some time ago in which he said in substance, "Accounting officers appreciate, of course, the responsibilities and duties which they owe to their several railroads. They also have an important duty to the public to perform. While operating and traffic officers have a large measure of responsibility, the great majority of transactions between shippers and carriers eventuate as accounting propositions, and for this reason accounting officers become to some extent joint administrators with the Interstate Commerce Commission in the enforcement of the act to regulate commerce." This, to me, indicates the importance of your relation to the public, and I would hesitate to set a limit upon your ability to assist in overcoming the lack of a complete understanding between the public and the carriers.

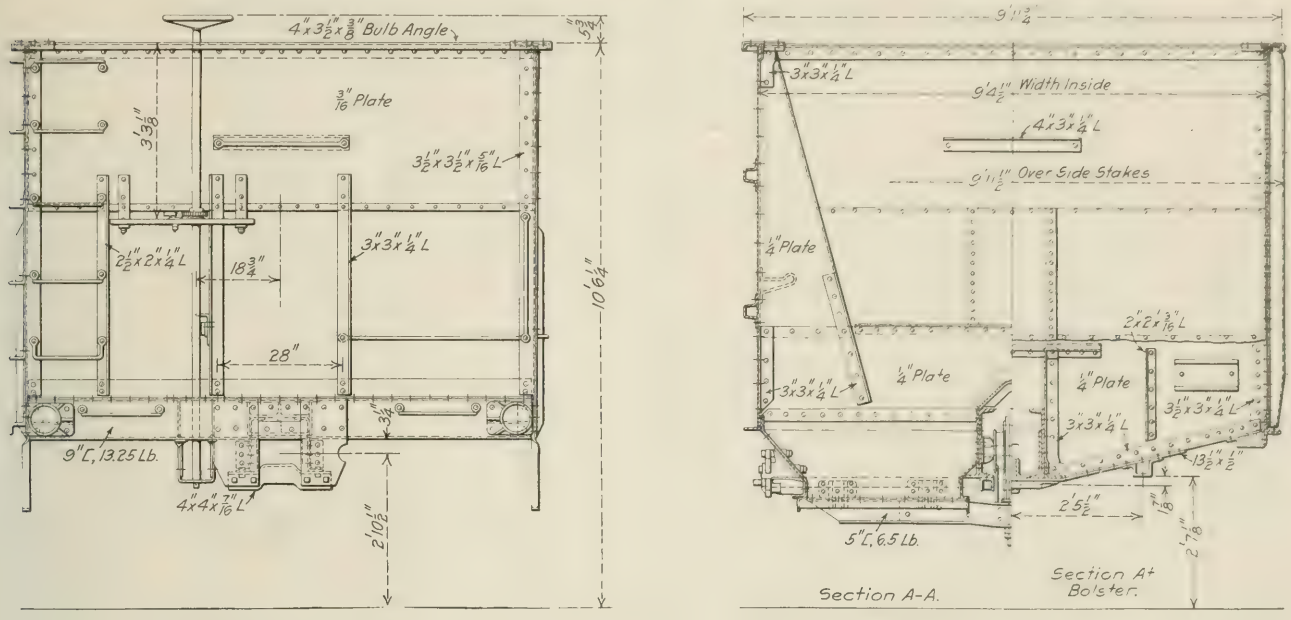
As I read the history of the industry, there seem to me to be three stages of railroad development. The first was the stage in which the railroad was unduly influential. The second, when, as a possible result of this the people generally took hold and said, "We will run the railroads," and the third, the happiest stage, the one upon which I believe we are now entering, in which the antagonisms of the past are being laid aside and the railroads and the public have come to appreciate each other and to realize that the prosperity of the community depends to a very great degree upon the railroad, and that of the railroad upon the community; that their interests are mutual, that what helps one helps the other, and that conversely what hurts one hurts the other. As I look at the situation, this feeling of cooperation is the guaranty of the future.

Erie Railroad 50-Ton Capacity Hopper Cars

One Thousand Recently Placed in Service Have Three-Hopper Dumping Arrangement; Unusual Side Bracing

THE standard design of car used by the Erie Railroad for transporting coal is a self-clearing triple-hopper-bottom car. By referring to the photograph and drawings of one of these cars, 1,000 of which have recently been built by the Pressed Steel Car Company, it will be noted that the bottom is equipped with three sets of doors. Each opening is provided with two doors hinged crosswise of the car. The doors are opened in multiples of four, that is, two pockets, one on each side of the center sill, are operated from one operating shaft. With this arrangement of hoppers, large and direct openings for discharging the lading are obtained. The total opening is from 30 to 50 per cent greater than with the standard double hopper bottom type of car and, therefore, the lading can be discharged more rapidly and with less labor.

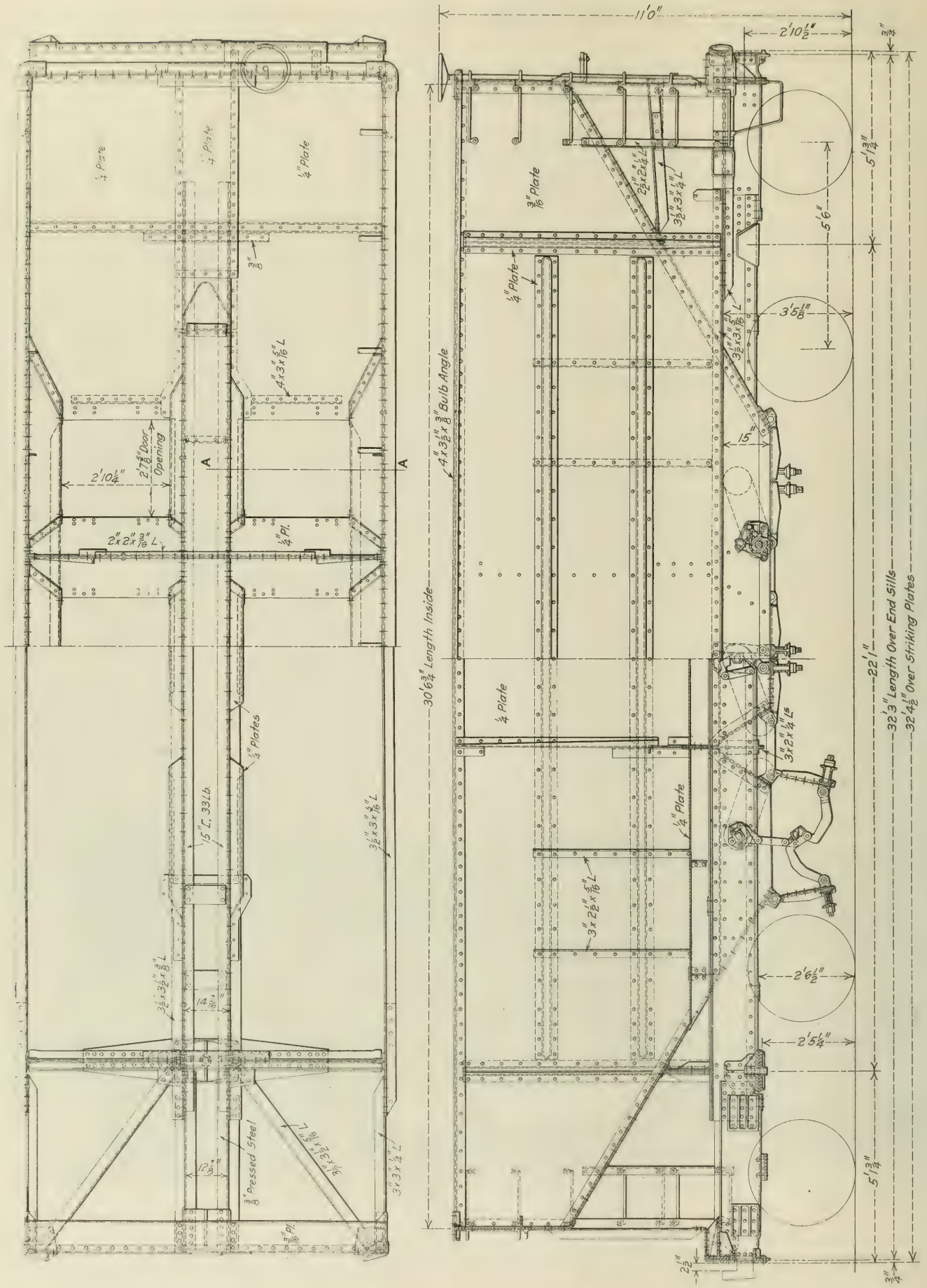
These cars have a special feature in the construction and bracing of the sides. Where outside vertical stakes and inside tie braces tying the sides together are used they are sooner or later damaged, the side stakes from being side brushed and the tie braces from the lading. The sides on these cars are braced differently from the usual practice, and instead of using outside vertical side stakes spaced at regular intervals between the bolsters, and bracing the sides by tying them together with tie braces, the main bracing on the outside is longitudinal and on the inside vertical. There are two



End Elevation and Cross Sections of the Erie Hopper Car



Erie Railroad 50-Ton Capacity Hopper Car



General Arrangement of the Framing of the Erie Hopper Cars

pressed steel stakes on each side, one at each bolster. These two stakes are well braced, being anchored to the end of the body bolster girder. Between the bolsters the sides are braced on the outside with four longitudinal members. One is at the top of the car and consists of a 4 in. by 3½ in. by 1½ in. by ⅜ in. bulb angle, continuous from corner post to corner post. At the bottom of the side is a 3½ in. by 3 in. by 5/16 in. rolled angle continuous between points just beyond each body bolster. Between these two rolled members, and spaced about equally, are two pressed steel stiffeners extending from bolster to bolster. On the inside there are two heavy triangular-shaped gusset plate braces. These extend from the top of the sides to the cross girders and have a width at the bottom of about one-half the distance between the side and center sills. There are four additional vertical stiffeners, made of angles, on the inside and spaced equally between the bolster and the triangular-shaped gussets. It is found that this construction stands up very well and repairs are small when compared to the usual construction of having all vertical side stakes on the outside, and inside cross tie braces.

With the exception of the end sheet, the end side sheet and the end sill cover plates, which are 3/16 in. thick, the plates used throughout are ¼ in The cross ridges, which at the same time form cross girder constructions, each consist of a vertical web plate running from side to side of the car and in depth from the bottom to about 20 in. above the top of the center sills. These are reinforced at the bottom with two angles, extending from side to side, which pass below the center sills, and at the top with an angle extending between the side gusset plates which are attached to the top of these plates. To this plate, about in line with the top of the center sills, are also attached four sheets which slope down to and form one side of the door opening to which the drop doors are hinged.

The center sills consist of 15-in., 33-lb., rolled channels, with the flanges turned in, reinforced at the bottom on the outside with a 3½ in. by 3½ in. by ⅜ in. angle extending from draft rigging to draft rigging. To these sills, in front of the body bolster, are spliced ⅜ in. thick pressed steel draft sills. The body bolsters are of the usual single web construction. The end sills consist of 9-in., 13¼-lb., rolled channels, backed by a heavy steel casting behind the coupler horn striking face.

The specialties used are New York air brakes, Simplex, Gould and National Malleable Castings Company's couplers, Reliable uncoupling device and Miner friction draft gear with forged steel yoke. The trucks are of the cast steel side frame type, having 5 in. by 5 in. by ½ in. spring plank angles, and are equipped with Simplex bolsters having Miner side bearings, M. C. B. brake beams, steel back brake shoes, Barber roller device, cast iron wheels, Gould journal boxes and drop forged wedges.

The length of the car over coupler striking face is 32 ft. 4½ in., the height from rail to top of side 10 ft. 6¼ in. and the width over all 10 ft. ¼ in. The cars are of 100,000 lb. capacity, level full, hold 1,880 cubic feet and have a weight of 41,000 lb.

A Subaqueous Tunnel.—One of the most notable achievements in gas engineering is the successful construction of a subaqueous tunnel connecting Astoria, L. I., with the borough of The Bronx, New York City. The tunnel lies beneath the waters of the East river at an average depth of 225 ft. below mean sea level. It is 19 ft. wide, 18 ft. high and 4,662 ft. long. It accommodates two 72-in. gas mains, with abundant space for other utilities. The route of the tunnel lies through a long stretch of disintegrated rock where the water pressures run up to 95 lb. per sq. in., thus making it impossible to use compressed air to exclude water.—*Jour. Amer. Soc. of Mech. Eng.*

INTERIOR TRANSVERSE RAIL FISSURES*

By P. H. Dudley.
Consulting Engineer, New York Central Lines

My investigations show that interior transverse fissures in rail heads are induced by a combination of two or more exceptional conditions of manufacture in an occasional rail head by direct rolling, which can and should be avoided.

Induced interior transverse fissures in basic open hearth rails are due in part to an occasional hot rail being cooled so rapidly by the rolls and their pressures to elongate the bar, or chilled by gusts of air before recalescence on the hot beds, as to cause a lag of some of the transformations of the metal in the interior of the head. Induced interior transverse fissures can only develop in the track from the effects of preceding causes, either of which is no longer a mystery, and

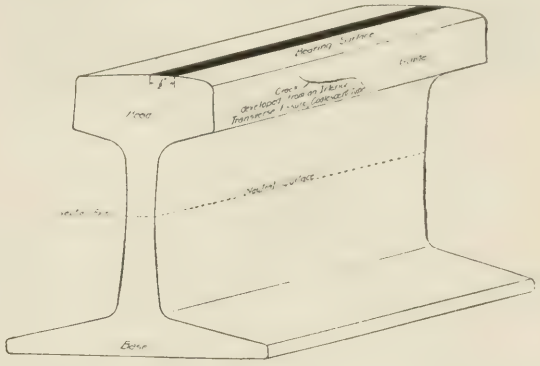


Fig. 1

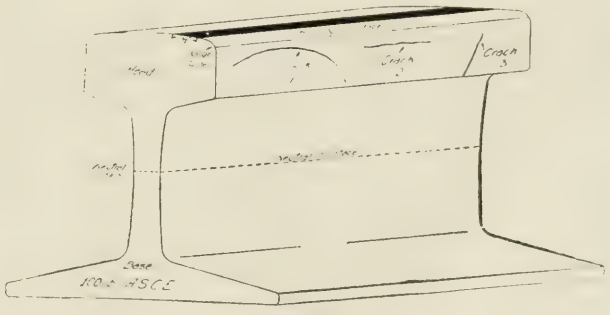


Fig. 2

Coalescent Type of Cracks. Gage Side of the Heads of the Rails

their progressive stages of development occur in the following order.

In manufacture delayed transformations of the metal near the center of the head, and chemical or mechanical defects induce loss of strength, initial strains and physically a nonductile core of heterogeneous metal near the center of the head. Again, mechanical injury to the heterogeneous metal may occur, the nucleus is checked by the gag (Figs. 1 and 2) producing a defect of an interior invisible portion of fractured metal near the center of the head before the rail leaves the steel plant.

In service under abnormal conditions the checked interior metal in either type is no longer able to restrict the strains of the wheel loads within the usual range of elastic limits of the steel as in the case of sound metal. There then develops by detail growth, from and around the checks, the specular surfaces of the induced interior transverse fissures until the section ruptures.

When the induced interior transverse fissures by growth

*Abstract of a report to A. H. Smith, president, New York Central, announcing discoveries and conclusions of the cause and cure of flaws in steel rails.

crack through the metal to the air, the specular surfaces discolor and darken, as found in ruptured rails by the trackmen. Interior transverse fissures have not occurred in the countless thousands of rail heads of physically homogeneous metal for the reason that they do not contain the conditions of the first contributory cause, consequently, while the metal is lengthened or shortened by the second contributory cause, it is not checked.

Basic open hearth rails in the composition of the New

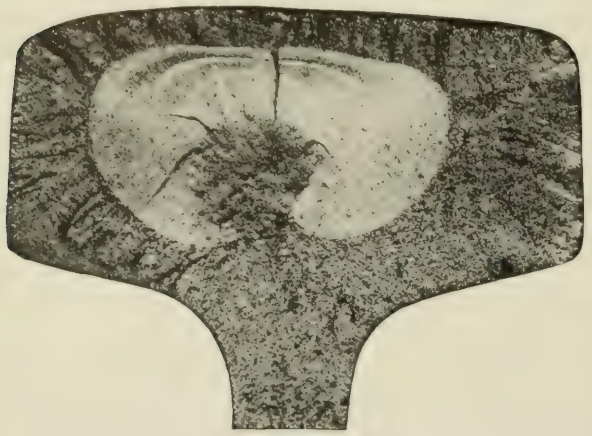


Fig. 3—Induced Interior Transverse Fissures—Intergranular Type. Rolled November 8, 1910; Failed March 5, 1915

York Central Lines specifications and rolled from reheated blooms have not, to date, developed interior transverse fissures. The specimens in my collection, after investigation, I classified by June 9, 1915, into two general types—intergranular and coalescent.

Intergranular.—The nucleus, in effect physically a non-ductile core in the head which is checked between the grains of the metal by the gag of the straightening press, may be



Fig. 4—Induced Interior Transverse Fissures. Coalescent Type. Rolled January 12, 1912; Failed January 16, 1915

five-eighths of an inch in diameter, or as small as one-eighth. The subsequent development in the track of this type of interior transverse fissure from the checked nucleus is *through* the grains, a "detail" growth of specular surfaces, in striking contrast to the check *between* the grains, the effect of the blow of the gag. This type develops in rails or part of the rail, which cooled "low" on the "hot beds," and were then gagged upon the base to shorten its metal and lengthen that of the head. (Fig. 3.)

Coalescent.—This is a checked longitudinal elliptical nucleus, the imprint of the gag on the non-ductile metal, one-half to five-eighths of an inch under the bearing surface of the head which enlarges to a longitudinal fissure by the passing wheel loads. This fissure coalesces through a transverse or oblique crack at the side of the maximum shearing stresses produced by the gag, and usually develops after two or more years of service in the track into the nearly vertical interior transverse fissure. The fracture is often conchoidal at the juncture of the coalescence. The longitudinal fissure, and sometimes the vertical, open on the gage side of the head, and can be discovered by careful inspection before rupture of the rail occurs in the track. (See Figs. 1 and 2.) This type develops in rails, or part of a rail, which cooled "high" on the "hot beds," and were then gagged upon the head to shorten its metal and lengthen that of the base below the neutral surface of the section. (See Fig. 4.)

Supervisors should instruct trackmen to distinguish between the induced interior transverse fissures in the rail heads herein described and the now rare surface crack which sometimes occurs where the drivers have slipped on the head of the rail and hardened the metal, and then, by "detail" growth, develops down through the head and web to the base until the section ruptures. Two or more surface cracks may occur in the same rail length at stations and waterplugs. It is now usual to remove rails from the main line tracks where the drivers have slipped on the heads of the rails to a noticeable extent. Such practice is to be commended.

A full discussion of induced interior transverse fissures as a result of rail gagging appeared in the November 26, 1915, issue of the *Railway Age Gazette.* The conclusions shown in this report are the results of further investigations.

British Coal Exports.—The falling off in British coal exports is becoming more considerable, the shipments in June having been 3,265,698 tons, as compared with 3,557,306 tons in June, 1915, and 5,734,220 tons in June, 1914. For the first six months of this year the aggregate exports were 19,075,461 tons, as compared with 22,332,590 tons, and 34,586,938 tons in the corresponding periods of 1915 and 1914.

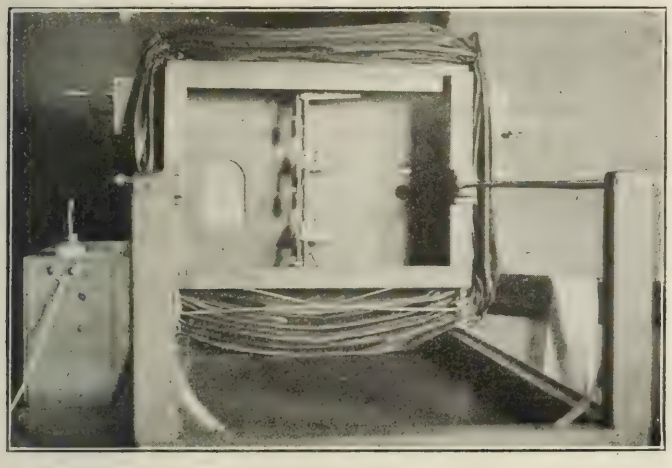
Swiss Railway Electrification.—The general management and the standing committee of the Swiss Federal Railways have just submitted a report to the council of administration in regard to the projected electrification of the Erstfeld-Bellinzona section of the St. Gothard Railway. It is first pointed out that the three-phase system would be unsuitable for the purpose in view, while the advocates of the direct-current method base their contention on experience with lighter trains and pressures far below 3,000 volts. The single-phase system, which is already employed on the Lotschberg Railway, can now be recommended for adoption without reserve. No other electric railway exists which can be placed on an equality in regard to the varied nature of service, the number of locomotives, length of the track and extent of services rendered with that of the New York, New Haven & Hartford. At the same time this railway is the first which, owing to the system used, has proved itself to be extensible at will and capable of being accommodated to all kinds of services. In the case of the Lotschberg Railway, the interruptions in working were attributed chiefly to the difficult circumstances under which the electrical equipment had to be provided. The report also discusses the problem of uniformity in the form of current and periodicity, which it is sought to attain in the distribution of energy throughout Switzerland. The Amsteg and Ritom power stations, which are proposed for the working of the Erstfeld-Bellinzona section, will be able to furnish energy not only for this section, but also for the whole line from Lucerne to Chiazzo, the conversion of which will not be long deferred.—*Railway Gazette, London.*

Scientific Tests on Signal Interpretation*

Psychologists Undertake to Compare Value of Signal Indications and Improve Method of Selecting Engineers

By O. V. Fry

A CAREFUL study of data supplied by the larger roads covering their experience with train accidents shows that 85.3 per cent of all accidents involving signals were caused by misinterpretation, while 14.7 per cent were the result of improper operation of the signals. The records of 72 accidents caused by misinterpretation of signals were further investigated to determine the lines along which scientific tests in this field could be of the greatest value. Following this study a very complete investigation was undertaken to establish, if possible, means for determining the best location for a signal, the best type of signal indication and the best man for the interpretation of signals.



The Apparatus Used for Displaying Signals

Method of Making Tests.

The signals, consisting of miniature lights and semaphores, were displayed at the back of a camera-like apparatus, being controlled electrically by the operator. At the point in this apparatus corresponding to the lens in an ordinary camera provision was made for inserting a ground glass which could be moved toward or away from the signals within the limits of 10 centimeters and 90 centimeters. This provision in connection with smoked glasses enabled the operator to determine experimentally the effect of fog conditions, since the greater the distance of the ground glass from the signals, the greater the fog-like effect. The subject was seated 4.1 meters (about 13½ ft.) from the signals behind a screen and viewed them through a tapered box 10 in. long, the end towards the subject being large enough to permit clear vision and the smaller end 1¼ in. by 2¼ in. opening towards the signals. Below this focus box at a convenient height for operation with the hands were located levers and keys providing two systems of registering the subject's reaction. A registering apparatus was developed by which a sheet of paper 1 ft. wide was moved continuously under a battery of 7 pens, one marking the time in one-tenth seconds, one each for the danger, caution and clear indications as shown by the operator, and one each for a reaction by the subject corresponding to danger, caution, or clear signals. Four types of indications were considered, semaphores and beam lights under daylight conditions and colored lights and beam lights under night conditions. Daylight conditions were simulated by lighting the interior of the signal displaying box by two 40-watt lamps which could be extinguished while a new indication was being set up, thus preventing the subject from seeing the signal change.

Location of Signals.

While other conditions must determine very largely the location of signals some weight should certainly be given to the range of visibility. For colorless vision, that is, when looking at a white light or a position signal, the limit of visibility extends about 73 deg. above and 54 deg. below the point on which the eyes are focused. This limit is much less, however, for true color vision. If an engineer has his eyes fixed on the track, a red signal 70 deg. above him will appear a dark gray. At 45 deg. from him he may see it as a blue or yellow, depending upon the purity of the color, and only at 25 deg. or less will he see it in its true color. All colors similarly have a limit in which they can be seen in their true value or as some shade of neutral gray.

Comparison of Indications.

The tests on semaphore and beam light signals under daylight conditions indicated that the beam signal will be visible under foggy conditions long after the semaphore signal has disappeared. It must be concluded therefore that the beam signal is superior to the ordinary semaphore for daylight indications. While psychologically the best colors for color signals are "plus red," "minus red minus yellow" and white, the ordinary signal green was used in the tests for caution instead of the "minus red minus yellow." The comparison of color light signals and beam light signals under night conditions was favorable to the color signals. It was clearly indicated that a color signal will remain visible in fog and smoke long after other methods of signaling have become useless. It was also indicated clearly that color signals possess a value greater than the night beam signal. While the substitution of the latter would do away with color examinations,



Subject Making a Correct "Red" Reaction with Levers

*Abstracted from a paper read before the Economic Psychology Association at a meeting held in New York on April 27.

it is a question whether as much can be laid to the door of color as has been hitherto. There is also a question whether we do not have "position weak" people. A combination of the two indications might improve conditions, that is, by providing in the center of the horizontal beam a single red light and in the diagonal beam a green light. While the clear position could not be helped by any color indication the colors would help on the signals which are the most important.

Selecting Enginemen.

The methods in use at present of selecting new employees from among the applicants for engineers are far from accurate. The practice of depending upon the sizing up of an applicant by a man whose only qualification is that he has succeeded in the position himself cannot be condoned. It does not follow because a man can see well, is in good physical condition and clearly understands the mechanics of a locomotive, that he will be a good engineer. All these things are necessary, but they are only a part of the well rounded whole that defines the requisites of a good engineer. In the ideal mental make-up of a man for this position we demand first and foremost attention. We demand that he must be able to react to color signals within a given time and that his total variations in time must not be more than a given amount; he must not be suggestible, that is, he must not give preference to the audible signal of the fireman over the visual stimulant; he must have the ability to meet new conditions and he must have a high degree of visual acuity. All of these points and others are psychological elements that can best be tested by the use of psychological principles.

The psycho-physiology of the color question is another important and entirely distinct matter. A color test does not indicate that a man possesses the mental qualifications necessary for an engineer, nor will a demonstration of such mental qualifications indicate that he could pass a color test. The color tests in use at present follow in the main the wool and lantern tests. The trouble with all of them is that they test too much that is not really called for in conditions met on the road and not enough attention is given to the differences presented under actual operating conditions. What practical difference does it make whether an engineer can pick out old rose or nile green if he can always correctly interpret the red and green signals under every condition that he may be called upon to read signal indications. Surely a test that would present red, green and white in all possible conditions under which an applicant would have to view them in service and that would determine whether he reacted within a time which would be sufficient for safety on the road would cover all known possibilities.

Tests such as those outlined above would be valuable not only in the selection of men capable of running a locomotive, but even more so in the grading of the men in service. Anything that would tend to place the rating of men on an impersonal basis should be welcomed.

There are two ways to find out whether a man is fitted for the position of locomotive engineer: put him on an engine and find out how many wrecks he will cause or submit him to a series of tests arranged by a psycho-technician. The first is expensive. The second is untried, but surely is less expensive and has behind it the sanction of science. It is realized that much experimental work must yet be done in this field, but the most pressing need is for an application of the methods outlined above in actual service. As defects are located there, they can be taken up in laboratory research and results of definite value to the roads of the country obtained.

Railway Flood Protection in China.—Chinese railroad embankments are protected from floods by planting them with a native grass with tenacious roots that resist erosion.

CONSTRUCTION OF STEAM AND ELECTRIC RAILROAD CARS

A summary of the general results of the 1914 census of manufactures with reference to the construction of steam and electric railroad cars has been issued by the Bureau of the Census, Department of Commerce. It consists of a detailed statement of the quantities and values of the various products manufactured, prepared under the direction of the chief statistician for manufactures.

Returns for 1914 were received from 242 establishments which manufactured 138,178 steam and electric cars, valued at $165,071,427. These totals include figures for 118 railroad repair shops which reported the construction of 11,049 new cars, valued at $12,811,087, and 7 establishments engaged primarily in other lines of manufacture, but which produced 4,481 railway cars, valued at $3,178,677, as subsidiary products. For 1909 there were reported 280 establishments which manufactured 101,243 cars, valued at $102,147,396. Of these 280 establishments, 140 were railroad-repair shops which constructed 14,792 cars, valued at $13,952,923, and 16 were establishments engaged primarily in other industries, but which built 8,981 cars, valued at $5,934,871, as subsidiary products. The number of establishments engaged in this industry thus decreased by 38, or 13.6 per cent, during the five-year period; but the number of cars built increased by 36.5 per cent, while their value increased by 61.6 per cent.

In 1914 there were built 135,357 steam-railway cars, valued at $155,029,539, as compared with 98,471 cars, valued at $94,884,287, built in 1909, the percentages of increase in number and value of annual output being 37.5 and 63.4, respectively. The number of steam passenger cars built in 1914 was 3,558, and their value was $45,027,083. The corresponding product for 1909 was 1,819 cars, valued at $15,120,961. The increase in annual output of such cars during the five-year period amounted to 95.6 per cent in number and 197.8 per cent in value. Of freight and other cars for use on steam railroads, the output in 1914 was 131,799, valued at $110,002,456, the corresponding output for 1909 being 96,652, valued at $79,763,326. The increase amounted to 36.4 per cent in number and 37.9 per cent in value.

The number of electric cars manufactured in 1914 was 2,821, and their value was $10,041,888. In 1909 there were built 2,772 electric cars, valued at $7,263,109. The number of cars constructed was thus only 1.8 per cent greater in the later year than in the earlier, but during the five-year period their value increased by 38.3 per cent. The output of electric cars in 1914 comprised 2,583 passenger cars, 110 freight cars and 128 other cars.

The statistics for 1914 and 1909 with respect to the construction of steam and electric railway cars, whether in establishments engaged primarily in the building of cars, in railroad-repair shops, or in establishments where cars are manufactured only as a subsidiary product, are summarized in the following table:

Construction of Cars for Use on Steam and Electric Railroads—Comparative Summary: 1914 and 1909

	1914	1909	Per cent of increase,* 1909-1914
Number of establishments	242	280	—13.6
Total cars built:			
Number	138,178	101,243	36.5
Value	$165,071,427	$102,147,396	61.6
Steam—			
Number	135,357	98,471	37.5
Value	$155,029,539	$94,884,287	63.4
Passenger—			
Number	3,558	1,819	95.6
Value	$45,027,083	$15,120,961	197.8
Freight and other—			
Number	131,799	96,652	36.4
Value	$110,002,456	$79,763,326	37.9
Electric—			
Number	2,821	2,772	1.8
Value	$10,041,888	$7,263,109	38.3

*A minus sign (—) denotes decrease.

President as Mediator in Wage Controversy

Calls National Conference Committee and Brotherhood Representatives to Washington to Avert Strike

PRESIDENT Wilson on Monday assumed personal charge of the efforts to bring about a peaceful settlement of the wage controversy between the railways and the four brotherhoods of train service employees, who have demanded an eight-hour basic day and time and one-half for overtime.

After the brotherhoods had announced the results of their vote to strike unless a settlement satisfactory to their leaders was effected the United States Board of Mediation and Conciliation spent five days in an unsuccessful attempt to effect an adjustment or an agreement to submit the points in controversy to arbitration. On Sunday the President sent a letter addressed to the National Conference Committee of the Railways and to the executive officers of the four brotherhoods asking them to confer with him at Washington on Monday.

After receiving a report from Commissioner W. L. Chambers of the United States Board of Mediation and Conciliation the President announced that he had cancelled other engagements and would devote his efforts to effecting a settlement which would avert a disastrous strike. He then began a series of conferences with the National Conference Committee of the Railways and the executive officers and a sub-committee of 30 general chairmen of the brotherhoods.

While the exact nature of the discussion betwen the President and the two committees was not disclosed it is understood that the President was emphatic in his insistence that there should be no strike and that he exerted great pressure on both sides to make concessions, on the brotherhood committee to agree to waive their persistent refusal to submit to arbitration and on the managers' committee to concede the principle of the eight-hour day. He is also understood to have proposed various possible bases of compromise.

The officers and committeemen of the brotherhoods held the first meeting with the President on Monday morning. A. B. Garretson, president of the Order of Railway Conductors, acted as spokesman, and gave an explanation of the employees' demands, making a strong plea for a reduction of the hours of employment in freight and yard service. In the afternoon the members of the National Conference Committee met the President and Elisha Lee, chairman of the committee, explained the position of the railroads, showing that the committee had offered to refer the entire controversy to the Interstate Commerce Commission or to arbitration under the Newlands law. After the two conferences it was announced that additional meetings would be held on the following day. The president gave out a statement saying: "I have met both sides and have gone over the case with the utmost frankness. I shall not be able to judge until tomorrow whether we have found a feasible basis for settlement."

On Tuesday President Wilson again conferred with the managers' committee in the morning and with the brotherhood representatives in the afternoon, later giving out statements saying that "a very candid and honest discussion was in progress about a practicable basis of settlement" but that there was no change in the situation. After the meeting with the brotherhood committee it was decided to send to New York for the full brotherhood committee of general chairmen, in order that the discussion might not be confined to the sub-committee of 30. The full committee left New York on Wednesday to meet the President on Thursday.

The President is said to have expressed very strongly his sympathy with the idea of an eight-hour day and to have indicated that he would give support to any plan calculated to bring about its adoption in railroad service if a practical



Group of Railway Managers

This group constitutes the delegation of railroad officers, representing 225 railway systems comprising 1,700 railroads, which conferred with President Wilson at three o'clock Monday afternoon on the pending railway strike. From left to right they rae: J. G. Walber, Secretary of the Eastern Conference of Managers; W. L. Seddon, Vice-President, S. A. L.; H. W. McMaster, General Manager, Wheeling & Lake Erie (top row); P. E. Crowley, Assistant Vice-President, N. Y. C. (middle row); S. E. Cotter, General Manager, Wabash; N. D. Maher, Vice-President, N. & W.; P. R. Albright, General Manager, Atlantic Coast Line (middle row); L. W. Baldwin, General Manager, Central of Georgia (top row); Elisha Lee, Assistant General Manager, Pennsylvania (bottom row); A. M. Schoyer, Resident Vice-President, Pennsylvania Lines West of Pittsburgh (face partly hidden by hat); E. W. Grice, Assistant to President, C. & O.; A. S. Greig, Assistant to Receiver, St. Louis & San Francisco (top row); C. L. Bardo, General Manager, N. Y., N. H. & H. (in light suit); A. J. Stone, Vice-President, Erie; E. H. Coapman, Vice-President, Southern Railway; James Russell, General Manager, Denver & Rio Grande; C. H. Ewing, General Manager, Philadelphia & Reading; G. H. Emerson, General Manager, Great Northern; G. S. Waid, Vice-President and General Manager, Sunset Central Lines and C. W. Kouns, General Manager, Atchison, Topeka & Santa Fe.

means could be found, leaving the question of a higher rate for overtime to be settled by arbitration. The National Conference Committee explained the physical operating conditions in railroad service, such as the varying speed of trains, number of stops and length of runs, which stand in the way of a fixed period of service. They also showed the President that the demands of the brotherhoods do not provide for either a maximum or a minimum period of service of eight hours but merely provide for a change in the basis of pay from one-tenth of a day's pay or 10 miles per hour to one-eighth of a day's pay or 12½ miles per hour, with a rate 50 per cent higher than the regular rate for overtime.

Mediation Proceedings in New York

As reported in last week's issue the members of the United States Board of Mediation and Conciliation, W. L. Chambers, Martin A. Knapp and G. W. W. Hanger, came to New York on August 9 and at the request of the National Conference Committee of the Railways began conferences with the committees representing the two parties to the controversy in the effort to bring about an adjustment. The board met with the brotherhood officers and committee at Webster Hall on Wednesday, with the National Conference Committee at the Biltmore hotel on Thursday, and with both committees again on Saturday. On Saturday evening it was announced that efforts to reach a basis for a settlement had failed and that the board was concentrating its efforts toward an agreement to submit the controversy to arbitration. On Sunday, August 13, the board met with the brotherhood committee in the morning and with the railroad conference committee in the afternoon, after which it was announced that the efforts of the mediators had been unsuccessful. The announcement was made by the board in the following statement:

"After repeated efforts to bring about an arbitration of the pending controversy betwen the railroads and their employees in train and yard service, the United States Board of Mediation and Conciliation was today advised by the representatives of the employees that they would not submit the matters in dispute to arbitration in any form.

"The employees further stated to the board that they would not arbitrate their own demands, even if the contingent demands of the railroads were withdrawn, and also declined to suggest any other plan or method for a peaceful settlement.

"They were informed that their decision would at once be made known to President Wilson and also that the President claimed the right to a personal interview with both parties before any drastic action was taken.

"This request was of course granted and a large delegation of employees, with a number of railroad managers, will be in Washington Monday for a conference with the President.

"Early in the negotiations the railroads had informed the Board of Mediation and Conciliation that they would accept arbitration."

A. B. Garretson, president of the Order of Railway Conductors, explained the attitude of the organizations in a statement as follows:

"The Board of Mediation and Conciliation came to us this morning with the statement that all they could offer was precisely what the managers offered us the day we broke with them. That was a proposition that was made across the conference table to us by the conference committee of railroad managers on June 15.

"In other words, after invoking federal mediation the conference committee had not in any way consented to be mediated, but expected all the mediating to be done by the side that had not invoked such offices.

"In answer to the proposition to arbitrate all pending differences, including the managers' tentative proposals, we replied: 'As our proposition for the eight hour day and the punitive overtime has been in the hands of the managers for many months and no proposition has come from them direct or indirect toward settlement, we have nothing to add to our demands as contained in Form 35.'

"We refused to arbitrate on any such basis and shall consider ourselves at liberty to take the necessary steps toward effecting a settlement of the pending controversy in accordance with the methods of these organizations—by withdrawing our men from the services of the roads.

"The mediators, then announcing they officially represented the President of the United States, requested in his behalf a conference with both parties before the final break should take place. They were notified later the four executives of the organizations accompanied by a representative committee would be in Washington tomorrow morning, subject to the request of the President for a conference."



Brotherhood Representatives Who Conferred with President

This group comprises the delegation of brotherhood leaders who conferred with President Wilson Monday evening. They are, from left to right: C. M. Rodgers; Mr. Lewis; W. G. Lee, President of the Brotherhood of Railway Trainmen; S. Veach; A. B. Garretson, President of the Order of Railway Conductors; W. J. Burke; W. S. Stone, Grand Chief of the Brotherhood of Locomotive Engineers; W. S. Carter, President of the Brotherhood of Locomotive Firemen and Enginemen; William Parks; Mr. Rickert; Henry Huddleston; W. O. Van Pelt; O. P. Kelly; F. D. Howard; Peter Kilduff and F. S. Evans.

The letter from President Wilson asking the parties to confer with him was brought to New York during the evening by his secretary, Joseph P. Tumulty, who had left Washington just before the break in the mediation conferences. The letter was addressed to Elisha Lee, chairman of the railway committee, and to the presidents of the four brotherhoods. The President said:

"I have learned with surprise and with keen disappointment that an agreement concerning the settlement of the matters in controversy between the railroads and their employees has proved impossible. A general strike on the railroads would at any time have a most far reaching and injurious effect upon the country. At this time the effect might be disastrous. I feel that I have the right, therefore, to request, and I do hereby request, as the head of the Government, that before any final decision is arrived at I may have a personal conference with you here. I shall hold myself ready to meet you at any time you may be able to reach Washington."

The members of the conference committee and the officers of the brotherhoods, together with a sub-committee of 30 of the general chairmen that had taken part in the conferences, left New York at midnight Sunday for Washington.

R. T. Frazier, Jr., of the Nashville, Chattanooga & St. Louis, who as announced in last week's issue has been securing signatures to a petition urging a settlement on behalf of the unorganized railway employees who would be thrown out of employment by a strike, called at the White House and presented his petition signed by 16,000 men. Mr. Frazier made an unsuccessful effort to see the President before his meeting with the committees.

While the conferences with the President were in progress the following telegram was addressed to Secretary Tumulty, Elisha Lee and the heads of the four brotherhoods by E. L. Howe, executive secretary of the National Retail Dry Goods Association:

"This association, representing large and small retail dry goods merchants throughout the country who have several million employees, and hundreds of millions capital investment, who would be seriously harmed by threatened railway strike, urges you to use every human endeavor to prevent such a calamity. The responsibility for the harm to life and property that would surely follow is too great for any human being to assume. Regardless of the justice of the contention on either side, the country must not from either health or business standpoint be subjected to the terrible harm, not to mention inconvenience, that would result from such a strike. The business of the country will strongly uphold the hands of the President in any move he may take to avert this threatened calamity."

A letter from President Wilson to the president of the Boston Chamber of Commerce, indicating that he is not in favor of an investigation of the wage controversy by the Interstate Commerce Commission, was given out on Monday. The President said:

"Allow me to acknowledge the receipt of your telegram of August 9, conveying to me the vote of the Boston Chamber of Commerce recommending that the Interstate Commerce Commission be instructed by Congress to ascertain the facts in the pending railroad controversy.

"You need not doubt that the full importance and gravity of the now acute controversy between the railroads and their employees has been a constant subject of thought and conference with me, or that I have been trying to make sure that no means of assisting a settlement was overlooked.

"There is no compulsion of law available by which we could oblige either party to the controversy to await the finding of an inquiry by the Interstate Commerce Commission, and it seems to me that such an inquiry is not a remedy at the moment."

Orders which had been issued for the movement of 25,000 additional members of the National Guard from Kentucky, Ohio and Vermont to the Mexican border were suspended by the War Department on Tuesday following the receipt of the following message from General Funston:

"In view of the possibility of a general railroad strike, I desire to call the attention of the War Department to difficulties that will follow in maintaining food supply not only of troops in this department, but of the civilian population as well. These border states produce but little foodstuffs except cattle. In view of foregoing, I recommend that National Guard organizations which are about to start for border stations be retained in their mobilization camps until such time as the question of a general strike shall have been determined."

Several roads have announced that they would be able to obtain enough men to operate trains in the event of a strike. President Ripley, of the Atchison, Topeka & Santa Fe, was quoted as saying that his road would attempt to operate as many trains as possible. The Erie on August 9 published a large advertisement in the newspapers addressed to its train employees. After calling attention to the offer to arbitrate, the statement said: "The long period of friendly relations between the company, its officers and the men on this property is apparently about to be broken by your act in leaving the service. The management deeply regrets these conditions, and has earnestly endeavored to show you the desirability of continuing the friendly and cordial relations which we have mutually enjoyed so many years."

It was then stated that employees who remain in service in the event of a strike will be placed at the head of the respective service rosters in order of their present relative position, and will hereafter be considered the senior employees of the company; that employees who join the strike thereby give up all rights and privileges as employees, and may re-enter the service only at the option of the division superintendents as new employees.

NATIONAL INDUSTRIAL TRAFFIC LEAGUE

The summer meeting of the National Industrial Traffic League was held at Detroit, Mich., on August 10 and 11. Among the important topics discussed were the Newlands resolution, authorizing the investigation of the whole subject of railroad regulation, the subject of railway leases and side-track agreements, uniform baggage rules, the Alexander bill to create a United States Shipping Board, and various proposed changes in demurrage and storage rules.

In discussing the Newlands resolution, H. G. Wilson, chairman of the legislative committee, urged that the League bring strong pressure to bear on the Congressional committee, provided by this resolution, to oppose the elimination of section 4 from the Act to regulate commerce and the amending of section 15 to provide for the payment of the increased rates named in suspended tariffs, the money accruing from the increase to be held by some competent official and paid to the carrier of the tariffs were permitted or refunded if they were condemned. In accordance with the recommendation of the committee, the League ordered that the membership be circularized to sound its sentiment on the following questions:

1. Shall the League favor exclusive federal control of railroads?

2. Shall the League favor exclusive federal incorporation and the regulation of the issuing of securities?

3. If there is to be exclusive federal control, what shall be done about taxation—shall the states continue to levy taxes, or shall it be done by the United States and the amount be apportioned to the states?

4. If there is to be exclusive federal control, shall it include the policing of the operation of trains, etc.?

The committee on railway leases and side-track agree-

ments reported that shippers had been generally signing away their common law rights in side-track agreements and leases of railway property, absolving the railways of all liability in case of loss or damage to the property. On the basis of the recommendations of the committee the League has arranged to be properly represented at the hearing before the Interstate Commerce Commission on "The Matter of Leases and Grants of Property by Carriers to Shippers," which will occur in the fall.

The League approved the recommendation of the legislative committee that the Alexander bill be amended to exclude the regulation of internal and coastwise water-carriers by the proposed United States shipping board, believing that the law, if enacted, would soon force such water lines out of business.

The report of the baggage committee was adopted, the sentiment of the League being strongly in favor of publishing one joint baggage tariff for each passenger association territory.

The recommendation of the committee on car demurrage and storage, that storage rules be not applied on tank cars of crude petroleum oil during the process of loading on carriers' tracks between October 1 and March 31, inclusive, north of the 35th parallel, was approved. It is believed that it is impracticable to load tank cars with crude petroleum oil during cold weather within the free time now allowed. The change in Demurrage Rule 3 and Storage Rule 4, recommended by the American Railway Association, which provides that Sundays and holidays no longer be excluded in computing free time, did not meet with the favor of the League. The recommendation of the committee that the demurrage rules be amended to provide additional time within which to furnish billing instructions on shipments of grain was approved. In accordance with the advice of the committee the League will recommend that the American Railway Association urge upon the various railroads the advantages of publishing and filing in tariff form the Uniform Code of Demurrage Rules and Interpretations with the Interstate Commerce Commission, and also that demurrage rules give cross reference to various interpretations.

In adopting the report of the express committee, the League went on record as not believing the question of carload shipments by express of great importance, and not desiring to interfere with the carriers in classification matters.

With reference to pooling of equipment, the League decided to reserve judgment until the present car service rules, in force since June 1, have been thoroughly tried out.

The League urged the adoption by all carriers of the National Code of Weighing Rules, agreed upon by the League and the American Railway Association.

The recommendation of the general classification committee that the sliding scale of minimum weights now in force in the territory of the Western Classification be adopted by the Official and Southern Classification committees was approved.

Consideration of the reports of the Southern Classification committee on C.L. ratings and mixtures, the unification of rules fixing minima for cars of different lengths, applicable to light and bulky freight, and the minimum charge assessable on long articles, such as iron bars, etc., was postponed until the annual meeting in November.

Considerable discussion was given to the increase in demurrage rates proposed by the American Railway Association as follows: First two days, free time; next three days, $1 per car per day; three succeeding days, $3 per car; each day thereafter, $5 per car. The League membership, after considerable discussion, voted to decline the basis offered by the American Railway Association, and in lieu thereof offered the following counter proposition: First two days, free time; next three days, $1 per car per day; sixth day, $2 per car; seventh day, $3; eighth day, $4; ninth day, $5, and $5 per car per day thereafter. Under the average agreement one credit will be allowed on each car released within the first twenty-four hours, all debits accruing up to 14 days to be offset by credits which may accrue regardless of the demurrage charge, all debits which accrue after the 14-day period not to be offset, it being understood that the carriers would put into effect the following three propositions: First, the increase in per diem rates to $1 per car per day; second, waiving of the home-loading rule during period of car shortage; third, pooling of ordinary box car equipment. It was also suggested that the carriers keep accurate record of the demurrage figures during the period when the higher rates are in effect, in order that it may be demonstrated whether the higher charge accomplishes that for which it was intended; also that the demurrage rules be impartially administered by the carriers; furthermore, that in the event that a joint congestion conference is again in session in New York city or elsewhere the shippers have representation thereon, it being understood that the above higher rates will be effective from October 1, 1916, to April 1, 1917, after which date the present demurrage basis will be automatically restored.

BRITISH RAILWAY WAGES IN 1913

Seven dollars per week was the average wage of all British railway employees during the year 1913. This average, arrived at by the Bureau of Railway News & Statistics and based on the official returns of the British Board of Trade, represents approximately $364 per year against $826 on United States railways in 1915.

"For the first time in history," says the Bureau, "an adequate statement of British employees and labor is rendered possible by the report for 1913, this being the first purporting to cover an entire year. Heretofore, returns were given for only one selected week in each of the four quarters of the year, while every three years a complete census of numbers employed was made.

"British railways employed an average of 615,985 persons during the year for which the average weekly compensation was $4,313,929, or per employee $7.01 weekly and $364 yearly. 'Salaried staff,' the higher classes of employees in each department averaged $10.07 per week, or $524 per year; 'wages staff' received only $6.53 per week, or $340 per year. Weekly wages of salaried and wages staffs and both combined in each department are as follows:

Department	Salaried	Wages	All
Maintenance of way	$14,68	$6.15	$6.51
Maintenance of locomotives	12.21	7.00	7.22
Maintenance of cars	11.40	6.69	6.86
Locomotive operation	10.81	7.85	7.91
Traffic superintendence	12.48	8.15	12.10
Station masters and clerks	8.28	6.58	8.11
Signalmen and gatemen	.....	6.46	6.46
Ticket collectors, policemen, porters, etc	10.98	5.67	5.68
Guards	8.00	7.71	7.71
Collection and delivery freight	10.22	5.70	5.83
General (secretary, general manager, accountant and clerks)	14.33	4.62	13.18
Total	$10.07	$6.53	$7.01

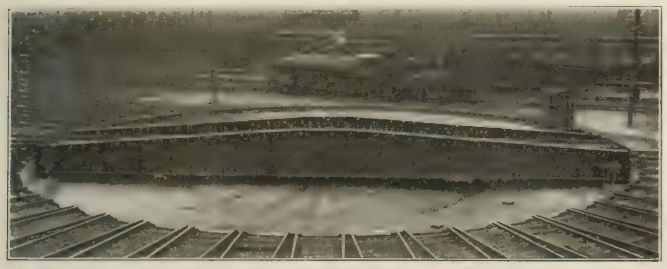
"None of these is exactly comparable with any division on American railways, owing to inclusion of several classes under each heading. The $7.91 per week ($412 per year) for all in locomotive service may be roughly compared with averages of $878 per year for the lowest class of firemen and $2,041 for the highest class of engineers for the United States in 1915. Guards, with $7.71 per week ($401 per year) compare roughly with $825 for the lowest class of trainmen and $1,766 for the highest class of conductors for the United States.

"With 40 per cent as many employees British railways paid only 17 per cent as much in wages. Since the war British employees have received a war bonus which increases their earnings about $62 yearly."

AN IMPROVED TURNTABLE

The Atchison, Topeka & Santa Fe has recently installed new turntables at Wellington, Kan., Amarillo, Tex., and Albuquerque, N. M., in the design of which particular attention was given to the elimination of the customary "pounding" as engines come on and leave the table. Records completed on the Santa Fe show that the cost of maintenance of the center and of the end trucks on other tables on this road amounts to $500 annually, practically all of which is a result of "pounding." The results secured up to the present time from these new tables, which have been in service since last November, appear to justify the conclusion that this hammering is practically eliminated.

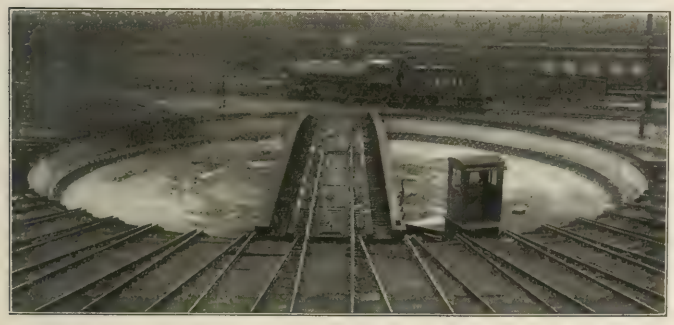
This design of table is 97 ft. 6 in. long, out to out of girders, and the inside diameter of the circle wall is 100 ft. These tables replace old ones which were 85 ft. long. They



Side Elevation of the Table

were required primarily to handle the Prairie Mallet locomotives which are operated extensively on the low grade line between Wellington, Kan., and Belen, N. M. These engines are 89.2 ft. long between the centers of end wheels. The tables are of the through type and weigh approximately 90 tons each. With the cast steel filler pedestal blocks supporting the 46 radial tracks at Albuquerque, the table at that point weighs 109 tons complete.

In the design of these tables particular attention was devoted to the connection between the radial tracks and the track on the table. The radial tracks extend to a point 7 in.



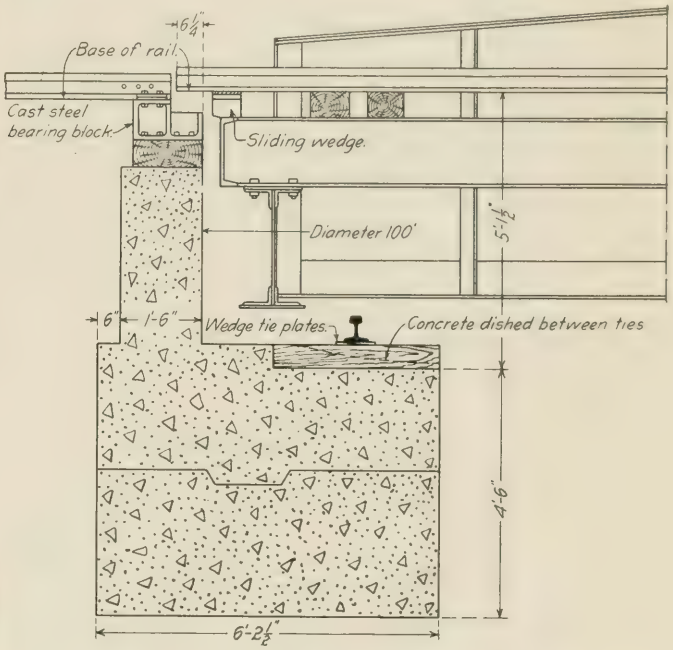
Looking Across the Deck

back of the face of the circle wall and are supported on cast steel bearing blocks which rest on the concrete circle wall. The table rails project 6¼ in. over the circle wall and are supported by wedges which slide in and out on the bottom flanges of the rails and rest on the bearing blocks supporting the radial track rails.

At a point 5 ft. 1½ in. below the base of rail the circle wall is stepped out 4 ft. 2½ in. and provides a support for the pit circle track. This track consists of sized creosoted ties 3 ft. long supporting the circle rail. On each tie is a pair of wedge tie plates, each of which varies from a minimum of ¼ in. to a maximum of 1 in. in thickness. Slots are provided in these plates through which the screw spikes pass which fasten the rail to the ties. If the circle rail pounds down at any point in service it only requires a few minutes to adjust the wedges and bring it back to the proper elevation. By these measures any causes for "pounding" in passing from the radial track to the table are eliminated.

Also, although at first a special tilting arrangement was provided to bring either end of the table down to a bearing to enable engines to pass on to the table, the necessity for this has been removed by counterweighting the motor to keep it on the rail when the table is empty and requiring all loads to come on to the table at this end. The special tilting arrangement was only installed on the first table and its use has been discontinued here.

The center used is the Santa Fe standard conical roller center designed for 500 tons turning load, with steel cones moving between two special nickel steel discs. This is similar to the American Bridge Company's type "D" center. With the tender loaded, the distance from the center of the forward wheel to the center of gravity of the Prairie Mallet locomotive is 46 ft., and with the tender empty, 39 ft. At Albuquerque a small shifting engine is employed to haul



Section of Circle Wall and End of Table

locomotives about the yard. This engine and a large Pacific type passenger locomotive are commonly turned on the table at one time. While the Mallet locomotive can be centered approximately on the table if desired, the two engines cannot, but this lack of balance has not been found to interfere with the operation of the table in any way.

The center is carried on a concrete pedestal supported on creosoted timber or Bois d'Arc piles. The pit is provided with a 4-in. concrete floor. At a distance of 31 ft. 3½ in. from the center of the table, two concrete jacking blocks spaced 17 ft. apart are provided on each side corresponding with shelf angles on the girders above. This permits the table to be raised clear off its bearings twice each year for inspection, in accordance with the standard practice on the system. The top of the center is lifted with the table, permitting the interior of the center to be examined also.

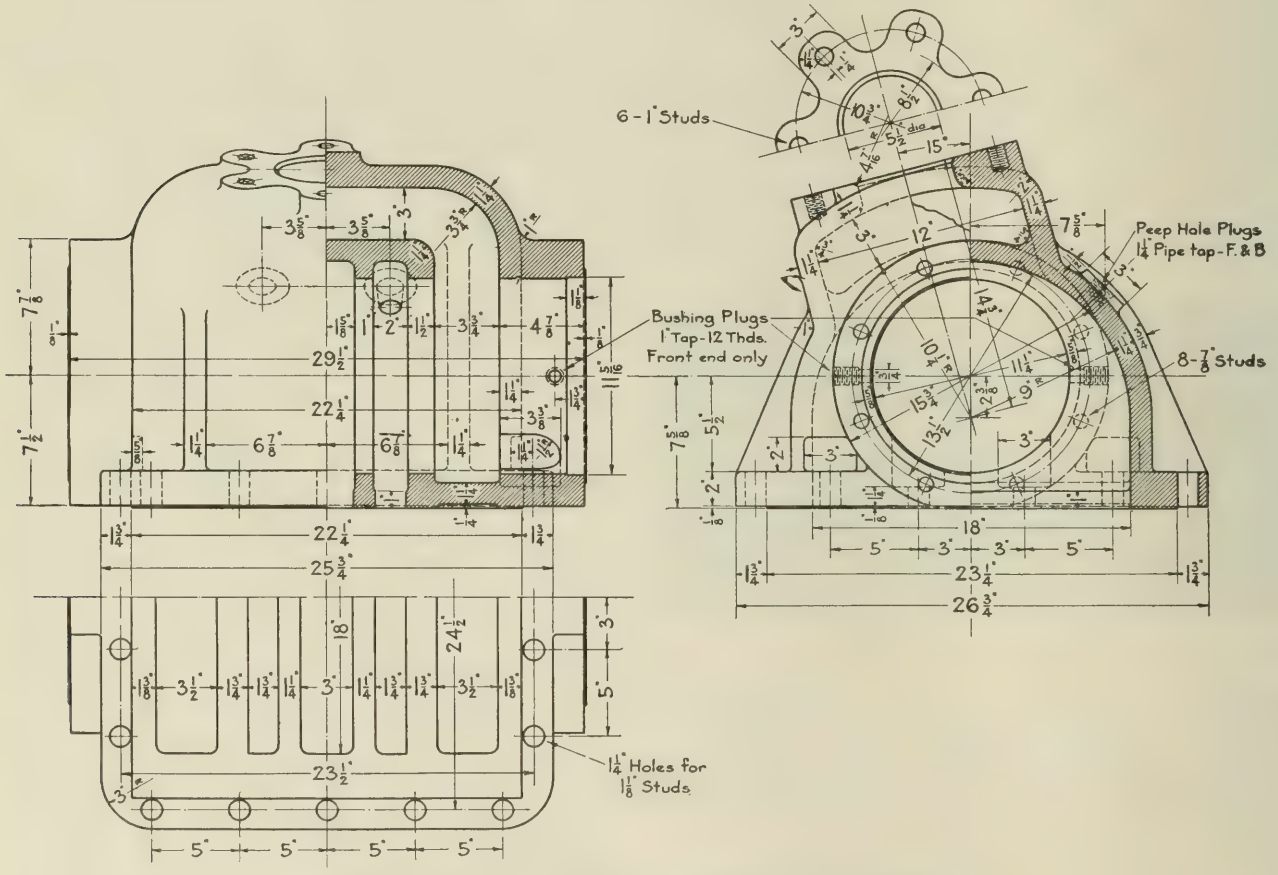
These tables have given excellent satisfaction up to the present time. They are easily operated. On a recent inspection 51 engines were handled on one of the tables in three hours without its being necessary for the operator to reset the table once. These tables were built by the American Bridge Company under the direction of A. F. Robinson, bridge engineer, Santa Fe System.

PISTON VALVE CHAMBER FOR SLIDE VALVE CYLINDERS

The drawing shows a type of piston valve chamber for application to slide valve cylinders which has recently been placed on the market by the G. F. Cotter Supply Company, Houston, Texas. The valve chamber is of a straightforward design, being cast in one piece and fitted to the cylinders in place of the slide valve chest. It is fitted with a bushing having 5/8-in. walls.

The steam chest shown is designed for use with outside steam pipes, this type generally being desirable when the locomotive is equipped with a superheater. The smokebox ends of the steam passages is the cylinder saddles are blanked, the valve ends being blanked by the steam chest, and steam is admitted directly through the top of the steam chest. The steam chest is also built for use with the existing steam pipe arrangement in general use on the older locomotives equipped with slide valves.

The joint between the chest and seat is said to be easily kept tight, sufficient stock being provided in the central bridge in the chest and bushing to admit the use of a stud if desired. Each port is surrounded by a copper wire gasket and special steel holding-down studs are provided for additional security. The effective port opening in the case of the 11-in. valve which is used on engines having cylinders up to 22 in. in diameter is 26 in. in length. Peep-holes are provided to facilitate the inspection and the setting of the valves. The valve spool is a single casting made up of two end rings and a central hub around which is the exhaust cavity.



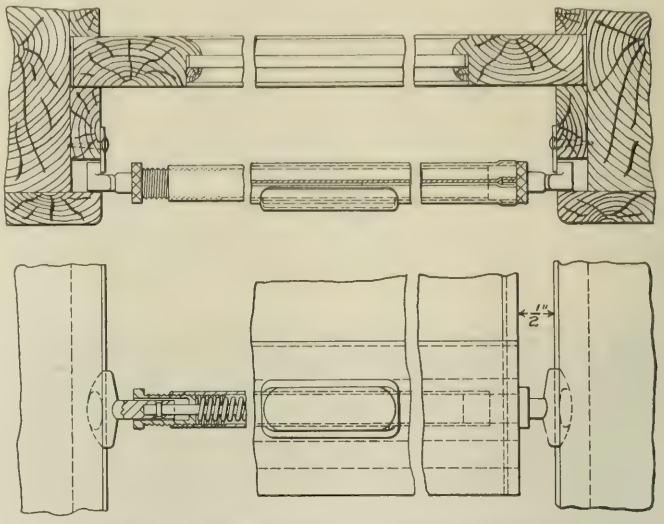
A Simple Piston Valve Chamber for Slide Valve Cylinders

Each of the end rings is fitted with two packing rings of L section.

This steam chest has been in use for several years with both saturated and superheated steam, and it is said to be giving satisfactory service.

ACME ENCLOSED GROOVE CURTAIN FIXTURES

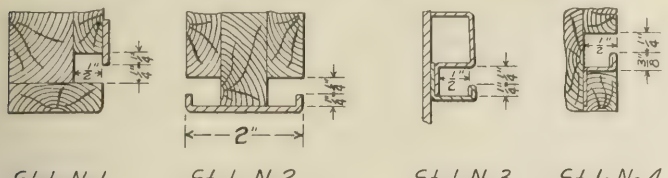
The Acme Supply Company, Chicago, Ill., has recently placed on the market a new curtain fixture, the interesting feature of which is the arrangement preventing the curtain



Acme Enclosed Groove Curtain Fixture

from being accidentally removed from its groove. This is accomplished by placing a retaining strip over the groove, as shown in the illustrations. Metal shoes on the fixture at the bottom of the curtain are provided with flanges, which are held in contact with the retaining strip by springs located inside the fixture tube. No pinch handles are required to operate the curtain, and it can be raised or lowered from any point along the bottom. It automatically retains its

alinement in the horizontal position and the fixture stays inside the groove where it belongs. The springs in the fixture tube cause the flange on the metal shoe to clutch the retaining strip firmly enough to prevent the creeping of the curtain under any service conditions. The groove recommended for the use with this fixture is shown in Style 1. It is ½-in. wide by ½-in. deep, with an opening 5/16-in.



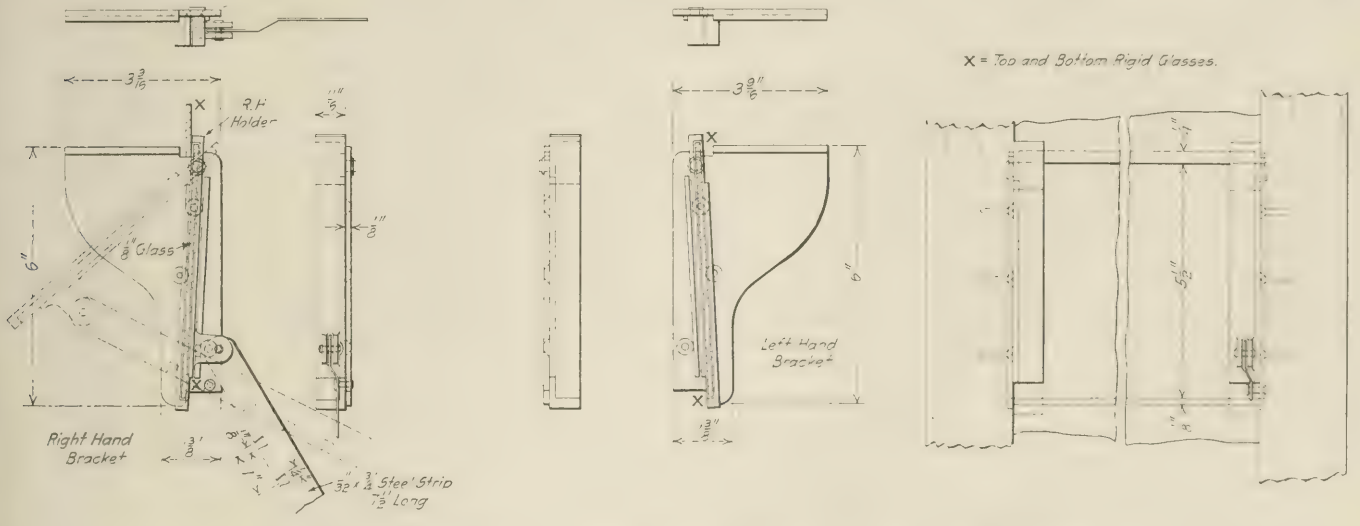
Styles of Groove Construction

wide. Special fixtures, however, can be furnished which will operate in grooves ⅜-in. by ⅜-in., but the ½-in. width is preferable. There are four styles of grooves illustrated to accommodate the various types of car construction. The fixture can be adjusted for proper tension without removing the curtain from the groove.

CLEAR VISION CAB WINDOW

A clear vision cab window which meets the requirements of the new Federal government ruling has been designed and a patent applied for by F. Hopper, master mechanic of the Duluth, Winnipeg & Pacific, Duluth, Minn. The drawing shows the details of the window's construction and its application to front cab windows.

It is necessary in applying this window to cut a hole in the cab window in the direct line of the engineman's vision. This hole is made the full width of the window and 5½ in. deep. The brackets, which are applied to the side frames of the window, contain a piece of glass 5⅞ in. deep and of a width to suit the width of the cab window and the space taken by the brackets. The glass in the clear vision window overlaps that of the cab window at the top on the inside ¼ in. and at the bottom on the outside ⅛ in. An operating handle is provided to move the window into whatever position is desired and when it is closed direct air currents, rain and snow are excluded because of the overlap at the top and bottom. It is advisable to place tape on the ends of the glass before placing it in the holders. There are no cross pieces of wood or metal in the cab window to obstruct the view of the engineman; even with the clear vision window applied the complete area of the window glass remains. The window is inexpensive to make; there are only four small metal parts which may be made of brass, pressed steel or malleable iron. It is easily applied and the cost of application is small. Windows of this type are in service on the Duluth, Winnipeg & Pacific and the enginemen express themselves as greatly pleased with them.



Details and Application of Clear Vision Window to Front Cab Windows

TEAM-WORK ON THE SOUTHERN

Fairfax Harrison, president of the Southern Railway, in executive order No. 76, issued August 11, congratulates the officers and employees of the company on recent events as follows:

"In the emergency created by the recent floods our organization has had a new test and has given a new proof of its efficiency. Men of all departments and of all branches of the service have demonstrated again the reason why the management has confidence and pride in them. In saving life and property while the danger was imminent, in promoting the comfort of marooned passengers, in restoring structures and reconstructing track so as to make possible, in the shortest possible period of time, a resumption of service vitally necessary to many isolated communities, and not forgetting the less conspicuous but equally necessary work of assembling and forwarding material, the Southern organization has deserved and won much praise from the public. Those of us who know in detail what the character of the work has been and the difficulties which have been surmounted by sheer courage and trained skill can best appreciate how well that praise has been merited.

"Where all have done their duty it would be invidious to single out for special mention even those whose service has been most notable because their opportunity was greatest. I must, then, content myself with thanking you as an organization, but I intend the thanks for each of you who is conscious of deserving them.

"In saying this I have a deep sense of pride in my own membership in that organization, for I do honor to myself in honoring you.

"The company has suffered a hard blow in property loss, but, as none of us is to blame, there is no use in repining. Let us rather gird up our loins for a new effort to make up the losses in the coming year; to repeat the kind of service which has made so great a success of our work during the past two years. Finally, while congratulating ourselves on what has been accomplished, let us not forget that we all owe and cheerfully give a tribute of our highest respect to those brave men who lost their lives in the line of duty at the Belmont bridge."

General News Department

Representative Taggart of Kansas has introduced in Congress a bill to amend the employers' liability act. He proposes to take away from employers the defense of contributory negligence in every case where the road has violated any *state* or federal law; to abolish entirely the doctrine of assumption of risk, and to add a new section providing that where suit is brought for the death or injury of an employee on a railroad there shall be a prima facie presumption that he was engaged in interstate commerce. The House committee reported this bill to the House of Representatives August 4.

The Boston & Albany has ordered the necessary material to at once comply with the recommendations of the recent grade crossing conference in relation to signs at highway crossings. Disks will be used by the attendants in the daytime in place of flags, and for night signals lights will be provided which will show red to the highway and white to the enginemen of trains. Gates will be painted with "barber-pole" stripes, black and white. The company will furnish free, to cities and towns, the 24-in. disks needed for the fixed caution signal, and is asking the municipalities to co-operate with the road in these measures to promote safety.

In the United States district court at Belmar, N. J., August 10, a preliminary injunction was issued restraining the commissioners of Jersey City from enforcing their embargo on shipments of munitions, in pursuance of which the city police officers stopped numerous freight trains entering Jersey City for the purpose of forbidding the entrance of explosives. The action of the court was taken on petition of the Canadian Car & Foundry Company, complaining that its shipments of munitions for Europe over the Delaware, Lackawanna & Western, were being illegally delayed. The Central of New Jersey on August 15 secured from the same court a general order restraining the officers of the city from interfering with the movement of explosives; and other roads will take similar action.

Standard Coupler Adopted

The result of the special letter ballot for the adoption of the Type *D* Standard Coupler of the M. C. B. Association gives the adoption of this coupler a majority of 83 per cent, there being 2,037 votes cast in favor of this coupler and 416 against, making a total of 2,453 votes cast, with 1,635 necessary for adoption.

Trolley-Car Disaster Near Johnstown, Pa.

In a collision of electric cars of the Southern Cambria Traction Company, on August 12 at Echo, Cambria county, Pa., seven miles from Johnstown, 25 persons were killed and many others were injured. The accounts indicate that a car which became uncontrollable on a steep descending grade crashed at full speed into a car standing on the main track at the foot of the grade.

The Local Freight Conductor's Duty

At least 75 per cent of the OS&D errors referred to me are cases where a proper check of freight has not been made of l. c. l. freight unloaded from cars in transit in local freight trains.

The chief weakness in the matter seems to rest in the lack of co-operation that the freight crews give the station force. The freight crews seem to be engrossed with the "get over the road" idea. No manner of persuasion from a station force can get the idea into a train crew that they should unload the freight slowly so it can be checked properly, and that it is wrong to open up two to five cars at once and unload freight while there is only one station man on hand to check the freight. A large percentage of the fellows in the freight claim department are entirely unfamiliar with this feature and therefore do not understand why it is that a station agent should make such a contention when these OS&D matters are referred to him.

I have worked for 22 railroads and have worked as despatcher and chief despatcher on eight of them, and I have found but few cases where, sooner or later, a local crew did not begin to get away from the idea that their train was being run primarily for the distribution of l. c. l. freight. There is no reason why a local, handling l. c. l. and general way station work, should endeavor to make red ball freight train time for no other purpose than to "get over the road."

A local freight train should be operated with the chief aim to handle the l. c. l. business and station work thoroughly and practically. This should be kept constantly in mind by the conductor rather than the necessity for "getting over the road." The local freight train conductor should specialize on how to serve and improve upon serving the purpose for which his train is operated. The chief elements in this specific purpose are the matter of station switching and the handling of l. c. l. freight. He should instruct his crew to see that each waybill is properly checked and that all notations are placed thereon in a complete manner.—*R. L. Carter, in M. K. & T. Magazine.*

Master Blacksmiths' Association

The twenty-third annual convention of the International Railroad Master Blacksmiths' Association was held at Hotel Sherman, Chicago, August 15 to 17, T. E. Williams of the Wabash railroad presiding. The meeting was opened with prayer by Reverend De Lacey, and the convention welcomed to the city by a representative of the Mayor. The following companies were represented by exhibits at the convention:

Acme Machinery Co., Cleveland, Ohio.—Machine forgings manufactured with Acme machines. Represented by Charles W. Durschlag and Frank Andrews.

Ajax Manufacturing Co., Cleveland, Ohio.—Machine forgings which are products of the Ajax forging machines. Represented by J. R. Blakeslee, Henry Gaul, A. L. Guilford and J. A. Murray.

Goldschmidt Thermit Co., New York City.—Thermit and Thermit welding appliances, together with specimens of welds free from carbon and ferro alloys. Represented by William Aldrich, H. D. Kelley, Anton Lucas, H. S. Mann and J. G. McCarty.

E. F. Houghton & Co., Philadelphia, Pa.—Case hardening compounds, quenching, tempering and cutting oils and air brake and hydraulic packing. Represented by E. J. Graham and E. Nilssen.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, New Orleans, La.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.

American Association of Railroad Superintendents.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Annual meeting, August 16-18, 1916, Memphis, Tenn.

American Electric Railway Association.—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.

American Electric Railway Manufacturers' Association.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Railway Association.—J. E. Fairbanks, general secretary, 75 Church St., New York.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, New Orleans, La.

American Railway Tool Foremen's Association.—Owen D. Kinsey, Illinois Central, Chicago. Annual meeting, August 24-26, 1916, Hotel Sherman, Chicago.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meteings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

Association of Manufacturers of Chilled Car Wheels.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

Bridge and Building Supply Men's Association.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE, 1916

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of—										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Atlanta, Birmingham & Atlantic	640	$175,114	$42,844	$237,615	$30,190	$48,052	$14,951	$90,360	$25	$9,198	$192,777	$44,838	$13,100	$31,738	.....
Bingham & Garfield	36	246,653	2,640	250,948	23,548	24,323	1,007	27,073	74	4,741	80,765	170,182	5,949	164,233	59,341
Buffalo & Susquehanna R. R. Corp.	253	129,257	5,138	137,087	41,578	25,321	1,606	37,207	.....	5,134	110,847	26,240	2,600	23,640	16,069
Chicago Great Western	1,496	835,958	309,704	1,261,660	165,533	108,067	48,625	386,003	7,694	33,785	748,770	512,890	49,341	462,650	129,837
Denver & Rio Grande	2,577	1,538,239	364,995	2,061,735	240,506	366,805	40,513	480,467	30,957	55,126	1,214,375	847,360	94,461	752,791	105,539
Denver & Salt Lake	255	132,553	34,508	172,729	16,899	41,468	3,890	50,372	.....	9,482	122,112	50,618	8,017	42,601	34,193
Detroit, Toledo & Ironton	441	165,965	13,141	193,006	16,072	25,290	4,165	87,112	.....	6,313	138,952	54,053	9,467	44,586	6,050
Georgia	307	146,420	60,715	213,966	10,740	36,997	14,372	109,253	89	8,430	178,272	35,695	4,874	30,516	5,199
Great Northern	8,101	5,162,057	1,307,828	7,133,075	1,512,763	634,968	117,827	1,822,635	82,581	131,729	4,220,808	2,912,270	508,111	2,403,438	716,928
Gulf & Ship Island	308	117,765	23,366	150,686	11,098	26,365	4,206	80,353	316	7,729	130,067	20,619	7,556	12,594	—34,694
Kansas City, Mexico & Orient	738	156,258	28,461	195,653	46,311	44,193	9,667	92,538	.....	10,248	202,957	—7,305	11,000	—18,305	—8,270
Minneapolis, St. Paul & Sault Ste. Marie	4,228	2,137,023	577,582	2,928,243	314,101	347,176	57,239	807,660	13,321	63,486	1,600,411	1,327,832	130,447	1,197,385	593,497
New Orleans, Texas & Mexico	192	70,554	17,660	93,329	14,571	27,062	6,537	40,948	.....	128,922	218,039	—124,710	1,637	—126,366	—75,535
Northern Pacific	6,505	4,626,017	1,418,953	6,664,577	996,493	1,058,155	116,474	1,750,417	90,940	99,979	4,071,905	2,592,672	538,731	2,052,578	—89,897
Oregon Short Line	2,259	1,531,127	443,507	2,207,632	285,409	220,935	36,572	455,712	33,120	55,394	1,087,141	1,120,490	135,230	984,468	436,183
Pittsburgh, Shawmut & Northern	294	186,659	9,775	199,111	48,394	59,613	1,520	63,453	.....	5,294	178,273	20,838	1,902	18,935	—31,028
St. Louis & San Francisco	4,752	2,684,231	1,072,111	3,997,016	538,669	794,064	76,100	1,217,155	.....	99,795	2,677,164	1,319,853	173,657	1,145,020	589,387
St. Louis, San Francisco & Texas	235	48,139	24,027	73,831	17,695	20,113	2,483	43,275	.....	4,278	87,844	—14,013	1,565	—15,616	5,428
St. Louis Southwestern of Texas	810	220,399	67,125	320,052	47,436	101,735	17,232	137,532	1,761	19,624	318,928	1,125	16,783	—15,685	—32,442
Spokane, Portland & Seattle	555	259,993	150,684	460,267	76,912	44,174	10,838	106,953	4,754	15,150	258,388	201,879	57,445	144,357	94,531
Ulster & Delaware	129	38,402	32,611	89,504	9,765	13,578	3,306	36,030	53	6,150	68,883	20,621	10,208	10,409	14,298
Union Pacific	3,622	3,787,214	1,017,218	5,528,087	886,864	485,872	114,769	1,200,488	90,848	123,148	2,871,794	2,656,293	209,700	2,443,054	685,557
Virginia & Southwestern	225	145,714	15,932	167,614	30,568	94,438	2,383	50,723	.....	7,316	185,427	17,813	7,517	25,401	—59,127
Wheeling & Lake Erie	512	814,445	53,459	958,234	126,958	111,406	10,286	292,126	1,427	15,744	557,946	400,288	44,366	355,884	182,779

TWELVE MONTHS OF FISCAL YEAR 1916

Alabama & Vicksburg	143	$1,125,637	$412,276	$1,684,825	$205,433	$357,941	$44,745	$574,697	$25,159	$66,032	$1,273,263	$411,622	$112,371	$298,072	$215,918
Alabama Great Southern	309	4,100,575	1,136,300	5,641,402	498,852	1,341,320	160,321	1,621,706	36,212	107,001	3,761,383	1,880,019	198,420	1,681,301	737,038
Arizona Eastern	378	2,679,386	438,526	3,310,302	597,832	332,325	28,182	682,364	15,870	131,297	1,784,772	1,525,530	220,020	1,304,170	632,800
Atchison, Topeka & Santa Fe	8,648	75,617,801	27,541,698	112,625,273	15,455,619	17,336,929	2,322,006	30,350,471	.....	2,269,408	67,553,414	45,071,859	5,327,652	39,711,168	8,781,068
Atlanta & West Point	93	722,770	460,617	1,367,285	161,210	256,268	73,102	426,441	24,251	54,505	994,834	372,451	77,639	288,270	112,816
Atlanta, Birmingham & Atlantic	640	1,131,996	232,673	1,478,665	236,653	285,306	84,202	564,165	154	53,539	1,224,018	254,647	78,600	176,047	.....
Atlantic Coast Line	4,706	23,292,589	8,271,629	34,445,110	4,311,802	5,580,775	703,179	11,216,199	125,147	884,196	22,797,008	11,648,102	1,793,831	9,838,827	2,809,713
Baltimore & Ohio Chicago Terminal	79	.....	6,786	1,796,502	199,073	237,436	11,221	824,668	18,962	101,931	1,360,216	436,287	227,967	206,476	—41,033
Baltimore, Chesapeake & Atlantic	88	686,921	387,810	1,127,927	91,630	304,300	17,146	604,151	.....	37,809	1,055,014	72,912	26,886	45,991	—68,696
Bangor & Aroostook	632	2,921,639	644,215	3,775,766	559,130	590,398	35,594	1,024,662	38,536	137,717	2,385,304	1,390,462	156,005	1,233,755	—37,663
Belt Ry. Co. of Chicago	31	.....	.....	2,911,555	208,620	371,468	12,949	1,250,486	.....	72,761	1,916,284	995,271	153,736	841,535	—481,958
Bessemer & Lake Erie	205	10,431,729	372,756	11,014,151	979,531	2,057,297	116,676	2,526,640	.....	177,703	5,712,600	5,301,551	232,670	5,068,853	1,378,083
Bingham & Garfield	36	2,107,082	38,010	2,159,059	207,024	205,011	12,499	275,222	1,103	31,424	732,283	1,426,776	59,932	1,366,845	617,114
Buffalo & Susquehanna R. R. Corp.	253	1,574,919	79,280	1,681,463	266,177	424,172	13,828	461,303	.....	65,215	1,230,696	450,767	31,200	419,564	253,356
Buffalo, Rochester & Pittsburgh	586	10,381,647	1,144,892	11,971,019	1,652,890	2,753,623	142,840	3,819,911	15,282	264,244	8,648,790	3,322,229	250,000	3,072,101	758,014
Canadian Pacific Lines in Maine	234	1,626,924	208,919	1,957,063	229,277	235,610	63,273	782,114	.....	45,255	1,355,528	601,534	96,309	505,225	436,454
Carolina, Clinchfield & Ohio	283	2,651,271	218,593	2,932,851	290,412	389,002	140,866	528,495	.....	123,789	1,460,414	1,472,437	147,181	1,325,125	473,189
Carolina, Clinchfield & Ohio of S. C.	18	148,382	15,595	168,593	15,474	1,068	23,735	30,477	.....	10,070	80,394	88,199	8,100	80,039	28,099
Central New England	301	4,219,857	431,341	4,870,933	495,384	428,961	14,227	1,642,818	.....	57,002	2,637,506	2,233,427	168,442	2,064,784	721,668
Central of Georgia	1,924	8,258,346	3,039,905	12,567,618	1,742,269	2,161,729	431,291	4,041,649	17,718	463,186	8,845,067	3,722,551	639,520	3,067,289	519,656
Charleston & Western Carolina	341	1,451,402	334,040	1,885,624	286,017	243,024	39,949	609,091	.....	56,563	1,234,266	651,358	75,122	575,873	236,123
Chesapeake & Ohio Lines	2,386	39,079,087	5,998,044	48,239,012	5,553,447	10,561,094	648,188	13,809,686	288,847	953,685	31,789,179	16,449,833	1,587,407	14,842,218	4,292,304
Chicago & Alton	1,052	11,126,697	3,929,506	16,325,288	1,849,002	3,421,351	430,104	5,480,917	117,612	369,629	11,601,794	4,723,494	566,839	4,147,140	1,486,556
Chicago & Eastern Illinois	1,136	12,471,388	2,907,481	16,698,404	2,284,191	3,849,471	302,563	5,721,359	95,282	455,673	12,680,319	4,018,085	703,457	3,309,647	1,315,418
Chicago & Erie	270	6,623,708	587,583	7,820,770	708,056	783,122	213,687	2,907,626	26,126	175,171	4,803,042	3,017,728	264,827	2,752,866	1,398,249
Chicago & North Western	8,108	60,353,399	21,445,004	91,313,866	11,608,646	14,598,777	1,307,139	32,119,223	664,390	1,874,091	61,952,329	29,361,537	4,741,527	24,606,707	4,722,802
Chicago Great Western	1,496	10,492,684	3,280,656	15,067,345	1,983,135	2,436,353	546,487	5,257,979	101,749	406,925	10,716,498	4,350,847	553,129	3,787,048	897,117
Chicago Junction	13	.....	.....	2,329,410	249,878	219,420	13,525	1,276,218	.....	65,181	1,824,222	505,188	38,649	466,527	166,717
Chicago, Milwaukee & St. Paul	10,210	76,036,097	18,923,893	105,646,484	11,563,769	16,518,476	1,899,027	37,728,571	738,379	1,920,467	69,120,958	36,525,526	5,264,331	31,222,860	6,537,747
Chicago, Peoria & St. Louis	255	1,368,590	287,142	1,752,800	236,325	348,812	68,305	711,444	.....	64,894	1,429,779	323,021	63,015	260,006	140,274
Chicago, Rock Island & Gulf	477	2,285,781	615,285	3,151,053	495,053	421,643	115,614	1,076,698	18,313	99,288	2,226,249	924,805	116,703	807,294	216,056
Chicago, St. Paul, Minn. & Omaha	1,753	12,860,214	5,191,441	19,522,563	2,340,883	2,419,137	350,316	7,208,271	185,008	472,922	12,958,838	6,563,725	1,022,053	5,535,335	821,448
Cincinnati, Hamilton & Dayton	622	8,131,885	1,330,171	10,561,749	1,769,145	2,118,617	194,518	3,742,576	39,598	271,655	8,113,865	2,447,884	378,857	2,066,038	1,344,328
Cincinnati, Indianapolis & Western	322	893,940	286,289	1,296,706	166,124	168,727	38,891	565,504	2,726	48,655	988,383	308,323	66,591	241,732	.....
Cincinnati, New Orleans & Tex. Pacific	337	8,620,611	1,779,080	11,060,440	1,092,408	2,705,302	302,480	3,165,059	71,731	255,573	7,592,379	3,468,061	380,147	3,087,016	845,327
Cincinnati Northern	246	1,538,404	206,389	1,816,370	300,424	301,984	35,174	579,377	.....	36,113	1,253,072	563,298	68,371	494,853	178,259
Cleveland, Cincinnati, Chic. & St. Louis	2,384	30,572,917	9,120,149	43,478,002	4,489,879	8,181,629	934,307	14,513,103	284,157	877,290	29,195,230	14,282,772	1,556,131	12,717,953	5,475,761
Colorado Midland	338	1,211,655	179,452	1,516,758	258,651	365,233	88,515	650,821	12,765	65,164	1,441,149	75,610	96,862	21,252	—78,485
Cumberland Valley	164	2,654,252	656,869	3,478,178	367,432	315,172	50,716	1,021,222	11,391	107,772	1,865,892	1,612,286	71,030	1,541,218	721,053
Delaware & Hudson Co. R. R. Dept.	886	21,620,334	2,860,323	25,922,671	2,113,551	4,216,582	326,886	8,670,845	209,830	852,757	16,370,167	9,552,504	658,458	8,891,854	1,552,350
Delaware, Lackawanna & Western	955	36,034,113	8,462,493	49,335,739	4,572,871	7,180,602	894,349	15,587,129	370,713	982,935	29,511,905	19,823,834	2,210,734	17,609,604	4,083,452
Denver & Rio Grande	2,577	18,314,342	4,764,729	24,890,084	2,536,790	4,189,310	487,024	6,500,570	419,987	605,733	14,739,410	10,150,674	1,091,461	9,057,705	2,546,098
Denver & Salt Lake	255	1,485,507	325,116	1,893,747	223,655	391,965	25,761	665,893	.....	60,517	1,367,681	526,067	90,503	435,399	18,625
Detroit & Mackinac	393	786,082	310,506	1,175,727	132,937	207,414	25,043	398,010	988	33,192	797,584	378,142	99,506	275,336	74,245
Detroit & Toledo Shore Line	81	1,693,407	.....	1,706,518	134,349	96,970	18,525	444,124	.....	33,737	727,705	978,812	80,280	897,339	236,421
Detroit, Toledo & Ironton	441	1,902,238	161,654	2,212,266	229,427	288,619	49,356	968,802	.....	74,891	1,611,094	601,172	72,967	528,170	409,553
Duluth & Iron Range	277	6,062,342	247,338	6,493,283	743,740	873,513	16,433	1,539,040	17,359	127,197	3,308,341	3,184,941	353,699	2,830,152	1,015,813

REVENUES AND EXPENSES OF RAILWAYS

TWELVE MONTHS OF FISCAL YEAR 1916—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of—										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Duluth, Missabe & Northern	411	$10,640,876	$338,597	$11,470,003	$1,311,087	$1,345,887	$29,778	$1,921,554	$60,139	$155,639	$4,824,084	$6,645,919	$629,565	$6,016,354	$3,041,424
Duluth, South Shore & Atlantic	628	2,316,448	890,511	3,506,792	582,103	430,019	89,012	1,223,400	43,984	113,631	2,482,149	1,024,644	251,683	772,711	433,369
Duluth, Winnipeg & Pacific	187	1,415,904	225,122	1,692,720	158,792	179,717	26,854	617,700	7,957	73,261	1,058,281	634,440	84,711	549,728	299,500
El Paso & Southwestern Co	1,027	8,438,925	1,643,229	10,671,627	1,314,373	1,337,981	221,241	2,631,995	76,084	342,732	5,924,268	4,747,359	471,367	4,275,680	1,632,288
Elgin, Joliet & Eastern	800	12,511,829	111	13,353,457	1,050,552	2,544,942	80,798	3,683,693	.....	262,089	7,620,248	5,733,209	458,783	5,273,556	2,460,500
Erie	1,988	49,863,156	9,171,190	65,115,459	5,144,907	11,563,393	1,095,233	23,132,457	412,513	1,363,869	42,638,484	22,476,975	2,104,882	20,333,154	8,526,115
Florida East Coast	745	4,255,965	2,032,689	7,204,482	805,011	795,253	112,075	2,034,715	42,316	234,676	3,995,586	3,208,897	326,855	2,881,418	1,023,419
Galveston, Harrisburg & San Antonio	1,351	8,985,996	3,052,189	12,831,389	1,951,668	1,776,595	364,702	4,752,244	126,262	385,800	9,315,071	3,516,318	596,447	2,912,587	1,458,680
Galveston Wharf	14	.....	.....	1,373,245	41,039	27,611	4,492	374,208	412,884	4,611	864,844	508,401	131,199	377,161	—347,082
Georgia	307	2,095,295	771,068	3,097,865	272,377	483,953	152,954	1,242,351	1,087	93,077	2,242,930	854,935	134,562	719,083	316,901
Georgia, Southern & Florida	395	1,471,091	654,867	2,445,408	270,527	467,120	86,264	895,502	3,966	110,672	1,833,853	611,556	137,075	471,055	217,649
Grand Rapids & Indiana	575	3,613,839	1,572,032	5,632,005	647,804	955,728	131,607	2,220,098	16,134	178,531	4,149,903	1,482,102	272,638	1,207,572	239,129
Great Northern	8,101	60,177,249	13,661,645	81,233,092	9,696,663	8,737,483	1,168,733	22,292,307	875,730	1,355,155	43,862,972	37,370,120	5,130,379	32,234,834	6,531,594
Gulf & Ship Island	308	1,479,916	344,208	1,964,177	171,989	309,775	37,633	528,356	3,511	90,174	1,141,437	822,740	83,737	738,167	308,583
Gulf, Colorado & Santa Fe	1,938	11,448,109	3,015,263	15,425,934	3,033,511	2,350,124	362,055	6,492,462	.....	491,853	12,672,696	2,753,238	724,838	2,021,730	—2,162,791
Houston, East & West Texas	191	1,050,981	340,281	1,486,214	261,972	206,214	24,991	489,454	8,291	38,475	1,027,525	458,688	54,675	403,123	153,326
Houston & Texas Central	895	4,548,162	1,424,266	6,484,167	1,021,981	907,799	193,638	2,258,536	65,749	225,083	4,665,365	1,818,802	361,905	1,454,398	401,125
Illinois Central	4,767	50,045,039	13,582,092	69,077,343	9,506,527	16,547,749	1,252,366	21,841,050	375,222	1,763,356	51,173,728	17,903,615	3,724,021	14,155,087	3,276,614
Indiana Harbor Belt	110	.....	.....	4,136,471	469,396	456,222	34,260	1,628,730	.....	96,742	2,685,351	1,451,120	91,248	1,358,584	438,152
International & Great Northern	1,159	6,869,511	1,822,362	9,420,291	1,450,127	1,623,969	254,063	3,792,984	47,342	346,919	7,339,224	2,081,067	418,677	1,660,408	853,908
Kanawha & Michigan	177	3,173,632	372,036	3,636,400	473,840	775,305	36,311	914,353	193	82,413	2,282,414	1,353,986	161,860	1,191,758	482,231
Kansas City, Mexico & Orient	738	2,075,502	385,960	2,599,332	625,761	537,624	106,614	1,090,325	.....	123,972	2,484,297	115,036	141,208	—26,196	—224,530
Kansas City Southern	837	8,094,107	1,513,168	10,583,630	1,132,086	1,277,531	334,668	3,298,504	.....	410,184	6,361,722	4,221,909	561,990	3,655,260	677,986
Lake Erie & Western	900	5,858,815	741,358	6,941,354	791,825	1,219,981	155,516	2,289,841	.....	150,623	4,607,786	2,333,568	283,803	2,048,803	1,056,596
Lehigh & Hudson River	97	1,798,159	84,618	2,109,857	205,440	269,259	17,815	681,828	.....	52,288	1,226,629	883,228	58,010	825,218	253,663
Lehigh & New England	296	3,080,845	14,908	3,278,968	436,557	386,352	24,201	839,651	.....	71,872	1,758,037	1,520,931	88,360	1,432,377	333,640
Lehigh Valley	1,444	40,027,913	4,300,183	47,382,569	4,657,854	9,364,629	996,249	16,966,439	153,599	984,132	33,092,978	14,289,592	1,706,093	12,574,714	1,702,911
Long Island	397	4,173,239	8,159,048	14,208,120	1,615,026	1,543,366	135,219	5,712,866	74,538	392,434	9,463,675	4,744,445	900,208	3,838,450	462,169
Louisiana & Arkansas	279	1,416,959	186,350	1,652,092	294,361	258,088	39,995	425,907	.....	50,762	1,069,112	582,980	92,562	489,915	6,341
Louisiana Ry. & Navigation Co	351	1,705,989	333,608	2,180,030	317,634	327,992	75,456	727,761	.....	63,942	1,512,785	667,245	113,955	553,133	176,819
Louisiana Western	208	1,634,922	641,618	2,441,952	324,223	386,330	85,273	638,538	21,987	73,210	1,529,422	912,530	121,022	790,805	266,563
Louisville, Henderson & St. Louis	200	1,114,524	411,653	1,617,244	357,891	191,711	60,489	483,040	.....	38,380	1,131,512	485,732	45,877	439,308	168,847
Maine Central	1,220	7,758,889	3,371,976	12,001,673	1,644,715	1,691,646	137,860	4,328,942	43,035	347,911	8,192,578	3,809,095	636,423	3,171,505	610,023
Michigan Central	1,803	26,846,145	10,129,996	41,884,593	4,906,157	6,239,845	758,723	14,519,445	626,806	794,960	27,845,935	14,038,658	1,633,936	12,398,101	5,047,825
Midland Valley	385	1,343,069	425,170	1,862,608	334,566	300,461	29,215	577,805	.....	75,198	1,316,159	546,448	77,866	467,935	226,505
Minneapolis & St. Louis	1,646	8,166,056	1,951,088	10,721,513	1,116,265	1,525,268	212,151	3,896,217	931	271,265	7,022,098	3,699,414	458,679	3,237,062	460,758
Minneapolis, St. Paul & Sault Ste. Marie	4,228	26,181,226	6,357,573	35,010,064	3,230,947	4,193,675	632,827	10,168,375	184,561	704,801	19,081,068	15,928,996	1,537,712	14,391,284	5,574,872
Missouri & North Arkansas	365	758,183	352,166	1,195,832	320,960	242,892	36,150	432,793	.....	66,338	1,099,132	96,700	71,972	24,019	245,639
Missouri, Kansas & Texas System	3,865	21,697,723	8,321,250	32,485,508	6,734,992	5,864,189	692,662	11,223,773	200,868	1,122,023	25,794,345	6,691,163	1,650,167	5,029,973	—3,554,632
Missouri, Oklahoma & Gulf Ry. of Texas	125	210,063	5,091	217,663	39,763	30,753	21,669	113,753	.....	16,894	222,832	—5,170	2,765	—7,935	9,581
Mobile & Ohio	1,122	9,998,658	1,218,798	11,868,038	1,185,363	2,486,541	429,098	4,094,740	28,246	373,441	8,533,737	3,334,301	406,384	2,925,200	264,438
Monongahela	108	1,801,465	75,254	1,906,247	261,776	163,547	10,675	405,506	.....	42,948	884,452	1,021,795	58,855	962,940	.....
Morgan's La. & Texas R. R. & S. S. Co.	405	3,170,470	1,001,059	4,546,868	695,228	758,193	141,789	1,590,472	27,035	139,421	3,350,772	1,196,096	270,697	923,264	214,406
Nashville, Chattanooga & St. Louis	1,231	8,989,417	2,670,319	12,670,688	1,481,600	2,329,256	613,330	4,463,966	122,753	438,069	9,439,033	3,231,655	325,251	2,903,144	1,386,530
Nevada Northern	165	1,697,976	136,039	1,885,753	218,950	165,556	7,469	343,956	884	55,101	791,916	1,093,837	80,586	1,013,232	561,157
New Orleans & North Eastern	204	2,807,263	593,420	3,781,662	406,689	644,471	126,135	1,141,549	70,572	139,824	2,527,344	1,254,318	188,399	1,064,440	398,290
New Orleans, Mobile & Chicago	402	1,656,759	288,439	2,039,134	311,200	323,036	51,393	629,280	62	82,698	1,397,668	641,466	80,472	559,916	185,787
New Orleans, Texas & Mexico	192	1,274,625	273,301	1,637,820	315,044	273,729	52,099	569,765	.....	234,779	1,445,416	192,404	18,231	173,591	63,540
New York Central Railroad	6,093	131,823,248	48,548,075	209,303,754	20,537,477	36,264,195	2,913,548	65,918,375	2,803,828	4,511,748	132,949,171	76,354,583	8,823,200	67,509,927	.....
New York, Chicago & St. Louis	570	12,497,580	1,331,107	14,378,614	1,093,772	2,398,806	537,599	5,564,638	47,722	261,562	9,904,100	4,474,514	501,376	3,967,070	2,071,081
New York, New Haven & Hartford	2,005	37,448,021	29,620,567	76,311,653	8,779,166	10,859,656	470,278	28,423,557	845,780	1,756,431	51,078,358	25,233,295	2,856,255	22,371,280	3,870,392
New York, Ontario & Western	568	6,011,150	1,618,562	8,942,252	1,055,019	1,391,248	93,120	3,462,601	.....	203,449	6,202,922	2,739,330	259,923	2,477,863	336,423
New York, Philadelphia & Norfolk	112	3,993,599	441,045	4,764,736	404,306	918,733	57,921	1,722,714	48,593	133,549	3,282,701	1,482,035	124,967	1,355,752	673,726
New York, Susquehanna & Western	140	2,509,831	628,812	3,537,346	270,835	384,570	23,444	1,666,013	.....	70,170	2,413,001	1,124,345	161,857	961,864	22,920
Norfolk & Western	2,086	49,559,140	5,796,583	57,304,586	6,571,329	10,046,263	703,055	14,135,112	106,483	891,631	32,181,346	25,123,240	2,065,000	23,054,786	9,779,324
Norfolk Southern	908	3,246,086	1,061,954	4,591,924	553,298	661,882	90,041	1,550,396	1,244	211,288	3,068,148	1,523,776	148,391	1,371,975	602,303
Northern Pacific	6,505	55,656,395	13,852,254	75,939,231	8,833,210	7,846,259	1,177,971	20,900,055	986,735	1,134,020	40,366,412	35,572,819	5,073,415	30,493,190	8,904,696
Northwestern Pacific	507	1,752,406	2,078,202	4,319,598	660,183	501,547	68,947	1,441,561	4,241	96,414	2,752,955	1,566,643	204,818	1,361,361	582,479
Oregon Short Line	2,259	18,376,526	4,731,988	24,982,959	2,945,924	2,869,527	417,795	5,552,982	360,143	667,981	12,810,584	12,172,374	1,615,864	10,551,561	3,751,389
Oregon-Washington R. R. & Nav. Co.	2,053	11,528,584	4,419,729	17,447,346	2,900,606	1,993,901	532,703	5,513,121	215,674	750,725	11,846,448	5,600,898	1,192,503	4,406,384	71,222
Panhandle & Santa Fe	670	4,182,259	968,381	5,394,313	967,803	804,430	50,034	1,298,745	.....	129,137	3,245,109	2,149,204	141,663	2,006,253	1,117,130
Pennsylvania Company	1,758	53,586,339	11,086,953	71,255,665	9,055,642	11,758,928	960,297	22,696,913	399,674	1,587,203	46,447,373	24,808,292	3,403,105	21,402,493	10,892,352
Pennsylvania Railroad	4,541	158,597,513	42,035,662	220,113,358	27,159,754	42,259,305	2,371,229	75,441,498	2,870,414	5,176,779	155,278,979	64,834,379	7,839,321	56,949,999	20,577,121
Pere Marquette	2,249	15,098,256	4,129,018	21,210,053	2,007,172	4,268,058	381,311	7,338,105	48,323	492,361	14,530,425	6,679,629	626,275	6,045,026	1,974,394
Philadelphia, Baltimore & Washington	717	12,231,167	9,209,652	23,680,869	3,120,217	4,202,129	324,152	8,936,810	1,248	607,656	17,192,213	6,488,657	668,780	5,816,899	2,655,707
Pittsburgh & Lake Erie	225	19,508,994	1,789,561	22,635,156	1,772,059	3,174,086	163,718	4,859,454	41,913	360,583	10,371,814	12,263,342	649,122	11,614,177	6,811,270
Pittsburgh, Cincinnati, Chic. & St. Louis	1,489	33,217,119	8,856,110	47,370,153	6,627,203	9,005,131	792,352	15,955,313	316,572	1,134,790	33,827,895	13,542,258	2,038,313	11,501,395	4,167,132
Pittsburgh, Shawmut & Northern	294	2,259,199	113,874	2,405,641	384,488	607,023	18,870	737,862	.....	58,366	1,806,606	599,034	23,735	575,299	209,929
Rutland	468	2,188,951	1,204,751	3,875,098	451,212	637,381	112,156	1,349,956	12,491	74,897	2,638,094	1,237,004	204,897	1,032,091	304,345
St. Joseph & Grand Island	258	1,417,780	310,936	1,840,900	371,023	271,168	53,617	602,425	2,111	65,998	1,366,342	474,558	97,443	376,637	137,845
St. Louis & San Francisco	4,752	32,287,854	11,122,728	46,358,626	6,900,946	7,742,853	800,382	14,553,898	.....	1,185,625	30,811,370	15,547,256	2,093,945	13,434,112	2,358,491
St. Louis, Brownsville & Mexico	548	1,650,829	753,249	2,606,446	453,827	356,479	72,516	883,347	.....	145,883	1,873,267	733,179	105,171	624,264	98,996
St. Louis Merchants' Bridge Terminal	9	.....	3,524	2,245,527	318,654	111,361	9,563	1,007,031	.....	79,281	1,525,891	719,636	103,598	616,011	203,504
St. Louis, San Francisco & Texas	235	719,283	277,768	1,095,698	250,434	193,770	25,595	505,591	.....	53,482	1,028,874	66,825	20,848	45,415	44,137

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next meeting, August 15-17, 1916, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, August 29 to September 1, Hotel Sherman, Chicago.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 12-14, 1916, "The Breakers," Atlantic City, N. J.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Annual meeting, October 3-5, 1916, New York.

RAILWAY REAL ESTATE ASSOCIATION.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 11-13, 1916, Chicago.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 12-14, 1916, Grand Hotel, Mackinac Island, Mich.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Washington, D. C.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEWARK.—Roy S. Bushy, Firemen's Bldg., Newark, N. J. Regular meetings, 1st Monday in month, except July and August, The Washington, 559 Broad St., Newark.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agent, Erie R. R., 1924 Oliver Bldg., Fittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—W. S. Crilly, 620 South 7th St., St. Louis, Mo. Annual meeting, December 5, 1916, Noonday meetings, October to May.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next meeting, September 5-8, 1916, Hotel Sherman, Chicago.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

WESTERN SOCIETY OF ENGINEERS.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The Southern Pacific has reduced freight rates on various commodities from California to points east of the Mississippi and south of the Ohio river, including canned goods, apples, pears, beans, peas, citrus fruits, dried fruits, melons, hops, brandies, wines, nuts and tomatoes.

The Pennsylvania Railroad, in a circular calling attention to the need of checking infantile paralysis, recommends that certificates be procured from the proper health officers for all children under sixteen years of age before buying tickets to any point. In the region of New York City and Philadelphia, additional quarantines are being constantly established, and in all directions children are likely to have their journeys cut short by the quarantine officers. The Baltimore & Ohio, whose cautionary circular to employees was issued July 10, soon after the epidemic began to spread from New York City to surrounding places, set forth in succinct fashion what is known as to the cause and the prevention of the disease, with advice as to proper hygienic measures.

Panama Canal Traffic

The annual report of the Panama Canal will show a large deficit as compared with the preceding year, owing to the obstruction of the canal by slides from the middle of September to the middle of April. The figures, for the principal items, for the years ending June 30, are as below:

Panama Canal Traffic.

	1916 5 Months	1915 10½ Months
Vessels	787	1,088
Net Tonnage	2,479,761	3,843,035
Cargo	3,140,046	4,969,792
Tolls	$2,399,830	$4,343,384
Op. and Maint. Exp.	6,999,750	
Deficit	4,599,920	
Surplus Over Exp.		$276,656

The cost of the dredging done in the last fiscal year was $3,560,016. This is the largest item under the head of operation and maintenance.

LIGHT RAILWAYS IN WARFARE.—The network of light railways belonging to the Belgian Société des Chemins de Fer Vicinaux has been very extensively used by the German forces, and it appears that when these lines are somewhat too far from the scene of operations the tracks have been taken up and have been employed, together with the rolling stock, where they are required.

NEW GERMAN RAILWAY TAXATION.—An extension and increase of the stamp duty on railway consignment notes and other railway documents is one of the features of the taxation recently approved by the German Federal Council and voted by the Reichstag. It is anticipated that the new duties will bring in a new revenue of 80,000,000 marks ($19,200,000). This is the second recourse that Germany has had to taxation on railway transport since the beginning of the war, the first having been early in 1915, when the cost of certain auxiliary services was increased. The new taxation is confined to freight traffic, because the tax imposed in 1906 on railway tickets led to such a large migration from the higher to the lower classes of carriage as to be practically worthless from a revenue standpoint. Consignment notes for full car-loads first had to pay a stamp duty in 1906. This duty is now increased, and a duty is also to be payable on consignment notes for less than a car-load, which have hitherto escaped taxation. Documents bearing on "traffic de groupage," i. e., where several consignments are grouped together to form one car-load, will have to bear a stamp of 5 pfennings (1 cent) each. Another important innovation is the imposition of a charge of 3 pfennings per metric ton on traffic originating on private industrial railways. In many instances the industrial railways belonging to large concerns are of considerable length, and have direct communication with inland waterways, and without this special charge they would have avoided any contribution to the new taxation.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

In a general circular issued August 10 the commission called attention to the threatened car shortage, now believed to be pending, due in some measure at least to the heavy shipments of grain during this period of the year. The commission urges upon both carriers and shippers the necessity of carefully supervising methods of loading and moving cars, and declares particularly against the use of cars by shippers for storage purposes, requesting that all cars be released as promptly as possible, and that shippers should not avail themselves of the full limit of free time provided by the tariffs. Carriers are advised to exert every effort to eliminate delays and expedite the movement of shipments, returning to the home line as promptly as possible after unloading all cars received from connecting companies.

Indiana and Illinois Coal

Opinion by the commission:

The commission finds that the carriers have justified proposed increased rates on bituminous coal in carloads from mines in Illinois and Indiana to points in Illinois, Indiana, Wisconsin and Michigan. The increases amount to 5 cents a net ton. (40 I. C. C., 603.)

Rates from Shreveport, La., to Points in Texas

Railroad Commission of Louisiana v. Arkansas Harbor Terminal Railway et al. Opinion by Commissioner Hall:

The commission finds that the class rates between Shreveport and points in Texas are unreasonable and that they are prejudicial to that point in so far as they exceed the rates for like distances between points in Texas, except in instances where the latter have been reduced below the regular mileage scale applied in that state on account of water competition along the Gulf of Mexico or waters contiguous thereto. It also makes similar findings concerning the carload commodity rates on beef cattle; stock cattle; horses and mules; stone (rough); sand and gravel; common brick; fire brick; junk; lignite; cordwood and tan bark; machinery (gin and irrigation); glass fruit jars and bottles; iron and steel articles; potatoes and turnips; fruits, melons, and vegetables; empty barrels and kegs; blackstrap molasses; cottonseed and products; unshelled peanuts; flour; wheat; corn; hay; agricultural implements, except hand implements; bagging and ties; binder twine; cans, cases, and pails (tin); baskets; chocolate raw materials; dry goods; window glass; glassware (table); horse and mule shoes; oil (refined petroleum); iron and steel pipe; wrapping paper; printing paper; tin articles; wire and nails; door locks; tools, files and rasps, and other articles taking the same rates.

It is also found that the present differences in classifications is prejudicial to Shreveport. The carriers must apply to the transportation of property between points in Texas the provisions of the western classification.

In Railroad Commission of La. v. St. Louis Southwestern, 23 I. C. C., 31, the commission found that the class rates of the Texas & Pacific, the Houston, East West Texas, and the Houston & Shreveport from Shreveport to certain points in Texas were unreasonable. Its order required the establishment of reasonable rates and the three carriers were required to "abstain from exacting any higher rates for the transpotation of any article" from Shreveport to Dallas, Tex., and points intermediate via the line of the Texas & Pacific, and from Shreveport to Houston, Tex., and points intermediate via the lines of the Houston, East & West Texas and the Houston & Shreveport, than are charged from Dallas or Houston, for an equal distance toward Shreveport. From the latter portion of that order the carriers appealed to the Commerce Court, where the order was upheld in Texas & P. Ry. Co. v. United States, 205 Fed., 380. That court's decision was sustained by the Supreme Court of the United States in Houston & Texas Ry. v. United States, 234 U. S., 342.

Upon petition by complainants for additional relief a supplemental hearing was had and on June 17, 1915, there was a supplemental report and order, Railroad Commission of Louisiana v. St. L. S. W. Ry. Co., 34 I. C. C., 472. This order applied to many carriers not parties to the original proceeding and required, among other things, that all the carriers named therein should establish on or before September 15, 1915, and maintain for single-line application from Shreveport to all points in that part of Texas on and east of a line drawn through Gainesville, Fort Worth, and Waco, Tex., and thence via the Brazos River to the Gulf of Mexico, the territory so described being termed "eastern Texas" in the supplemental report, class rates no higher than a certain mileage scale there found reasonable. These carriers were authorized to construct rates for joint line application by adding certain amounts to the scale prescribed for use over single lines. The order also required the carriers to cease charging rates from Shreveport to destinations in eastern Texas higher than for an equal distance from points in eastern Texas toward Shreveport, or higher, distance considered, than the corresponding class rates named in the order.

Rates were filed as required by this order, but after protest the effective date of the supplemental order was postponed. This matter and other points are here again taken up in a single case.

The commission as a result of its investigations notes as to the condition of the railways in Texas that:

First—The amount paid out by these roads for rental of equipment is an unusually large proportion of their revenues. This is said to be due to lack of funds available for the purchase of equipment.

Second—The personal injury claims paid were relatively large and constitute a material drain. They amounted to $2,905,398 in 1914, 5.813 cents for every revenue train-mile of service performed and 2.47 per cent of the total railway operating revenue. This percentage is much higher than that paid by some of these lines upon the revenues earned in adjoining states, and is far in excess of the proportion paid by other lines operating in contiguous territory.

Third—Loss and damage to freight, damage to property and damage to stock on right of way on the Texas roads amounted to $2,720,226 during the fiscal year 1914, or 2.32 per cent of the total railway operating revenue for the year. The amount so paid by Texas roads greatly exceeds that paid by other lines operating in adjoining states.

Fourth—The taxes paid in 1914 amounted to $5,058,269, or 4.32 per cent of the total railway operating revenues for that year. Taxes for all the years shown from 1908 to 1914 have quite steadily increased. This might be expected, since the values of the properties have been increasing. The total railway operating revenues, however, have not kept pace with the rising tide of taxes. The percentages of those revenues which have been required to pay the taxes were 2.36 per cent in 1900, 2.87 per cent in 1909, and 4.32 per cent in 1914.

Fifth—The exhibits of average loading of cars in Texas as compared with the minima required intrastate in Texas show that many of these commodities can be, and generally are, loaded to and above the minima required by the interstate tariffs.

Sixth—The net corporate income was, for the fiscal year:

1908	loss..	$6,294,769
1909	gain..	3,278,347
1910	gain..	1,594,519
1911	gain..	507,108
1912	loss..	3,282,493
1913	loss..	1,601,378
1914	loss..	8,144,597
1915	loss..	6,619,553

The 1915 report includes only 32 roads and embraces the entire lines of the Texas & Pacific, Gulf, Colorado & Santa Fe, and Missouri, Kansas & Texas of Texas, respectively. The aggregate net corporate loss of these 32 roads during the last eight years is over $20,000,000. This does not take account of the interest on the second mortgage income bonds of the Texas & Pacific, which amounts to more than $1,100,000 annually and has not been paid. If this interest had been paid or became a charge against the property, the deficit shown would have been correspondingly larger.

The arrangements of these Texas lines with affiliated interstate lines for divisions and for the exchange of traffic and equipment are said to be satisfactory to the Texas lines and appear to be fair to them.

From the record before us we are unable to tell in all instances by whom the losses indicated have been borne. Some of the

bonds and certificates of indebtedness are held by other railroad companies operating through other states.

A new mileage scale of class rates is prescribed as follows:

Miles.	1	2	3	4	5	A	B	C	D	E
10 and less	23	19	16	14	10	10	8	7	6	5
20 and over 10	27	22	19	16	12	13	10	9	8	6
30 and over 20	30	25	21	18	14	16	12	10	9	7
40 and over 30	33	28	23	20	16	17	13	11	10	8
50 and over 40	37	31	26	22	18	19	15	13	11	9
60 and over 50	40	34	28	24	20	21	16	14	12	10
70 and over 60	43	37	30	26	21	22	17	15	13	11
80 and over 70	47	40	33	28	23	24	19	16	14	12
90 and over 80	50	43	35	30	25	26	20	18	15	12
100 and over 90	53	45	37	32	27	28	21	19	16	13
110 and over 100	57	48	40	34	29	30	23	20	17	14
120 and over 110	60	51	42	36	30	31	24	21	18	15
130 and over 120	63	54	44	38	31	33	25	22	19	16
140 and over 130	67	57	47	40	33	35	27	23	20	17
150 and over 140	70	60	49	42	35	36	28	25	21	18
175 and over 150	75	64	53	45	38	39	30	26	22	19
200 and over 175	80	68	56	48	40	42	32	28	24	20
225 and over 200	85	72	59	51	43	44	34	30	26	21
250 and over 225	90	77	63	54	45	47	36	32	27	22
300 and over 250	100	85	70	60	50	52	40	35	30	25
350 and over 300	103	87	72	62	52	54	41	36	31	26
400 and over 350	106	90	74	64	53	55	42	37	32	26
Over 400	106	90	74	64	53	55	42	37	32	26

In its original report the commission used the Texas intrastate rates as a guide for the construction of rates between Shreveport and Texas points for distances of 245 miles or less. It seems clear from the present record that the class rates prescribed are too low for hauls of 60 miles or less.

The percentage relation of the various classes in this scale follows closely the relation in Memphis Freight Bureau vs. St. L., I. M. & S. Ry. Co., 39 I. C. C., 224; cities of Marshall and Jefferson, Tex., vs. T. & P. Ry. Co., 39 I. C. C., 249.

It is as follows:

Class	1	2	3	4	5	A	B	C	D	E
Percentage	100	85	70	60	50	52	40	35	30	25

Class rates for joint line application may be made by adding to the rates prescribed in the above table the following amounts, in cents per 100 pounds:

Class	1	2	3	4	5	A	B	C	D	E
Cents	8	7	6	5	4	4	4	3	2	2

Rates so made, however, must not exceed the following in cents per 100 pounds for distances of 400 miles or less:

Class	1	2	3	4	5	A	B	C	D	E
Cents	106	90	74	64	53	55	42	37	32	26

The western boundary of Texas common-point territory on interstate traffic coincides in part with the western boundary of that territory as it applies on intrastate traffic. In all instances in which these two boundaries do not coincide, the boundary of the intrastate territory is farther west than that of the interstate. For example, Laredo and Amarillo are both west of interstate, but within intrastate common-point territory. The territory in Texas lying west of these boundaries is known as differential territory. A table is given of the proper differentials to be applied in this case ranging from 2 cents on first class to one cent on class E for 20 miles or less to 30 cents on first class to 10 cents on class E for over 300 miles.

The commission notes concerning the relation of intrastate and interstate rates that if the sole issue were whether or not the present adjustment of rates was prejudicial to Shreveport, an order might be issued which could be complied with by increasing the Texas rates to the level of the interstate rates, or by reducing the interstate rates to the intrastate basis.

"Should the latter alternative be adopted, either voluntarily or under compulsion of the State authorities, the intrastate rates and regulations would be given extraterritorial force and would become the standard for interstate commerce. The effect of adopting such a plan would not stop with Shreveport. Alexandria and Monroe, La., Vicksburg, Miss., and other points are in competition with Shreveport for trade and commerce to and from Texas and, so far as we are advised, there is no more reason for extending the Texas rates and classification to Shreveport than to other points in Louisiana or other States east of the Mississippi River.

"It can easily be conceived that if carriers in removing prejudice against interstate commerce, were bound to follow the standard set by the State authorities, interstate rates, based in part on the requirements of one State and in part on those of others, would soon be in inextricable and intolerable confusion, productive of discord, and ruinous alike to shippers and carriers. This the commerce clause of the constitution, under which Congress has created this commission and vested it with power, was designed to prevent.

"In this proceeding the allegation of undue prejudice is not the sole issue. Defendants' class rates and many of their commodity rates are attacked as unreasonable.

"It is perhaps unnecessary to say that the findings and conclusions of State commissions respecting the reasonableness of intrastate rates should be given great weight, that rates established in accordance with such findings should not lightly be disturbed and that we consider it our duty to cooperate in every proper way with the State authorities.

"But the obligation placed upon us by the law requires us to exercise our best judgment upon the facts placed before us and, in a case such as this, to prescribe just and reasonable maximum rates and enter such order as shall prevent or remove undue prejudice to interstate commerce, even though in some instances such action may incidentally affect the level of intrastate rates." (41 I. C. C., 83.)

COURT NEWS

Seizure of Shipment Under Legal Process

Action was brought for the alleged conversion by the defendant railroad of goods shipped by the plaintiff over the road from a point in Minnesota to a point in Montana. After the goods arrived at destination they were seized under a writ of replevin issued in an action brought in Montana against the plaintiff. The railroad promptly notified the plaintiff of these proceedings. The Minnesota Supreme Court held that it was a good defense to the action if the railroad proved that the legal process under which the property was seized was regular and valid upon its face. The process was not invalid on the ground that the seizure was an interference with interstate commerce.—Burkee v. Great Northern (Minnesota), 158 N. W., 41.

Initial Carriers' Liability

The Idaho Supreme Court holds that a common carrier which receives goods for interstate shipment is the initial carrier, although it only switches the cars in which they are loaded to the lines of another common carrier to be transported out of the state.

An initial carrier is not liable for damage to goods occurring on lines not its own, and over which they are routed without notice to it. The obligation of such a carrier ceases when the goods reach, in good condition, the destination to which they were originally consigned.—Barrett v. Northern Pac. (Idaho), 157 Pac., 1016.

Right of Track in a Terminal Yard

In an action against a railroad company for the death of a fireman in a rear collision in a terminal yard, it appeared that the company's rules provided that a signal at proceed does not insure an unobstructed track ahead, and enjoined extraordinary care, reminded employees that other trains are acting on the same rules, and that within the interlocking limits trains must expect to find the tracks occupied; and that trains must be kept under full control. The Missouri Supreme Court holds that ordering the train on which the deceased was fireman to proceed past a signal post was not negligence on the part of the company. Nor was it negligence to send out two trains on the same track one minute apart.—Moyes v. St. Louis, I. M. & S. (Mo.), 186 S. W., 1027.

Municipal Consent Not Required to Build Branch Lines

The Lehigh & New England built a single track 100 feet long from a point on its main line in Bethlehem across Conestoga street to the plant of the Lehigh Valley Chemical Company without the borough's consent. In an action by the borough to require the removal of the track, the Pennsylvania Supreme Court held that the line was not a "lateral track," but a "branch line," within the act of 1868 authorizing railroad companies incorporated under that act to construct such branches from their main lines as they may deem necessary. The railroad company, having laid its main line in the borough with the consent of the municipal authorities, the borough could not restrain this construction of a branch line across a street.—Borough of Bethlehem v. Lehigh & N. E. (Pa.), 97 Atl., 1074.

Railway Officers

Executive, Financial, Legal and Accounting

Alexander R. Lawton has been elected president of the Sylvania Central, with headquarters at Savannah vice Mills B. Lane, resigned.

Arthur C. Griffith has been appointed auditor and treasurer of the Pittsburg & Shawmut, and Charles W. Hatch, cashier, both with headquarters at Kittanning, Pa.

R. Home Smith has been elected president of the Mexico-North Western, succeeding Dr. F. S. Pearson, deceased. His offices will be located at Toronto, Ont., and El Paso, Tex.

F. C. King has been appointed real estate and claim agent of the Wabash Pittsburgh Terminal and the West Side Belt, with headquarters at Pittsburgh, Pa., vice P. K. Soffel, resigned.

L. C. McCutcheon, chief clerk in the freight loss and damage claims department of the St. Louis & San Francisco, has been promoted to assistant superintendent of freight loss and damage claims department, with headquarters at Springfield, Mo.

The agreement under which the receiver of the Pittsburg, Shawmut & Northern is operating the Pittsburg & Shawmut will be terminated at midnight August 31, 1916. After that date the Pittsburg & Shawmut, comprising the railroad from Erie Junction, Brockwayville, Pa., to Freeport, Pa., will be operated independently by its own officers, with general offices at Kittanning, Pa.

Albert William Johnston, whose appointment as assistant to the president of the New York, Chicago & St. Louis, has been announced, was born at Boston, Mass., on March 4, 1853. He graduated from the Massachusetts Institute of Technology. He entered railway service in July, 1875, and was consecutively clerk and draftsman in the office of the general superintendent of the Pittsburgh, Cincinnati & St. Louis until December, 1878, when he was made assistant engineer on the same road. From March, 1880, to January 1, 1882, he was superintendent of an industrial corporation in Arizona. He was then chief engineer of the Toledo, Delphos & Burlington until April, 1882, when he was appointed superintendent of the Leavenworth, Topeka & Southwestern. From April, 1884, to January, 1889, he was division engineer of the Eastern division of the New York, Chicago & St. Louis, and from the latter date to October 1, 1893, was superintendent of the same division. He was general superintendent of the Nickel Plate from October 1, 1893, to February 1, 1906, when he was promoted to general manager, the position he held up to the time of his recent appointment as assistant to the president. His headquarters will continue to be at Cleveland, Ohio.



A. W. Johnston

John F. Turner, whose appointment as general auditor of the Boston & Maine, with headquarters at Boston, Mass., has already been announced in these columns, has been in the service of that road or its predecessors since 1885. He was born July 24, 1865, at West Lebanon, N. H., and received his education at Kimball Union Academy, Meriden, N. H. He entered railroad service on June 1, 1885, as yard clerk in the employ of the Passumpsic Railroad, now a part of the Boston & Maine. In July, 1886, he became a division office clerk for the Boston & Lowell at Concord, N. H., and November, 1886, was transferred to a similar position at White River Junction. In February, 1887, he became an audit office clerk for the Boston & Lowell at Boston. He became a clerk in the office of the auditor of freight accounts for the Boston & Maine in April, 1888, and served as chief clerk in that office from June, 1892, to April, 1911, when he became auditor of freight receipts. It is this position he leaves to take up his new duties as general auditor as above noted.

Operating

Enoch W. Underwood has been appointed superintendent of the Buffalo division of the Erie, vice Charles E. Eckels, transferred.

Charles E. Eckels has been appointed superintendent of the Rochester division of the Erie, vice Edmund I. Bowen, transferred.

Edmund I. Bowen has been appointed division superintendent of the Erie, with headquarters at Marion, Ind., vice Theodore Mackrell, deceased.

Fred Hugh Knickerbocker, assistant to the vice-president and general manager of the Oregon Short Line, with headquarters at Salt Lake City, Utah, has been appointed general superintendent, with headquarters at Pocatello, Idaho, in place of W. A. Whitney, transferred. Mr. Knickerbocker was born at Chicago, Ill., on December 10, 1875, and was educated in the public schools of Omaha, Neb. He first entered railway service on March 16, 1897, as a stenographer in the general freight department of the Oregon Short Line at Salt Lake City. From December 31, 1899, to January 1, 1900, he was general freight agent of the same road, following which he was secretary to the general superintendent until May 15, 1902, when he was made secretary to the vice-president and general manager. He was promoted to assistant to the general manager on January 1, 1909, since which time he has been consecutively assistant to the general manager, assistant general manager and assistant to the vice-president and general manager. His appointment as general superintendent at Pocatello, Idaho, was effective on August 15.



F. H. Knickerbocker

E. D. Leavitt has been appointed trainmaster of the western division of the Southern Pacific, with headquarters at West Oakland, Cal., vice G. E. Gaylord, promoted.

The office of superintendent of car service of the Pittsburg, Shawmut & Northern has been abolished and the duties of that office will be assumed by J. D. Beaver, superintendent, St. Mary's, Pa.

James T. Colbert, superintendent of car service of the Pittsburg, Shawmut & Northern has been appointed superintendent of the Pittsburg & Shawmut with headquarters at Kittanning, Pa.

R. D. Williams, general agent of the Erie, with headquarters at Los Angeles, Cal., has been appointed manager Pacific Coast traffic, with headquarters at San Francisco, Cal., to succeed C. W. Colby, deceased.

R. A. Grammes, terminal train master of the Philadelphia division of the Baltimore & Ohio has been appointed assistant superintendent of the Baltimore division in charge of the terminals at Baltimore. He will have offices at Baltimore. He succeeds J. P. Kavanaugh, transferred and assigned to other duties.

W. A. Whitney, general superintendent of the Oregon Short Line at Pocatello, Idaho, has been appointed superintendent of transportation of the Union Pacific, vice W. D. Lincoln. F. H. Knickerbocker, assistant to the vice-president and general manager of the Oregon Short Line, has been appointed general superintendent at Pocatello to succeed W. A. Whitney. G. L. Hickey, trainmaster of the Oregon Short Line, with headquarters at Pocatello, Idaho, has been appointed assistant to the vice-president and general manager, with headquarters at Salt Lake City, Utah, vice Mr. Knickerbocker, promoted. H. W. Doty has been appointed trainmaster, with headquarters at Pocatello, in place of G. L. Hickey, promoted, effective August 15.

Kenneth M. Nicoles, whose appointment as superintendent of transportation and telegraph of the Western Pacific has been noted, was born on July 17, 1859, at Paris, Ill., where he received a common school education. He entered railway service as a telegrapher on the Indianapolis, Peru & Chicago, on December 24, 1879. From 1883 to 1888 he served the Chicago & North Western as telegrapher and train despatcher. He then entered the employ of the Northern Pacific as despatcher, subsequently being promoted to chief despatcher. In 1906 he was appointed trainmaster of the Lake Superior division with headquarters at Duluth, Minn. He was promoted to assistant superintendent of the same division in October, 1909, and to superintendent in November of the same year. In June, 1912, he was transferred to Fargo, N. D., where he remained as division superintendent until February, 1913, when he resigned. He entered the service of the Western Pacific in April, 1913, as trainmaster at Stockton, Cal. He was promoted to superintendent of transportation and telegraph with office at San Francisco, Cal., on August 1.

George D. Hood, whose appointment as superintendent of telegraph of the Chicago, Rock Island & Pacific, with headquarters at Chicago, Ill., has been noted in these columns, was born at Yarmouth, N. S., on November 16, 1875. He was educated in the common schools and at Yarmouth Academy, and first entered railway service as a telegraph operator on the Intercolonial in Nova Scotia. Subsequently he was employed in the same capacity by that road in New Brunswick, and by the Western Union Telegraph Company at Halifax, N. S., in 1892, and at St. Paul, Minn., in 1893. For a short period in 1893 he was a telegraph operator for the Northern Pacific at St. Paul, following which he went to Helena, Mont., where he remained in the service of the same road until 1902, successively as telegraph operator, wire chief and assistant city ticket agent. He then left the Northern Pacific to enter the service of the Atchison, Topeka & Santa Fe at Topeka, Kan. He remained in that city as wire chief, manager of the telegraph and relay office, and chief clerk to the superintendent of telegraph until 1910, when he went to Seattle, Wash., to become superintendent of the Pacific division of the Western Union Telegraph Company. His appointment as superintendent of telegraph of the Rock Island was effective August 1.



G. D. Hood

Traffic

Raymond E. Ball has been appointed general freight and passenger agent of the Pittsburg & Shawmut with headquarters at Kittanning, Pa.

W. T. Kraft, traveling freight agent of the Northern Pacific at Jamestown, N. D., has been promoted to general agent, freight department, at the same city.

John L. Greenwood has been appointed general agent of the Toledo, St. Louis & Western, with headquarters at San Francisco, Cal., succeeding G. L. Townsley, the office of commercial agent having been abolished.

H. O. Mills, commercial agent of the Toledo & Ohio Central and the Zanesville & Western, with headquarters at Columbus, Ohio, has been promoted to division freight agent, with headquarters at Toledo, vice H. G. L. Campbell, resigned to engage in other business. Eugene Dupuis has been appointed commercial agent, with headquarters at Columbus, Ohio, vice Mr. Mills, promoted.

Bode K. Smith, whose appointment as general passenger agent of the Western Pacific has been announced, was born at San Francisco, Cal., on August 2, 1883. He was educated in the public schools of his native city and first entered railway service in a minor capacity on the Rio Grande Western on May 1, 1899. Subsequently, he served the following railroads consecutively at San Francisco: The Denver & Rio Grande as traveling passenger agent, the same railroad as city passenger agent, the Denver & Rio Grande, the Texas & Pacific and International & Great Northern as city passenger agent, and the Missouri Pacific as city passenger agent. From September 1, 1913, to August 1, 1916, he was assistant general passenger agent of the Western Pacific at San Francisco. As general passenger agent, he will continue to have headquarters at that city.

John Hawkins Andrews, whose appointment to the position of assistant general freight agent of the Southern Railway, with headquarters at Mobile, has already been announced in these columns, has been in the service of the Southern Railway since 1897. He was born at Raleigh, N. C., March 9, 1876, and was educated at Raleigh Male Academy and the University of North Carolina, graduating from the latter in 1897. He entered the service of the Southern Railway on June 9, 1897, as an office boy in the division freight agent's office at Raleigh, N. C. He gradually worked his way up in that office to chief clerk, and on July 1, 1903, was made traveling freight agent. He was transferred to Greensboro, N. C., December 15, 1904, and returned to Raleigh in 1908. On September 1, 1911, he became commercial agent at Raleigh and was appointed division freight agent on November 15, 1912. He held this last named position until August 1, 1916, when he was promoted to assistant general freight agent at Mobile, as above noted.

Engineering and Rolling Stock

John L. Smith, Jr., has been appointed master mechanic of the Pittsburg & Shawmut with office at Brookville, Pa. George K. Russell has been appointed general storekeeper with office at Kittanning, Pa.

OBITUARY

C. W. Colby, manager Pacific Coast traffic of the Erie with headquarters at San Francisco, Cal., died at his home in that city July 29.

John M. Thurston, who was general solicitor for the Union Pacific from 1889 to 1895, and who afterward became United States senator, died at his home in Omaha, Neb. on August 9, age 69.

CANADIAN PIG IRON.—The production of pig iron in Canada in 1915 totaled 825,420 tons, of which Ontario produced 450,174 tons and Nova Scotia, 375,246 tons. The production in the first six months of 1916 was 507,750 tons.

"GOING AFTER BUSINESS."—Every day finds new evidences of loyalty and interest in the welfare of the company. And it is not such a hard job after all: The young lady stenographer buys her finery at Smith, Jones & Company and hears that they are about to enlarge their store. She sees Mr. Smith and says: "I am glad to hear of your plans for handling a larger stock. Now Mr. Smith, when you get your new fixtures won't you please route them over the Southern Pacific Lines? I would appreciate your patronage in return for that which I and my sisters give you; our service is the best, and we love reciprocity." A little talk along this line and the routing is secured.—*Southern Pacific Bulletin.*

Equipment and Supplies

LOCOMOTIVES

The Nevada Consolidated Copper Company, New York, has ordered two 0-6-2 type locomotives from the Baldwin Locomotive Works.

The Pennsylvania Equipment Company, Philadelphia, Pa., is in the market for a second-hand, standard gage Shay locomotive.

The Mogyana Railway, Brazil, has ordered 3 Pacific type locomotives from the American Locomotive Company. These locomotives will have 17½ by 20-in. cylinders, 45-in. driving wheels, a total weight in working order of 118,000 lb., and will be equipped with superheaters.

The Braden Copper Company, 165 Broadway, New York, has ordered 2 four-wheel tank locomotives from the American Locomotive Company. These locomotives will have 11 by 16-in. cylinders, 33-in. driving wheels, and a total weight in working order of 39,000 lb. The engines are for use in Chile.

The Bingham & Garfield, reported in last week's issue as being about to purchase a Mallet type locomotive, has ordered one superheater 0-8-8-0 Mallet type locomotive from the American Locomotive Company. This locomotive will have 26 and 41 by 28-in. cylinders, 51-in. driving wheels, and a total weight in working order of 461,000 lb.

PASSENGER CARS

The Lehigh Valley is in the market for 25 60-ft. baggage and express cars.

The Havana Central recently ordered 3 third-class coaches and 5 combination baggage and mail cars from the Wason Manufacturing Company; 7 motor coaches from the American Car & Foundry Company, and one semi-convertible car from the J. G. Brill Company.

FREIGHT CARS

The Kansas City Southern is inquiring for 1,900 freight cars.

The Atlantic Coast Line is in the market for 100 underframes.

The Illinois Central is about to order 500 refrigerator and 700 box cars.

The Bethlehem Steel Company has issued inquiries for 20 50-ton hopper cars.

The St. Louis & San Francisco is inquiring for 500 36-ft. and 500 40-ft. box and 1,000 hopper cars.

The Michigan Central has ordered 500 center constructions from the Pressed Steel Car Company.

John J. McPherson, Kansas City, Mo., has ordered 10 50-ton tank cars from the American Car & Foundry Company.

The New Orleans & Northeastern has ordered 100 30-ton box car bodies from the American Car & Foundry Company.

The Pierce Oil Corporation, St. Louis, Mo., has ordered 50 50-ton tank cars from the American Car & Foundry Company.

The East Jersey Railroad & Terminal Company has ordered 20 40-ton tank cars from the American Car & Foundry Company.

The Wilhoit Refining Company, Springfield, Mo., has ordered 10 50-ton tank cars from the American Car & Foundry Company.

The Miller Petroleum Refining Company, Chanute, Kan., has ordered 5 50-ton and 10 40-ton tank cars from the American Car & Foundry Company.

The New York Central has ordered 1,000 box cars from the Haskell & Barker Car Company for the Lake Erie & Western and 1,000 box cars from the American Car & Foundry Company for the New York Central itself.

The New York, Chicago & St. Louis has ordered 500 underframes for reinforcing wooden box cars from the Illinois Car & Manufacturing Company and 500 underframes for reinforcing gondola cars from the Ryan Car Company. It may also buy 1,000 new cars.

IRON AND STEEL

The Havana Central has placed orders for 5,000 tons of rails.

The Cuba Railroad has ordered 350 to 400 tons of bridge work from Milliken Brothers, Inc.

The Philadelphia & Reading has ordered 180 tons of bridge work from the McClintic Marshall Company.

The Pennsylvania Railroad recently received bids on 1,000 to 1,200 tons of steel for a freight house and bridge work at Connellsville, Pa.

The Chicago, Milwaukee & St. Paul has ordered one 85-ft. 155 ton double track girder span from the Wisconsin Bridge & Iron Company. It has also ordered two 108-ft. pony truss spans from the Fort Pitt Bridge Works for a bridge at McGregor, Ia.

MISCELLANEOUS

The Michigan Central is in the market for bridge stringers.

The Minneapolis & St. Louis is inquiring for eight carloads of bridge stringers.

The Minneapolis, St. Paul & Sault Ste. Marie is in the market for about 400,000 ft. of bridge stringers and timbers.

The Atchison, Topeka & Santa Fe is inquiring for about 2,500 bridge stringers.

The Alaskan Railway Commission has given orders to the Seattle Car & Foundry Company for about $12,000 worth of clamps, blocks, forgings and other material to be used in constructing the government railroad in Alaska.

The Pennsylvania Equipment Company, Philadelphia, Pa., is in the market for the following second-hand equipment: two standard gage locomotive cranes of 5 to 10 tons capacity; one 14-ft. gage locomotive crane, any capacity; one standard gage Ohio locomotive crane, Model D, 8-wheel type, 20 tons capacity and one 15-ton standard gage locomotive crane with 40 ft. boom and preferably 8 wheels.

The Cement-Gun Construction Company, Chicago, reports that it is now engaged upon the following railroad work: Lining two tunnels for the Northern Pacific in Montana; lining a tunnel for the Illinois Central near Unionville, Ind., protecting the steel work on the New York, Chicago & St. Louis bridge at Seventy-ninth street, Chicago, where the railway crosses over the Illinois Central, and covering the entire head-house, total approximately 200,000 sq. ft., for the Chicago & North Western grain elevator at South Chicago with 2-in. reinforced Gun-crete siding.

The Spanish Coal and Iron Trade.—The Spanish coal output in 1914 amounted to 3,905,080 metric tons, of which 2,457,613 tons proceeded from the province of Oviedo. The lignite yield was 291,057 tons. The iron ore output reached a total of 6,819,964 tons, or a falling-off of 3,000,000 tons, compared with the yield for 1913. The greatest yield was obtained from the province of Vizcaya with 2,618,150 tons, followed by Santander and Almeria with about 1,000,000 tons each. The output of manganese ore in 1913 was over 21,000 tons, and in 1914 just over 13,000 tons, in which the province of Huelva contributed 9,375 tons. In 1914 Spain produced 382,044 tons of pig-iron and 330,000 tons of iron and steel. The men employed in iron and steel works numbered 24,500 in 1914, while the plant comprised 21 blast-furnaces, 38 puddling furnaces, 27 open-hearth furnaces and 7 converters.

Supply Trade News

E. W. Richey has been appointed assistant to the president of the Standard Forgings Company, with office at Chicago, Ill.

The Ellcon Company, 50 Church street, New York, announces that the appointment of Wm. M. Wampler as eastern sales manager of the Acme Supply Company, Chicago, as announced in last week's issue, will in no way affect Mr. Wampler's interest and activity as vice president and general manager of the Ellcon Company.

W. Sharon Humes, formerly employed in the motive power department of the Pennsylvania at Altoona, Pa., and later sales manager of the General Railway Supply Company at Chicago for a period of six years, has become associated with the Hewitt Company, Chicago, in the manufacture and sale of anti-friction metals and locomotive packing.

Frank J. Engel, recently with the Boston & Albany, and Herman P. Hevenor, recently with the New York, New Haven & Hartford, and previously with the Brooklyn Rapid Transit, have formed a copartnership for carrying on an engineering and contracting business under the firm name of Engel & Hevenor, with offices at 220 Broadway, New York.

Thornton Hopkins, connected with the Beckwith-Chandler Company, New York, manufacturers of high grade varnishes for many years as a representative in the railway department, and subsequently as assistant secretary, died at his home in Brooklyn, N. Y., July 31. Mr. Hopkins was for several years a clerk in the employ of C. T. Raynolds, and when that firm was consolidated under the name of Devoe & Raynolds continued in its employ. In 1906 he severed his connection and subsequently accepted a position with the Beckwith-Chandler Company, and remained with them until his death, although for the past year or more he had been incapacitated from active duties on account of ill health.

John P. Risque, superintendent of locomotives and cars for the Cuba Cane Sugar Corporation at Havana, Cuba, writes that his company would like to receive catalogues of railway equipment and supplies. The company's lines carry cane principally, and do little passenger business. The railway organization is under the direction of the department of railways and lands of which A. Ximeno is engineer in chief, with headquarters at Obispo, 59, Havana. All catalogues pertaining to maintenance, etc., should be addressed to him. Catalogues dealing with car and locomotive specialties, shop equipment, tools, etc., should be addressed to Mr. Risque at the same address. E. L. Ragonnet (inventor of the reverse gear by that name) is mechanical engineer of the company.

G. A. Trube has been appointed export manager of the Westinghouse Air Brake Company and the Westinghouse Traction Brake Company, effective August 1, 1916, with headquarters at Pittsburgh, Pa. Mr. Trube has had a wide foreign experience, having been associated with the Westinghouse Air Brake and Westinghouse Electric interests for many years, both in this country and abroad. He went to England in 1900 to carry out some special work, and soon afterwards made his headquarters there. In January, 1912, he was transferred to Paris to become managing director of the French Westinghouse Company, which position he has now resigned in order to return to this country and take up his new duties here.

Thomas J. Drummond, president of the Lake Superior Corporation, the Canadian Iron Corporation, and the Algoma Steel Corporation, Ltd., died suddenly at his summer home in Castine, Me., Sunday, August 6. Mr. Drummond had been very prominent in iron and steel manufacture in Canada for many years. He was born in Tawley, Ireland, September 26, 1860, and received his education in the public schools of Montreal. In 1882 he became a partner in the firm of Drummond, McCall & Co., of Montreal, manufacturers of iron and steel. While with this company he aided in the founding of the Montreal Car Wheel Company, the Canadian Iron Furnace Company, the Radnor Forges and the Drummond-McCall Pipe Foundry. Mr. Drummond was also president of the Algoma Central Railway and held directorships in the Canadian Car & Foundry Company, the Cockshutt Plow Company and the American Iron and Steel Institute.

T. F. Flanagan, whose appointment as general sales and advertising manager of the Pyrene Manufacturing Company, New York, has already been announced in these columns, is only 25 years of age. He was educated at Trinity College in Hartford, where he was active in the management of both the college magazine and newspaper. During the same time he worked nights as a reporter on the Hartford Courant, and during the summer did police reporting. Following his graduation, Mr. Flanagan went to New York and became associated with the Wales Advertising Agency, which he left to become advertising manager of the C. J. Tagliabue Manufacturing Company, in Brooklyn. In that company, he worked rapidly into the sales department where he directed the work of about 20 salesmen and where he remained until 14 months ago when he joined the Pyrene Manufacturing Company as assistant advertising manager. Soon after he joined the Pyrene forces, he became assistant to C. Louis Allen, now the company's president but then its sales manager, and when Mr. Allen's promotion left the position of head of the sales force vacant the work devolved on Mr. Flanagan. Now he has been given the title of general sales and advertising manager as above noted.



T. F. Flanagan

American Locomotive Company

It sounds striking enough to say that the American Locomotive Company's fiscal years ending June 30, 1915, and June 30, 1916, were respectively the worst and the best in the company's 15 years of business. When one reads in the annual report, however, that the net profits were 69 per cent greater than those of the best previous year, one begins to realize the extent to which the company has benefited by the revival of business conditions and its activity in the manufacture of munitions of war.

The gross earnings of the American Locomotive Company and the Montreal Locomotive Works, Ltd., in the year just closed were $59,316,016 as compared with only $9,303,298 in 1915, a difference of over $50,000,000. These gross earnings were the largest in the company's history, the best previous gross earnings having totaled $54,868,000 in 1913. The net profits after the deduction of manufacturing, maintenance and administrative expenses and depreciation, including cost of equipment for ammunition orders, and deductions for interest, etc., on bonds of constitutional companies, etc., were $10,769,429. This compared with a deficit in 1914-15 of $1,491,980, and was $4,411,222 or 69 per cent greater than the net profits of $6,358,207 made in 1906-07, the best previous year. The report says that, "This good showing was due to the successful execution of the company's munitions orders." It does not say how much was made on the war orders, but it will be remembered that the company was reported May, 1915, as having received orders from the Russian government for $65,000,000 of shells, half of which it sublet to the Westinghouse and New York Air Brake Companies. The report says further: "In arriving at the profit of $10,769,429 there has been deducted from earnings the sum of $1,761,682 for depreciation on all classes of property. There has also been charged against the profits for the year the entire cost of all new equipment of every description purchased for use on munitions work, together with the cost of alterations of plants in connection with such work. In addition to the foregoing a sufficient amount has been set aside from this year's earnings to

provide for the cost of eventually restoring the two plants now making munitions to the best conditions for locomotive work when it is resumed at such plants."

Dividends of 7 per cent, totaling $1,750,000, were paid on the preferred stock and a reserve for additions and betterments of $3,000,000 established, so that the credit to profit and loss was $6,019,429. This compared with a debit of $3,241,980 in 1915, but in 1915 the dividends on the preferred stock, also amounting to 7 per cent, were paid out of surplus.

The amount of unfilled locomotive orders on the books on June 30, 1916, was $19,376,532 as compared with $5,838,235 on June 30, 1915. Practically all of the munitions orders which were on hand at the beginning of the year have been completed and shipped. The unfilled munitions orders on the books on June 30, 1916, together with the munitions orders taken since, amount to $41,642,905.

The combined balance sheet for the American Locomotive Company and the Montreal Locomotive Works, Ltd., on June 30, was as follows:

Assets		
Cost of property (less depreciation reserves)		$48,530,258
Securities owned		705,750
Convertible assets		
Cash assets	$10,351,071	
Accounts collectible	11,769,379	
Bills receivable	900,307	
Accrued interest	1,704	
Material and supplies	5,899,020	
Contract work in course of construction	6,698,488	
Locomotives and snow plows in stock	141,725	
		35,761,694
Sundry deferred charges		72,341
		$85,070,043
Liabilities		
Capital stock—		
Preferred	$25,000,000	
Common	25,000,000	
		$50,000,000
Bonded debt of constituent companies		1,932,000
Current liabilities—		
Gold notes outstanding	$2,722,000	
Accounts payable	11,018,725	
Income tax withheld at source	1,058	
Accrued interest	94,530	
Unclaimed interest	5,802	
Dividends on preferred stock payable July 21, 1916	437,500	
		14,279,615
Reserve for United States income and Canadian war taxes, restoration of plants, etc.		1,857,175
Reserve for additions and betterments		3,035,563
Profit and loss—		
Balance June 30, 1915	$8,293,678	
Add—Surplus for year	6,019,429	
	$14,313,107	
Add—Unexpended balance in "Reserve for loss in liquidation of auto business," now restored to surplus	453,325	
	$14,766,432	
Deduct—Estimated property loss due to retirement and eventual disposition of Rogers and Manchester plants	800,742	
Surplus, June 30, 1916		13,965,690
		$85,070,043

New York Air Brake Company

The New York Air Brake Company has declared a quarterly dividend of 2½ per cent. The company paid dividends of 6 per cent in 1896 and 8 per cent annually from October, 1899, to October, 1907. Dividends were not resumed until 1910, when the stock was placed on a 6 per cent basis. Last March the dividend was increased to 2 per cent quarterly, and this was continued at the June meeting.

In announcing the increased dividend, President Starbuck said in part:

"It is expected that this will be the regular dividend rate in the future.

"The company earned for the past six months of the year in excess of $5,000,000 after amortizing all its new equipments.

"The company's financial position is exceptionally firm, as its total liabilities are less than $30,000, and it has more than $3,500,000 cash deposits in bank and upwards of $4,000,000 due on delivered orders.

"Since the last monthly meeting the company has closed a contract for 600,000 fuses, which was duly announced. In addition to this, the company has just closed a contract for 2,500,000 cartridge cases, which contract runs until March 31, 1917.

"The directors deem it wise not to make any distribution of the munition profits at this time, as the company is still bidding for additional war orders, and its present firm financial position will enable it to fill any further orders without borrowing."

Railway Construction

Atchison, Topeka & Santa Fe.—This company has filed articles of incorporation for the building of a line 70 miles southwest of Lubbock, Tex., to a point near Seminole, Tex.

Cleveland, Southwestern & Columbus (Electric).—This company planned to award contracts on August 9, for the construction of a cutoff between the north and south corporation line of the village of Berea, Ohio, three miles outside of the village limits. The cutoff will shorten the railroad one-half of a mile. The work involves the construction of three bridges, two of which will be of concrete construction, 50 ft. in length, and one of steel construction, 150 ft. in length. The maximum grade is about two per cent. F. T. Pomeroy, member of the executive committee, 525 Garfield building, Cleveland, Ohio.

Lehigh & New England.—This company is constructing second track between Greenwood street, Tamaqua, Pa., and Seek and has awarded a contract for the grading work to F. H. Clement & Co., of Philadelphia.

Mexican Roads.—According to a Texas correspondent the de facto government of Mexico has placed orders for materials for the construction of more than 1,200 miles of new railway and for the rehabilitation of the National Railways of Mexico, now known as the Constitutionalist Railways of Mexico. The proposed work includes the resumption of the construction of a line between Campeche, in the state of Campeche, and Santa Lucrecia, in the state of Vera Cruz, 450 miles, previously projected by a British syndicate; a line from Durango to Concepcion del Oro, 250 miles; a railroad from Ameca, Jalisco, to the Pacific port of Chamela, 150 miles; a road from Saltillo, Coahuila, to Oreaga, 100 miles; a line from Allende, Coahuila, to Las Vacas, opposite Del Rio, Tex., 75 miles; another from Tampico, Tamaulipas, to Matamoros, 315 miles.

Mobile & West Alabama.—Lewis A. May, of Norwood, Birmingham, Ala., is credited with saying that a British syndicate is ready to take up the proposed building of this road, charter for which was granted in 1893, as soon as financial conditions permit. The route surveyed is from Florence via Tuscaloosa to Mobile, 350 miles, with a branch to Birmingham, 30 miles, making a total of 380 miles of line to be built. The maximum grade would be about one-half of 1 per cent. The charter for the road was granted in 1893, the incorporators including Governor Thomas Seay, Huriosco Austill and J. L. Rapier, of Mobile; L. B. Musgrove, of Jasper, Ala.; J. W. Whiting, of Mobile; Howard Douglass, R. C. McCalla and others. It has been kept alive and rights of way granted and station sites are still, it is said, held in the name of the company It is estimated that the line would cost about $20,000,000 to build. Jere H. Austill, of Mobile, Ala., son of Huriosco Austill, is also interested.

New York Subways.—The contract for the installation of tracks in the Broadway-Fourth avenue subway system in Manhattan and Brooklyn, from Fifty-ninth street and Seventh avenue to the Flatbush Avenue Extension in Brooklyn, has been awarded by the Public Service Commission, First district, to the T. H. Reynolds Contracting Company, Inc., the lowest bidder, for $288,400. The board of estimate and apportionment will be asked to approve this contract as soon as possible, so that the work may be gotten under way without delay.

Northern Montour Railroad.—A company by this name has applied to the Pennsylvania Public Service Commission for approval of incorporation. The company proposes to build a line about 35 miles long from a point on the Montour Railroad in Robinson township, Washington county, to a point about one mile from Smiths Ferry, in Ohio township, Beaver county, Pa. Protest has been entered against the approval of this incorporation. The initial hearing has been held, but no action has yet been taken by the commission.

Northern Pacific.—This company has awarded a contract for the grading of a branch line from Dixon, Mont., to Polson, 33.75 miles, to Siems, Wickham & Co., St. Paul, Minn. (July 14, page 90.)

SEABOARD AIR LINE.—This company, as part of a plan to establish a low grade line from Hamlet, N. C., to Savannah, Ga., via Charleston, has awarded a contract to the Vaughan Construction Company, Shawsville, Va., for grade revision work on a portion of the 10 miles between Hamlet and Gibson, N. C. The work will be begun as soon as possible and will be in charge of H. S. Thomas, engineer-in-charge at Hamlet, N. C.

RAILWAY STRUCTURES

BALTIMORE, MD.—The Pennsylvania Railroad received bids August 14 for a passenger station near Edmondson avenue. The station will be a one-story structure 70 ft. by 25 ft. in size, and will cost about $25,000.

BRANDON, VT.—The Central Vermont will erect by company forces a three span reinforced concrete bridge, costing about $21,000, over a highway at present crossing the tracks at grade.

HARRISBURG, PA.—The Pennsylvania Railroad has awarded to Warren, Moore & Co., of Philadelphia, the contract for two freight houses at Harrisburg, to cost about $350,000. Both buildings will be of reinforced concrete, the inbound house being 44 by 50 ft. and four stories high, the outbound 470 by 20 ft. and one story high.

JACKSONVILLE, FLA.—The Jacksonville Terminal Company has decided upon designs for a new union passenger station and has selected Kenneth M. Murchison, 101 Park avenue, New York, as architect. The terminal will be on Lee street at West Bay street and will cost about $1,000,000. Grading and track work for the station will be begun during September and will be completed during the winter. The station itself will not be begun until after the close of the tourist season. J. E. Willoughby, chief engineer of the Atlantic Coast Line at Wilmington, N. C. is chairman of the committee of engineers.

JOHNSON CITY, N. Y.—The Erie will build a concrete and steel bridge to carry Lester avenue over its tracks. The bridge will have two 29-ft. spans and one 96-ft. span. The steel will be taken from an old bridge. The Robert Grace Contracting Company, Pittsburgh, Pa., has the contract for the foundation; the remainder of the work will be carried out by company forces. The total cost is about $18,000.

NEW ORLEANS, LA.—Architects are preparing plans, it is said, for a new steel and brick passenger station for the Louisiana Railway & Navigation Company in New Orleans. The station will be on Rampart street, between Firard and Julia streets. Improvements in freight facilities will also be made, the total cost of the passenger and freight terminal improvements being estimated at between $350,000 and $500,000.

SAVANNAH, GA.—The Midland Railway will erect a two-story brick passenger station 50 ft. by 84 ft. in size. The building will have a tile roof, and will be steam heated. Its second floor will be used for offices. It will also build a freight station 50 by 450 ft. in size. The cost will be about $25,000. Construction will be done by company forces.

SOUTH BELOIT, ILL.—The Chicago, Milwaukee & St. Paul will make terminal improvements at this point costing about $65,000.

TULSA, OKLA.—The Midland Valley has awarded a contract to the Manhattan Construction Company for the erection of a one-story passenger station, 30 ft. by 180 ft. The structure will cost about $25,000 and will be of concrete construction. Work is now under way. Charles Kaighn, chief engineer, Muskogee, Okla.

TWO HARBORS, MINN.—The Duluth & Iron Range has commenced the construction of a new car repair shop, one story high, 275 ft. wide and 298 ft. long. The shop will be of mill building construction with steel frame, concrete block wall, concrete mastic floor and pitch and gravel roof. The Bowe-Burke Company, Inc., Duluth, Minn., has the general contract.

WASHINGTON, IND.—The Evansville & Indianapolis has let contracts to Standish & Allen, Chicago, Ill., for the reconstruction of a bridge over the White river and the erection of a new bridge over Doane's creek. The project involves 300 tons of steel, furnished by the American Bridge Company, about 1,500 cu. yd. of concrete and about 500 cu. yd. of excavation. Work is now under way.

Railway Financial News

BOSTON & MAINE.—The following is taken from a letter addressed by President Hustis, of the Boston & Maine, to W. H. McClintock, president of the Connecticut River Railroad, and B. A. Kimball, president of the Concord & Montreal:

The proposition which, it is understood, your committees are prepared to recommend to your respective boards is stated substantially as follows:

"The existing leases of the Concord & Montreal and the Connecticut River railroads be continued in force, with the exception that the future annual dividends of the Concord & Montreal shall be at the rate of 6 per cent upon its capital stock, instead of 7, and the future annual dividends of the Connecticut River Railroad upon its capital stock shall be at a rate correspondingly lower than the 10 per cent now stipulated in its lease."

You also state your belief that this proposition "will be acceptable to the directors and stockholders of their respective companies, and of greater advantage to the Boston & Maine, and all other interests concerned."

Your plan does not provide for a financial coördination of the properties which are under direct lease now comprising the system, and it therefore falls short of what is an essential in any reorganization—the principle of which is included in the amended plan submitted by your boards on June 17. It is the principle on which all interests have been working.

When it became apparent about three years ago that the Boston & Maine would fail to earn its fixed charges, the plan you now suggest was considered informally by some of the leased lines, and abandoned as unsound and failing to solve the fundamental difficulties, since, even if all the roads directly leased to the Boston & Maine reduced their rentals in the proportions now suggested by you, the fixed charges would still bear a much higher ratio to the average net of the last sixteen years than is regarded as safe by the investing public, and the Boston & Maine would still be without necessary credit. The proposed reduction, even if applied to all those roads now leased directly to the Boston & Maine, would reduce the annual fixed charges of the system less than $400,000, and would not appreciably affect the present ratio of net to fixed charges.

We are assured that the Boston & Lowell and the Fitchburg will not assent to a suggestion which will change their status, so as to make the Connecticut River and Concord & Montreal their creditors. It is also true that even if these two roads did assent to such a change it would be impracticable without further radical change in the proportion of income to fixed charges, to underwrite a subscription to new stock by Boston and Maine stockholders or obtain the further sums needed to fund the floating debt of the leased lines, and provide for improvements which have been already too long delayed.

The aim and effort has been to bring together all those properties under direct lease to the Boston & Maine because it was recognized from the beginning that it would be difficult to also bring in those properties not directly leased to the Boston & Maine.

Since the system assumed its present shape through the lease of the Fitchburg in 1900, there has been a constant growth of business, but little has been done to coördinate the facilities of the system to provide for economical handling of the business, two exceptions being the Billerica shops and the Mechanicville classification yard. Both of these developments were necessary and both have benefitted system operation. But there is no assurance that they will be needed under separate operation. The entire expense of the Billerica improvement, adjacent to the Boston & Lowell Railroad, and a substantial portion of the expense of the Mechanicville improvement, which is on Fitchburg property—the two running into millions of dollars—are still being carried in the Boston & Maine accounts, and represent part of the Boston & Maine's present indebtedness, because those roads have no assurance that these facilities would be needed for separate operation.

Other improvements equally important from the standpoint of the system as well as of the public are being deferred to the detriment of both.

Failure to develop the properties for system operation is to a much larger extent than is generally appreciated responsible for the situation that has existed, that now exists, and that will continue to exist until reorganization is accomplished. Improvements must be developed without reference to individual ownership. Equipment should be provided for system operation.

There is no charge that can be sustained that the system as a whole is overcapitalized, and it therefore should, and we have reason to believe will be allowed to earn reasonable returns on its combined capitalization. Abnormal conditions have prevailed during the year just closed and the financial showing is more favorable than we can reasonably expect in the future unless the railroad can be rehabilitated so that it may handle its present business with expedition and economy and provide for normal growth.

The floating debt has been reduced, but a large amount remains unpaid. The later renewals of the notes have been made possible by the action of the Boston & Lowell and the Fitchburg in accepting the principle of reorganization laid down in the plan, and by the hope that the other leased lines would also accept it. Provision must be made for the payment of the notes and for the cost of developing the railroad to the point where it can do its business efficiently.

The proposal you submit is not calculated to produce this result, and for the reasons stated the directors of the Boston & Maine find it impossible to accept your proposition. They recognize the gravity of the situation and urge most earnestly that your directors reconsider the matter to the end that without delay a consolidation be effected that will work a permanent cure of the fundamental of defects of the Boston & Maine system.

CANADIAN NORTHERN.—Wm. A. Read & Co., New York, and the Dominion Securities' Corporation, Toronto, have bought $1,250,000 5 per cent equipment trust certificates, series L, of the Canadian Northern. The equipment on which these certificates are secured cost $1,677,000.

CHICAGO, ROCK ISLAND & PACIFIC.—Theodore Prince, of the New York Stock Exchange firm of L. M. Prince & Co., has a long article in the August number of Moody's Magazine, which he calls Rock Island—Reorganization by Anaesthesia. The conclusion he reaches apparently is that it would be best for everyone concerned if a $50 per share assessment was to be made.

MISSOURI PACIFIC.—The Commercial & Financial Chronicle says that applications for participation in the syndicate formed by Kuhn, Loeb & Co., for the purpose of underwriting the $46,000,000 cash requirements of the reorganization plan, are understood to aggregate approximately $76,000,000.

NEW YORK, NEW HAVEN & HARTFORD.—The following is taken from a statement sent out by the New York, New Haven & Hartford:

"All earnings are being put back into the road in order to bring it up to the necessities of the business requirements of New England. It will be necessary for the company to expend, within the next five or ten years, from $20,000,000 to $30,000,000 in order to equip the road with the necessary facilities, motive power, yards, terminals, station improvements, etc., to meet the growing requirements of New England. The floating debt of the company is $45,000,000, including $20,000,000 three-year collateral gold notes of The New England Navigation company maturing May 1, 1917.

"The New Haven has suffered serious disadvantage because of the lack of adequate motive power and terminal facilities.

"It is suffering from these drawbacks today and it will continue to suffer until the necessary funds with which to correct these drawbacks can be obtained. The management, thoroughly alive to the situation and familiar with the necessities of the company, ordered last fall 83 new locomotives of the biggest and most modern type. Some of these locomotives were to have been delivered early in the year, but the American Locomotive Company, like most other manufacturing concerns, has been choked with other domestic orders and overjammed with foreign business. Therefore there has been delay on the part of the American Locomotive Company in delivering most of these new locomotives to the New Haven, but word was received several days ago that deliveries would begin within a few weeks on the scale of three locomotives a week. With this new motive power in full operation on the main line, the locomotives now on the main line are to be transferred to branch lines, and in this way greater service can be given to the business interests of New England. All told, it is estimated that within the last two years it was necessary to condemn approximately 266 engines—66 on the New Haven and 200 on the Central New England.

"It is very frequently stated that most of the yard terminals on the New Haven were laid out when the company was doing 50 per cent less business than it is called upon to do today; and it is a prime essential that these terminals be improved as quickly as possible.

"The great business boom in New England started about a year ago. The New Haven then had many idle engines and many idle freight cars. Even as late as August 1, 1915, the New Haven had 200 engines in apple pie order, laid up on side-tracks with nothing to do. Then this business, this wonderful business, started. Within a month or two the New Haven was swamped with business. Because of the shortage of motive power President Elliott telegraphed to every railroad executive east of Chicago and Pittsburg in an effort to lease additional locomotives. He also telegraphed to Sir Thomas Shaughnessy of the Canadian Pacific, and, as a result, he was able to obtain only 23 additional engines.

"At one time there were 55,000 loaded freight cars on the New Haven's lines and from 10,000 to 13,000 on other lines waiting to come into New England over the New Haven's tracks. Not only was the New Haven swamped with business but most New England manufacturers found themselves in the same predicament. Many manufacturers were without adequate storage capacity, and their inability to promptly unload cars, together with the New Haven's lack of adequate motive and terminal facilities, led to the serious congestion on the New Haven's lines. This serious congestion was a severe detriment to the New Haven, for the reason that it led to heavy financial loss through demurrage charges. In other words, in order to accommodate the manufacturers, the New Haven was compelled to try to do a gallon of business with a quart of facilities.

"The congested conditions at the present time are somewhat better, not much. The New Haven has on its lines today 45,000 loaded freight cars, its complete capacity, and on other lines waiting to come in are 8,000 additional loaded cars. This state of affairs cannot be very much improved until the New Haven can find the money to increase its terminal facilities.

"President Elliott recently said: 'A low estimate of what the New Haven road should spend to be able to turn out a first-class article of transportation in New England territory is probably $30,000,000, more likely $50,000,000. I believe we are to increase our business. In the period from 1903 to 1914 the transportation output of the New Haven increased between 40 and 44 per cent, and it is going to increase in the next ten or twelve years an additional 30 per cent to 40 per cent. All transportation agencies must be able to increase their facilities; but it is going to take money and it cannot be done simply by one railway improving its facilities, because a chain is no stronger than its weakest link. If we should improve our lines, and the New York Central and the Pennsylvania were blocked, it would not help very much, or, if they improved their lines and we did not improve ours, it would not help very much.'

"The New Haven, like all other railroads in the country, has been compelled to pay from 100 per cent to 700 per cent more for railroad materials. In addition, it is confronted with the demands of the four big railroad brotherhoods for an eight-hour day at pay for what is practically now a ten-hour day. These demands of the four big railroad brotherhoods would represent an additionnal expense to the New Haven of about $2,000,000 a year. These brotherhoods represent 18 per cent of the total number of railway employes; they now receive 28 per cent of the total railway payrolls."

WABASH-PITTSBURGH TERMINAL.—This property was sold under foreclosure on Augsut 15 to the reorganization committee for $3,000,000.

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*Illustrated.

Application has been made for the appointment of a receiver for the Boston & Maine in what is presumably a "friendly" receivership proceeding. For many months the conflicting interests of security holders of the Boston & Maine and the leased lines have been struggled with by the president and directors. If the Boston & Maine's credit were now good and the necessary permissive legislation passed by the states in which the Boston & Maine operates, there would be no necessity for a receivership because of the company's inability to earn its fixed charges. The difficulties, however, were added to by a stupidly shortsighted policy on the part of state legislatures which have spent so much time haggling over the necessary legislation that the company's credit has been seriously affected. The principal leased lines have refused to accept any diminution in the rate of return which they are now getting, and to further complicate matters, some of the leased lines are attempting to block reorganization by suggesting a wholly different plan from the one agreed upon by Boston & Maine directors and directors of the more important leased lines. The patient is suffering from a complication of diseases, of which, however, neither insufficiency of earnings nor unduly high expenses of operation is one. Behind the present difficulties, however, is the fact that the Massachusetts laws did not permit the sale of stock at less than the market quotation. The result was that financing had to be done by bond issues instead of by the sale of stock. The Boston & Maine, if the receiver is appointed, will be one more name added to the long list of railroads now in the hands of receivers where one of the fundamental causes of receivership has been pernicious state regulation.

The Boston & Maine Receivership

In its latest decision in the long-drawn-out litigation of the Shreveport rate case the Interstate Commerce Commission has again delivered a blow at the making of rates by a state commission which discriminate against interstate traffic. In the order issued by the Commission on August 12, like the orders recently issued in the Missouri River-Nebraska and the St. Louis Business Men's League cases, no option is left to the carriers to increase the state rates or to reduce the interstate rates, as in the earlier decisions of this kind, but the Commission itself has prescribed a scale of rates which it holds to be reasonable, to be applied to the intrastate traffic which competes with the interstate traffic. The Commission at first ordered the carriers to abstain from charging higher rates from Shreveport, La., into Texas than were contemporaneously charged from Dallas or Houston to other Texas points for an equal distance. When the roads sought to readjust their rates in accordance with the order the result was not satisfactory to the shippers either in Texas or in Louisiana and a new series of hearings was held. While the Commission did not entirely approve of the interstate rates of the carriers it found that the Texas rates were too low to furnish a reasonable standard and settled the difficulty by prescribing rates of its own. It has also ordered the application of the provisions of the Western Classification to traffic in Texas instead of the state classification. As was pointed out in last week's issue, in our comment on the two recent similar decisions of the Commission, how much better it would have been for all concerned if these rates, which are so directly related in their effect on commerce, could have been subject to regulation by one single authority instead of two conflicting jurisdictions.

State Rate Discrimination

According to Walter B. Stevens, secretary of the City Plan Commission of St. Louis, the people of that city are bewailing the fate that located their union station a mile distant from the business center, where it is "admirably situated to enable through travel to make the closest possible connection and to encourage the shortest possible stay in St. Louis." This statement ought to prove interesting reading for the officers of the railroads which not long since petitioned for the right to build a new passenger station in Chicago. There they had encountered city planners of another breed, who couldn't push the passenger station away far enough nor get too many railroads into one grand union station "admirably situated to encourage the shortest stay." Apparently the city beautiful can be attained only by making the greatest possible rearrangement of the existing layout or by following the most expensive plan that can be devised, particularly if someone else can be made to pay for it. The

Regulations by City Planning

claim is made in Chicago that the presence of certain railway freight and passenger terminals south of the business center are throttling the growth of the retail and financial district in that direction. Consequently the railroads ought to be pushed out forthwith, although no effort is being made in the meantime to eliminate the large number of barrel houses, cheap hotels and second-hand stores which still occupy a zone several blocks in width between the "loop" district and the railroad property in question. When reforming a city, always reform the railroads first and at their own expense.

TRAVELING ENGINEERS' CONVENTION

THE convention of the Traveling Engineers' Association which will be held in Chicago, September 5 to 8, is deserving of more than passing notice. This association has an exceptionally large membership, which means that its deliberations on methods, "to improve the locomotive engine service of American railroads," its slogan, will receive wide circulation amongst the railroads in this country. It is necessary that the attendance at its conventions be as large as possible in order that the greatest amount of information may be brought out, touching the various subjects discussed. This year these subjects are especially interesting and the reports on them, together with the discussions, should bring forth a considerable amount of valuable data and information. The railway mechanical officers should give the matter of having their roads well represented at this convention their earnest consideration.

There are three important reasons why the convention should be well attended. Perhaps the most important one is the broadening of the men's knowledge by the important ideas picked up in their informal talks with fellow members on problems that they are perhaps having difficulty in solving. The next is the information they receive in listening to the results of a committee's work on a certain subject and the discussion which follows. Here is where they can perform a dual service—absorb all the information they can from fellow members and give those same members the benefit of their personal experience. It is only by such reciprocity that the most can be learned from any subject discussed.

The supply men's exhibit is also of great importance. It is well known that most of the economies effected in locomotive operation are the results of devices sold or controlled by the railway supply firms. These companies, specialists in their respective lines, spend large sums of money in studying and developing their products and come to these conventions well prepared to show the railway men on the firing line just what their devices will do. The traveling engineer is called upon to instruct the men regarding the use of more different devices, and make reports to his superior officer regarding them, than perhaps any other man on the railroad. If he is to do this intelligently he must see the devices in the form of models and be thoroughly posted on their operation and special features. It is much more satisfactory, both to him and the manufacturer, to have these devices explained from working models cut open or taken apart for the purpose, than from the finished devices which are perhaps located on some inaccessible part of the locomotive. He also may find a new device that will prove to be of decided advantage on his particular road. The exhibits are an important part of any convention, and the supply men's associations aim to make them complete and educational in nature. Last year there were 72 exhibitors at the Traveling Engineers' convention and this year there will be between 80 and 85.

The men should be sent to the conventions to give and receive all the information possible. On some roads it is the practice for the men attending to submit written reports to their superiors concerning the important things learned from both the discussions of the committee reports in the convention hall and from a study of the exhibits shown in connection with the convention. This is a splendid plan to follow, for it not only firmly fixes the benefits obtained from the convention in their own minds, but also gives the men at home the benefit of the attendant's experience.

EFFICIENCY TESTS ON THE PENNSYLVANIA

THE plan of operations in any extensive business must include Herbert Spencer's "business principle" of always assuming that things are going wrong until it is proved that they are going right. This is the explanation and justification of the elaborate efficiency testing now conducted in the train service department of our large railroads, an account of which, on one road, the Pennsylvania, is given in current issues of the *Railway Age Gazette*. And this principle is of permanent application, whatever the conditions of the past or the progress of the present. The owner of a large number of dwellings in a large city sent his rent collector persistently and regularly to tenants who he felt sure would cheat him out of part of his pay because, he said, it was necessary to prevent the cheating spirit from growing and spreading. The government checks the national banks very thoroughly, though dishonesty in keeping the accounts has long since been reduced, probably to its lowest terms. The thoroughly intelligent, conscientious, and qualified engineman checks himself against error in every way that he knows how. Whichever of these illustrations applies to a given railroad or force of men, the need of constant testing by the superintendent remains.

To get some idea of the magnitude of the work of inspection on the Pennsylvania the reader may refer to the tables and other data printed last week; and the two essays printed this week illustrate the spirit with which it is conducted. And the spirit is the feature of interest. Fault-finding is the most delicate business in the world, and this testing partakes in large degree of fault-finding. Whether such work is successful or otherwise depends on the spirit of those conducting it. It may be technically all right and practically all wrong. We theorize a good deal about *esprit de corps*—a sympathetic, enthusiastic spirit among the whole body of the employees—but our theorizing is very liable to end in talk. Here is an example of something more practical than talk. The best way to promote *esprit de corps* is to cultivate acquaintance among the rank and file and between the officers and the rank and file; and the only safe way to accomplish this cultivation is through improving the quality of the work of the men. Cultivating acquaintance without at the same time aiming at higher standards tends to a general lowering of efficiency.

It will be observed that the term "surprise test" is not used in connection with the inspections here described. Some tests are truly surprising to the engineman as, for example, in a case where he finds a distant switch signal set against him when he has a view far enough ahead so that he can see that the switch itself is set straight. In less degree it is surprising to find such a signal set at caution, at midnight, on approaching a switch at an obscure siding which is never used except in the daytime. We may go farther, and say that any signal which a runner *very rarely* finds set against him constitutes a surprise when it is set at stop; but as it is his duty to approach every signal with no expectation at all—with his mind prepared equally for stop or proceed—we cannot call this a surprise, except to the degree that we assume the runner to be careless, negligent or absent-minded. As all runners are human, and complete perfection is admitted to be unattainable, this assumption is not entirely out of place, and the term "surprise test" is not likely at present to be consigned to utter oblivion; but "efficiency test" is, of course, the accurate, comprehensive and business-like term. Spotters who are set to check cash-fare collectors

are accused, usually, of doing their very best to catch men stealing, even if they are obliged now and then to manufacture a temptation to be put in the path of their intended victim. In the same way, an inspector who tests enginemen, if not forbidden, might perhaps set traps in such a way as to catch any but the most alert; but this kind of trickery is not countenanced by any fairminded superintendent. Inspectors should, of course, be men big enough to be above using such methods.

The Pennsylvania's tests fall into three general classes: first, those on Form 686 A, under eleven heads; second, those on form 686 B, under 38 heads; and third, the fifty-one "miscellaneous" items contained in the list printed in this issue. The reader will have noticed that in the first class the number of tests made is very small as compared with those in the second. These last are called "observations." In a general way they may be called less important than the others; but they have a function more useful than may be apparent on the surface, in that they exemplify the fundamental principle that strictness in enforcing the rules in minor matters tends to produce habits of care in major matters; the habit of obedience to all the rules, whether minor or major. Not only that; this quality of obedience —the habitual state of mind which carries out the rules at all times, just because they are rules, and because uniformity of conduct is desirable and necessary—is fostered by having the substance of the various precepts constantly brought to mind even if cases of disobedience were not detected once in a year. Any engineman or conductor, of experience, who is fit for his job, can tell of small errors—avoided or quickly corrected—which have helped him to avoid larger ones. Being watched by another helps one more effectively to watch himself. The work of those 29 inspectors on the Schuylkill division would be useful and highly important if no inspector were ever able to record any infractions of the rules.

The most significant feature of this Pennsylvania record is the statement of Inspector Strebig that a large majority of the locomotive runners on his division testify to the value, fairness and usefulness of his tests. His task is to convert the minority to this position and to strengthen the convictions of the majority. The superintendent who sets out to test all of the operations in his train service will undertake an impossible task. A reckless or a dull-minded man will disregard automatic block signals, and ignore torpedoes which he thinks unnecessary, in spite of the most frequent tests that could be made; but with properly educated consciences, and minds made systematic by intelligent direction, enginemen will be vigilant without "surprise checking." The efficient inspector does just enough testing, so that with the right kind and frequency of interviews with the runners, he can carry out, to a good degree of success, this education of conscience and intellect.

STANDARD TYPE D COUPLER ADOPTED

IT must be a source of great satisfaction to the M. C. B. Committee on Couplers to find that the majority of the railroads of the country have approved its final recommendation for a standard coupler. This action is significant. It shows that the roads appreciate the value of standardization. The vote was not overwhelmingly in favor of the standard coupler, there being 416 votes cast against it. But it won by a good majority, 83 per cent of the votes being cast in its favor, whereas 66 2/3 per cent was sufficient for adoption. It remains to be seen just what the "ayes" meant by their vote—whether the coupler was adopted as a matter of sentiment or for actual use on railway equipment. The committee said in its last report that only 3,192 of the type *D* couplers were in use. This is a very small number. The figures next year will show just how the roads feel about this device. It would seem, in view of the active work being done to push the standard car, that all roads would deem it advisable to put this coupler in service as fast as possible, for surely it will be a detail part of the standard car when that car is adopted.

That the coupler is the best for all around service and one that will measure up to the requirements of the present, there can be no question. Large amounts of time and money have been spent in its development. The committee has been working for five years in bringing it to a satisfactory conclusion. It has had the full support of the manufacturers, who have made sacrifices in the matter of patent rights to give the railroads one standard coupler. Now that it has been adopted the roads should hasten to use it. While it may be heavier than some of the couplers now used and therefore cost more, its service and increased length of life will tend to overcome this disadvantage and will undoubtedly make it the most economical coupler to buy. The manufacturers should also be able to handle the coupler business at a lower cost because of having but one type of coupler to provide. They can make them in large quantities which will in turn reduce the cost of manufacture. But to insure this being done the railroads must show by their purchases that there is a distinct demand for this coupler.

R. L. Kleine who, as chairman of the Coupler Committee, has so ably carried this work to its successful conclusion, is to be heartily congratulated. His reports have been exceptionally complete and free from criticism. The fairness with which the manufacturers were dealt with throughout is noteworthy. Although Mr. Kleine has finished this task his work on standardization is not ended. The executive committee of the M. C. B. Association has appointed him chairman of the Draft Gear Committee, which position he is well qualified to fill because of his long experience with the coupler question. Professor Endsley, who has so ably led this committee for the past few years, still remains a member of it, so that the valuable experience he has obtained in his previous capacity will be used in the constructive work of the future.

SQUARELY UP TO THE PRESIDENT

THE *Railway Age Gazette* said last week that it was inconceivable that the President of the United States could have proposed to the railways that they should abandon their position in favor of arbitration and grant the demands of the train employees for a so-called "eight-hour day." It seemed inconceivable that the President should do this, but it is now only too well known that this is what he actually did.

The nation regarded first with surprise, then with astonishment and finally with absolute amazement the course taken by the President. If he thought it to be generally popular he has been rudely disillusioned. The business interests have risen to the situation and are backing the railways in their insistence on arbitration with an outspokenness, an energy and a unanimity which has been surprising even to railway men. Only a small part of the press has endorsed the President's course, and in a lukewarm manner. On the other hand, a very large part of the press is savagely denouncing Mr. Wilson, and declaring that by his abandonment of the principle of arbitration he has dealt a heavy blow to the cause of industrial peace, which will tend to cause strikes, lockouts and anarchy in every branch of business.

The President denies that he has thrown over the principle of arbitration. But actions speak louder than professions. The railways repeatedly offered arbitration, and the President made absolutely no real effort to get the men to accept it. The President adds that the eight-hour day is sanctioned by social progress and justice and is not an arbitrable question. This is sheer nonsense, and if it were not it would have no application to the present controversy. To say that the question of an eight-hour day is not arbitrable when a

day of that length has been established in only a very small part of the commercial and industrial concerns of the country is absurd on its face. Furthermore, what is more important in this connection, the train employees have not asked for a real eight-hour day, and the acceptance of the plan which the President has endorsed would not establish an eight-hour day. The plan of the employees which the President has endorsed does not provide that no man shall work either more or less than eight hours. It provides that if an employee works more than eight hours he shall be paid overtime for the excess hours, and that if he works less than eight hours he shall receive a full day's pay, anyway. Preposterous as it may appear, this is the plan the President has said it is the duty of the railways to accept without arbitration; and the result of its adoption would be that railways would pay a day's pay for much less than an average of eight hours' work.

The correctness of the President's statement that the situation shows the need for a compulsory arbitration law is evident. But why did he have to let such a situation develop to teach him this, and if we should have compulsory arbitration, why, in the name of all that is reasonable, should it not be applied to this, the greatest labor dispute in the history of the world? The President says he cannot secure arbitration. Perhaps he cannot, now that he has publicly endorsed the men's position in refusing it; but if he cannot this probably is entirely due to his own fault.

The *Railway Age Gazette* believes that not only the future of the railways, but to a great extent the industrial future of the United States has been put at stake by the form this controversy has been given by President Wilson. It believes there is absolutely no justification for giving these employees in train service higher wages and then passing the burden along to the public in the form of increased rates. It believes there is absolutely only one fair and just way for settling this controversy and that is by arbitration. It, therefore, believes that the railway presidents and managers should reject the President's proposal, even though it seems probable that this will result in a strike; and it believes that if a strike comes the chief responsibility for it will rest on President Wilson. The President was in the best position of anybody to avert a strike until last Monday; and if he is not now, it is because he abandoned the strategic position which he then occupied.

NEW BOOKS

Synopsis of Decisions and Recommendations Relating to Freight Accounts. Edited by the secretary and published by the Association of American Railway Accounting Officers, Washington, D. C. Price, 75 cents.

Mention was made in these columns in the issue of January 14 of the Synopsis of Decisions and Recommendations Relating to Special Accounts published by the Association of American Railway Accounting Officers. The volume relating to freight accounts has been, like the previous volume, carefully edited. It covers decisions and recommendations of the association from July, 1888, to June, 1916. The text is logically arranged and the index is comprehensive. The book includes a complete list of waybill prefixes and also the association's standard freight forms.

Women Railway Workers in England.—The Committee on Production has decided, on an application of the National Union of Railwaymen against the Great Western Company, that women railway workers are not entitled to the same war bonus that is being paid to the men railway servants. A war bonus is now being paid to the salaried members of the staff who receive £200 ($1,000) a year or less. The amount is at the rate of 5s ($1.25) per week. Those whose salary is over £200, but less than £213 ($1,065) are to receive such an amount as will bring their salaries to £213 a year. The bonus came into operation July 1.

Letters to the Editor

WHAT IS THE MOST ECONOMICAL FREIGHT CAR?

Pittsburgh.

To the Editor of the Railway Age Gazette:

A writer asks the above question in the *Railway Age Gazette* of June 9 and I echo it with the accent on the "is," but deducing to my own satisfaction, as I hope I may to yours and your readers', that the large-capacity steel car is the most economical from every point of view rather, than the small wooden car that he favors.

Seriously, a return to the use of the small wooden car not only would be equivalent to turning back the hands of time, but would vitiate every principle of the "safety first" propaganda. But why argue? The days of the wooden freight car, whether small or large, are numbered, for the very simple reason that the staunchest car of the type in question cannot withstand the strains to which it is subjected in the heavy freight train service of the day. And when the yet heavier locomotives now under construction shall have been delivered and placed in commission, yet heavier trains will be the result and the wooden car will be even more unable to stand the strain.

The changes in type of railroad equipment that have occurred in recent years, particularly since the automobile industry has assumed the proportions it has, also emphasize the importance of building longer and stronger box cars which may be utilized for that as well as other traffic, since special equipment for a particular class of freight is always an expensive luxury and automobile equipment notably so. In the circumstances, would it not, I ask, be better in every way, for the manufacturer who could thus procure what equipment he desires at any time, as well as for the carrier which could utilize it for general traffic when not employed specially, for a standard box car 46 ft. long to be adopted, although it goes without saying that such a one could not be built of wood economically?

The only conclusion to be drawn from the writer's statistics, as embodied in the table with which his communication is embellished is, I think, that it emphasizes the importance of changing the classification of freight, as well as the tariffs, so as to bring both to date in order that they may perform their part in the matter of filling modern equipment. As things are now, the highest classes of traffic are accorded the lowest minimums, as automobiles, for example, which with a tariff minimum of 10,000 lb. average only 12,000 lb. to a car, notwithstanding the lading occupies all the space of 100,000-lb. capacity car. In such cases, why should not the minimum be charged for at least 50 per cent of the car's capacity? Similar illustrations may be given regarding nearly all high-class freight.

The communication under review ends with the comment that it is interesting to note that the great commodity "merchandise" averaged only from five to eight tons per car of 50,000 cars selected by the writer for investigation, and that in the circumstances it was absurd to build cars of 80,000 lb. capacity to carry loads of 10,000 and 12,000 lb. This is undeniably true if the railroads purpose continuing old-fashioned practices, such as making low minimums for high-class freight. But the highest classes of traffic require the most costly service and are, therefore, the least remunerative, notwithstanding the higher rates they bring. On the other hand, open car traffic, technically known as coarse freight, coal, ore, coke, etc., moved slowly, in reality is far more remunerative to the carrier than is the high-class freight

moved in regular merchandise cars under guaranties of specified deliveries regardless of quantity, such service being, in effect, express and very costly.

Referring to the writer's rejoicing over the order placed recently by the Chicago & North Western for 1,000 34-ft. wooden box cars, I am convinced it was prompted by the necessity of the road for additional equipment immediately, and because steel for larger and heavier cars was not procurable and would not be for months to come.

TRAFFIC MANAGER.

SAVING CAR-DAYS AT TEAM TRACKS

WILLIMANTIC, Conn.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Your correspondent G. D. M. (July 7, page 4), writing on the Economical Use of Team Tracks, presents some interesting speculations. As every one knows, this is a very difficult subject and possibly we shall not make much progress except in the field of speculation. Nevertheless, every trainmaster and all local freight agents have numerous very practical questions in this field, and a perusal of G. D. M.'s letter leads me to offer some speculative thoughts of my own.

In the first place, however, let me mention one or two facts, not speculations. In taking the average of ten prominent stations on the New York, New Haven & Hartford, it is found that 59 per cent of the carloads of bulk freight go to team tracks, and 41 per cent to private sidings. This fact confirms the view that what may be called the small or miscellaneous business is of sufficient consequence to demand careful attention. At Providence 88 per cent of the cars go to team tracks, while at Waterbury the percentage is only 20. No uniform rule will apply to all cases; each must be dealt with by itself. On a certain private siding the average delay of cars is only one day; while at another it is five days.

There is an ample field for study, also, in the detention of freight cars at freight houses. There is one freight house where the average detention is only one-sixth of a day; but at other places the average is a good deal more than one whole day. There is one team track where the average detention is only 1.5 days, whereas the average on the team tracks at a number of large stations is 2.5 days. There are similar variations at private sidings.

The most suggestive part of your correspondent's letter is that referring to the need of securing co-operation among teamsters. The railroad agent has to go out of his own field —perhaps out of any legitimate field—if he is to do missionary work among teamsters; but going out of one's field is now strictly regular; the traffic department spreads itself out into the fields of the farmers wherever it pleases; and so the operating man, therefore, need have no fears. To make improvements in the railroad's part of this service it is necessary at the outset to consider whether one will take the empty cars out of a given team track oftener than once in 24 hours. Once a day is a simple and workable plan; but just as soon as you try to do more you greatly increase the cost for locomotive service. The yard engine cannot wait for cars to be unloaded, as it would in the case of self-clearing coal cars; but every agent and yard master should be on the lookout for places where savings of this kind can be tried.

The greatest dampener, however, neutralizing one's best efforts, is the fact that in normal times the demand for freight cars, calling for special attention, exists only for three or four months in the year. During the other eight or nine months everybody wants to be using his energies in some other direction. In this situation, it may well be that all that the car-service superintendent or anybody else can do is to exercise moral suasion and moral influence wherever possible.

An agent at a freight station seeing an enterprising teamster, who, when he has a rush of freight, hires the teams of his neighbors or his competitors and who thus introduces a novel element of economy, would do well to commend that teamster in every way possible. His common sense ought to be advertised. The owner of a horse or a team of horses, or an automobile truck, who allows his property to stand idle when he might make a little money, perhaps earn his regular wages, by lending his facilities to other teamsters, ought to be instructed how to take advantage of his opportunities. The railroad, as a prospective beneficiary of such efficiency, may rightfully do the missionary work necessary. P. H. F.

LOCOMOTIVE REPAIR FACILITIES

BALTIMORE, Md.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have been very much interested in the editorial on Locomotive Repair Facilities, published on page 137 of the July 28 issue of the *Railway Age Gazette*. The statement made in this editorial agrees exactly with my own observation. The workings of the Federal Inspection rules, which went into effect January 1, are making it more and more apparent that good facilities for the quick handling of repairs will be absolutely necessary in the future, if we are to keep the number of locomotives held out of service for repairs down to a minimum.

M. K. BARNUM.

ANOTHER VIEW OF THE RAILROAD CLERK

SPRINGFIELD, Mo.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read very carefully the letter printed in the *Railway Age Gazette* of March 17, entitled "The Ambitious Railroad Clerk," and see a lot of truth in it, but I also see what I may be permitted to term overdrawn "glooms."

In the first place, with all due respect to Mr. J.'s clerk, his vision must be limited to the accounting and auditing departments; he has most certainly left out several of the most promising departments in which a young clerk may get his training for a responsible position in the company, namely, the transportation and operating departments.

These are not theoretical departments; they are undeniably practical departments; therefore, a man with 14 different views of a question, one that has spent his time looking after his immediate position and has applied his 14 different views with such a degree of caution as to lose the confidence of his superiors, in a time when quick practical action was essential, is not the one when a minor official position opens up, to be promoted. The practical man, who, in a tight position, has used tact, and while looking at the question at issue from all sides, renders a decision which in nine cases out of ten is correct, and also renders it in such a manner as to leave the impression that he is fully conversant with what he is talking about and impresses his hearer of the fact, is the one the management is interested in.

While I have not risen to any high official position—in fact, my name is not even in the Official Railroad Guide—that fact does not prevent me from looking on my work as an officer would. In my own mind I make decisions on cases that come up for decision of the officer for whom I work personally, and after his decision has been made I compare mine with his and profit by his judgment.

Is it immoral to "drift along" in clerical positions when there seems to be no future? It is immoral to the man himself because it is only a matter of time until he becomes "deadwood" in the office—he has long since ceased to even show an inclination to want anything better—he is in a rut. Whom can he expect to take an interest in him now, if he doesn't take an interest in his own welfare?

If you intend to hit the bull's-eye of success, you must aim and shoot straight. Don't allow your eye to wander, your enthusiasm to drop, for if you do your shot is going to fall short, or go wide of the mark. Moral—Hit the ball.

ANOTHER ONE OF THE CLERKS

Convention of the Master Blacksmiths

A Digest of the Papers and Discussion Presented at the Association's Annual Meeting Last Week in Chicago

THE twenty-third annual convention of the International Railroad Master Blacksmiths' Association was held at the Hotel Sherman, Chicago, Ill., August 15 to 17, 1916, T. E. Williams, of the Wabash Railroad, presiding. The meeting was opened with prayer by Reverend De Lacey, and the association was welcomed to the city by a representative of the mayor. Mr. Williams, in his presidential address, called attention to the desirability of all the members participating freely in the discussion and telling fully of their experience in the various subjects discussed in order that the members of the association may profit to the fullest extent by this convention. W. J. Tollerton, general mechanical superintendent of the Chicago, Rock Island & Pacific, presented an address of welcome.

Address of Mr. Tollerton

Associations, such as the Railroad Master Blacksmiths', are of the utmost importance. Upon you gentlemen falls the burden of advancing our knowledge concerning improved methods of blacksmith shop practice. By means of your various committee investigations and the discussions of the reports in conventions you, as members of this association, may interchange ideas with the privilege of choosing therefrom those which will tend toward a constantly increasing economy and efficiency in railroad operation. The blacksmith's art is probably the oldest metal working craft in existence, but during the long years of its practice very little real progress was made until about 60 years ago. One might truthfully say that the modern blacksmith shop came into existence with the invention of the steam hammer. Since then a wonderful advance has been made, until now we have forging machines capable of producing accurate and intricate forgings in a few minutes that formerly would have required hours of hard labor. I believe that the development of the forging machine and the perfection of machine made forgings is the line of future progress for the modern blacksmith. A very essential part of your work as an association consists in the interchange and publication of machine forging methods now in successful use on the many railway systems with which you are connected.

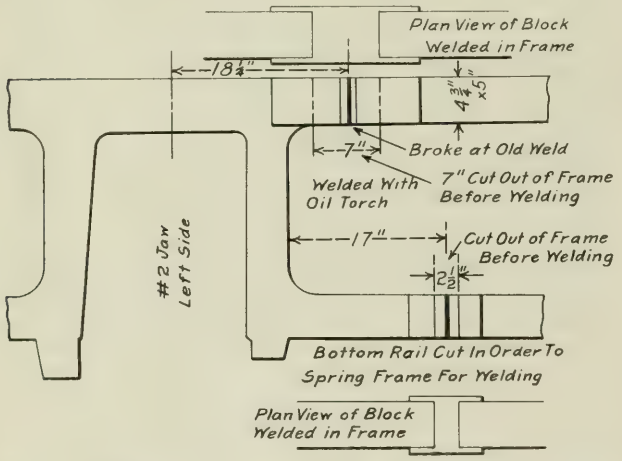


Fig. 1—Location of Oil Weld on Frame of Passenger Locomotive

While reading the committee reports and various papers presented in past conventions the thought occurred to me that it would be of enormous benefit to all railroads if this association would formulate some kind of a standardized schedule of blacksmith shop practice. As an example of what I mean, let us consider the process of case-hardening; with all the information we have on this subject, would it not be possible to arrive at some conclusion as to the exact procedure to be followed to give a case-hardened product of maximum value in railroad service?

The present convention is assembled at a very serious period, and at a time when the need for economical methods and the conservation of material is more pronounced than at any other time in the history of this association. One of the most promising avenues for saving now open to the railroads is in the scrap dock. By means of the oxy-acetylene and electric welding processes the blacksmith is enabled to weld and repair a great many parts which he formerly was obliged to scrap. In the reclamation of material considerable study and the use of considerable judgment is of prime importance in determining to what extent we should go in placing old material back in service. The fact should not be lost sight of that many locomotive and car parts fail because they were not properly designed in the first place. It would be poor economy to reclaim such parts unless they could be reinforced or a change effected in the design, such that the original defect will be overcome. In all of this work an accurate determination of costs is of first importance, and this association will agree, I think, that cost-keeping methods in the average railroad blacksmith shop are open to considerable improvement.

Tube Welding

George Massar, of the Cincinnati, New Orleans & Texas Pacific, presented a paper on this subject, in part, as follows:

With the high pressures of steam which are now commonly carried on the locomotive boiler, it is essential to provide good welds when safe ending boiler tubes. In the first place, the tube end and the safe end should be properly prepared. Second, a good furnace should be provided which will heat the tubes quickly and evenly, and, third, a good welding machine should be used and placed conveniently near the furnace. It is generally conceded that lap welds are stronger than butt welds. It is much easier to work a lap weld and to keep the tube straight. Also there is not the same danger with the lap weld that there would be in the butt weld if the weld should let go or pull apart. With the lap weld there would only be a small leak, for the lap would still hold the body of the tube in place, but when a butt weld fails, the body of the tube drops down and leaves the full area of the tube exposed, which is almost sure to cause serious injury.

Close attention should be paid to the proper scarfing of both the safe end and the tube end. A sharp short lap of from ½ in. to ⅝ in. is advisable on small tubes. When the joint is prepared in this way the place at which the weld is made will not be much thicker than the gage of the tube and it will heat evenly. Where the tubes are not scarfed there is a double thickness of metal to heat, and there is a tendency to overheat and burn the tube just back of the joint, particularly with steel tubes. There should be a proper plan adopted for scarfing the tubes and the safe ends so that the metal of the body of the tubes and the safe ends fit closely together. Care should be taken to keep the heating port in the oil furnaces, which are now commonly used for tube welding, narrow so as to concentrate the heat on the weld. If this is neglected and the opening is too broad the safe end will be

overheated on the tube sheet end where it has to stand the rolling, beading and prossering. The mandrels on the welding machine should be kept well up to size. On small locomotive tubes the welding and swedging should be done at the same heat and thus eliminate the cost of a reheating.

All superheater flues should be welded at one heat. It is a very simple matter to do this by getting the proper heat on the flue, which can be done by watching the heat inside of the flue. The bumper should be removed from the back of the furnace, and the heater stand at the back and hold the safe end in place with tongs until it shows signs of the welding heat. The safe end could then be given a few light taps with a hand bumper until it is well set in the flue. When

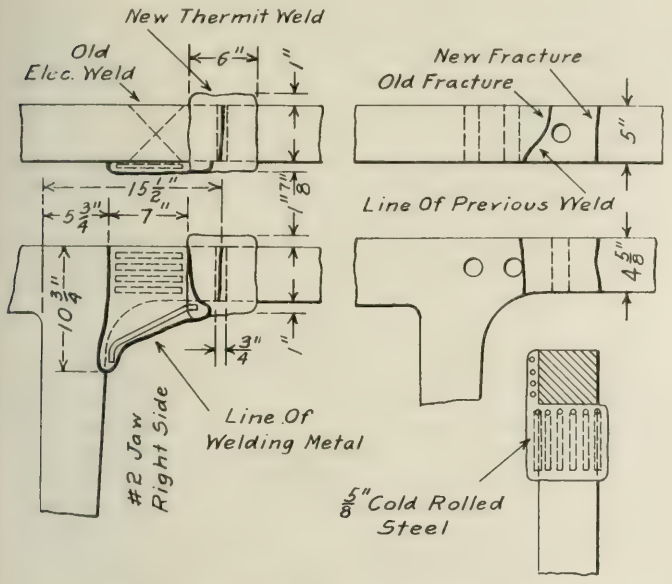


Fig. 2—Cast Steel Frame Thermit Weld

the metal on the inside shows that it has been heated to the proper temperature the flue with the safe end should be placed in the welding machine and welded.

Good heating is the most important part of tube welding. No matter how well a tube is scarfed and prepared, or what type of welding machine is used, or in how perfect a condition the welding machine is kept, results cannot be obtained unless the metal is properly heated. Overheating of the metal causes more accidents than underheating, for in the first case it will break off abruptly and allow the tube to drop, giving a full opening for the escaping water and steam.

L. R. Porter of the Illinois Central also presented a report on this subject, saying in part, as follows: The tube welding work on the Illinois Central is done by the boiler shop forces. The tubes are trucked from the engine to the boiler shop where they are run through an Otto rotary machine and then passed to the cutting machine. One man handles the two machines. He cuts off one while the other is cleaning. One man applies the safe ends, sticking them on, welding them and swedging them, averaging about 22 tubes per hour. The tube is swedged and welded with a Draper pneumatic hammer. The superheater flues are swedged in the smithshop under a Beaudry No. 7 power hammer. In this hammer dies are used, but no mandrel of any kind. The work is done with very good success. Two men will swedge 12 tubes per hour and carry them in and out of the shops, as the room is limited and they cannot be piled inside.

Frame Making and Repairing

G. A. Hartline of the New York Central West presented a paper on this subject, from which the following is taken: The portable system of repairing locomotive frames in position on engines has largely solved the problem of doing this class of work in roundhouses or machine shops where no other facilities are at hand. One of the most essential features in making the different kinds of welds is to have a clean surface at the point where the weld is made. Great care should be taken to avoid all strain in cooling, as the frame is liable to break in some other location. In our shop we use the oil furnace and the electric processes of welding. Fig. 1 shows an oil weld made on a passenger engine. The upper and lower rails were welded at the same time. Enough of the fracture was cut away to leave both ends square. A block was finished all around on the inside to make a good fit between the rails of the frame. After the frame had been jacked apart three-quarters of an inch the block was inserted and caulked with an air hammer all around to keep out any dirt or scale that might accumulate at this point. A brick furnace was built around the frame with a two-inch clearance. The burners were located on either side of the frame and the frame brought up to a welding heat. A few of the bricks were then removed and the frames rammed on both sides, after which the bricks were replaced and the frame allowed to cool off. This frame was welded the latter part of December, 1914, and is still in service.

Fig. 2 shows the method of welding a locomotive frame by the electric process. The fracture was cut away to an angle of 45 deg., and the opening filled in to the full size of the frame. It was then reinforced, as shown in the illustration, with strips of ⅝-in. round cold-rolled steel on the bottom and sides, this steel being welded into place directly over the crack. The top and inside of the frame could not be treated in this manner on account of a heavy cross brace that was located at this point.

The following is from a paper on this subject by P. T. Lavender of the Norfolk & Western: In making or repairing locomotive frames the first essential is having the necessary facilities to handle the heavy frames which are constantly increasing in weight. The blacksmith should have at all times sufficient experienced help so that the job can be properly and quickly done. Welding frames with Thermit, oil or by the electric process, has proved satisfactory where the repairs to be made are of a light nature and when the engine is being rushed back into service. In repairing with the electric process the frames are prepared in a manner similar to that used when they are welded on the anvil. The break is V-ed out with an oxy-acetylene torch and then welded up by the electric process. When an engine comes in for heavy repairs and the frames are in bad condition they are brought to the smithshop and welded on the fire.

Drop Forging

H. E. Gamble, of the Pennsylvania Railroad, presented a paper on this subject, in part, as follows: In drop forge work, if the dies and trimmers do not have the proper treatment and are not made from good steel they will not last. Carelessness in making them will cause many delays and also much expense. It is also bad practice to overtax any hammer. The expense in replacing rods, dies and anvil blocks would more than pay for the purchase of a hammer of larger capacity. In the Juniata shops of the Pennsylvania Railroad, the Chambersburg, the Erie and the Morgan hammers are used. The steels used for the dies are Colonial, Carpenter, Sanderson, Vanadium cast-steel, Hardtem, Chrome Vanadium (*S* grade), Park alloy, Mayari, Adamite and 45-point carbon well hammered bloom steel. For hot trimming we use axle steel, bloom steel, Crescent hot work No. 2 Peerless *A*. Firth-Sterling, Colonial and Sanderson No. 3 to 3½ temper. We make out of the scrap iron or steel all of the large forgings that can possibly be made. The extra cost for roughing dies and preparing the metal for the forming dies should be carefully considered, as it all means time and money and also reduces the output of the hammer.

The first question to arise when the dies or trimmers are

being designed is how much strength is required to withstand the working conditions. That material should be used, the grade and carbon content of which will admit of its being treated so that the longest wearing surface can be obtained in conjunction with sufficient strength to resist the working conditions. We must have a sufficient working knowledge of the critical points of the steel or the nature of the mineralogical changes in the steel when it is heated in order to properly prepare the dies and trimmers. Keep the tools and furnaces up in good condition, as the time spent in fooling around with an old tumble-down furnace will cost more than if money were spent for a good furnace.

Good steel for dies may be found in the following three brands: Sterling, Mayari and Hardtem. This material is forged in suitable blocks for drop forge work, and is a special alloy steel treated before leaving the mill, so that it is not necessary to harden it. After the impression is worn out it is not necessary to anneal this steel; just simply plane and resink the die and it is ready for use. A good steel for piston rods is the Heppenstall, which is treated at the mill and delivered rough-turned. This gives excellent service.

Unless everything connected with the drop hammer is properly handled by the operator you are bound to have broken dies and piston rods. Sediment under the section blocks and dies not properly treated and keyed up will give bad results. Make the tongue on the dies of good width to insure a good bearing on the section block; it saves liners and keys. Always have the guides adjusted and oiled regularly. The operator must examine the many parts of the drop hammer regularly. It will overcome many an accident. Use plenty of lubricant when necessary to insure good service.

Tools and Formers

George Fraser, of the Atchison, Topeka & Santa Fe, presented a paper on this subject, in part, as follows: There is

Spring Making and Repairing

The following is from a paper by W. C. Scofield, of the Illinois Central, on this subject: Many roads are discontinuing tapering the ends of the spring leaves, as an unnecessary expense, but it does not make as nice a looking spring. It is the practice on the Illinois Central to fit and cool the springs in an oil bath at the same heat. The open hearth spring steel over 5/16 in. thick is not flashed, but left as it comes from the oil. It is very important that the heat in a fitter's furnace be regulated properly and easily controlled, as a uniform heat is absolutely essential in making good springs. The best method of fitting is to use a machine that sets each leaf to leaf by air or hydraulic pressure and one which operates quickly. The steel must be of uniform grade and quality, as it is self-evident that where different kinds of steel are used in the same spring, all being heated and treated the same, the spring will not give the proper results. In repairing springs, if the leaves are not broken or worn too much and are of the proper set, they are not overheated or refitted, but are placed in the spring as required. Vanadium steel springs are being used by many roads, which report excellent results.

J. W. Riley, of the Lehigh Valley, contributed a layout of the spring plant of that road at the Sayre, Pa., shops, which is shown in Fig. 3.

Carbon and High-Speed Steel

George W. Kelly, of the Central Railroad of New Jersey, presented a paper on this subject, in part as follows: The forging of carbon steel always requires skilled workmen, especially for the larger tools, such as taps, reamers, etc. Carbon steel should be hardened at the lowest possible heat, and always on a rising heat. Steel may be forged at a higher heat than the hardening heat, but should, in all cases where a large or expensive tool is being forged, be annealed before be-

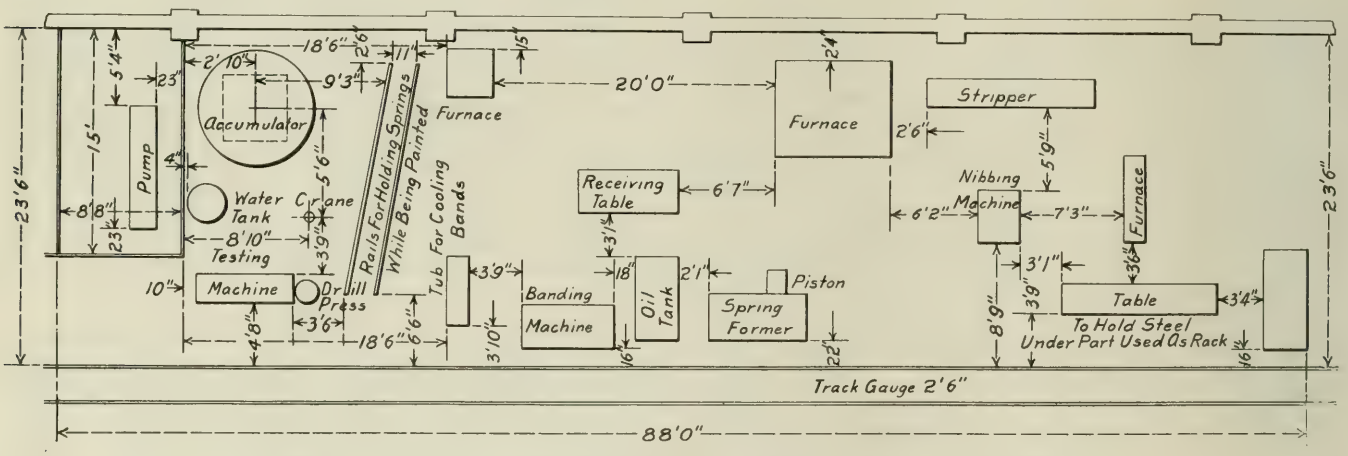


Fig. 3—Plan of the Spring Plant of the Lehigh Valley at Sayre, Pa.

no place about a railroad shop where such a saving can be made, provided the shop has good tool equipment, as in the blacksmith shop. Good shop organization and a first-class supply of good tools of all kinds are necessary to increase the output and reduce the cost in the smithshop. In the Topeka shops we have about 1,500 dies and formers of all kinds.

A method was shown of reclaiming car axles. The scrapped 5-in. by 9-in. axles are made over into 4¼-in. by 8-in. axles, the 4¼-in. by 8 in. into 3¾-in. by 7-in., etc., by the following method: The axle is heated and is made to the correct length. At the same time the collar on the end of the axle is swedged down to the size of the journal. The axle is then annealed. The ends are heated and forged in a forging machine.

ing heated for hardening. We are welding tips on tire steel for all lathe tools by the electric welding process and obtaining very good results. When the 6-in. by 10-in. special milling cutters are worn down they are box annealed, recut and hardened, as follows: They are first preheated in an oil furnace up to 1,400 deg. F. They are then passed to a specially prepared hollow fire and heated to 2,000 deg. F. The cutting edges are protected by powdered borax. The cutter is then dipped into a cask of melted lead. Running water is allowed to circulate around this cask. When the lead is set it is reheated and the tool taken out and cooled in oil. The tire-forming tools are hardened in the same manner. This gives very good service with no breakage.

J. J. Conners, of the Atlanta & West Point, also presented

a paper on this subject, from which the following is an extract: During the past two years we have been welding high-speed steel on axle steel shanks by the oxy-acetylene method, and in this way use up all of the small high-speed steel. The smaller pieces of high-speed steel are drawn out for use in smaller tools. In annealing the high-speed steel it is heated to a red heat and placed in an iron box or pipe and covered with pulverized charcoal, put in the furnace over night and removed the next morning, but the box is not opened until it is thoroughly cooled. In hardening the high-speed steel lathe and planer tools, they are heated to a high heat sufficient to just about burn the point of the tool and cooled in a fan blast. The taps or reamers made of high-speed steel are hardened in oil.

D. M. Dulin, of the Norfolk & Western, also presented a paper, in part, as follows: We have been welding high-speed steel tips on carbon steel shanks by the electric butt welding process. The tools to be welded have the surfaces ground bright and are clamped in the vise, and the current applied. A vise screw is operated to press the two metals together as the temperature increases. The power required to operate the machine is from ½ to 5 volts, and 8,000 to 16,000 amperes. We weld tools from the smallest size up to 2 in. by 3 in., with good success. The tools are dressed after welding and are hardened in an air blast or oil, as preferred.

Frogs and Crossings

George T. White, of the Missouri, Kansas & Texas, presented a paper on this subject, saying, in part, as follows: At the Parsons shops of the Missouri, Kansas & Texas we manufacture 150 rigid frogs per month, and repair 30 spring frogs per month, in addition to various other items, such as guard rails and reinforced switch points. In making repairs to frogs and switches our Oxweld plant plays a very important part. We have several switch points which were built up by the Oxweld system that have been in service six or eight months and are good for several months to come. This is about the length of service we get from most new points on this line. This road also operates a repair car fully equipped for making light repairs to frogs and crossings on the road. Three men, who accompany the car, make the light repairs wherever they may be necessary, and where they can be made without removing the frog from the track. This car is sent over the entire road. The road's repair gang keeps the shops at Parsons advised as to when the frogs will need to be replaced. This gives the shops time to build the frogs for any given place.

D. Huskey also read a paper describing briefly the new frog and switch plant of the Chicago Great Western at Oelwein, Iowa.

Discussion.—Mr. White stated further that switch point repairs by the Oxweld methods cost an average of $1.25 each, and repairs to a spring frog cost an average of $2. Some, however, will run as high as $4 or $5. It has been found on the Missouri, Kansas & Texas that this class of repairs will give practically the same life as a new point. However, it was stated that the Frisco did not find this to be the case. On that road it is the practice to raise the point by splitting the web and then fill in the web by the Oxweld method, thus using the original material on the point. The use of manganese rail for all frogs and crossings was strongly recommended.

Reclamation of Scrap

J. Harkins, of the Southern Pacific, presented a paper on this subject, from which the following is taken: There is no department in connection with a railroad that should be given more attention than the reclaiming department. This is particularly true at the present time when all classes of material used in railway equipment have advanced in price from 10 to 50 per cent, and in some cases even more.

There are many articles that can be made from scrap and obsolete material as a substitute for new material. Old boiler tubes when flattened can be used for making car door plates, washers, split keys, pipe hanger clamps, angle irons, etc. Coil springs of various sizes, after having been straightened, are used for making lining bars, drift pins, etc., and can also be rolled into smaller sizes and used for making new springs. Thirty-ton car axles are made from scrap 40-ton axles, and 40-ton are made from 50-ton axles, this being done by upsetting the collars on the journal end and drawing the axles to the proper length.

Scrap tire steel can also be used for making standard track claw bars, pick points, tamping bar ends, headers and dies for bolt forging machines and shanks for lathe and planer tools of various sizes. These tire steel shanks with high-speed steel tips are giving very good service. At our shops we endeavor to reclaim all serviceable material. The remainder is sheared to length and turned over to the rolling mill, where it is rerolled into all standard sizes of bar iron and shapes. This iron is then shipped to all outside points on the company line. The average amount of scrap reclaimed each month in this mill is about 4,350,750 lb.

J. H. Daltry, of the Erie, also presented a paper on this subject, of which the following is a part: Lathe tools are made out of scrap tires with high-speed steel tips welded on by the electric process at a cost of about 10 cents per tool. They are giving very good results. Worn coupler knuckles are reclaimed by welding on a piece of ⅜ in. by 2 in. iron where the knuckle is worn. The cost of labor for this is 15 cents a piece for all classes of knuckles and about one pound of wrought iron is used. The reclaimed knuckle is practically as good as new. The side ladders on box cars are made from scrap boiler tubes flattened out under the steam hammer, for which $1 per 100 is paid. This is used in place of the ⅜ in. by 2 in. iron which is generally used for this purpose. Tube beading tools are also made out of tire steel and are doing the work just as well as those tools made from tool steel. All the hexagon-headed bolts removed from locomotives when undergoing repairs are annealed and turned down to a smaller size and used again. All of the blacksmith tools, except chisels, are made from scrap tire steel. Boiler and machinist hand tools are made out of scrap coil springs and give very good results.

Topical Discussions

Beside topical discussions on Oxyacetylene and Electric Welding, and Case-Hardening, H. E. Gamble, of the Pennsylvania Railroad, gave a brief talk on the heat-treatment of metals, referring to his rather extensive paper on the subject printed in previous proceedings. He stated that the steel should be heat-treated according to its carbon content. The steel should be analyzed before being treated to find out just what its percentage of carbon is. The smaller articles are heat-treated in oil and the larger ones in water. The success of heat-treating is dependent to a very large extent on the facilities for doing the work. In annealing rods it was stated to be bad practice to anneal one end of the rod at a time. The entire rod should be heated and annealed at the same time.

In replying to a question concerning adjusting the length of a heat-treated side rod on the smith fire, Mr. Hutton, of the New York Central, stated that if the heat used in making this adjustment was at a temperature lower than that used in treating the rod the heat-treatment would not be affected. On the other hand, if the heat used in adjusting the rod was greater than that used in treating it, it would be necessary to reheat-treat the entire rod. Attention was called to the articles on the heat-treating of steel in the Railway Mechan-

ical Engineer for July and August, and it was voted to have these articles reproduced in the proceedings of this convention.

Other Business

H. D. Wright, Cleveland, Cincinnati, Chicago & St. Louis, read a paper on Piece Work.

A paper was also read on the use of powdered coal as fuel for blacksmith shops, by C. F. Herington, mechanical engineer of the Bonnot Company, Canton, Ohio. The following officers were elected for the coming year: President, W. C. Scofield, foreman blacksmith, Illinois Central, Chicago, Ill.; first vice-president, John Carruthers, foreman blacksmith, Duluth, Missabe & Northern, Proctor, Minn.; second vice-president, George T. White, foreman blacksmith, Missouri, Kansas & Texas, Parsons, Kan.; secretary-treasurer, A. L. Woodworth, Lima, Ohio. The secretary reported a total membership of 237. Chicago received the largest vote for the next place of meeting.

ROADS THAT LEAD TO THE ITALIAN FRONT

By Our Special European Correspondent

The visitor to the Italian front who has prepared himself to meet with all kinds of physical inconveniences and to encounter an infinite confusion is likely to be considerably surprised. He gets up out of his bed in the sleeper, and has his eggs and coffee in the dining car, with all the leisure of a senator approaching Washington, D. C. Then, unless he wishes to read his morning paper, brought by the fast Paris-Milan or Lausanne-Milan express, and delivered at a station while he was asleep, he sits by the window and watches the telegraph poles whiz past at a forty or fifty-mile rate. He sees spread before him the smiling plains of northern Italy, rich with the fruits of industry. Here and there against the near horizon he sees the brick colored cupolas and cathedral towers of the proud little towns that used to fight each other or Austria, as the humor swayed them, and that are now fighting Austria to the drop of the hat.

He sees here and there little groups of women working in the fields, and at the way stations soldiers in their almost invisible dun-colored Italian uniforms waiting for the slow trains that take them forward. He sees here and there long lines of freight trains on the sidings, but always with a smoking engine at the head, ready to pull on toward the front when their turn comes. Finally the train slows down—it is a train of eighteen to twenty light coaches after the Italian fashion—and the crowd of civilians and soldiers who have business at the army hearquarters tumbles out, swarms over a twelve-track platform, passes line after line of waiting trains, towards the exits. Here the visitor before he can pass out must see an officer, show his papers, and, these being in order, accept the guidance of a soldier to his hotel, the aforesaid soldier being responsible for him. He must not leave your presence an instant until he has been fully recognized at headquarters and given new papers.

Outside, the visitor meets an instant's feeling of confusion. The little station of a little city, of the quiet, uneventful European kind, has overnight, so to speak, become the brain center of all the efforts of Italy. It is crowded; there are no rooms left in the hotels or the houses, the streets are jammed with hospital wagons, carts, and every animate or inanimate object that can move or be moved. One gets the impression of a country summer resort that has suddenly become the center of three or four big city picnics, or of a county capitol of the South that is holding a circus, a Chautauqua, and a fair all in the same week. Here it certainly isn't safe for a chicken to cross the road. What more, the sky above is crowded. The guide says that the town has just been bombarded by a group of aeroplanes, and the watchers are out, coming home after the chase. He says it just as if he were stating there had been a heavy dew that morning. In fact, that is the spirit of the town, and of the whole army. Who cares anything about an aeroplane raid? Of course it might pique the airmen to let the Austrians put one over on them, to fail to beat back the Austrians. Their personal efficiency would be involved. But nobody else is interested. If a barbed arrow or a bomb strikes you, well, what about it? Other people have been so struck and they haven't made any fuss about it. Why should you? Mind your own business, do your work, and let the Supreme Command worry.

How can confusion or excitement exist when such a state of mind prevails?

Right here I want to tell an incident that is the keynote to the whole Italian war, that will interpret exactly the placid state of mind of the people supposed to be the most excitable in Europe. It will show how marvelously efficient is this transportation organization built up in a new country, the enemy's country—for the Italians are here in Austrian territory—an organization built right up out of nothing by sheer force of brains and executive ability, helped along by the temperament of a nation. The incident culminated long after I had left the war zone, but this is the place to tell it.

Two men, civilians, boarded a train one night at Brescia, at the foot of the Alps, on a bee-line south from the Swiss frontier, and rode across country as far as Mestre. There they got off to change cars, the train going on three miles further to war-clad Venice. The next day one of the men said to the other: "By golly, I've lost my camera and field glasses." A hunt high and low in the baggage and recollection of the two men was fruitless. The camera and field glasses had disappeared somewhere, but where neither could recall.

Weeks after, when one man had gone to France and the other to Rome, the second received an official note inquiring if he or his companion had not lost a camera and a pair of field glasses. A photograph developed from one of the films in the camera showed him that the objects were those lost by his friend. In due time the camera and field glasses reached their owner, but minus the films, these doubtless being regarded as military in their nature. The astonishing part about this incident is that at the time the objects were lost the Italian army was suffering temporary though serious reverses in the Seven Commune region and it seemed a waste of time to bother with lost objects.

The explanation is that a system has been established that can't break down. The lost objects were picked up in the passenger train, duly turned into the railroad's lost property room at Venice and then, as they seemed of a military character, were turned over to the local military authorities, who in turn forwarded them to the headquarters of the army, where the films were examined and the face of one of the owners recognized.

This is not a press-agent story. The owner of the camera and glasses is Will Irwin, the magazine writer. His companion was myself.

This incident, if let stand alone, might seem exceptional. But it does not stand alone. For weeks I rode over this vast front of mountains and plains and rocks and rivers and not once did I see a stalled train or a wrecked train, except when the fact was due to enemy bombardment. But once did I see a stalled automobile and that was also due to an Austrian battery that was shelling at haphazard a road during the night, it having previously by day taken its range, the shelling going on in order to cut off troops from their provisions. But once during this journey covering hundreds of miles of territory did I see a near-collision, and this was of my automobile while driving in a pouring, blinding rain at dusk. Its wheels were bumped into by a

heavily-freighted army wagon that was taking more than its duly allotted half of the road.

According to the official statistics furnished me, this army has constructed 600 miles of new roads, has built 10,000 military provision or troop sheds, has run 20,000 miles of telephone wire, has built 125 miles of cable railway lines, and has in service 175,000 mules, not counting mules or horses used by the artillery and the cavalry. These figures do not include the thousand and odd new railroad bridges nor the 500 and odd miles of railway track laid.

West street, New York, or rather the entire distance of the Hudson River front from the Battery to Forty-second street, is considered one of the busiest freight traffic spots in the world. There are hundreds of such West streets all along the Italian front, where millions of tons of food and freight are ever converging toward the narrow firing line. But there is never any confusion. The railroads, of course, have to bear the brunt of the transportation job. They must handle not only lifeless freight, but run passenger and troop trains without number. There is a great distributing center whence trains branch out to Brescia, to Vicenzia, to Padua, to Treviso, on up toward Venice, and the Isonzo front. These trains operate under the handicap of too few tracks, too few cars, of depreciating rolling stock, and other conditions peculiar to other countries at war. During the past winter these weaknesses became evident through the unusual number of accidents, but since that time passenger schedules have been lengthened, and other steps taken, with the result that no serious accidents have been reported since March.

When, however, these West streets of the front are reached, it is a positive delight to the transportation man to watch the way the job is handled, to see in operation the vital spirit of order that was first brought into the western world on a large scale by the Romans. The distributing depots are not uselessly blocked with freight, or with freight cars waiting to be unloaded, as happened and is still happening in France, and especially in that part which is occupied by the British forces. On only one occasion did I see an idle train of cars at the front. It was piled with barbed wire.

It is even curious how little freight there is to be found about any railway station in the war zone. It seems to disappear as if by magic as soon as it arrives. It is piled upon trucks, buses, wagons or carts, bundled off as at the wave of a wand, and is soon put where it can be of immediate use or held in reserve storehouses. These road vehicles work night and day—often they can work only in darkness to keep hid and be safe from the enemy artillery that sweeps any well used road within four miles of the front line. But there is no West street jumble made of the business. Certain roads are mapped out for these countless lines of vehicles to take as they move forward and certain others for them to use as they return empty, and woe to the driver who violates his route, or who takes the middle of the road when but half of it belongs to him.

This orderly manner of working, the supreme quality and attribute of the human mind, goes right along, smoothly, under artillery fire. Nothing stops it.

It seems trite, if not ridiculous, to call upon history for comparisons in this war as it is conducted. The writer, after having traversed the same territory as did Hannibal and Caesar and Napoleon in their Alpine expeditions, feels it would almost belittle the wonderful work today to say that "the glory that was Rome" is again the glory of modern Italy.

Whereas the hardy armies of these audacious victors of other times moved in bodies of five, ten, twenty thousand at most and therefore swiftly hurrying over the Alps lest they freeze or starve, today the armies of Italy numbering hundreds of thousands of men to a section of territory occupy, live, advance, retreat, and advance again through valleys and mountains five, eight, ten, eleven thousand feet high, climb to heights that would have defeated the staunchest efforts of these ancient armies to which history so proudly points. Hannibal's conquest of the Alps, in reality the passing of heights of hardly 6,000 ft. is a job that is repeated every week or two by the Italian Alpine regiments and is done in a matter-of-fact manner, as a part of routine. Napoleon's spectacular march into Russia has lived in memory because of its frightful consequences, because it meant the downfall of an imperial fabric. If undertaken today by the armies of the Alps, the job would not fail merely because of ignorance of weather conditions or of mismanagement of transportation facilities. As they moved forward they carry all the resources of a country with them, and as they go they figure out the physical difficulties ahead and leave behind permanent roads to back them up.

It used to take a year, two years to build a railroad in Italy. Now it is done overnight. If a general of a division needs to move in a certain direction, he passes along an order to the engineering corps and within a few days at most this division has its steel roadway to move upon. Industry has been intensified in a way that can but be an inspiration to future generations. Heights, distances, tunnels mean nothing to the builders, these soldiers who have so magnificently improved upon the methods of the ancients. Time after time I saw narrow gage roads in preparation as I passed a certain route and, if by chance, I returned that way as soon as the next day the whole was finished and the little engines were doing their work as if they had been there forever and expected to stay until the end of time.

Every once in a while a movement of troops requires the establishment of a new front terminal. This means the building of immense new storehouses and of sidings to them from the main line. To quote the official figures that 10,000 military houses have been built means nothing. One must see them to understand. They are laid out on some bit of level land like a city. Long rows of houses spring up overnight, perfectly equipped to withstand a dozen winters. This genius for solid building of the Italians does not stop with mere solidity. They go further and decorate their work with delightful bits of marble or concrete frescoes, with splendid columns standing in pretty rows outside the prosaic storehouse city.

To the man looking at the work of the front from a transportation point of view, it is at first disheartening to see mile upon mile of beautifully built track idle, without a wheel turning, with its rails rusting, with artillery planting scattering shots along it, splitting ties, digging holes in the roadbed, shattering the neat railroad stations here and there. But one soon gets used to it, for the army engineers explain how readily the whole can be put in perfect order again, with this same dazzling rapidity that makes it possible to build entirely new lines. Indeed, time and time again they finish a road, build fine new bridges for it, and then have to see their work immediately destroyed by the fortunes of the war.

Such roadbeds and depots have been put to curious uses during the war. Now they are used as defensive breastworks by one army or the other, their pretty depots figuring as division headquarters, now for the Austrian generals, then for the Italians, according as the battle line shifts.

In one such way station along the Isonzo river, the writer took shelter one afternoon from a driving mountain storm. As the village about was a heap of ruined homes, he thought it deserted. It was occupied by a division general whose time was hanging heavy on his hands, the weather preventing operations in the trenches on the mountain above the station. After a pleasant hour's talk, the storm slackened and I asked leave to be going up the side of the other mountain. "You know the Austrian artillery has been fairly

busy today, and it may occur to some fool officer to drop a few shells on this building."

"I wouldn't worry about that," said the general, "I have been here for weeks and they haven't bothered me yet. They probably hope to come this way some time and already have an eye on this place as shelter."

But I went on just the same. Hardly had I got two hundred yards away before a few desultory shells began to fall, tearing jagged, black holes in the sodden earth along my path. All the way up the mountain side I looked back now and then and watched the progress of the artillery fire. Sure enough, it was as the general had predicted. The Austrians, for some curious reason, were leaving the little depot untouched, its sidetracks and the roadbed that swung down the river side and disappeared in a tunnel cutting a gorge a couple of miles below.

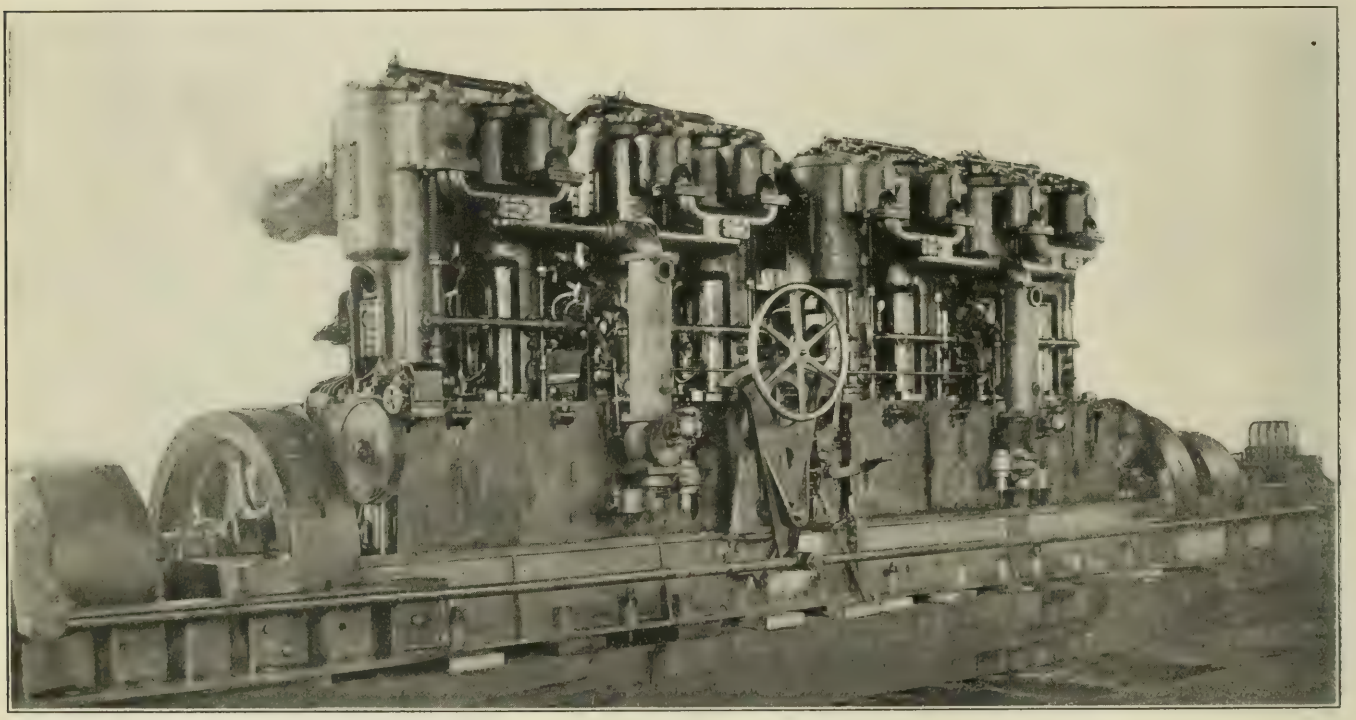
Despite all the reckless ruin and heartbreaking waste that takes place on the battle front, the secret of the success of this transportation system is detail. By grace of this system that brought home the lost camera and field glasses, marvels without end are accomplished. By grace of this system a letter posted in Rome on a given day is delivered, along with a couple of millions of others, at the front the second day therefrom. On the third day at the latest this letter will find its way from mail car to pack mule and reach the utmost, topmost trench line of this 400-mile front that slopes from the 11,000 foot height of Stelvio, the three confines point of Switzerland, Italy and Austria, down the Alpine ranges to the foothills, on to the flat lands that are stopped by the Adriatic Sea. Likewise, the delivery is as prompt from the battle end. I received at Rome on the third day of posting from a military acquaintance, since dead and buried in his mountains, a letter written on the Adamello glacier of the high Alps, a letter that had come across the glacier, a quarterday's journey down the mountain by burro to train.

By grace of this system pine planks from Georgia reach the lower Alps, are then carried on a man's back dozens of miles up the mountain so that they may there be built into the shelter shacks. In the same manner big cannon are freighted by rail, by rock road, by the cable railway known as the teleferica upon the mountains—all to the end that ruin may be wrought. It is hard to realize that the end and object and purpose of this system is ruin, and one does not realize it until he sees the system delivering thousands of troops at some weak point in the battle line where the enemy is breaking through, until he sees the returning trains loaded down with civilian refugees, with women and children fleeing in the dreadful night.

Some day monuments will be raised to the transportation geniuses of this war.

GASOLENE-DRIVEN CAR FERRY

The Oakland, Antioch & Eastern operates between Oakland and Sacramento, Cal., with boat connections from San Francisco, running a total of seven electric trains daily each way. Five of the trains connect at the M street bridge in the outskirts of Sacramento with trains of the Northern Electric Railway running to Chico. Three trains each way carry parlor observation cars, and on one of these trains the parlor observation car is hauled through between Chico and Oakland so that no change of cars at Sacramento is necessary. The system also has two seven-mile branches, one to Antioch and the other to Danville, making a total of approximately 150 miles, which is protected by block signals throughout.



The Gasolene Engine Used on the Car Ferry

To avoid the necessity of making passengers change cars in order to cross Suisun bay the railway transports its trains across the bay from Bay Point to Chipps Island. It is planned to have a bridge 10,000 ft. long and 70 ft. high span this bay, but while the structure is being built the railway ferries its trains across by means of the gasolene-engine-driven car ferry shown in the photograph. This is the only electric railway in the United States that ferries its cars with passengers aboard, in order to make change of cars en route unnecessary.

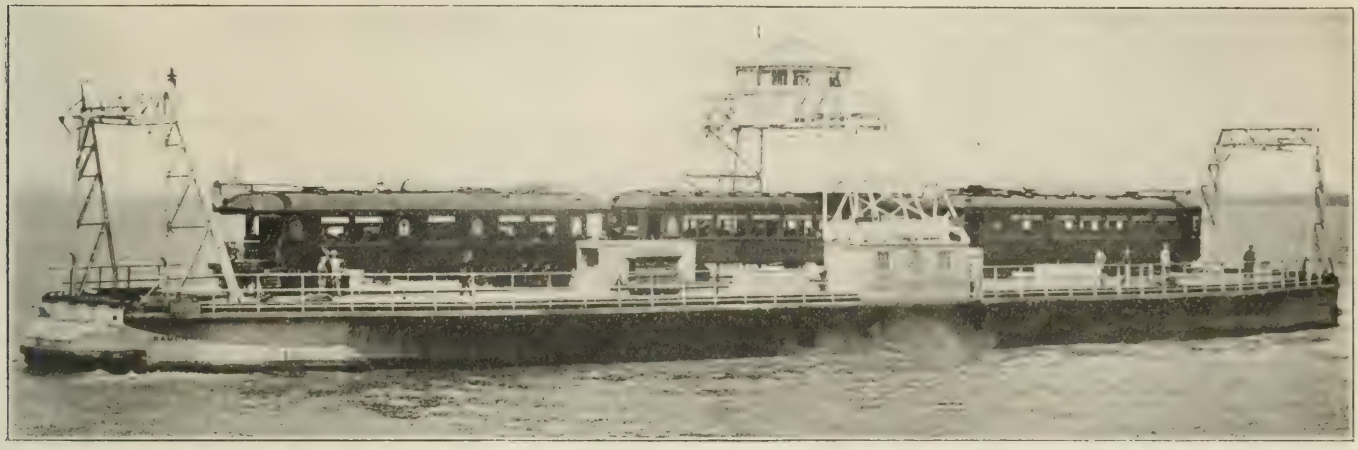
The car ferry is named the Ramon and was designed and built by the Oakland, Antioch & Eastern. It is constructed entirely of steel, is 185 ft. long, and weighs 590 gross tons. It is driven by a 600-horsepower, eight-cylinder gasolene en-

gine of the electric ignition type, built by the Union Gas Engine Company, San Francisco, and has sufficient capacity to carry six loaded passenger cars or eight freight cars. The engine is of unusually massive construction, weighing approximately 120,000 lb.

The method of propelling the boat is rather unusual for a motor-driven craft. The engine is set amidships and is coupled to a propeller at each end through friction clutches. As the two propellers are of opposite pitch the direction of the boat is controlled by engaging either one clutch or the other, thus eliminating all necessity for reverse gears or making the motor directly reversible. This is said to be the largest gasolene engine built.

A noticeable feature of the boat is the absence of curved plates and the adoption of a box-like design with ends that are extremely flat in order to present a large area of displacement to overcome tipping while loading or unloading cars.

There are three tracks on the main deck, each 220 ft. long, having a total capacity of nine cars. As will be seen from the illustration of the ferry, there is an overhead catenary construction so that the trains are able to run off the boat under their own power.



Car Ferry of the Oakland, Antioch & Eastern, Propelled by a Gasolene Engine

To meet the demand of the heavy passenger traffic the Oakland, Antioch & Eastern employs single cars, multiple unit trains, and trains hauled by high-speed electric locomotives. All the electrical equipment was furnished by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

A SUGGESTION FOR ARBITRATION

WASHINGTON, August 23.

Among the countless suggestions for arbitration in the present and for future disputes between the carriers and their employees, one which comes from the defunct Federal Commission on Industrial Relations is interesting to recall at this time.

The essentials of the plan proposed by the Industrial Commission are those of the Canadian Industrial Disputes Act. The plan proposes the establishment of a National Mediation Commission, whose functions, while they would not be confined wholly to the railroad field, would nevertheless operate largely in that field. The scheme provides that mediation and arbitration shall be attempted, as the present laws allow, and that, in the event of the failure of mediation and arbitration, for the placing of the controversy before a Board of Mediation and Investigation. As the Industrial Commission defined them, these would be the powers of such a board:

"If the parties to the controversy cannot be induced to arbitrate, and if the controversy should threaten to interrupt the business of employers and employees to the detriment of the public interest, the Commission should be authorized to request the two parties to consent to the creation of a Board of Mediation and Investigation. If the consent of the parties to the controversy is secured, the Commission shall form such a board. Of the three members of the board, one shall be selected by the employers, one by the employees, and a third on the recommendation of the members so chosen. If either side fails to recommend a member, he should be appointed by the Commission. If after a stated time the third member is not recommended, the Commission should select him. Appointments to boards of mediation and investigation shall be made by the Commission from a list prepared for this purpose by the Advisory Board. The Board of Mediation and Investigation should offer its friendly offices in bringing about a settlement of the dispute through mediation. If mediation should not be successful, and if the parties to the controversy refuse to arbitrate, this board should have power to make an investigation of the controversy and should be required to submit to the Commission a full report thereon, including recommendations for its settlement. The Commission should be empowered to give this report and recommendations adequate publicity."

The Board or Boards of Mediation and Investigation thus described are to be subsidiary to the National Mediation Commission, which is to be appointed by the President, by and with the consent of the Senate, and representing in proper balance, the interest of employers, employees and the public. Next in rank to the Commission, according to this plan, stands the Advisory Board, referred to above. This board is to be a representative body, its membership coming from leading organizations of employers and employees designated for that purpose by the President of the United States, the individuals, however, being appointed by the organizations which they represent. The duty of this board is to give advice regarding the duties of the Commission, including the administration of its affairs and the selection of mediators. It is to be empowered, further, to make recommendations regarding legislation, and to prepare lists of persons who may be called upon to serve on boards of arbitration and mediation.

"It is considered desirable," declares the report of the Industrial Commission, to which the name of A. B. Garettson was signed, "for the present to provide for the existence of the two commissions"—the Newlands Act Board and the proposed new board—"at least until the proposed commission has been thoroughly tested. It is believed to be wise, however, to provide for their close co-operation from the very beginning, with the idea that they will ultimately be consolidated."

BUILDING A LINE TO THE PUBLIC*

By Anderson Pace,
Manager, Bureau of Railway Publicity of Illinois

That a gap between the railways and the public exists today needs no admission. That a line to the public can be built is equally certain. Let me emphasize my belief that the railways, and *not* the public, must build that line.

There are railway men who deny the existence of the gap. Perhaps they have not asked help for the railroads from the public when the interests of the latter were *not* visibly at stake. Many trades associations in my own state, though linked by common interest with the railroads, have often refused co-operation because of the animosity members of those associations have against the carriers. Other groups refuse to co-operate because "your kind of team-work always means for us to help you get increased rates, or relief from legislation."

I don't mean to say that the gap is always caused by the railways' unwillingness to see the other fellow's side; that is only part of the trouble. Misunderstanding has to bear part of the responsibility, but misunderstandings would diminish if more railroad men would talk face to face with the railway critic. Some railway men, while admitting the existence of the gap, get away from it by ignoring those pleas of the public, which, when ignored, simply make the gap wider. Those men object to advertisements, saying, "What's the use of stirring things up?" My answer to such men is this: "If there is something to be stirred up, it existed before the stirring began. If the demands of the public are unjust, it is better frankly to explain why they can't be granted. If they are just, the railroads will save in the long run by granting them at once." Which is safer, to let the public mull over its fancied grievances in silence, or to give these grievances a hearing? If the demand is foolish, the mere exposure of it often wipes it out, but, if the demand is just, postponement merely keeps the railroad from ever capitalizing the concession in terms of good will.

If you compel a man by law to do a thing that he should do of his own free will, do you give him much credit for the doing of it? If the public forces concessions through its organized strength, does it pay back the railroad in greater co-operation or good will for concessions which were given because resistence to them was out of the question?

On January 1, 1916, I was instructed by the presidents of the railways operating in Illinois to organize a "Bureau" which would seek to develop a better understanding among the railroads of what the public wants and thinks; a better understanding by the public of railroad needs and problems; and hearty co-operation between the railroads and the people they serve. Figuratively, our job was to build a line to the public.

The first move we made was to start surveying the field we were to work in. We tried to get at the motives that underlie the actions and thoughts of the railways' public. We tried to find out not only what people thought of the railroads, but the reasons behind the thoughts. Only in that way could we learn how to make the plans that would remove the obstacles that prevent team-work today.

The American citizen is an individualist. His attitude towards the railroads depends largely upon the treatment he has received at the hands of the railway employees; upon the cartoons, news and editorials he sees in his paper; on his inability to see why his town cannot have finer stations or lower rates than competitive towns. To try to argue with him on any of these subjects is simply to breed more trouble. If he and the railroads knew each other better, explanations and arguments would get farther with him. Unfortunately, he does not understand railway operation, management, finance or regulation. He has never been taught to look upon railroads as he would other business, and so his views and judgment of railroads are biased.

All of these things form parts of the problem the Bureau of Railway Publicity of Illinois is attacking. As a representative of the railways of the State of Illinois, we are locating our friends and cementing them to us. We are getting acquainted with the neutrals as a first step in making friends of them. We are discovering enemies and trying to remove the causes of their enmity.

We are running advertisements in order to show the public that the railways are not autocrats, always ignoring the public; to seek out overlooked causes of trouble; to get away from the old begging attitude; to win the sympathy of the employees; to put the public in a boosting frame of mind; and to put a premium on courtesy and good service.

We are building mailing lists of farmers, bankers, retailers, school teachers, manufacturers, clubs, associations, laboring men and railway employees, for the purpose of following all these people up through the mails. Our representatives parallel this work by calling on our correspondents, thereby making us seem more than a name to the man we want to influence. We have representatives at conventions and gatherings of newspaper men, manufacturers, retailers, tradesmen, club women and miscellaneous people, co-operating with them in their work, hearing about their troubles, telling our story, and making friends.

Speakers are placed upon programs, and before granges, farmers' institutes, town meetings and gatherings like those cited before, we are telling the story of the interdependence of farmers, manufacturers, distributors, consumers and the railways. In the case of all associated groups, friends are made of the officers and directors.

If co-operation between the railways and any group is impossible because of some difficulty, we draw up a bill of particulars for discussion by a committee of broad-minded men chosen from both sides. The resulting settlement usually improves the relations and leaves both sides on a common ground of undertaking and friendship.

Whenever a chance for service comes along we seize it. For example, the Department of Foreign and Domestic Commerce has not funds enough to send its confidential bulletins to Illinois manufacturers, so we enclose them in our regular letters to the manufacturers of the state, thereby rendering a service which improves relations.

We try to help local commercial clubs in their civic and industrial development work. This is paralleled with periodical district meetings with secretaries and officers of these associations. Whenever possible, we try to get a local railway man into a position of influence on the associations' rolls, so that the work done may not be interrupted and its effect destroyed. Also by co-operating in local affairs such a man improves the standing of his own road. He is likewise in position to be helpful when controversies and misunderstandings arise.

By far the most important part of our work is being done through and with the attorneys, surgeons, agents, traveling representatives, train masters and superintendents of the railways of Illinois. Although we report directly to the presidents, much of our work is being done with the advice of the superintendents. For this reason, when one of our men is in the field, his first stop in any district is usually the office of the local division superintendent.

The agents hold the key to the local situation. They can make or break a railroad in a town. We have built a list of agents (approved by the superintendents) and have started to improve the position of the local agent in his home town; to develop real friendship between him and us; to work out a small but systematic plan of missionary work for him to use

*Abstract of an address delivered before the American Society of Railroad Superintendents, Memphis, Tenn., August 16, 1916.

in his home town; to get him credit for the work he does for us; and to build around him a local committee of friendly active non-railroad men. We meet with this committee periodically, co-operate all the time, and now are developing those parts of our own campaign which the committee can dovetail into.

We are far from finding our way through the woods, but we believe that there is one tool which could do more than all the rest. That tool is the organized employee. Get him on the side of the railroads, let him be our missionary, and the conversion of the public is over.

THE CHICAGO ZONE VALUATION COMMITTEE

Of the railroads that participate in the support of the President's Conference committee on the Federal Valuation of the Railroads, 24 enter and use the Chicago terminals, and these 24 have organized what is known as the Chicago Zone committee, which is serving as an auxiliary to the national organization. The local committee is carrying on work of an allied character in connection with the Federal valuation of railway properties within the limits of the Chicago terminals. This organization has been created because of a realization on the part of the officers of these roads of the extremely complex and highly specialized character of the problems to be encountered in the inventory of the properties within the terminal limits.

The magnitude of the railway plant in Chicago was brought out in the report of the Chicago Association of Commerce on smoke abatement and electrification, which was abstracted in the *Railway Age Gazette* of December 10, 1915, page 1089. The district under consideration in that report comprised 3,576.4 miles of track, of which 1,079 has been elevated to eliminate grade crossings with the streets. There are 362 grade crossings between railroad tracks, while at 113 crossings the grades have been separated in connection with the track elevation work. There are 131 interlocking plants; 65 engine houses, containing a total of 1,129 stalls; 125 shop buildings; 51 coaling stations and 93 water stations. This extensive property is interlaced into a fabric of such intricacy that the map of the Chicago terminals presents the most remarkable network of railroads to be found anywhere in the world. This has been the result of years of gradual growth, not only as to the original construction, but also as to the extensive reconstruction necessitated by the grade separation work, which has been in progress for the last 24 years.

The object of the Chicago Zone committee is to make an exhaustive and co-operative study of the local problems. Not only does the very nature of the railway network demand its consideration as a whole, but the physical conditions at Chicago are so nearly uniform throughout the entire area that a great deal of data can be compiled co-operatively that will be of value in the consideration of any individual property. The primary object is a study of the construction costs, particularly in view of the fact that it is the opinion of many that the data collected by the Interstate Commerce Commission, division of valuation, in accordance with its order No. 14 (pertaining to the prices paid for materials and the rates of compensation paid to labor), are entirely inadequate and will bring about misleading results. Another problem of formidable proportions is the determination of the construction periods and other construction arrangements to be assumed in evolving the reproduction costs.

The committee seeks to attain the fullest possible co-operation with the government organization on these and other matters concerning the valuation work. Thus far the government engineers have taken the position that the work done up to the present time in Chicago has been of such a tentative or experimental nature as to preclude the expression of any definite policy. Up to the present, inventories are being taken only of the property of the Chicago, Rock Island & Pacific and the New York Central. The valuation section on the Rock Island extends from the La Salle street Station to Rockdale, Ill. The conduct of the work in this case is different from the usual practice, in that the railway company furnishes the field party which is accompanied only by an inspector to represent the government. The government engineers have not announced whether this method is to be used on the other work in the Chicago terminals.

The Chicago Zone committee consists of one representative from each of the 24 participating railroads, many of whom devote practically all of their time to the committee work. A. W. Newton, assistant to the president, Chicago, Burlington & Quincy, is chairman of the committee, and Robert H. Ford, engineer of track elevation, Chicago, Rock Island & Pacific, is secretary. The committee meets once each month, but a large part of the work is done by sub-committees, which meet oftener, and by the individual members. The territory to be included in the Chicago zone has not yet been clearly defined. It is the intention to make this conform to the limits of the terminal valuation sections for each road, but these have not yet been determined by the government. For the purpose of outlining the work the zone has been taken tentatively as including all of the territory encompassed by the line of the Elgin, Joliet & Eastern, or, in other words, all of the area enclosed in an arc having a radius of from 40 to 50 miles from the business center of Chicago.

Thus far the committee has devoted its time largely to the problem of a determination of weighted average unit costs for materials and quantities entering into railroad construction for each of the past five years and for the full five year period. With these unit costs there are to be prepared statements of the wages, the unit costs of materials, the costs of equipment and the overhead charges, which were used in the compilation of the weighted average unit costs, so that the results may be supported or readily adjusted to conform to changes in wages, material costs, differences in local conditions, etc.

For the purpose of carrying on this work the committee has been divided into sub-committees, which were assigned individual branches of this problem, as indicated by the subjects of labor, concrete, metallic bridges and metallic structures, grading, ballast, track laying and surfacing, buildings and train service.

The committee on labor is to tabulate the information reported by the member roads in accordance with the Federal valuation order No. 14, for the purpose of comparison with additional information to be gathered in greater detail. This will cover the rates paid for construction and maintenance work during the last five years. It will also involve a comparison of rates between union and non-union labor and of the rates paid by contractors, street railways and industrial concerns. Data will also be collected concerning the amounts, sources and classes of the available labor and the comparative efficiency of these various classes.

The committee on concrete will investigate and report on the costs of all elements entering into the construction of the masonry structures built by railroads. This will include the excavation and back filling, as well as all work done in connection with the foundations. Similar information is to be obtained concerning structures built for the local public authorities.

In the case of grading, which is concerned almost entirely with the embankments required for track elevation purposes, the committee will be concerned largely with the sources of supply of materials, the transportation and the extra cost of delivery due to the operating interference always experienced under the heavy traffic conditions obtaining in the Chicago terminals.

The ballast committee will investigate the source of supply and manufacture of all the classes of ballast now existing in

the railroads of the Chicago zone. Special attention is to be given to the item of waste. The cost of the ballast will be in terms of materials actually delivered to the track. In the case of the committee on track laying and surfacing, the cost of installing the different kinds of special work, such as turnouts, crossings, slip switches, etc., form an important part of the work.

The first work of all the sub-committees has been the study of the forms or blanks upon which the railroads will be requested to tabulate the cost data desired. This is one of the most difficult parts of the work, as it involves not only the question of the detail in which it is desired to compile the information, but also the character of the data which the railroads have available for tabulation on such forms. In many cases the cost records of work done during the period in question have not been kept in the detail that is desired. In practice, the sub-committees work out these forms to their own satisfaction and then submit them to the secretary of the general committee, who in turn re-submits them to the general committee for study and discussion at the general meetings. Realizing the importance of this work, thoroughness has been the keynote. The work is being done carefully and involves a large amount of detail. It will not be finished for some time, but the results ought to justify the time and money required.

ABANDONED PROPERTY

The general secretary of the Presidents' Conference Committee on the Federal Valuation of the Railroads, has issued a circular on the subject of abandoned property. As outlined in valuation order No. 10, the carriers are required to file with the Commission detailed schedules of all abandoned property, which schedules are to be used by the Commission in identifying the property through its field parties. After a careful consideration of the orders of the Commission and a conference with the director, the Presidents' Conference Committee makes the following suggestions:

It is clear that property which has been gradually consumed in the business of the carrier and replaced in ordinary maintenance should not be included in the list of abandoned property. Property which is not now in use, but which is intended to be used in the future for the purposes of a common carrier, should not be included in the list of abandoned property, because such property is owned or used for the purposes of a common carrier and will be valued as such. The intention of the carrier is an important element in deciding what is and what is not abandoned property.

It is the desire of the Commission that each carrier shall make a complete and detailed statement of all its claims with respect to its abandoned property and the effect of such abandonment. Such statement should accompany the schedule. It is understood that the orders do not require the preparation of new maps and profiles of abandoned property.

It is important to show the total investment of the carrier (whether paid for out of capital or earnings) from the date of the inception of the enterprise to the date of valuation. Included in that investment are those amounts representing the original cost of property abandoned to the date of abandonment. Such amounts should be ascertained and claims made for their inclusion in connection with the facts required to be ascertained under the paragraph entitled "fourth" of the Valuation Act.

Fixed physical property includes all property of that kind which has been abandoned, whether or not physical evidence of the existence of such property now remains. All such fixed physical property should be listed wherever evidence of the existence of such property can be found, whether in the records of the company or elsewhere.

Where a temporary track was constructed and used until the completion of a tunnel, and where other structures were built in aid of the construction of the railroad or to hasten its completion, even though permanently abandoned, the estimated present cost of all of the same should be included in the cost of reproduction new of the railroad, and the actual cost thereof should be included in the original cost to date of the same. However, in order to avoid the possibility of having the original cost and reproduction cost of property of this kind omitted by the Commission, each carrier is advised to include all of the same with the cost thereof to the date of abandonment in the schedule of abandoned property with its claims in reference thereto fully stated, and in such case the inclusion will not prevent allowance therefor by the Commission in original cost and cost of reproduction.

Loss resulting from the permanent abandonment for railroad purposes of right of way or other real estate should be included in the schedule, showing the original cost and the salvage value (which is its value for purposes other than those of a railroad), the difference between the two being the amount of the loss. When the title of the carrier became extinguished by the abandonment, there is, of course, no salvage, and the amount of loss is the original cost.

The following are not to be included in the schedule of abandoned property: Hidden quantities, land still owned by the carrier, structures temporarily out of service, such as interlocking and other signal towers, bunk houses, etc., salvage value of rails and other materials that may have been removed from abandoned line.

The following are to be included in the schedule of abandoned property: Land the title to which was lost through abandonment, roadbed of an abandoned line, terminal improvements which have been abandoned, bridges on an abandoned line, protection work, culverts and other structures, and the foundations and abutments of bridges on abandoned lines.

It is suggested that the carriers prepare two separate lists of abandoned property; the first list dealing with that abandoned property whose cost would properly be included in the determination of the cost of reproduction new, and as to which, therefore, the carriers should claim that the cost thereof should be included, not only in the original cost to date, but in the cost of reproduction new and reproduction less depreciation of the existing property. The second list should include all other abandoned property, and the claim with respect thereto should be that the original cost to date of abandonment of this property represents a portion of the investment of the carrier, and as such should be reported under paragraph "fourth" of the Act.

GERMAN RAILWAY WOMEN IN TROUSERS.—The director of the Prussian state railways has issued a new order to female railway employees. Women conductors and guards must in future wear the ordinary service uniform, including "dark grey wide trousers." Skirts and other articles of female attire will only be allowed when the employees are off duty and outside the railway premises. On the Berlin elevated railway, where the women guards have already worn knickerbockers for some time past, the Prussian railway administration has ordered that the women shall wear long trousers, like the railway's masculine employees.

TRAIN FERRY BETWEEN SWEDEN AND ENGLAND.—The government of Sweden has instructed the management of the Swedish State Railways to examine the question of a regular daily service by train ferries or steamers between Gothenburg and an English port. If train ferries were adopted they would have a displacement of about 11,000 tons or three and a half times that of the Trelleborg-Sassnitz train ferries, and would have to make a journey of over 500 miles. Five would be required—four for service and one for reserve—but it is said that none could be delivered either by a Swedish or a foreign shipyard before 1919.

Opportunities for the Railroad Superintendent*

Importance and Difficulties of the Position Now Greater Than Ever Before in History of American Railroads

By C. H. Markham,
President, Illinois Central Railroad

THE office of superintendent is one of the very oldest in the railroad organization. When railways were new each independent road had a much smaller mileage than is now ordinarily included within a single division. The head of the road was then usually a representative of the financial interests that controlled it; and under him was a "manager" or "superintendent" who was really the chief executive of the property. He had direct charge of the building of new mileage. He handled the movement of trains and the maintenance of track and equipment. He solicited traffic. There were others who were directly concerned with these and various other matters of importance, but they were foremen and clerks under the superintendent rather than what we would now call officers.

As the railways grew in mileage, in volume of traffic, and in the complexity of their operations it became necessary to subdivide their mileage into divisions and districts and to subdivide their organizations into numerous branches and departments. On large roads a general superintendent has been put over the superintendent, a general manager over the general superintendents, a vice-president over the entire operating organization, a president over all departments and perhaps a chairman of the board over him. The foreman in charge of the maintenance of equipment has developed into a mechanical department, the foreman in charge of track into an engineering and maintenance of way department, the clerk who kept the books into an accounting department, and the superintendent's rate clerk into a great traffic department. In consequence of changes of this kind, the number of kinds of functions directly and regularly performed by the superintendent has been greatly reduced, while the number of officers who are superior to or co-ordinate with him has grown very large. He is no longer directly concerned on most roads with the solicitation of traffic or the keeping of accounts, and on some which are highly departmentalized he has little or nothing to do even with the maintenance of track or of equipment. His main duty on all roads, and almost his sole duty on some, is to *operate* that part of the railroad over which his jurisdiction extends.

And yet, while all this is true, it does not follow that as a result of this process of development and evolution the railroad superintendent's position has become any less important or less difficult to fill. On the contrary, the importance and difficulties of his position and work probably are greater now than they ever were before in the history of American railroads. This is due to many causes. The modern superintendent has jurisdiction over about 400 miles of line. This is more than was included in most railroads when the superintendent was the "old man." The amount of traffic handled on each mile of line has grown 150 per cent within the last twenty years. The conditions under which it must be handled have greatly altered. The only inducement the traffic department can now offer to attract competitive business is superiority of service, and the kind of service that is rendered depends very largely on the efficiency of the superintendent. The public and regulating authorities have also grown much more exacting in their demands regarding service, whether competitive or non-competitive. While the demands for better service have been thus increasing, the railroads have been subjected to greater and greater pressure from their employees on the one hand for easier conditions of work and higher wages, all tending to increase expenses, and from the public and public authorities, on the other hand, for lower rates. When employees are given more favorable conditions of work or higher wages, or when rates are reduced, it becomes necessary to effect greater economies in some way or ways, and the duty of actually carrying out the plans and applying the methods adopted by the managements for this purpose falls with its greatest weight on the superintendent. Finally, the superintendent, as the principal officer of the railway on his division, has a great responsibility for maintaining satisfactory relations with the public, and this is a much more difficult and delicate task now than it ever was before.

While this summary expresses only in the briefest possible way a few of the changes that have taken place in the superintendent's position, in the respects that are essential characteristics of the position there has been no real change. The division superintendent is still the real operating official who is personally on the job. He is still the backbone of the railroad organization. The business of a railroad is the conveyance of persons and commodities from place to place, and the superintendent is still the officer to whom the company and the public chiefly look for the proper rendering of this service.

Because of the conditions under which railways must now be operated, the superintendent is under constant pressure to effect economies without impairing, and, indeed, while constantly improving, the service rendered. While the end to be sought is so easy to define, the means that must be used in attaining it are numerous and much more difficult to state. The greatest practicable amount of traffic must be handled with each car and locomotive on the road. At the same time, great care must be taken to move traffic promptly and to get trains over the road in reasonable time, as delays in the handling of traffic irritate shippers and consignees, and delays in the movement of trains pile up overtime.

Ordinarily, the division superintendent has jurisdiction over 400 miles of railroad, which passes through 80 villages, towns and cities. With the inspection motor car now furnished the superintendent he should be able to visit each of these cities and towns at least once every ninety days, and should become acquainted with influential citizens, as well as city officials. There should be very few disputes arise between the people in towns along the line and the railroad which cannot be settled on the ground, if the superintendent is acquainted with the people. By his settling matters in this way the railroad will gain more friends along its line.

The superintendent should become acquainted with every shipper or receiver of carload freight, and also with many of those whose patronage takes the form of less-than-carload freight, and he should in season call upon grain shippers, lumber dealers, coal operators and dealers, live stock men and other large shippers.

In order to retain the respect and loyalty of employees, all grievances or complaints from employees should be given attention immediately, and if possible should be settled on the division.

It is an unfortunate fact that there is much misunderstanding even among the leading business men and the most

*Abstract of an address delivered before the American Society of Railroad Superintendents, Memphis, Tenn., August 16, 1916.

intelligent people of this country regarding the railway situation and railway management in the United States; and a large part of the public is extremely misinformed and prejudiced. The superintendent, because of his position, his wide acquaintanceship among the people on his division, and the confidence in him he should cause them to have, is peculiarly well situated to do effective work in removing popular misconceptions regarding railway matters and in fostering a friendly sentiment toward the roads.

Now, I have referred to many things that the superintendent ought to know, ought to be and ought to do, and yet the summary of them I have given is very inadequate. The fact is that the first-class superintendent must be an all-round railroad man. He must have a broad knowledge of both the theory and the practice of railway transportation, and he must be patient, tactful, firm, forceful and a tireless worker. He is the official personification of the road to that part of the public that may be affected by the management and physical operation of his division as a component part of a system, and so far as the central administrative organization is concerned, he is the agent on the ground to see that its policies are carried out on that division and that necessary knowledge of local conditions is provided for its use. He is not a specialist who, except for adventitious circumstances, might be performing the same duties for an employer engaged in a wholly dissimilar line of business. In its general operation from day to day he is almost as much the organization itself, on his division, as in the days when the whole road was small enough so that its entire field of operation was within the convenient supervision of one man.

The superintendent's office is a hard one to fill satisfactorily, but it is in the hardest positions that there are developed the best men, and it is a well-known fact that a large part of the executive officers of our railroads came up through the superintendent's office. The Biographical Directory of Railway Officials gives sketches of the railway carcers of 645 officers who have reached the rank of president, vice-president or general manager. Of this number 271, or 42 per cent, have at some time in their railway history passed through the grade of superintendent. The whole number of these executive officers whose history is given in detail includes 233 presidents, 285 vice-presidents and 127 general managers. Of these numbers 83 presidents, 94 vice-presidents and 94 general managers reached those positions through the grade of superintendent.

The large percentage of general executive officers who have obtained a part of their training as superintendents is significant, when consideration is given to the variety of lines through which attainment to the higher positions may come. Quite a number of presidents are such because of purely financial or legal relations. The ranks of vice-presidents are filled from the various departments—legal, accounting, traffic or financial, as well as from the operating department, and their administrative functions are confined to the headship of the department through which they have risen. In nearly all cases the general manager has had preliminary operating experience as a division superintendent, if the road be an important one, or as a general superintendent of a smaller line. It is apparent, then, that there are opportunities higher up for the superintendent. Special conditions may at times dictate the propriety of choosing for the leadership of a railroad corporation one who has shown conspicuous capabilities or influence in some special direction. But the line of promotion will always be open to the man who demonstrates conspicuous ability as a superintendent.

Italian Colonial Railway Development.—The Italian Ministry of the Colonies has announced that the Central railway station at Benghasi is now open, and that the line from Benghasi to Er-Regana is in an operating condition.

INITIAL STRAINS IN RAILS

The Interstate Commerce Commission has issued a report on the derailment of a west bound passenger train on the Western Maryland near York Road, Pa., on January 7, 1916, which was caused by a broken rail. The derailment resulted in the injury of one employee and two passengers. The train, which consisted of six cars, was derailed with the exception of the locomotive and the rear truck of the rear sleeping car. The accident occurred on tangent track nearly 300 ft. beyond the westerly end of a one-degree curve. The track was laid with 90-lb. rail, single spiked to about 18 ties per panel and ballasted with stone.

The rail which caused the accident was an "A" rail of 90-lb. A. S. C. E. section, rolled by the Maryland Steel Company in December, 1905. It was originally laid in tangent main track in 1906. It was removed from the track in September, 1915, and relaid at the point of the accident about December 20 of the same year.

A portion of the receiving end of the rail, about 11 ft. in length, was broken into many pieces, 56 of which were recovered. The rail was examined and submitted to tests by James E. Howard, engineer-physicist of the commission. The following is an abstract of his report:

The primary cause of failure was the presence of a split head, which had reached an advanced stage of development prior to its complete fracture under this train. Secondary lines of rupture were developed at the time of derailment, the latter separating the metal of the web and the base at a considerable number of places.

The fracture of the rail occurred at its receiving end. The splice bars held the fragments at the extreme end in place, beyond which the fracture of the rail was complete. The section fractured was 11 ft. long, of which 8 ft. showed the presence of a seam in the head. The shape of the fragments, in cross section, indicated that the origin of the split was in the upper part of the head, a short distance below the running surface. Individual fragments indicated that the split had been a progressive one, extending downward toward the web, and traveling lengthwise the rail from some definite although unidentified starting point.

A polished and etched cross section of the rail displayed markings characteristic of seamy steel. Such seaminess is recognized as a common cause, leading to incipient separation of the metal, and eventually resulting in split heads and certain base fractures. Interior seams, as well as surface defects, are of more serious import in hard steels than in mild grades of metal. The conditions of service have much to do in defining what constitutes a serious defect in the metal, the need of structural soundness increasing as the stresses in the rails increase in magnitude and in the number of times the loads are repeated. The relations between structural defects and the grade of steel increase in importance as harder steels are used.

As it is supposed that the period in the process of steel making during which streaks have their origin is confined to the ingot, their elimination, partial or complete, is a metallurgical problem. Whatever difficulties interpose, streaks of this kind should not find their way into finished rails in greater degree than the state of the art renders unavoidable.

Rails in the track in which split heads are in process of development admit of recognition only at a late period. A general increase in the width of the head is one of the indications of a split head. The width of opening of an interior seam is closely represented by the gain in width of the head. The depth of the seam is many times its width. The head may be far advanced toward separation when its increase in width is first noticed. The formation of a fin along the edge of the head, from the lateral flow of the metal at the immediate surface, will not be mistaken for evidence of a

plit head, the general width of the head remaining unhanged. Other indications of split-head fractures consist of slight depression along the middle of the top of the head, r the presence of a dark streak at that place, also local sags n the head, as seen from the side of the rail.

On the rail which fractured there was a dark streak along he middle of the running surface about 0.60 in. in width. The general increase in the width of the head was 0.13 in. Unruptured metal, about 1-16 in. in depth, between the running surface and the seam appeared to have existed prior to ne time of derailment.

In the investigation of rail failures it is essential to inuire into conditions associated with those which have led o specific failures. During the present examination supplementary data were acquired upon the state of internal strains nd stresses which affect rails and which must be taken into onsideration in judging of the total stresses which rails are eing called upon to endure while in the track. These initial trains, markedly pronounced in steel in the form of rails nder current methods of fabrication, are to all appearances ust as real as the direct strains which attend the passage of locomotive over the rails. The total stress in the steel is ne sum of these strains which include the cooling strains of abrication, the cold rolling strains in the head resulting from uccessive wheel pressures on the running surface, and the irect bending loads which are present when the locomotive nd train are supported by the rail. The magnitude of the tress is the algebraic sum of these several components, since ne direct loads of the equipment cause reversed stresses of ension and compression, according to the position of the heels, with reference to any given place on the rail.

The state of the initial strains in the present rail was scertained, in a section taken from the receiving end just eyond the last fracture made at the time of the derailment, lso in a section from the leaning end of the rail, each section being examined in the condition it was left by the derailment. A duplicate section was taken from the receiving nd, which was annealed before its examination. In addiion, pieces of new rails were examined for the purpose of scertaining the primitive strains acquired during fabrication, hose resulting from accelerated and from retarded rates of ooling, the residual strains after annealing, also measuring he modified strains in sections which had been gagged. A ew observations were made, illustrating the manner in which xposure of the base of the rail to heat affects the head, the xpansion of the base by rapid heating, momentarily causing ontraction of the upper elements of the head.

Referring to the rail which caused the present derailment, here was a maximum stress of compression of 11,100 lb. er sq. in. at the top of the head. The sides of the head nd the web were each in a state of compression. The edges f the flanges were in a state of tension, an unusual circumtance which requires explanation, since the flanges are also xpected to be in compression when normal cooling strains of abrication alone are present.

At the time of derailment the receiving end of this rail was ubjected to bending stresses of unusual degree. Pieces were roken off in succession by the hammering of the wheels of he train after an opening had been made in the track. In onsequence of this the overhanging end was bent downward, verstraining the rail and resulting in the reversal of the trains in the flanges from a primitive state of compression to final state of tension.

The stresses which were present in the section taken from he leaving end of the rail were more nearly normal to rails vhich have been exposed only to usual track conditions. It s believed, however, that this portion of the rail was subected to an unusual load at the time of derailment, but of esser degree than the receiving end. The third section from he fractured rail was annealed. The initial strains throughout were of moderate degree, showing a decided reduction below those witnessed in the other two sections and below those generally in rails of similar dimensions and weight. The effect of annealing is to efface initial strains, the magnitude of the primitive strains and the annealing temperatures being factors which influence the results.

Observations were continued upon a series of seven sections of 85-lb. rails, of the type known as the Dudley section, having rather thin flanges. New rails were used in which the strains were measured due to cooling under normal conditions, those resulting from an accelerated rate of cooling, and those from a retarded rate of cooling, also strains which remained in the rail after annealing and the strains as they were modified by the operation of gagging.

The section which represented the normal rate of cooling was taken from the end of a rail which cooled in the usual manner on the hot bed of the rail mill. The section of accelerated rate of cooling was cooled rapidly by a blast of air directed upon it by a hose, the air being applied immediately after the section came from the hot saw, and continued until the section was cool enough to handle. The section of retarded rate of cooling was buried in dry ashes, in company with two other sections, each taken immediately after hot sawing. The two additional sections were placed in the ashes in order that the increased volume of metal might aid in accomplishing a slow rate of cooling.

The gagged sections were taken from a rail which cooled normally on the hot bed.

Under the normal rate of cooling the stresses of compression in the flanges were found to be 16,800 and 18,300 lb. per sq. in., respectively, with a tensile stress of 4,800 lb. in the elements along the middle of the width of the base. Lower stresses prevailed in the head, the maximum compression there being 6,900 lb. per sq. in. The thinner metal of the flanges, permitting a more rapid rate of cooling, accounts for the difference in the initial strains in the head and the base. The total range in stresses in the base, those of tension plus those of compression, was 23,100 lb. per sq. in.

Under the conditions of accelerated cooling the initial strains were much increased, particularly in the thinner parts of the web and the base. The maximum compression in the flanges rose to 33,300 lb. per sq. in., with tension along the middle of the base of 19,200 lb. per sq. in. The total range in stresses in the base was therefore 52,500 lb. per sq. in. The metal at the middle of the web showed a compressive stress of 11,400 lb. Less pronounced effects were found in the metal of the head, each gaged length of which, however, showed higher results than in the normally cooled section.

The section of retarded rate of cooling showed moderate initial stresses along each of the elements examined, which did not materially differ in magnitude from those of the annealed section. The results upon this section furnish data concerning the period in the fabrication of the rail when the initial strains are acquired. It appears that initial strains are chiefly acquired during the period of cooling, succeeding the last pass in the rail mill. The reductions in the rolls, occurring at a time when the metal is plastic, do not appear accountable for the final strains which are in the rails. The difference in the rate of cooling of the thick and thin sections of the rail chiefly influences the results. Sections having thin flanges may be expected to display greater initial strains than those with heavier bases.

Steel is susceptible of acquiring initial strains by rapid cooling from higher temperatures, which slow cooling ameliorates. A state of complete repose, in which initial strains are entirely absent, is not practical to reach in rolled and forged shapes. The shape of a steel rail is one that readily acquires internal strains, which weight and dimensions of section modify.

With reference to the effects of gagging, initial strains of

tension or of compression may be introduced at will on one side or the other of a bar, according to the direction of the bending load. It follows that a modification of the initial strains in a rail may be effected in a similar manner by cold bending. The strains introduced during cooling admit of being disturbed and even reversed by gagging. The gagged sections were found to have strains present of diminished magnitude over those in the section of the rail which cooled normally. The operation of gagging, in so far as it related to these sections, was therefore an ameliorating process rather than one which increased the intensity of the strains in the surface metal of the rail.

Strains may be at least partially eliminated by annealing, effacing in part those which had been acquired, and also by slow cooling from the temperature of rolling they may in part be prevented from forming. While the steel is in its plastic state at rolling temperatures initial strains of substantial amount can hardly exist. The capacity for retaining initial strains is apparently controlled by the elastic limit of the steel. If the metal is allowed to cool after any of the passes in the blooming or rail mill it would then acquire initial strains. These earlier shapes have displayed initial strains when cold, but of lesser degree than witnessed in the finished rails.

A distinction must be made between the amount of extension or compression which may be given the rail by the process of gagging and the initial strains which result therefrom.

The capacity for initial strains is necessarily limited to the elastic limit of the metal—that is, the initial strains in an ordinary rail can hardly be greater than represented by two-thousandths of its length, the strain corresponding to an assumed elastic limit of 60,000 lb. per sq. in., whereas the total extension or compression from gagging may be any reasonable amount—several times the amount of the initial strain which results therefrom. In respect to the amount of extension or compression given the rail, gagging is not the same as peining the surface, nor the same as the cold rolling effects of wheel pressures; each have their own characteristics.

The normal stresses which affect rails—that is, the direct bending stresses from wheel loads—cause unit stresses considerably higher than engineering practice prescribes for use in permanent structures, and to these direct stresses the initial strains must be added to show the total strains and stresses in the rails. Initial strains have not generally been given due consideration. They have not even been measured in many instances. The present determinations and those of earlier reports show the initial strains to be of magnitude approaching or even exceeding at times the direct bending stresses of the train loads.

In both of the gagged rails the permanent sets in the head were greater than those of the base. This result occurred regardless of whether the sets were of extension or compression.

The longitudinal effects of gagging are greatest in the outside fibers of the rail. The interior fibers are strained in a lesser degree than those at the top of the head, or along the lower surface of the base. While any straining beyond the elastic limit of the steel may be considered as having a detrimental tendency, and if long continued would eventually end in rupture, nevertheless the overstraining of rails for the purpose of straightening them, by loads once applied, and of a magnitude causing permanent extension amounting to only one-tenth of 1 per cent, should not seriously affect a grade of steel which is suitable for rails. In a crosswise direction the effect of the plunger of the gagging press, according to the testimony of those in position to make frequent observations, does not cause material visible deformation.

A general summary of the results of the measured strains which were found in the several sections is shown in Table No. 1:

TABLE NO. 1—INITIAL STRAINS IN STEEL RAILS

(Stresses in pounds per square inch, corresponding to measured strains. Compressive stresses in ordinary-faced type. Tensile stresses in heavy-faced type.)

Description	Head			Base			
	Side	Top	Side	Web	Middle of Flange width		Flange
90-lb. rail, Western Maryland:							
Fractured end	7,200	11,100	6,900	2,700	**2,100**	**3,900**	**2,400**
Leaving end	3,300	15,600	**1,500**	**600**	15,600	**6,900**	8,700
Fractured end, annealed	1,500	3,300	1,200	**900**	900	300	3,300
85-lb. rail, new:							
Normal cooling	4,500	6,900	5,100	**1,800**	16,800	**4,800**	18,300
Accelerated cooling	8,400	7,200	8,100	11,400	33,300	**19,200**	31,800
Retarded cooling	3,300	1,500	2,100	**1,800**	300	3,600	300
Annealed	1,500	3,900	1,200	**600**	2,400	4,200	1,200
Gagged on head	5,700	**3,600**	5,400	600	9,900	**1,200**	9,600
Gagged on base	**3,000**	6,900	**3,600**	10,500	8,400	**3,600**	6,000
Gagged on base, then on head	8,400	**6,000**	8,400	**4,800**	**1,200**	....	1,200

EFFICIENCY TESTS ON THE PENNSYLVANIA PART II

The function of an inspector of train service is to see and note any and every feature of train work which may come within the range of his observation; and, if he is to make himself of the utmost usefulness to his superior he will, of course, make note of all operations, regardless of their magnitude, and will never decide that a given act or course of action should go unnoticed because it is small. This is the explanation of the "miscellaneous" list given herewith. The article published last week gave the lists of the more formal efficiency tests; and, with the table now given, the reader has the whole program, the formal and the informal. Following the list are two sketches prepared by two of the men who perform inspection service on the Schuylkill division:

MISCELLANEOUS EFFICIENCY OBSERVATIONS; PENNSYLVANIA RAILROAD, SCHUYLKILL DIVISION

1. Use of intoxicants.
2. Use of tobacco.
3. Conduct of newsboys, etc., on trains.
4. Use of reliable watches.
5. Proper use of engine bell.
6. Placing torpedoes where persons are not liable to be injured.
7. Inferior trains properly clearing superior trains.
8. Movement through sidings used by trains in both directions.
9. Trains using caution in passing trains receiving or discharging passengers.
10. Heat, light and ventilation of passenger cars.
11. Fire protection.
12. Lights in block stations properly shaded.
13. Unauthorized persons in block stations.
14. Trains stopping and ascertaining condition of block ahead for which there is no block signal, unless proper signal be given by signalman.
15. Reporting clear of block between block stations.
16. When stopped by block signal, conductor and engineman immediately ascertaining cause.
17. Operation of levers and appliances by authorized persons only.
18. Signal levers in normal position.
19. Aisles in passenger cars free from hand baggage.
20. Employees reporting for duty on time.
21. Clocks adjusted to show correct time.
22. Train employees making station and train announcements.
23. Proper percentage of cars with operative air brakes in trains.
24. Adherence to regulations as to eye glasses.

25. Train employees taking proper precaution to prevent personal injury.
26. Hand brakes set on cars left standing.
27. Cutting loose from train when taking coal and water.
28. Baggage agents noting condition of baggage.
29. Brakemen in proper position.
30. Sanitary conditions.
31. Yards in clean condition and free from obstacles.
32. Bridge guards in proper positions.
33. Baggage masters and agents; rough handling of baggage.
34. Conductors and enginemen showing train orders to brakemen and firemen.
35. Derailers and throw-off switches.
36. Enginemen's observance of stop signals.
37. Men having current time table with general order inserts and up to date.
38. Cutting trains at road crossings.
39. Lading stored to prevent shifting and rolling against doors.
40. Men wearing uniforms neat and clean.
41. Promptness of station employees on arrival of trains.
42. Condition of track for high speed.
43. Tail gates in proper position on passenger trains.
44. Vestibule trap doors properly closed.
45. Black smoke.
46. Men turning turntable by air carefully.
47. Uncoupling air hose when cutting cars.
48. Firemen top dressing coal on tender to prevent it from rolling off.
49. Conductors noting if flagman goes back.
50. Track foremen properly flagging when track is broken.
51. Whistle posts; enginemen whistling for road crossings.

XPERIENCES OF AN INSPECTOR ON THE SCHUYLKILL DIVISION

By Ira I. Strebig

After serving 39 years in the train service, 28 years of hich was in the capacity of passenger train conductor, I as assigned on January 1, 1911, to my present position as nspector of passenger train service.

My instructions were to look after the efficiency of the ersonnel; efficiency tests had been made for a number of ears previously, but at this time had developed so as to war- nt the undivided attention of one man supplemented by ie attention given by the division officials in their routine uties.

I had, of course, a wide acquaintance on the division, and had the good-will of the older employees; but some of the ounger element called me the "gum-shoe man." They had ie impression, which often prevails under circumstances of iat kind, that I had been appointed to put up jobs on them nd impose some new brand of discipline. Their view was, o doubt, that this discipline might have in it a large element f injustice.

I began by doing what might be called missionary work. circulated among the men and instructed them on the book f rules and on instructions in the time table, at the same time elling them what the company expected of them. Of course, went over a good deal of ground which was already familiar the men; but the time was not wasted; groundless fears ere removed and the men soon found out that there was ot the slightest danger that they were going to be imposed pon.

In particular, I impressed on them that it was my duty nd my aim to assist them, in every way possible, in the nowledge of the things necessary to enable them to perform ieir individual duty to the Pennsylvania Railroad. To hound" a man or try to get him into trouble was the farthest ossible from the thoughts of the officers of the road, and, of course, from my own purpose; and I reiterated this point until the true situation was understood.

This course has been signally successful; in fact it may be said that the heart-to-heart talks, hundreds of them, with the men in the manner here indicated, have been the chief element in bringing the efficiency of the men on this division up to the high standard which has now been attained.

In other words the making of tests to see whether or not the men comply with the rules, is in the nature of a review lesson; the real lesson, the effective instructions, is embodied in the talks which have been held with the men prior to tests or examination or without regard to such tests.

I am personally proud of the present efficiency of the train service on this division; not proud of my own doings, which are simply as here outlined, but proud of the things that the men have accomplished. Our success has been due to the elimination of carelessness and indifference and to the weeding out of derelicts and the mind poisoner; more than twenty years ago we had very vigorously throttled the use of intoxicants and have kept it under control. Another important element is the care with which men are selected for employment. The company sets a high standard, and the employing officers constantly do their best to adhere to the standard.

For the past year I have not had a fixed signal failure; and in the past five years and four months I have had but two failures of enginemen passing fixed signal in stop position. These were two tests made at a time when there was a driving snow, and one engineman ran 900 ft. past a block signal and another 33 ft. past the signal.

During the year I put up 369 signal tests on 85 enginemen on the Schuylkill division without any failure.

It is my duty to test the men systematically, and I endeavor to get five or six signal tests on each engineman per year. The main thing, however, is not the number of tests, it is the certainty that tests will be made, the knowledge among the men that the testing is carried on all the time and under a systematic plan.

The majority of our enginemen encourage the tests. They realize that the system tends to keep them alert at all times. Only last week an engineman came to me and asked me when I was going to test him, he not being aware that he had been subjected to several tests quite recently. He was much surprised when I told him this. He said that he did not care how many tests I put up on him. I have many responses like this. Of course, the last thing that a careful inspector would do would be to allow this attitude of the runners to cause any relaxation of his vigilance. I may make a test tomorrow on one of the most reliable enginemen, and may find that he fails. That queer thing, the "human equation," so called, is a thing which will never get beyond the need of being watched.

The efficiency tests, as I have observed them on my own division, also on other divisions, constitute, it seems to me, one of the most valuable assets of the Pennsylvania Railroad; although in large measure an intangible asset. To keep all of the men who are employed in the train service on the alert at all times, and by means which do not irritate the men or put any additional burden on their minds or nerves is a great thing. We have not attained perfection, but the ideal is kept constantly in view. I recall some years ago, a record of loss and damage due to carelessness, neglect of duty and indefinable inefficiencies due to many causes, which showed total losses on the division of a large amount in one year; and I compare this with the record for the year 1915 when these losses and damage amounted to only ten per cent of the former.

The company itself has, of course, made constant improvements which are to be credited with a part of this result; but the men themselves, with true devotion to the company's interest, have co-operated in all movements looking to the desired end.

We try constantly to keep in mind that the company's in-

terests and the employees' interests are in most things the same; and this is an important element with the man who seeks promotion or wishes to make himself more efficient in every way. We try to cultivate the spirit of "get together," to remember the golden rule.

On Friday evening (May 26), I was walking between stations when on reaching a point about 1,800 ft. east of a station, I noticed an extra train (engine and cabin) leaving its initial station. I had in my hand a 6-in. electric pocket lamp with 7/8-in. reflector. As the train was approaching I swung the electric pocket lamp on the engineman to stop. He answered me with two blasts of the whistle and came to a stop where I was standing, inquiring what was wrong. On seeing who I was, and being advised to proceed, he went on his way with a smile, after being told that he was alert and on the job.

EFFICIENCY TESTING ON THE SCHUYLKILL DIVISION

By J. D. Klingman
Traveling Engineman

The "efficiency test" is now a regular and an essential factor in our education of men in the train service to a strict observance of the rules. With these tests kept up with sufficient frequency the men of all classes are more vigilant and more careful; and, of course, they render better service. The men in engine service unconsciously form the habit of a strict observance of signal indications, and the tendency to take a chance on a caution or an imperfectly displayed signal is almost entirely eliminated. Our men invariably regard a signal failure as an efficiency test.

These tests are not only useful for the safety of train operation, but are an economic asset also. The observation tests reduce the damage to cars; and the losses on freight in transit have been very materially reduced.

About a year ago one of the leading railway labor journals published an article dwelling at considerable length on the great nervous strain that men in engine service were subjected to by the surprise test, as it was then called. Any one who has had an opportunity for close observation knows that this claim is unfounded. During the past six years, while riding locomotives in all classes of service, I have observed closely the performance of enginemen when efficiency tests were being made, and in no single instance has any one shown any signs of nervous strain because of a test. There is rather a feeling of satisfaction at being able to show that they are too alert to be caught by a test.

There has been quite a change of sentiment since the inauguration of the efficiency tests on our division. Men who at first were inclined to regard them as a new hardship now appreciate their value. In the past year I have had an expression of opinion from nearly all of our enginemen and I find that almost without exception they consider the efficiency test a benefit to all concerned. One engineman who spoke most highly of this test had been disciplined (on another division) a few years ago by a suspension of thirty days for overrunning a signal placed in the stop position as an efficiency test.

Possibly a good share of the success on the Schuylkill division is due to the fortunate selection of a man well qualified to perform the duties of an efficiency inspector—a man whom all regard as fair. This man [Mr. Strebig] has been in this position five years and he is always grieved by any man's failure.

We keep a record of all enginemen and firemen with whom we ride, first, by the use of the prescribed efficiency report of the motive power department covering the various duties in engine service. Next, in addition to this we carry a pocket ledger containing a key of 38 important items to be observed in service, and a miscellaneous list of 50 items covering almost every phase of train service operation. We also have the regular tests made by the efficiency inspector, such as home signal at stop, fusee, torpedo, light out, distant signal at caution, etc.

One of the most difficult tests to make is the checking of the important duty of enginemen and firemen to call the indications of fixed signals. Everybody assumes that this duty will be performed faithfully wherever a man in authority is riding on the locomotive, so we can only judge the runner by his general efficiency. I need not say that failure to call signals has contributed to numerous disastrous railroad wrecks.

There seems to be a prevailing opinion that enginemen are more likely to overlook signal indications at night than in daylight. One writer says it is a difficult matter to have men in the cab co-operate when running high-speed trains at 3 a. m., especially in fog. It has been my observation that our men are as vigilant at 3 a. m. as at 3 p. m., and we have been able to find very few failures to properly observe signal indications at night. A short time ago while I was riding on one of our engines at night, the engineman observed an imperfectly displayed signal due to the top light being out. The day aspect was plainly visible, but the engineman acted promptly and stopped as Rule 27 in such a case requires. He was taking no chance on an efficiency test. This is not an unusual occurrence. It is rather remarkable to notice the certainty with which enginemen detect the absence of a switch signal at night, often on the adjacent tracks and not affecting in any way the conditions on the track on which they are running.

This vigilance shows the result of efficient training. It is the neglect of small things that leads to difficulties in greater matters. As long as the safety of train operation depends so largely on the human element, it would seem that more and better efficiency testing would be a benefit to all concerned—to the railroads in the prevention of costly wrecks and to employees in the cultivation of correct and the abandonment of careless habits.

German Railway "Imperialization."—There would seem to be the beginnings of a very pretty little squabble between Prussia and other German states in regard to the administration of the railways. For years Prussia has tried hard to secure the realization of Bismarck's dream of an Imperial German State Railway system, but as the other states have realized that this would mean the extension of Prussian predominance, they have refused to fall into line. As a result, the only Imperial railways in the German Empire are those in Alsace-Lorraine, and the only state which has allowed its railways to come under the direct control of Prussia is the unimportant one of Hesse, whose lines form a section of the system officially known as the Prussian-Hessian Railway Administration. At the beginning of the war, the various German states which control individual railway systems, such as Bavaria and Wurtemberg, agreed to the "Imperialization" of all the railways within the Empire as a war-time measure, but made it clear that the concession was only of a temporary nature to meet emergency conditions. Now Prussia has proposed that this "Imperialization" shall be placed on a permanent basis. But war has not lessened the jealousy of Prussia felt by the smaller states, and Wurtemberg has lost no time in vetoing the scheme, pointing out that the existing conditions are only for the duration of the war. There can be no doubt that Bavaria, also Saxony and the Palatinate will make a similar refusal, but that will probably not deter Berlin from repeating the proposal. And a repetition may well cause friction.—*Railway Gazette, London.*

A New Type of Concrete Coaling Station

Structures of Cylindrical Section Constructed for the Frisco at West Tulsa, Okla., and Willow Springs Mo.

NEW coaling stations were completed recently for the St. Louis & San Francisco at West Tulsa, Okla. and Willow Springs, Mo., which were given the form of cylindrical towers, similar in some respects to a certain type of reinforced concrete water tower. In adopting this design all precedents for coaling stations in timber and steel have been disregarded, the design being based solely upon a consideration of the conditions imposed and the characteristics of the material used. The result has been a structure of simple though pleasing outline, in which the structural requirements are fulfilled in an economical manner. The West Tulsa station has a capacity of 300 tons and the Willow Springs station a capacity of 250 tons. The former is described in detail below.

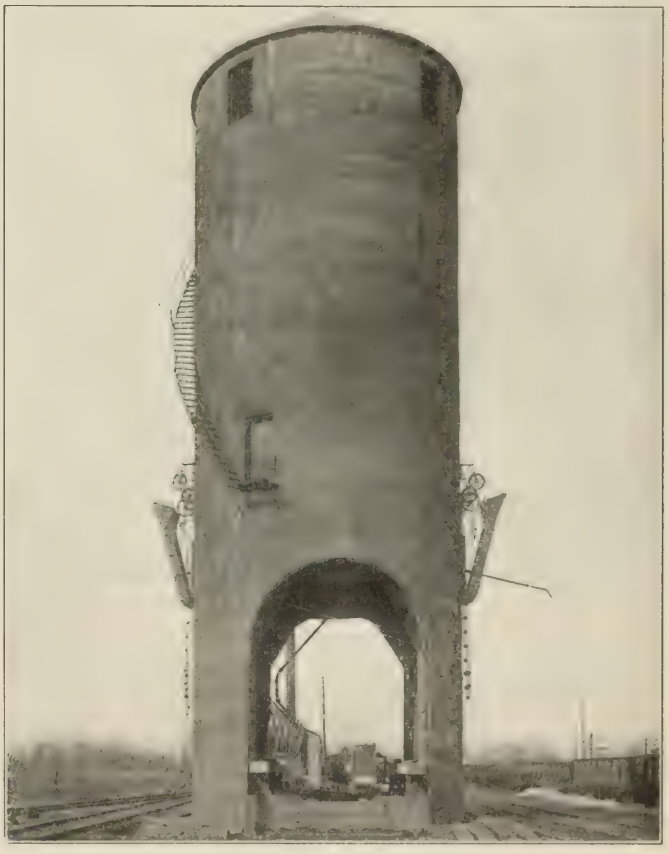


Side View Showing Engine House, Coaling Apron and Ladder

The structure is essentially a cylindrical tower with a uniform shell thickness of 9 in. and an outside diameter of 23 ft. The height is 89 ft. from the slab of concrete which serves as a footing to the flat conical roof. The upper 29 ft. 6 in. of the cylinder serves as the sides of the bin; the remaining portion acts as the bearing wall to transmit the load to the footing. Incidentally, the portion of the shaft between the bottom of the bin and the track level serves as a shelter for the coal cars while they are discharging coal into the track hopper, which occupies the portion of the concrete cylinder below the ground surface. Openings of sufficient size to permit the entrance of a car had to be cut into the shell on opposite sides, and hoods of thin reinforced concrete are provided outside these openings to supplement the shelter afforded by the tower barrel. The engine for operating the coal-handling machinery occupies a small lean-to, also of concrete, built against the side of the tower. The sand drying plant and boilers occupy a separate reinforced concrete building.

The storage bin has a cylindrical section 29 ft. 6 in. deep, with walls 9 in. in thickness, and a conical bottom 6½ in. thick, with a pitch of 10 in. vertical to 12 in. horizontal. The cylindrical portion is reinforced by ½-in. square bars placed in the form of hoops at various spacings, depending upon the distance from the bottom of the bin. They are secured in position by means of ½-in. vertical bars spaced 2 ft. apart circumferentially.

Special pains were taken in the design of the bottom, which is reinforced with bars placed in both circumferential and radial positions, the radial bars being attached at their outer ends to a structural steel ring located at the junction of the bottom shell with the cylindrical shell. This ring consists of a 9-in. 34.7-lb. ship channel. The apex of the conical bottom has a hole 35 in. in diameter for the discharge of the coal. This hole is armored by a structural steel collar, from which ten ⅞-in. radial rods extend out into the concrete shell in the form of a spider.



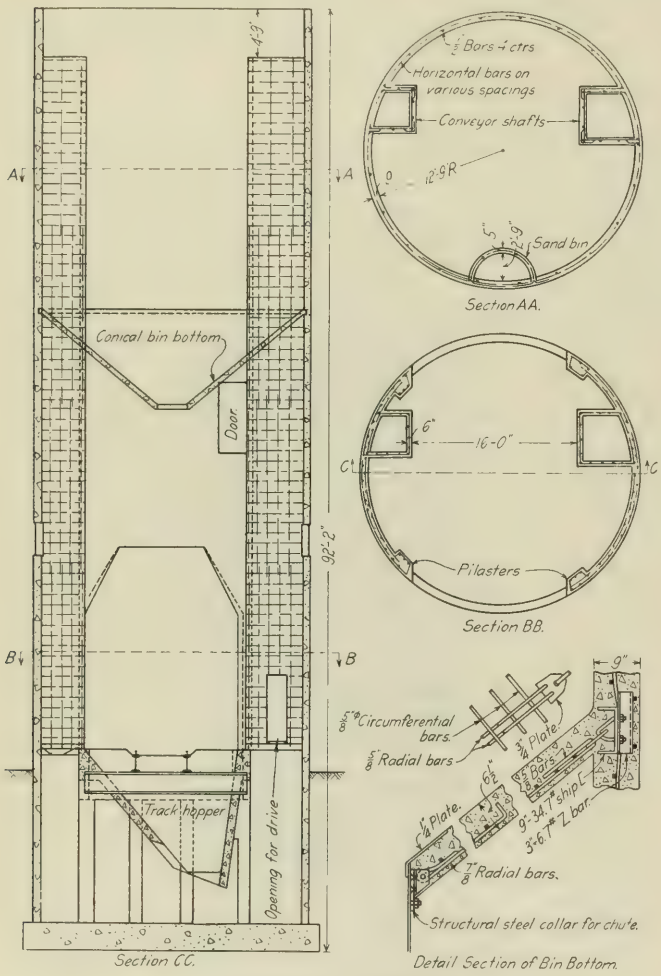
End View of the Station

In addition to the coal space, the bin contains three small separate compartments extending the full height of the bin. Two of these are of rectangular section with 6-in. walls and

serve as shafts for the vertical legs of the coal conveyor. The third small compartment serves as a sand bin and is semi-cylindrical in section, having an interior radius of 2 ft. 9 in. and 5-in. walls.

The shell of the cylinder below the level of the storage bin is of the same thickness as in the bin, but it is reinforced on the inside by a number of pilasters, one being provided on each side of each of the car openings.

The track hopper, which occupies the bottom of the cylinder, is also of reinforced concrete in the form of an inverted pyramid, with 9-in. walls, and is supported from the sides of the barrel in a manner similar to that used in the conical bottom of the storage bin. A number of auxiliary columns and pilasters are provided for the support of the hopper and the track load. The rails of the track are carried on 20-in. 72-lb. Bethlehem I-beams, which are given an intermediate support on a cross girder consisting of a 26-in. 160-lb. Bethlehem I-beam.



Structural Details

The footing consists of a slab of concrete 36 ft. long, 29 ft. wide and 2 ft. 6 in. thick. It is reinforced to distribute the loading over the full area of the slab. The roof consists of a thin shell of concrete placed on No. 24 self-centering, manufactured by the General Fire Proofing Company, which is supported upon eight rafters consisting of 8-in. 11¼-lb. channels, supported on the wall and coming to a common point at the apex of the roof. The roof is protected by three-ply Johns-Manville built up absetos roofing. The hoods extending out from the two car openings are composed of thin concrete on self-centering, supported on a light structural steel frame. Similar construction is used for the roof of the engine room.

Mechanical Equipment

The equipment for hoisting coal consists of two strands of Fairbanks, Morse S. R. 1 steel roller chains carrying 24-in. by 30-in. V-type buckets, spaced 64 in. apart. The chain is driven by a 25-hp. 10-in. by 12-in. vertical steam engine through a ¾-in. Jupiter steel transmission rope. The coal is fed from the track hopper into the elevator chain buckets by means of a Fairbanks, Morse beeded flight feeder 24 in. wide with 3/16-in. flights, on two strands of S. R. 4 steel roller chains, this flight feeder being operated by chain belting from the foot shaft of the main elevator. Hooded aprons are provided for coaling engines on tracks passing by both sides of the station. These aprons are fed by chutes running each way from the opening in the bottom of the storage pocket. They are 3 ft. wide, 2 ft. 5 in. deep and are provided with vertical gates.

The sand drier occupies a separate building, 76 ft. 10 in. long by 12 ft. 6 in. wide. One end of this is occupied by a boiler, the rest of the building being occupied by the sand drying room and storage bins for both wet and dry sands.

The steam drier consists of a rectangular structural steel box 7 ft. 4 in. long by 2 ft. 7 in. wide, containing a coil of steam pipes placed horizontally with a spacing between the pipes such that wet sand is readily retained above the pipes while dry sand will sift between them. The sand is passed from the drier to a receiving drum, 36 in. in diameter and 60 in. long, equipped with a self-closing hopper at the top, and the sand is transmitted from the drum to the storage bin in the coaling station by compressed air, through a 4-in. standard black pipe with long radius bends of hard cast iron. Air is supplied to the drum through a 1¼-in. pipe from a 9½ in. by 9½ in. Westinghouse air compressor. The locomotive feed pipes from the storage bin are of 3-in. standard wrought pipe with malleable fittings and are provided with self-closing weather proof valves. The sand outlet fixtures are made of 20-in. galvanized steel, telescopic and counterweighted.

These stations were designed and built by Fairbanks, Morse & Company, Chicago, under the direction of F. G. Jonah, chief engineer, and R. C. Stephens, architect, of the St. Louis & San Francisco.

Spanish Railway Purchase.—The Andalusian Railway has purchased the greater part of the shares of the Southern Railway and has undertaken the administration of the latter. It is not known whether the two companies will be amalgamated.

Russian Manganese.—Manganese ore is being produced in the Gaisinsk district, in the province of Podolia, near Hosheratovo. The natural supply, a pyrolusite, is considered large. The distance of the source of supply from Odessa by railway is 221 miles.

The Russian Bath Trains.—The chief committee of the Department of Ways of Communication has prepared a statement of the work of the four bath trains working at the front since the beginning of the war. The most extensive work was done during the cold winter months, when the need for baths was particularly felt. During that period about 850,000 soldiers washed themselves, making an average wash of about 2,585 per day. These soldiers received a change of clean linen in exchange for their dirty clothes, which were washed in the bath trains, and were given tea and bread, biscuits, sugar, etc., besides various gifts on fête days. In the current year, in the make-up of the bath trains, a special car will be provided for washing soldiers suffering from itch. The bath trains are playing a great part in the prevention of infectious diseases at the front. A description of one of these trains appeared in the *Railway Age Gazette* of February 26, 1915, page 378.

Conferences On Railway Wage Controversy

Over Fifty Executive Officers in Session at Washington in Conference With President on Plan to Avert Strike

OVER 50 of the leading railway executives of the United States, including chairmen, presidents and vice-presidents, representing practically all of the large railway systems of the country, as well as many of the smaller ones, have been in Washington for nearly a week conferring with Presidnt Wilson on a plan which he has proposed for the settlement of the wage controversy between the railways and their train service employees.

The President has recommended the concession by the railways of the eight-hour basic day—that is, the substitution of an eight-hour basic day for the present ten-hour basic day in all the existing schedules. He has also recommended that the demand for extra pay for overtime made by the employees and the contingent proposals of the railways be postponed pending an investigation by a special commission.

The plan has been accepted by the committee representing the brotherhoods of train employees, who had voted to strike unless a satisfactory settlement were reached on their demands, but was rejected by the National Conference Committee of the Railways. The railway executives, who were summoned to Washington by the President on August 17, after the plan had been rejected by the managers' committee, have declined to overrule the latter, stating that the conference committee had full authority to represent the roads, and have persisted in demanding that the entire controversy be submitted to arbitration, in accordance with the proposals originally made by the conference committee at the conclusion of the conference in New York on June 15.

The President has taken the position that "the eight-hour day has the sanction of the judgment of society in its favor and should be adopted as a basis for wages where the actual work to be done cannot be completed in eight hours," and that no other means of settlement is available to meet the national emergency created by the threat of the employees to strike. After several meetings with the President the railway executives appointed a sub-committee to study the entire situation but as we go to press the deadlock still continues and it is impossible to predict the result.

President Wilson's conferences with the National Conference Committee of the Railways and the officers of the four brotherhoods began, August 14, as reported last week.

On Thursday, August 17, after the conference committee had notified the President that it could not accept his plan, the President sent a telegram to a number of presidents of the larger railways of the country asking them to come to Washington. The telegram said: "Discussion of the matters involved in the threatened railroad strike has reached a point which makes it highly desirable that I should personally confer with you at the earliest possible moment, and with the presidents of any other railways affected who may be immediately accessible. Hope you can make it convenient to come to Washington at once."

In response to this telegram a party of 19 railway chairmen, presidents and vice-presidents left New York on a special train at 4:00 p. m., arriving in Washington in the evening and a number of others from the south and west arrived on the following day.

During the afternoon the President outlined his plan to the full committee of over 600 general chairmen representing the brotherhoods, whom he had sent for on Tuesday, after being informed that the officers and sub-committee of 30 whom he met on Monday did not have full authority. The brotherhood committee gave no definite answer, pending a meeting among themselves.

On Thursday evening the railway executives held a meeting with the National Conference Committee at the New Willard Hotel to discuss the situation and on Friday morning, after a conference with the western and southern executives who had just arrived, the entire party of about 30 called



Among the Railway Presidents First to Arrive in Washington.

From left to right: T. M. Schumacher, vice-president, El Paso & Southwestern; J. H. Young, president, Norfolk Southern; G. W. Stevens, president, Chesapeake & Ohio, Daniel Willard, president, Baltimore & Ohio; J. H. Carroll, general attorney, Chicago, Burlington & Quincy; Hale Holden, president, Chicago, Burlington & Quincy, and chairman of the delegation of railway presidents; M. J. Carpenter, president, Chicago, Terre Haute & Southeastern; R. H. Aishton, president, Chicago & North Western; James H. Hustis, president, Boston & Maine; W. J. Jackson, receiver, Chicago & Eastern Illinois; Frank Trumbull, chairman, Chesapeake & Ohio; L. E. Johnson, president, Norfolk & Western; W. H. Truesdale, president, Delaware, Lackawanna & Western.

on the President at the White House. The meeting was a brief one. The President explained his plan of settlement, stating that in his opinion the eight-hour day was not an "arbitrable question" and asking the roads to concede the demand for the eight-hour basic day, leaving the other questions for investigation. One of the arguments which he advanced was that the present situation would be liable to render more acute the danger of an agitation for government ownership, which he indicated he did not favor.

Hale Holden, president of the Chicago, Burlington & Quincy, acted as spokesman for the railway officers, giving a short general reply, and suggesting that a more specific reply be given at another meeting on the following day, after the matter had been more fully considered. He stated, however, that the Conference Committee had full authority and indicated also that the railways felt the entire controversy should be submitted to arbitration.

Meanwhile the brotherhood committee held meetings at the Bijou Theatre. In the afternoon their officers notified the President that they had voted to accept his plan.

On Saturday morning the railway executives, reinforced by several others who had just arrived, called on the President again to announce their definite conclusion, reached after a conference on Friday afternoon and evening.

While they were with the President the following statement was given out from the office of the President's secretary, outlining the proposed plan of settlement and the suggested course of future procedure:

President Wilson's Statement

"I have recommended the concession of the eight-hour day—that is, the substitution of an eight-hour day for the present ten-hour day in all the existing practices and agreements. I made this recommendation because I believed the concession right. The eight-hour day now undoubtedly has the sanction of the judgment of society in its favor and should be adopted as a basis for wages even where the actual work to be done cannot be completed within eight hours.

"Concerning the adjustments which should be made in justice to the railroads and their stockholders in the payments and privileges to which their men are now entitled (if such adjustments are necessary), there is a wide divergence of opinion. The railroads which have already adopted the eight-hour day do not seem to be at any serious disadvantage in respect to their cost of operation as compared with the railroads that have retained the ten-hour day, and calculations as to the cost of the change must, if made now, be made without regard to any possible administrative economies or readjustments. Only experience can make it certain what rearrangements would be fair and equitable either on behalf of the men or on behalf of the railroads. That experience would be a definite guide to the Interstate Commerce Commission, for example, in determining whether, as a consequence of the change, it would be necessary and right to authorize an increase of rates for the handling and carriage of freight (for passenger service is not affected).

"I, therefore, proposed that the demand for extra pay for overtime made by the men and the contingent proposals of the railroad authorities be postponed until facts shall have taken the place of calculation and forecast with regard to the effects of a change to the eight-hour day; that, in the meantime, while experience was developing the facts, I should seek and, if need be, obtain authority from the Congress to appoint a small body of impartial men to observe and thoroughly acquaint themselves with the results with a view to reporting to Congress at the earliest possible time the facts disclosed by their inquiries, but without recommendation of any kind; and that it should then be entirely open to either or both parties to the present controversy to give notice of a termination of the present agreements with a view to instituting inquiry into suggested readjustments of pay or practice. This seems to me a thoroughly practical and entirely fair programme, and I think that the public has the right to expect its acceptance."

Later in the day the railroads gave out the following statement giving the substance of Mr. Holden's statement to the President at the morning meeting:

Statement on Behalf of the Railways

"The representatives of the railroads here present have given careful consideration to the proposals submitted by you for an adjustment of the critical conditions confronting us. May we again express the grave sense of responsibility upon our shoulders to discharge, as faithful trustees of the public interest, the duty to maintain and operate these properties as agencies, efficient at all times—to serve the continuous public demand for transportation service—as faithful trustees also to protect, in so far as it is in our power, the interests of the owners of these properties committed to our charge.

"In the previous stages of these negotiations, the Conference Committee of Managers has consistently adhered to the policy of arbitration as a fundamental principle—it is essentially the common right of every citizen of whatever station in life, to be heard—to have his day in court—it is indeed a substitute for wasteful litigation recognized long since in the codes of all civilized countries.

"A denial of the right to be heard does not exist under any form of government with which our race has ever been familiar and the common acceptance in international affairs, in the adjustment of public and private rights under our federal and state governments, of the principle of arbitration as an approved method for the friendly settlement of the serious contentions of the parties, has put the right to claim arbitration as a method of settling such controversies beyond question. For these reasons, we have supported our committee in their continuous demand that in these important particulars upon which no agreement could be reached, arbitration should be accorded upon any reasonable basis that might be adopted.

"The eight-hour day—I shall not at this time stop to fully analyze or comment upon the importance of the difference between the eight-hour day as commonly understood in the building and manufacturing trades and the so-called eight-hour basic day demanded in this controversy—the eight-hour day is, in our mature judgment, *when considered in connection with railroad train service,* a question upon which honest minds may differ and is therefore necessarily a subject for arbitration. In that manner the contentions of the parties may be considered and a fair answer given.

"Social questions affecting the ordinary work day in which for six days a week a regular daily routine is pursued, are those which determine how long, during each of those periods, the laborer should work, and while in some states eight hours has been adopted as the desirable or compulsory maximum, this broad land is today teeming with the contented and efficient industry of millions of workers that are working more than eight hours a day. The precedent, therefore, exists; it exists in fact and the right or wrong of it, as we feel, has not yet, in this country, passed beyond the realm of debate.

"But those are not our problems. The railroad day is a different thing, as has been patiently, and I infer, many times explained. Railroad trains run throughout the twenty-four hour period—the public demands that they run on Sundays and holidays—they start at any hour that the necessities may demand—they cannot stop until a terminal is reached, and many conditions, stated and accidental, render it impossible to restrict the hours of railroad labor to a fixed standard.

"In a general movement of some years ago, the present ten-hour basic day was negotiated and approved by the representatives of the railroad labor throughout the country and has continued with some exceptions to the present day. These

exceptions have been worked out under local conditions, different often from the general conditions affecting the question.

"In several important arbitrations of railroad rates of pay and conditions of service within recent years—the last within two years involving 98 railroads serving the entire territory between Chicago and the Pacific Coast, the 10-hour basic day was incorporated in the demands of the organizations parties thereto and made the basis by them of the rates and rules awarded by the Federal Board.

"At the present time, in a controversy now pending over the identical questions involved here and in which numerous important railroads and a national organization of switchmen are parties, an arbitration through the friendly offices of the Federal Board of Mediation has been agreed to, wherein the question of an eight-hour basic day has been submitted as an arbitrable question.

"We stand for the principle of arbitration for the settlement of industrial disputes. Arbitration is the ideal toward which public sentiment and legislation of this country have been steadily tending for the settlement of disputes between employers and employees particularly in the case of public service corporations rather than the strike and the lockout with attendant disturbances and paralysis of public business. Arbitration has been provided by legislation both state and national. So late as 1913 the federal law was perfected or improved by amendments framed in conference with some of the railroad labor leaders now refusing to arbitrate, and includes in its scope all controversies in railroad service. We invoke that principle now and are willing for the Interstate Commerce Commission to arbitrate the whole question. More than that, we are willing for the President of the United States to appoint a commission of disinterested persons to arbitrate all matters in dispute if neither the Interstate Commerce Commission nor the machinery of the Newlands act is satisfactory to the labor leaders. But we have been met with a refusal to arbitrate in any manner, and are now asked to surrender the principle and to add an additional burden of many millions per annum to the cost of railroad transportation in this country for the benefit of a class who are among the most highly paid and favored workmen in the world. This is demanded under the guise of a plea for an eight-hour day. It is in reality only an indirect plea for an enormous increase in wages.

"The intricate and technical nature of the case and the complexity of the facts make the controversy pre-eminently one for arbitration by an impartial tribunal with authority to examine into every factor and reach a decision fair and just to the employees, the owners and the public which ultimately must bear the burden. To refuse to arbitrate is an admission of the unreasonableness of the demand. Moreover the refusal is by those demanding a vital change in an *existing status.* For a party to demand a change of such a status and accompany the demand with a refusal to arbitrate is in conflict with the right standards of conduct. In this instance, for those demanding a change to refuse to submit their demands to arbitration, is indefensible.

"To say that such a demand as that now presented for a revolutionary change in the arrangements that have grown up in the development of the railroad business and involving so many complicated facts and relations and such vast additions to the cost of the country's transportation is not arbitrable is to destroy the principle of arbitration and if successful would in our judgment tend immediately to discard all of the legisation, state and national, which has been enacted in recent years and set the country back to the old days of strikes, lockouts, public disorder and business anarchy for the settlement of questions inherent in the relations of employer and employee.

"The view that so important an issue as this may not in conscience be honestly debated and therefore arbitrated raises this question above and beyond the lesser contentions of hours of service or payment of wages—it raises it, in gravity, beyond the social or monetary questions affecting the parties before you because it tends to force, by the great weight of your spoken word, the railroads to surrender a right to be heard—a right expressly recognized by the policy of the federal legislation enacted for the purpose of adjusting these disputes and under the ban of your disapproval, expressed before the bar of public opinion, to accept as indisputable, conditions requiring, as we believe, an enormous sacrifice in efficiency of service and cost of operation of these properties. An adjustment in this manner will not stop with this controversy. It will be repeated in every industry wherein today industrial peace exists without controversy.

"It will, by the force of this high precedent, place in peril all that has been accomplished in the peaceful adjustment of labor controversies by methods of arbitration and therefore we present to you our respectful but earnest request that you do not lend the weight of your great influence against this right, which we claim, to be heard, but support the railroads in this crisis in the effort to maintain this great principle of arbitration."

Mr. Holden then explained that in accordance with past custom and the requirements of the situation, complete authority to conduct negotiations in behalf of the railroads in the present controversy had been conveyed to the Conference Committee of Managers. He further explained that the executives present had authority to speak only for the properties each represents. Telegrams were sent from the White House to other railroad executives of the country and the conference adjourned pending their arrival.

A large number of telegrams have been sent to the President from individuals and various associations from all parts of the country, many of them urging arbitration as a means of settlement and others simply urging the President to avert a strike. Among these was one from President George Pope of the National Association of Manufacturers.

"On behalf of 3,700 manufacturing organizations, employing 3,000,000 persons and utterly dependent on uninterrupted railroad service for their continued operation, I beg to express our deep appreciation of your efforts to prevent the threatened destructive stoppage of national railroad service and respectfully to urge that you will, with all the power of your great office and personality, assert and maintain the principle of arbitration for industrial disputes affecting national intercourse. No just demand can fear such a test. No unfair demand can or should survive it. We sincerely believe no man in our history has possessed such an opportunity to fortify this essential principle of public security against future attack by employer or employee."

On Sunday afternoon the White House gave out the following reply sent by the President:

"Allow me to acknowledge the receipt of your telegram of August 18, and to say in reply that I hold to the principle of arbitration with as clear a conviction and as firm a purpose as anyone, but that, unfortunately, there is no means now in existence by which arbitration can be secured. The existing means have been tried and have failed.

"This situation must never be allowed to arise again, but it has arisen. Some means must be found to prevent its recurrence, but no means can be found offhand or in a hurry or in season to meet the present national emergency.

"What I am proposing does not weaken or discredit the principle of arbitration. It strengthens it rather. It proposes that nothing be conceded except the eight-hour day, to which the whole economic movement of the time seems to point, and the immediate creation of an agency for determining all the arbitrable elements in this case in the light not of predictions or forecasts, but of established and ascertained facts. This is the first stage of the direct road to the discovery of the best permanent basis for arbitration when other means than those now available are supplied."

Governor James Withycombe of Oregon sent a telegram to

President Wilson, saying: "While the railroads are the property of the stockholders transportation service is the property of the public. Land grants and franchises were given with that implied understanding. The American people are committed to and believe in the principle of arbitration and the public welfare demands that this principle be preserved. Where differences between the railroad employees and the managers involve so serious an issue as transportation service to the public and cannot be mutually adjusted the public will and does insist on both sides submitting to arbitration."

Railway Executives in Washington

The railway executives who attended the meeting with the President on Saturday morning were:

R. H. Aishton, president, Chicago & North Western; W. W. Atterbury, vice-president, Pennsylvania; B. F. Bush, receiver, Missouri Pacific; M. J. Carpenter, president, Chicago, Terre Haute & Southeastern; A. T. Dice, president, Philadelphia & Reading; C. R. Gray, president, Western Maryland; S. M. Felton, president, Chicago Great Western; W. J. Harahan, president, Seaboard Air Line; Fairfax Harrison, president, Southern; Hale Holden, president, Chicago, Burlington & Quincy; C. W. Hotchkiss, chairman, Virginian; J. H. Hustis, president, Boston & Maine; W. J. Jackson, receiver, Chicago & Eastern Illinois; L. E. Johnson, president, Norfolk & Western; Julius Kruttschnitt, chairman, Southern Pacific; H. R. Kurrie, president, Chicago, Indianapolis & Louisville; J. L. Lancaster, vice-president, Texas & Pacific; L. F. Loree, president, Delaware & Hudson; R. S. Lovett, chairman, Union Pacific; C. H. Markham, president, Illinois Central; E. J. Pearson, vice-president, New York, New Haven & Hartford; Ralph Peters, president, Long Island; J. H. Peyton, president, Nashville, Chattanooga & St. Louis; M. W. Potter, president, Carolina, Clinchfield & Ohio; T. M. Schumacher, vice-president, El Paso & Southwestern; G. M. Shriver, vice-president, Baltimore & Ohio; A. H. Smith, president, New York Central; G. W. Stevens, president, Chesapeake & Ohio; W. H. Truesdale, president, Delaware, Lackawanna & Western; Frank Trumbull, chairman, Chesapeake & Ohio, and chairman Railway Executives' Advisory Committee; F. D. Underwood, president, Erie; Henry Walters, chairman, Atlantic Coast Line; Daniel Willard, president, Baltimore & Ohio, J. H. Young, president, Norfolk & Southern.

Since Sunday the following additional executives arrived in Washington: W. G. Besler, president, Central of New Jersey; J. M. Dickinson, receiver, Chicago, Rock Island & Pacific; W. M. Duncan, receiver, Wheeling & Lake Erie; L. W. Hill, chairman, Great Northern; E. F. Kearney, president, Wabash; E. T. Lamb, president, Atlanta, Birmingham & Atlantic; W. L. Mapother, vice-president, Louisville & Nashville; W. C. Nixon, receiver, St. Louis & San Francisco; E. Pennington, president, Minneapolis & St. Louis; E. P. Ripley, president, Atchison, Topeka & Santa Fe; C. E. Schaff, receiver, Missouri, Kansas & Texas; G. T. Slade, vice-president, Northern Pacific; W. B. Storey, vice-president, Atchison, Topeka & Santa Fe; R. H. Wilbur, president, Lehigh & New England; W. G. Bierd, president, Chicago & Alton; E. D. Sewall, vice-president, Chicago, Milwaukee and St. Paul; E. G. Buckland, president, Central New England; H. M. Biscoe, vice-president, Boston & Albany; M. C. Kennedy, president, Cumberland Valley; J. B. Kerr, president, New York, Ontario & Western; G. L. Peck, vice-president, Pennsylvania Lines; E. T. Stotesbury, chairman, Philadelphia & Reading; J. R. Kenly, president, Atlantic Coast Line.

Monday's Proceedings

At the request of the President the railway executives called at the White House again on Monday afternoon and the plan was again explained to the new arrivals. After this meeting the executives appointed a sub-committee to study the entire situation, consisting of Hale Holden, R. S. Lovett, Daniel Willard, W. W. Atterbury, A. H. Smith, Frank Trumbull, Fairfax Harrison, and E. P. Ripley.

On Monday evening Elisha Lee, chairman of the National Conference Committee issued a statement setting forth the objections to the abandonment of the principle of arbitration and explaining that the proposal of the President would not provide for a real eight-hour work day but merely an eight-hour basis for the payment of wages. The statement said:

"That the railroads should grant, under threat of a national strike, a $50,000,000 wage preferment to a small minority of their employees, without a hearing before a public tribunal, is inconceivable in a democracy like ours. All questions at issue—wages, hours, costs, operating conditions—these are submerged by the greater issue. Shall arbitration be abandoned in the settlement of industrial disputes?

"A nation-wide strike is unthinkable when the railroads are urging that all the matters in dispute be placed before any tribunal constituted by public authority.

"A simple illustration will suffice to show how the eight-hour basis of pay would work out. Take, for example, a freight employee paid 5 cents a mile with a day's guarantee of $5 for 100 miles or ten hours or less.

"It is proposed to make this guarantee the same for eight hours or less. On a freight run of say, only 60 miles in ten hours, he earns $5 for his time. It is now proposed that for this work he be paid $5 for the first eight hours and $1.25 for the other two hours, a total of $6.25, increasing his pay 25 per cent.

"If, by reason of traffic delays, he is held idle on a sidetrack, so that he does not complete his trip until the end of 12 hours, he now is paid $6 for his time, no matter how little work he performs. The demand is to pay him $7.50 for this 12-hour service.

"Meanwhile the employees would continue to have the same opportunities as now to make still larger pay on the mileage basis. For example, the man on a 5-cent-a-mile rate, making, say, 150 miles in only 7 hours, earns $7.50 for his day's work. If after this he is called for a short period of emergency work, say, only two hours, he gets another full day's guarantee of $5, making $12.50, in this example, for only 9 hours' service.

"Many other schedule provisions increase the wages of these well paid men without increase in their hours of service. It is because of these opportunities to take pay under mileage or arbitrary rule that their yearly earnings are so far beyond those of other workers charged with no less responsible duties."

On Tuesday the railways gave out a number of telegrams out of the hundreds which were received by the various railway officers from commercial organizations, business men, shippers, farmers and various large employers, some of which were copies of telegrams sent to the President urging that the principle of arbitration be not abandoned. Many of them said they would prefer a strike to the abandonment of the principle that such controversies should be settled by arbitration.

Many of the telegrams protested against the idea of the shippers being possibly required to pay increased rates to meet the expense of such a settlement as that proposed, and many of them urged the railroads to stand firm in the position they had taken.

Approximately 100,000 signatures to a petition on behalf of the unorganized railway employees urging the President to avert a strike have been filed at the White House by R. T. Frazier, Jr., of the Nashville, Chattanooga & St. Louis, and others whom he has interested.

Many of the presidents have given out statements and interviews explaining various features of the controversy and explaining why they were unwilling to accede to the President's proposals.

Hale Holden, president of the Chicago, Burlington & Quincy; R. S. Lovett, chairman of the Union Pacific, and Daniel Willard, president of the Baltimore & Ohio, went to the White House on Tuesday evening and had a conference with the President, lasting about an hour, during which the general situation was discussed. The conference was requested by the committee of railway executives.

There was another meeting of the railway executives at 11:30 Wednesday morning. It was a brief one and was adjourned until Wednesday evening. On Wednesday Elisha Lee, chairman of the Conference Committee, gave out a statement for the purpose of avoiding misunderstanding regarding the railways' estimate of the cost of complying with the demands. He said that investigation has confirmed the substantial accuracy of the estimate that to grant the original demands would cost $100,000,000, and that it is now estimated that to make the concessions which the President proposes would cost more than $50,000,000 a year.

During the day President Wilson conferred with Senator Newlands and Representative Adamson, chairmen of the Senate and House Committees on Interstate Commerce, and in evening conferred again with Messrs. Holden, Willard and Lovett, but no statement was given out as to the result.

General News Department

The president of Cuba has signed a bill providing for a commission to study the question of government ownership of railroads in Cuba.

A bill authorizing the sale of the Western & Atlantic, which is owned by the state of Georgia, was defeated in the lower house of the Georgia legislature recently by a vote of 46 to 102.

A press despatch from El Paso, Tex., says that the El Paso & Southwestern has given a voluntary increase of 7½ per cent in rate of wages of shopmen, section foremen, clerks, telegraphers and train despatchers.

Both the Senate and the House of Representatives have passed a bill postponing until April 15, 1917, the effective date of section 10 of the Clayton law. This is the section which requires competitive bidding for railroad supplies.

Despatches from Austin, Tex., say that the Texas railroad commission is prepared to oppose the change of the fiscal year from June 30 to December 31, which is to be considered by the Interstate Commerce Commission in October.

A committee representing boilermakers, machinists, blacksmiths and sheet metal workers, their apprentices and helpers, has presented demands to P. T. Dunlop, general superintendent of motive power of the St. Louis & San Francisco, for a decrease in the number of hours of work per day and wage increases of about five cents an hour.

The Norfolk & Western proposes to extend electric operation from Vivian, W. Va., westward 10 miles, and from Welch up Tug Fork branch for five miles. The new construction necessary will begin in the near future. The addition of the proposed electric mileage will amount to more than 50 per cent of the first installation and will make the total length of line electrically operated 43 miles.

The Northern Pacific has granted its train despatchers an increase in wages of $10 per month, effective August 1. The new scale provides for a salary of $190 per month for chief despatchers, $175 per month for night and assistant chief despatchers, and $165 per month for trick despatchers. The increase, which was applied for by the men several weeks ago, was granted by the company without the formality of a conference with the employees.

All threatened strikes on the western lines of the Canadian Pacific have been abandoned. The various shop unions had been negotiating through the federated trade committee since June 15, 1916. Increases in wages agreed to by the company average about 2½ cents an hour and apply everywhere west of Fort William. The new schedule gives boilermakers 48 cents per hour. Overtime up to midnight is to be paid for time and a half, and after midnight, double time.

Dennis W. Leonard, the engine driver on the New York Central's first section No. 86, which was struck by the second section in the New York Central's Amherst wreck, died of heart disease on August 14. The wreck was caused by the second section of 86 running into the rear of the first section, throwing the two cars across the track in front of the Twentieth Century Limited. There were two employees and 25 persons killed, all of them on Leonard's train, but no blame for the accident was found to rest on him.

Congress has passed and the President approved of an amendment to the Act to Regulate Commerce, excepting from the provisions of the act which make the carrier liable for full actual loss, damage or injury, notwithstanding any limitation of liability or release; baggage of passengers, and goods other than ordinary livestock. The commission by this latest amendment is authorized to make orders permitting rates based on agreed valuations, and these valuations, the amendment provides, shall be a limitation upon the amount that can be recovered for loss or damage.

Through its safety committee the Nashville, Chattanooga & St. Louis has inaugurated a campaign against "train hopping." Within the past two weeks two boys have been crippled while trying to catch rides on freight trains of this railroad. "Hopping" is usually practiced by the boys of the smaller communities. Arrests have proved only a temporary preventative, the danger seldom being realized until injury or death results—in which case a lawsuit usually follows. The central safety committee of the road has conceived the idea that a direct appeal to the parents, stating specific cases, such as the two accidents above referred to, will bring results.

Real Safety First

Under the date of August 15, E. E. Calvin, president of the Union Pacific, sent the following letter to the employees of the company, emphasizing the importance of the personal element to the success of the safety first movement:

"Safety First implies not alone the elimination of unsafe physical conditions; its attributes are manifold. It is the very eminence of those correlated principles, Responsibility, Sobriety, Morality, Loyalty, Courtesy and Honesty.

"Responsibility: Satisfy yourself that you realize the responsibility which rests upon you personally, and that it is fully and faithfully discharged.

"Sobriety is demanded overwhelmingly on every hand; no one in the railroad world can disregard it.

"Morality is essential to Safety, an attribute that is being required ever more constantly.

"Loyalty is indispensable to your success, and its observance will achieve much for the work you are engaged in.

"Courtesy costs you nothing but a little painstaking effort to make it an element of your character; it can be shown without intrusiveness. There is no better investment for an employee or employer, and certainly nothing else so satisfactory to the public.

"Honesty, not alone in your finances, but in every effort or endeavor. Be honest with yourself.

"Your unfaltering interest in Safety First is earnestly urged, in the hope that by united vigilance and concentrated effort this property will not only maintain its present high standard, but may stand pre-eminently in the foreground at all times in the future."

The End of the Threatened Street Railway Strike in New York

At the request of Mayor Mitchel, the New York Railways Company has agreed to reinstate 14 men who were convicted of crime during the strike which occurred on August 4 and 5, and to leave to arbitration the question of whether or not the 34 men, who have been dismissed since the strike, were really dismissed for the causes alleged by the company, or for activities in connection with the strike. The following is a brief history of this strike:

Some of the labor leaders who had organized conductors and motormen of interurban roads near New York, who were already on strike for higher wages, attempted to organize the motormen and conductors of the New York Railways Company. This is the company which operates all of the green surface cars in New York City. When these men threatened a strike the executive officers went before 2,500 employees who were holding a mass meeting, and asked them whether they wanted to strike. The unanimous answer was no, and a petition was sent by the men on August 4, signed by 2,400 uniformed employees, saying that they had given no one authority to present their demands, and that they desired to remain at work. On the same day six labor leaders demanded certain changes in wages, threatening to strike if the demand was not granted by three o'clock on August 4. This demand was not granted and a strike was called, the company claiming, however, that on Sat-

urday, the 5th, and Sunday, the 6th, they operated 60 per cent of the normal service.

On Sunday Mayor Mitchel and Oscar Straus, chairman of the Public Service Commission of the First district of New York, after conference with the strike leaders and with President Shonts of the New York Railways Company, underwrote an agreement by which the company pledged itself not to interfere with employees in the exercising of their rights to organize, to reinstate strikers without prejudice, and the employees agreed not to coerce an employee to join any organization, and to accept the fact that the management had the exclusive right to discharge employees for breaches of discipline. Both sides agreed to arbitrate any questions that might arise under this agreement.

The company issued notices to its employees asking them to name by secret ballot a committee to represent them with the management. A total of 1,846 votes were cast out of 5,400 eligible to vote, and a committee of 25 employees were elected to deal with the management.

A committee representing the union men then called on General Manager Hedley, of the New York Railways Company, claiming that the company was violating its agreement by (1) interfering with the men's organizing by providing the elections under its own auspices; (2) by refusing to reinstate 14 men who had been convicted of misdemeanors during the strike, and (3) by discharging 34 men for the alleged reason of failure to return fares, insubordination, intoxication and failure to report. Another conference was held with Mayor Mitchel, with the result that the unions withdrew their allegation that the election of a committee interfered with the men's organization; the company reinstated the 14 men convicted of misdemeanors, and the cases of the 34 men discharged for cause are to go to arbitration.

M. C. B. Association Committees

The Master Car Builders' Association has issued circular No. 7, giving the list of the committees, and their members, which will report at the 1917 convention. The number of committees remains the same. However, the committee on Settlement Prices for Reinforced Wooden Cars has been discontinued, and a new committee on Standard Blocking for Cradles of Car Dumping Machines has been formed, with James McMullen, mechanical superintendent of the Erie, as chairman. The changes in the membership of the committees have not been very great except in the case of the committee on Nominations. On this committee F. W. Brazier has been retained as chairman, but the other four members are new to this committee. There have been two important changes in the chairmanships of the committees, C. D. Young being made chairman of the Brake Shoe and Brake Beam Equipment Committee, vice Professor Charles H. Benjamin, and R. L. Kleine being made chairman of the Draft Gear Committee, vice Professor L. E. Endsley. These changes have been made in accordance with the decision of the Executive Committee to have none but active railway members chairmen of the various committees. Both Prof. Benjamin and Prof. Endsley, however, will serve on their respective committees.

A number of the committees have been increased in size as follows: Brake Shoe and Brake Beam Equipment Committee, two members added; Loading Rules Committee, one member added; Car Wheel Committee, two members added; Safety Appliance Committee, one member added; Car Trucks Committee, one member added; Draft Gear Committee, three members added; Welding Truck Side Frames, Bolsters and Arch Bars Committee, five members added. The following is the complete list of the committees appointed:

STANDING COMMITTEES

1—Arbitration

J. J. Hennessey (Chairman), M. C. B., C. M. & St. P. Ry., Milwaukee, Wis.
T. W. Demarest, S. M. P., Penna. Lines, Ft. Wayne, Ind.
Jas. Coleman, S. C. D., Grand Trunk Ry., Montreal, Can.
F. W. Brazier, S. R. S., N. Y. C. R. R., New York City.
T. H. Goodnow, A. S. C. D., C. & N. W. Ry., Chicago, Ill.

2—Standards and Recommended Practice

T. H. Goodnow (Chairman). A. S. C. D., C. & N. W. Ry., Chicago, Ill.
C. E. Fuller, S. M. P., Union Pacific R. R., Omaha, Neb.
A. R. Ayers, Engr. R. S., N. Y. C. R. R., New York City.
O. C. Cromwell, M. E., Balto. & Ohio R. R., Baltimore, Md.
O. J. Parks, G. S., German-American Car Lines, Chicago, Ill.
R. E. Smith, G. S. M. P., Atlantic Coast Line R. R., Wilmington, N. C.
C. F. Thiele, G. C. I., Penna. Lines, Columbus, Ohio.
A. G. Trumbull, Asst. to G. M. S., Erie R. R., New York City.

3—Train Brake and Signal Equipment

R. B. Kendig (Chairman), G. M. E., N. Y. C. R. R., New York City.
B. P. Flory, S. M. P., N. Y. O. & W. R. R., Middletown, N. Y.
J. M. Henry, A. D. S., Penna. R. R., Youngwood, Pa.
L. P. Streeter, Air Brake Engr., Ill. Cent. R. R., Chicago, Ill.
R. B. Rasbridge, S. C. D., Phila. & Reading Ry., Reading, Pa.
W. J. Hartman, Air Brake Inst., C. R. I. & P. Ry., Chicago, Ill.
G. H. Wood, G. A. B. I., A. T. & S. F. Ry,, Topeka, Kan.

4—Brake Shoe and Brake Beam Equipment

C. D. Young (Chairman), Eng. Tests, Penna. R. R., Altoona, Pa.
Prof. Chas. H. Benjamin, Purdue University, Lafayette, Ind.
R. B. Kendig, G. M. E., N. Y. C. R. R., New York City.
C. B. Young, M. E., C. B. & Q. R. R., Chicago, Ill.
C. H. Bilty, M. E., C. M. & St. P. Ry., W. Milwaukee, Wis.
G. H. Gilman, M. C. B., Nor. Pac. Ry., St. Paul, Minn.
T. J. Burns, S. R. S., Mich. Central R. R., Detroit, Mich.

5—Couplers

R. L. Kleine (Chairman), C. C. I., Penna. R. R., Altoona, Pa.
G. W. Wildin, M. S., N. Y. N. H. & H. R. R., New Haven, Conn.
F. W. Brazier, S. R. S., N. Y. C. R. R., New York City.
F. H. Stark, Supt. R. S., Montour R. R. Co., Coraopolis, Pa.
A. E. Manchester, S. M. P., C. M. & St. P. Ry., W. Milwaukee, Wis.
J. W. Small, S. M. P., S. A. L. Ry., Portsmouth, Va.
J. A. Pilcher, M. E., N. & W. Ry., Roanoke, Va.

6—Loading Rules

A. Kearney (Chairman), A. S. M. P., N. & W. Ry., Roanoke, Va.
A. B. Corinth, G. C. I., A. C. L. R. R., Wilmington, N. C.
L. H. Turner, S. M. P., P. & L. E. R. R., Pittsburgh, Pa.
R. L. Kleine, C. C. I., Penna. R. R., Altoona, Pa.
J. M. Borrowdale, S. C. D., Ill. Cent. R. R., Chicago, Ill.
C. N. Swanson, S. C. S., A. T. & S. F. Ry., Topeka, Kan.
H. C. May, S. M. P., C. I. & L. Ry., Lafayette, Ind.
E. J. Robertson, S. C. D., Soo Line, Minneapolis, Minn.

7—Car Wheels

W. C. A. Henry (Chairman), S. M. P., Penna. Lines, Columbus, Ohio.
A. E. Manchester, S. M. P., C. M. & St. P. Ry., Milwaukee, Wis.
C. W. Van Buren, G. M. C. B., Can. Pac. Ry., Montreal, Can.
J. A. Pilcher, M. E., N. & W. Ry., Roanoke, Va.
O. C. Cromwell, M. E., B. & O. R. R., Baltimore, Md.
J. M. Shackford, C. D., D. L. & W. R. R., Scranton, Pa.
H. E. Smith, Engr. Tests, N. Y. C. R. R., Collinwood, Ohio.
C. T. Ripley, G. M. L., A. T. & S. F. Ry., Chicago, Ill.
F. T. Slayton, S. M. P., Virginian Ry., Princeton, W. Va.

8—Safety Appliances

C. E. Chambers (Chairman), S. M. P., C. R. R. of N. J., Jersey City, N. J.
D. R. MacBain, S. M. P., N. Y. C. R. R., Cleveland, Ohio.
D. F. Crawford, G. S. M. P., Penna. Lines West, Pittsburgh, Pa.
C. E. Fuller, S. M. P., Union Pac. Ry., Omaha, Neb.
C. B. Young, M. E., C. B. & Q. R. R., Chicago, Ill.
H. Bartlett, G. S. M. P., B. & M. R. R., Boston, Mass.
E. A. Sweeley, M. C. B., S. A. L. Ry., Portsmouth, Va.
H. T. Bentley, S. M. P., C. & N. W. Ry., Chicago, Ill.

9—Car Construction

W. F. Keisel, Jr. (Chairman), A. M. E., Penna. R. R., Altoona, Pa.
A. R. Ayers, Engr. R. S., N. Y. Central R. R., New York City.
C. E. Fuller, S. M. P., Union Pacific R. R., Omaha, Neb.
E. G. Chenoweth, M. E., C. R. I. & P. Ry., Chicago, Ill.
J. C. Fritts, M. C. B., D. L. & W. R. R., Scranton, Pa.
C. L. Meister, M. E., Atlantic Coast Line R. R., Wilmington, N. C.
H. T. Bentley, S. M. P., C. & N. W. Ry., Chicago, Ill.

10—Specifications and Tests for Materials

C. D. Young (Chairman), Engr. Tests, Penna. R. R., Altoona, Pa.
J. R. Onderdonk, Engr. Tests, Balto. & Ohio R. R., Baltimore, Md.
J. J. Birch, D. C. I., Norfolk & Western Ry., Roanoke, Va.
I. S. Downing, G. M. C. B., C. C. C. & St. L. Ry., Indianapolis, Ind.
Frank Zeleny, Engr. Tests, C. B. & Q. R. R., Aurora, Ill.
A. H. Fetters, M. E., Union Pacific Ry., Omaha, Neb.
H. B. MacFarland, Engr. Tests, A. T. & S. F. Ry., Chicago, Ill.
G. S. Sprowle, S. M. P., A. C. L. R. R., Rocky Mount, N. C.
H. G. Burnham, Engr. Tests, Nor. Pac. Ry., St. Paul, Minn.

SPECIAL COMMITTEES

11—Car Trucks

J. T. Wallis (Chairman), G. S. M. P., Penna. R. R., Altoona, Pa.
E. W. Pratt, A. S. M. P., C. & N. W. Ry., Chicago, Ill.
Jas. Coleman, S. C. D., Grand Trunk Ry., Montreal, Can.
J. J. Tatum, S. F. C. D., B. & O. R. R., Baltimore, Md.
Prof. E. C. Schmidt, University of Illinois, Urbana, Ill.
C. W. Van Buren, G. M. C. B., Can. Pac. Ry., Montreal, Can.
J. McMullen, M. S., Erie R. R., Meadville, Pa.
A. R. Ayers, Engr. R. S., N. Y. C. R. R., New York City.
E. G. Chenoweth, M. E., C. R. I. & P. Ry., Chicago, Ill.
J. J. Maginn, G. F. S., Cin. Northern R. R., Van Wert, Ohio.

12—Prices for Labor and Material

P. F. Smith, Jr. (Chairman), S. M. P., Penna. Lines, Toledo, Ohio.
G. E. Carson, D. M. C. B., N. Y. C. R. R., W. Albany, N. Y
W. L. Kellogg, S. M. P., M. K. & T. Ry, Denison, Tex.
J. E. Mehan, A. M. C. B., C. M. & St. P. Ry., W. Milwaukee, Wis.

Ira Everett, G. C. I., L. V. R. R., So. Bethlehem, Pa.
Willard Kells, A. G. S. M. P., A. C. L. R. R., Wilmington, N. C.
O. J. Parks, G. S., German-American Car Lines, Chicago, Ill.
H. L. Osman, S. C. D., Morris & Co., Chicago, Ill.
G. F. Laughlin, S. C. D., Armour & Co., Chicago, Ill.
Thos. Beaghen, Jr., M. C. B., Union Tank Line, New York City.

13—*Train Lighting and Equipment*

J. H. Davis (Chairman), Elec. Engr., B. & O. R. R., Baltimore, Md.
C. H. Quinn, A. E. M. P., N. & W. Ry., Roanoke, Va.
D. J. Cartwright, Asst. Elec. Engr., Lehigh Valley R. R., So. Bethlehem, Pa.
E. W. Jansen, Elec. Engr., Illinois-Central R. R., Chicago, Ill.
H. C. Meloy, Elec. Engr., N. Y. C. R. R., Cleveland, Ohio.
J. R. Sloane, Engr. Elec. Car Lighting, Penna. R. R., Altoona, Pa.
E. Wanamaker, Elec. Engr., C. R. I. & P. Ry., Chicago, Ill.

14—*Nominations*

F. W. Brazier (Chairman), S. R. S., N. Y. C. R. R., New York City.
D. F. Crawford, G. S. M. P., Penna. Lines, Pittsburgh, Pa.
D. R. MacBain, S. M. P., N. Y. C. R. R., Cleveland, Ohio.
C. E. Fuller, S. M. P., Union Pac. R. R., Omaha, Neb.
M. K. Barnum, S. M. P., B. & O. R. R., Baltimore, Md.

15—*Arrangements*

C. E. Chambers, S. M. P., C. R. R. of N. J., Jersey City, N. J.

16—*Tank Cars*

A. W. Gibbs (Chairman), C. M. E., Penna. R. R., Philadelphia, Pa.
Thos. Beaghen, Jr., M. C. B., Union Tank Line, New York City.
C. E. Chambers, S. M. P., C. R. R. of N. J., Jersey City, N. J.
Wm. Schlafge, G. M. S., Erie R. R., New York City.
S. Lynn, M. C. B., P. & L. E. R. R., McKees Rocks, Pa.
O. J. Parks, G. S., German-American Car Lines, Chicago, Ill.
John Purcell, Asst. to V.-P., A. T. & S. F. Ry., Chicago, Ill.

17—*Draft Gear*

R. L. Kleine (Chairman), G. C. I., Penna. R. R., Altoona, Pa.
Prof. L. E. Endsley, University of Pittsburgh, Pittsburgh, Pa.
W. E. Dunham, Supr. M. P. & M., C. & N. W. Ry., Winona, Minn.
J. R. Onderdonk, Engr. Tests, B. & O. R. R., Baltimore, Md.
A. R. Kipp, M. E., Soo Line, Fond du Lac, Wis.
G. W. Rink, M. E., C. R. R. of N. J., Jersey City, N. J.
J. C. Fritts, M. C. B., D. L. & W. R. R., Scranton, Pa.
R. D. Smith, S. M. P., B. & A. R. R., Boston, Mass.
A. M. Darlow, S. M. P., B. & S. R. R., Galeton, Pa.
H. C. May, S. M. P., L. V. R. R., So. Bethlehem, Pa.

18—*Welding Truck Side Frames, Bolsters and Arch Bars*

W. O. Thompson (Chairman), S. R. S., N. Y. C. R. R., Buffalo, N. Y.
G. W. Rink, M. E., C. R. R. of N. J., Jersey City, N. J.
J. T. Wallis, G. S. M. P., Penna. R. R., Altoona, Pa.
J. J. Hennessey, M. C. B., C. M. & St. P. Ry., W. Milwaukee, Wis.
A. M. McGill, A. S. M. P., L. V. R. R., So. Bethlehem, Pa.
R. W. Schulze, S. C. D., St. L. & S. F. R. R., Springfield, Mo.
Willard Kells, A. G. S. M. P., A. C. L. R. R., Wilmington, N. C.
J. R. Gould, S. M. P., C. & O. Ry., Richmond, Va.
E. H. Sweeley, G. F. L. R., Long Island R. R., Richmond Hill, N. Y.
C. F. Giles, S. M., L. & N. R. R., Louisville, Ky.

19—*Standard Blocking for Cradles of Car Dumping Machines*

Jas. McMullen (Chairman), M. S., Erie R. R., Meadville, Pa.
J. W. Senger, M. C. B., N. Y. C. R. R., Collinwood, Ohio.
J. J. Tatum, S. F. C. D., B. & O. R. R., Baltimore, Md.
F. T. Hyndman, S. M. P. & C., W. & L. E. R. R., Brewster, Ohio.
T. W. Demarest, S. M. P., Penna. Lines, Ft. Wayne, Ind.
J. E. Davis, M. M., Hocking Valley Ry., Columbus, Ohio.
G. M. Gray, S. M. P., B. & L. E. R. R., Greenville, Pa.
J. A. Pilcher, M. E., N. & W. Ry., Roanoke, Va.

New York and New England Association of Railway Surgeons

The twenty-sixth annual session of the New York and New England Association of Railway Surgeons is to be held at the Hotel McAlpin, New York, Wednesday, October 18, 1916. Dr. William S. Bainbridge is to deliver the "Address in Surgery" on the cancer problem.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, New Orleans, La.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.

American Electric Railway Association.—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.

American Electric Railway Manufacturers' Association.—H. G. McConaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Railway Association.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Denver, Colo.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, New Orleans, La.

American Railway Tool Foremen's Association.—Owen D. Kinsey, Illinois Central, Chicago. Annual meeting, August 24-26, 1916, Hotel Sherman, Chicago.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

Association of Manufacturers of Chilled Car Wheels.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

Bridge and Building Supply Men's Association.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

International Railway General Foremen's Association.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, August 29 to September 1, Hotel Sherman, Chicago.

Maintenance of Way and Master Painters' Association of the United States and Canada.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

Master Car and Locomotive Painters' Association of the United States and Canada.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 12-14, 1916, "The Breakers," Atlantic City, N. J.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

Railway Fire Protection Association.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Annual meeting, October 3-5, 1916, New York.

Railway Real Estate Association.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 11-13, 1916, Chicago.

Railway Signal Association.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 12-14, 1916, Grand Hotel, Mackinac Island, Mich.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

Roadmasters' and Maintenance of Way Association.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Signal Appliance Association.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

Society of Railway Financial Officers.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Washington, D. C.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next meeting, September 5-8, 1916, Hotel Sherman, Chicago.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

Western Society of Engineers.—F. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

All trunk lines between Chicago and Denver have abandoned the sale of wines and liquors in the dining cars.

The annual picnic and outing of the Traffic Club of Chicago will be held at Ravinia Park, Ill., on August 30.

The Baltimore & Ohio has placed a temporary embargo on grain for export through the port of Baltimore, Md.

The State of Iowa has filed a complaint with the Interstate Commerce Commission, alleging that freight rates from Marion, Iowa, to Peoria, Ill., and Springfield, and from Eastern points to interior Iowa, are excessive and unreasonable.

An officer of the Texas Central division of the Missouri, Kansas & Texas is quoted as predicting a movement of 2,000 cars of peanuts on that division. Last year there were 1,004 cars of peanuts moved from the Texas Central division.

At the request of Senator Pomerene, the bill fixing the liability of railways for bills of lading which they issue, as amended by the United States Senate, has been concurred in by the House of Representatives and has now been sent to the President. (See *Railway Age Gazette* of June 30, 1916, page 587.)

Thirty-eight ticket agents of the Chicago, Burlington & Quincy from various sections of the country, are spending 10 days in the West renewing their acquaintance with Yellowstone Park, Thermopolis, Hot Springs, Wyo., and the new Rocky Mountain National Park. The men are traveling in small detachments, the first of which left Chicago on August 19.

A hearing on the application of the Union Pacific system for an advance in rates on shipments of refrigerator cars east from Idaho points will be held on September 23 before an examiner of the Interstate Commerce Commission at Boise, Idaho. The date of the hearing on an advance in freight rates on green fruit shipped east from Idaho points, filed some weeks ago by the Oregon Short Line, has not yet been set.

The through train service between Boston, Mass., and Washington, D. C., will not be discontinued, it is now announced, until September 29. This is the weekly service of the Federal Express which runs by way of Poughkeepsie. This service was to have been discontinued September 17 but on account of the desire of people returning from vacations in New England to avoid going through New York because of infantile paralysis, the train will be operated for two weeks longer.

The Grand Rapids (Mich.) Association of Commerce has filed a complaint with the Interstate Commerce Commission, alleging that freight rates, particularly those on furniture to points in the East, are discriminatory in favor of competitors in Chicago, Detroit, Toledo, Milwaukee and other cities. The Toledo Produce Exchange has filed a complaint to the effect that rates on grain from that city to Missouri river points, and to eastern points, favor Chicago, Buffalo, St. Louis and other cities with which it competes, and are discriminatory against Toledo.

At a hearing before the Texas Railroad Commission, to consider the relative adjustment of rates on cotton from Texas points to Galveston and to New Orleans, an agreement was reached among the traffic officials of the north Texas railways, except the Texas & Pacific, to advance the export rates on cotton to New Orleans to 61 cents, or 8½ cents higher than the rate to Galveston. The agreement was made contingent, however, upon permission being obtained from the Interstate Commerce Commission, under the provisions of the fourth section, to meet the Texas & Pacific rates to New Orleans at competitive or junction points. The hearing was called on the application of the Galveston Commercial Association asking for an investigation of the action of the roads in putting into effect the same rates to both ports, the effect of which it said "has been to divert considerable cotton to New Orleans that might just as well have been forwarded to Galveston without benefit to anyone except the Louisiana lines and ports."

Believing that the freight traffic officials and representatives of the Illinois Central, many of whom are stationed in remote parts of the country, should be made thoroughly familiar with the road they represent and the industries and resources of the territory it serves, F. B. Bowes, vice-president of traffic, arranged for them an educational tour over the system in charge of D. W. Longstreet, freight traffic manager. A special train of eight cars, including four sleepers, a dining car, library car, office car and observation car, was made up to accommodate 70 members of the freight traffic department. The party left Chicago on July 25, and arrived at Omaha, the end of the trip, on August 12, after covering a little short of 6,000 miles. The itinerary included practically every point of importance on the system, among which the following cities were visited in the order named: Champaign, Ill.; Cairo, Memphis, Tenn.; Vicksburg, Miss.; New Orleans, La.; Jackson, Miss.; Aberdeen, Birmingham, Ala.; Jackson, Tenn.; Louisville, Ky.; Evansville, Ind.; Indianapolis, Peoria, Ill.; Springfield, St. Louis, Mo.; Freeport, Ill.; Dubuque, Iowa; Waterloo, Ft. Dodge, Sioux Falls, S. Dak.; Sioux City, Iowa, and Omaha, Neb. The train traveled only by daylight, except when it was necessary to double back over a branch line. The observation car was especially constructed so that it would seat about 50 people. A member of the party best acquainted with the locality through which the train passed, discussed the commercial, agricultural and industrial development of the section through a megaphone from the back of the car. At the more important cities the party inspected the company's yards to get an idea of their capacity for handling freight. The local commercial organizations at almost every stop of consequence entertained the men in a most hospitable fashion. The trip, it is believed, is the first of its kind ever made, and, according to Mr. Longstreet, not only increased appreciably the efficiency of the freight traffic department, but served to advertise the cities which the traffic men visited and the progressive spirit of the road which arranged the tour.

Shippers and Carriers Disagree on Demurrage Rates

Recent negotiations between the Committee on Relations of the American Railway Association and the Committee on Car Demurrage and Storage of the National Industrial Traffic League concerning proposed increases in demurrage rates have resulted in disagreement. The committee of the American Railway Association expressed its intention of proceeding to the Interstate Commerce Commission with the following proposition:

First: Two days free time, third day $2 per car, fourth day $3 per car, fifth day $4 per car, sixth day $5 per car, and all days thereafter $5 per car.

Second: That under the average agreement the demurrage debits accruing on the first three days (instead of five days as at present) could be offset by credits accomplished by the unloading of cars on the first day of free time.

Third: That the weather rule would be abolished in connection with the straight plan.

The committee of the League has appealed to the Interstate Commerce Commission to take up the question of car demurrage for a thorough investigation and adjudication after a hearing of all parties, should new tariffs be filed by the carriers.

Traffic Restrictions in Scotland.—Practically all the mainland of Scotland north of the Caledonian Canal has been made into a special military area by virtue of a notice given by the Army Council under the Defence of the Realm (Consolidation) Regulations, 1914, which provides that, with certain specified exceptions, no person shall on and after July 25 be allowed to enter the area without permission from the Commandant at Inverness. Travellers seeking to enter the area will find at Inverness something like a Continental frontier station, from which they will be turned back unless they can produce the necessary permit. The railway companies concerned are taking all possible steps to bring the new regulation to the notice of passengers intending to enter the restricted area, and are not issuing tickets thither except to passengers who have authority to enter it. Moreover, at the London stations, from which the Scottish expresses start, passengers for certain destinations are being advised to bring their registration cards with them.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Shippers Ask Suspension of New Transcontinental Rates

So large a number of shippers appeared before the suspension board of the Interstate Commerce Commission last week, urging the suspension of the new transcontinental freight rates filed by the roads to take effect on September 1, that the commission did not have a room large enough to accommodate them. The rates are those filed in response to the commission's recent order made to meet new conditions created by the suspension of traffic through the Panama Canal. The new tariffs made considerable advances in the rates to Pacific Coast points. H. A. Scandrett, interstate commerce attorney for the Union Pacific, said that the reductions in coast rates were made to allow the roads to compete with the canal route, and that the higher rates are in accordance with those suggested by the commission itself in its previous decisions in the intermountain case. Representatives of some of the Pacific Coast shippers protested that the new rates were higher than those suggested by the commission. Some of them only asked that the rates be postponed until January 1.

Several hundred representatives of shippers from almost every part of the United States appeared at the hearing, the first two days of which were devoted to the increases in eastbound rates on canned goods, dried fruits, peas and beans, salmon and similar articles. Among the principal protestants were the representatives of Portland, San Francisco, Seattle, Astoria, Los Angeles, Fresno, Honolulu, Denver, Louisville, Chicago, New York, Des Moines, Omaha and other Missouri river cities. The attorney for the Spokane Merchants' Association opposed the suspension of the tariffs as a whole, as did the representatives of the Arizona, New Mexico and Nevada state railroad commissions. Some of the shippers of food products said that their business would be ruined by the new rates if allowed to go into effect without postponement.

On August 17 and 18 testimony was heard as to the advances in westbound rates, those comprised in Schedule C, on which the commission had authorized reductions to meet the canal competition, and had rescinded its relief order. Representatives of the shippers at San Francisco, Portland, Seattle and Los Angeles presented a most vigorous protest against the advances, which Seth Mann, representing the San Francisco Chamber of Commerce, said would increase the revenues of the roads by from $10,000,000 to $12,000,000 a year. The rates were criticised as unreasonable per se and discriminatory, and it was stated that unless the tariffs are suspended, application for injunctions will be filed in the federal courts at San Francisco, Seattle and Portland, on the ground that the commission has no authority to allow advances in rates that were reduced to meet water competition, except upon a showing of a change in conditions other than that created by the elimination of that competition.

Post Office Department Loses Freight Rate Case

United States v. Alabama & Vicksburg et al. Opinion by the commission:

The first-class rating provided in southern classification on postal cards, envelopes, and newspaper wrappers, stamped, when shipped for the account of the government on government bills of lading in cars protected by government locks and seals, minimum weight 30,000 lb., is found by the commission to be just and reasonable, and is prescribed as a reasonable maximum rating in official and western classification territories.

The post office department urged that the articles involved should be rated substantially the same as unstamped envelopes, cards, and wrapping paper, and asked for a rating on stamped envelopes and stamped newspaper wrappers in carloads not to exceed fifth class in official classification territory and third class in western and southern classification territories, and a rating on stamped postal cards in carloads not to exceed third class in all three classification territories. (40 I. C. C., 405.)

Class Rates from Chestnut Ridge Railway Stations

Opinion by Commissioner Meyer.

Divisions proposed to be paid to the Chestnut Ridge Railway by the Lehigh & New England, and connections out of joint class rates proposed from points on the Chestnut Ridge to points west of the Buffalo-Pittsburgh line, and out of class rates between stations on the Chestnut Ridge and on the Delaware, Lackawanna & Western, found excessive to the extent that they exceed $3.25 per car on traffic handled over the Palmerton branch of the Chestnut Ridge, and $4.50 per car on traffic handled over the main line. The Chestnut Ridge is owned by the New Jersey Line Company of New Jersey. (41 I. C. C., 62.)

Second Industrial Railways Case

New Jersey, Indiana & Illinois:

The divisions accorded by the Wabash and its connections to the New Jersey, Indiana & Illinois are not found excessive. This line extends from Pine, Ind., where it connects with the Wabash, about 12 miles north through Sweeney's, Wharton's and Kizer, to South Bend, Ind., where it connects with the Grand Trunk. The Singer Manufacturing Company has a plant at South Bend, and supplies a large part of the traffic. For this reason and because the Singer company is interested in the company, the Wabash and its connections proposed to cancel their joint rates with the New Jersey. The cancellations were disapproved generally in the commission's original report, 34 I. C. C., 596. (41 I. C. C., 42.)

Johnstown & Stony Creek:

The Johnstown & Stony Creek is found to be a common carrier industrial line. This line exchanges traffic with the Baltimore & Ohio and Pennsylvania. It principally serves the Lorain Steel Company, and it also serves 15 other industries directly, and many others besides on two team tracks which it maintains. The divisions to be paid will be based on the principles in Chicago, West. Pullman & Southern case, 37 I. C. C., 408:

> In so far as the industrial line serves the plant in interplant switching and other purely plant service the cost of such service and the investment in facilities used exclusively to perform that service must be excluded in calculating the cost of the switching service to and from the trunk lines. The investment in facilities used both for plant service and interchange switching can only be included in the proportion that they are used in interchange switching. Interior plant switching or any other service differing radically in nature from the general work of switching cars between industries and connections should be segregated as to investment and operating costs of the industrial line so far as this may be feasible. The engine hour will usually be found a safer guide than cars handled for making this general separation. For interior plant switching the industry benefited should be charged with the allocated capital and operating costs. The remaining operating and capital costs measure the maximum which may be received net for other switching, either in the form of switching charges or allowances, there being a minimum charge for the shortest switching and a somewhat higher charge for the longer distance switching. From its entire business the industrial line should not earn more than a fair return on the property devoted to the public use, less reserve for accrued depreciation, and including material and supplies in the investment.

The Pennsylvania and Baltimore & Ohio may properly decline to apply their Johnstown locality rates to and from points on the Johnstown & Stony Creek. (41 I. C. C., 46.)

Allowances to Kanawha, Glen Jean & Eastern:

The Kanawha, Glen Jean & Eastern is found to be a common carrier entitled to accept divisions of rates from its trunk line connections. This road is in the New River district of West Virginia. It extends from Tamroy, W. Va., 8 miles northeast through Kilsythe Junction and Sugar Creek Junction, to Glen Jean, W. Va., with a branch that extends from Sugar Creek Junction 6.2 miles northwest to Pax, W. Va. About 5 miles of sidetracks also are maintained. The road connects at Pax with the Virginian's main line from Deepwater, W. Va., to Hampton Roads, Va., and at Kilsythe Junction with the Loup Creek branch of the Chesapeake & Ohio that extends from Thurmond, W. Va., on the main line through Deepwater to Hampton Roads, 7 miles west to Glen Jean, and thence 3 miles southwest and parallel to the Glen Jean to Kilsythe Junction. Nearly all the traffic of the Glen Jean consists of outbound bituminous coal. A number of the coal mines it serves are operated by the McKell Coal & Coke Company, which is interested in the railway. (41 I. C. C., 53.)

Northampton & Bath Railroad:

The Northampton & Bath is found to be a common carrier.

This line extends from Northampton, Pa., about 7.1 miles east through Navarro, Weaversville, Lerchs, Jacksonville and Bath to Bath Junction, Pa. It connects at Northampton with the Central of New Jersey, and at Bath Junction with the Lackawanna and the Lehigh & New England. The line was built in the interest of the Atlas Portland Cement Company, which has a large plant at Navarro.

Commissioner Harlan dissents (41 I. C. C., 68.)

PERSONNEL OF COMMISSIONS

Walter Alexander has been appointed chairman of the Railroad Commission of Wisconsin to succeed Halford Erickson, who resigned from that position in May. Mr. Alexander has been a member of the commission since February, 1915, previous to which he was for 13 years assistant district master mechanic and district master mechanic of the Chicago, Milwaukee & St. Paul. He was born in Glasgow, Scotland, in 1872, and was brought to this country in 1873. He received a common school education in Milwaukee, and served an apprenticeship as a machinist and draftsman with the St. Paul, later being employed as a fireman on the same road. He entered the University of Wisconsin in 1893, and graduated from the course in mechanical engineering in 1897, receiving a second degree in engineering the following year. For three years he was an instructor in engineering at the University of Wisconsin, one year at Armour Institute and one at the University of Missouri. He then returned to railway work as assistant district master mechanic of the St. Paul at Minneapolis, Minn. Two years later he was transferred to Milwaukee, Wis., to a similar position, and later was promoted to district master mechanic at that point, which was the position he held at the time of his appointment to the railroad commission.



W. Alexander

COURT NEWS

Killing Stock—Negligence Must be Proved

The Texas Court of Civil Appeals holds that evidence that a train was run at an excessive speed without proper warning signals while passing through a town where the railroad was not required to fence its track, and that a mare was killed, and section men carried her away after the train had passed, does not show liability of the railroad, when other trains passed the point, and no one saw the train in question kill the mare.—I. & G. N. (Tex.) 186 S. W., 781.

Yard Accident—Contributory Negligence

The United States Circuit Court of Appeals, Second Circuit, holds that it is not contributory negligence as matter of law for a yard conductor, who was thoroughly familiar with the yard, to stop for a minute and a half on a track conversing with the yardmaster, with his back to an engine which he had a right to suppose would take another track, especially where the signal was set against the engine, so as to require the engineer to proceed with caution, having his engine under such control that he could stop it immediately if danger threatened. Rogers, Circuit Judge, dissented, as the plaintiff, an experienced man, had testified that the yard (of the New York Central at Buffalo) was a very dangerous place to work in, and one had constantly to be on the alert. About 1,600 trains moved over the crossover in the course of eight hours.—Pennsylvania v. Groves, 231 Fed., 663.

Railway Officers

Executive, Financial, Legal and Accounting

R. J. Lockwood, vice-president and general manager of the New Iberia & Northern, and chief engineer of the Marshall & East Texas, has been appointed vice-president and general manager of the Apalachicola Northern, with office at Port St. Joe, Fla., in place of L. H. Dimmitt, who has resigned to enter other business.

Operating

C. F. Jett, who has been appointed superintendent of the Anthony & Northern, in charge of the operating, mechanical and maintenance departments with headquarters at Pratt, Kans., began his railway career as an agent for the Union Pacific in 1887. The following year he entered the service of the Colorado Midland as relief agent. In 1893, he accepted employment with the Chicago, Rock Island & Pacific as agent at Pratt, Kans., and remained in the service of this company for 15 years. A year ago he was appointed trainmaster of the Anthony & Northern, which position he held until his appointment on August 1 as superintendent of the same road, with headquarters at Pratt, Kan., as above noted.



C. F. Jett

Pierce J. Landers, whose appointment as superintendent of the Indianapolis Union Railway became effective on August 1, was born in Indianapolis, Ind., on July 17, 1870. He was educated in the public and private schools of that city and entered railway service on July 15, 1888, with the Pennsylvania Lines. From this time on until July 31, 1898, he was successively rodman, superintendent's clerk, draftsman and assistant engineer on the Indianapolis and Vincennes division. On August 1, 1898, he became roadmaster of the Wisconsin Central, with headquarters at Oshkosh, Wis., and in September, 1900, was made division engineer of this same railway, with offices at Fond du Lac, Wis., remaining there until September 1, 1902, when he entered the service of the Indianapolis Union Railway as assistant engineer. In January, 1907, he was promoted to engineer maintenance of way of the Indianapolis Union Railway, and held this position until March 1, 1916, from which time up to August 1, 1916, he was acting superintendent.



P. J. Landers

C. L. Harris has been appointed assistant superintendent of the Toronto district of the Canadian Northern, eastern lines, with headquarters at Rosedale, Ont., with jurisdiction over the Muskoka, Trenton and Rideau subdivisions. Effective August 15. G. A. Hoag, assistant superintendent at Toronto, Ont., has been appointed assistant superintendent of the Toronto district,

with headquarters at Trenton, Ont., with jurisdiction over the Picton, Maynooth, Tweed, Irondale and Brockville subdivisions and the Trenton yard. The position of superintendent of branch lines has been abolished, and George Collins, superintendent at Trenton, has been appointed special representative with headquarters at Toronto, reporting to the general manager. Effective September 1.

W. A. Whitney, whose appointment as superintendent of transportation of the Union Pacific, with headquarters at Omaha, Neb., has been noted, was born at Sacramento, Cal., in 1858. He began his railway career as a messenger for the Alameda & Southern 39 years ago, and while in that capacity studied telegraphy. He served on the Southern Pacific, the Oregon Short Line, Northern Pacific, Atchison, Topeka & Santta Fe and Union Pacific as telegrapher and train despatcher, and while on the Union Pacific was made assistant superintendent at Laramie, Wyo., and later was promoted to division superintendent at Ogden, Utah. After a period of ill health which necessitated an extended retirement he returned to railway work on the Denver & Rio Grande as train despatcher, but was soon promoted to superintendent of transportation with headquarters at Denver, Colo. He resigned this position to become superintendent of the Southern Pacific and served in this capacity at various points on the system until his appointment as general superintendent of the Oregon Short Line two years ago. Mr. Whitney's present appointment became effective on August 15.



W. A. Whitney

A. J. Hills, general superintendent of the Canadian Northern, eastern lines, at Toronto, Ont., has been assigned to other duties, and the matters heretofore handled by the general superintendent have been assumed by the general manager.

Edward Wilson Mason, whose appointment as general superintendent of the Western Pacific, with headquarters at San Francisco, Cal., has been announced, was born at Moberly, Mo., on March 23, 1877. He was educated in the public and high schools of Peoria, Ill., and Tacoma, Wash., and first entered railway service as a call boy on the Northern Pacific in June, 1893. After learning telegraphy he worked as an operator from the fall of 1895 to 1898, at various points on the line. From 1898 to 1899, he was a despatcher at Missoula, Mont., and from June, 1899, to September, 1900, operator and ticket clerk at Helena, Mont. From the latter date until September, 1902, he was despatcher and night chief despatcher at Tacoma, Wash., following which he was made trainmaster of the Seattle-Tacoma Interurban with headquarters at Kent, Wash. He returned to the Northern Pacific as night chief despatcher at Missoula, Mont., in May, 1903, and in May, 1904, was made chief despatcher and trainmaster at Seattle, Wash. He then entered the service of the Western Pacific at San Francisco, Cal., and from November 28, 1909, to May 1, 1911, was car accountant and superintendent of telegraph for that road. He was next stationed at Sacramento, Cal., as division superintendent until August 1, 1916, when he was appointed general superintendent at San Francisco.



E. W. Mason

F. E. Dewey, general manager of the Wellsville & Buffalo at Buffalo, N. Y., has at his own request been relieved as general manager, and the duties of that office have been assumed by A. Weber, vice-president, at Buffalo. Effective September 1.

O. H. McCarty, superintendent of the northern division of the St. Louis & San Francisco at Ft. Scott, Kan., has been appointed superintendent of the southwestern division, with headquarters at Sapulpa, Okla., vice J. M. Chandler, assigned to other duties; H. H. Brown, superintendent of the western division at Enid, Okla., has been appointed superintendent of the northern division, with headquarters at Ft. Scott, Kan., vice Mr. McCarty, and E. C. Lilley has been appointed superintendent of the western division, with headquarters at Enid, Okla., vice Mr. Brown.

Traffic

W. D. Clifton has been appointed division freight agent of the Union Pacific with office at Cheyenne, Wyo.

Donald S. Dixon has been appointed industrial agent of the Chicago, Great Western, with headquarters at Chicago, Ill.

Logan A. Mizener has been appointed assistant general freight agent of the Chicago, St. Paul, Minneapolis & Omaha, vice Walter D. Burr, promoted.

Albion M. Fenton, who has been appointed general freight agent of the Chicago, St. Paul, Minneapolis & Omaha with office at St. Paul, Minn., was born on January 27, 1869, at Cresco, Iowa. He was educated in the common schools of his native city and entered railway service April 4, 1886, from which time to 1887, he was consecutively telegraph operator and agent for the Minneapolis, St. Paul & Sault Ste. Marie. From 1887 to 1888, he was operator on the Chicago, St. Paul, Minneapolis & Omaha and from 1888 to 1900, agent at various places along the line. From 1901 to August, 1903, he was traveling agent and from August, 1903 to July, 1906, he was general agent with office at Helena, Mont. In July, 1906, he was promoted to district freight and passenger agent with headquarters at Duluth, Minn., where he remained until July, 1910, being then made assistant general freight agent with headquarters at Minneapolis, Minn. He remained in this position until his recent appointment as general freight agent, effective August 1.



A. M. Fenton

George C. Wright has been appointed chief of tariff bureaus, and supervisor of tariffs of the Chicago, St. Paul, Minneapolis & Omaha, effective August 15.

R. C. Caples, general traffic manager of the Western Maryland at Baltimore, Md., having resigned, the position of general traffic manager has been discontinued.

W. E. Hunt, general agent of the Great Northern at Cincinnati, Ohio, has been appointed general agent, with headquarters at Great Falls, Mont., vice C. S. Merritt, resigned, and J. H. Carroll has been appointed general agent with headquarters at Cincinnati, Ohio, vice Mr. Hunt.

R. D. Williams, general agent of the Erie at Los Angeles, Cal., has been appointed manager of Pacific coast traffic, with headquarters at San Francisco, Cal., vice C. W. Colby, deceased. J. A. Lloyd, general agent at Salt Lake City, Utah, has been appointed general agent with headquarters at Los Angeles, Cal.,

vice Mr. Williams and M. O. Culton has been appointed general agent in charge of freight and passenger traffic, with headquarters at Salt Lake City, Utah, vice Mr. Lloyd.

James Westmoreland Hunter, whose promotion to the position of general freight agent of the Southern Railway, with headquarters at Birmingham, Ala., has already been announced in these columns, has been in the service of the Southern Railway since 1890. He was born on February 23, 1871, at Atlanta, Ga., and was educated in the common schools of that city and at a business college in Chattanooga. He entered railroad service January 17, 1890, as stenographer to the assistant general freight agent of the East Tennessee, Virginia & Georgia, now a part of the Southern Railway, at Selma, Ala., and remained in that office until February 1, 1896, serving respectively as trace clerk, rate clerk and chief clerk. He was then transferred to Raleigh, N. C., as chief clerk to the division freight agent at that point and served successively as rate clerk and chief clerk to the division freight agent at Birmingham to June 14, 1899, soliciting freight agent at Selma, Ala., to July 1, 1900, commercial agent at Selma until December 1, 1905, and division freight agent, also at Selma, until June 1, 1911, at which time he became assistant general freight agent of the Southern Railway at Mobile, Ala. It is this position he leaves to take up his new duties as general freight agent at Birmingham, Ala., as above noted.

Dudley G. Gray, general freight agent of the Western Maryland at Baltimore, Md., has been appointed freight traffic manager, with headquarters at Baltimore, effective September 1. Mr. Gray was born at Columbus, Ohio, in 1868, and after going through the public schools, graduated from the Ohio State University. He entered the service of the Baltimore & Ohio as messenger in the office of the division freight agent at Columbus in 1887, and occupied all the various positions up to chief clerk in that office. He was transferred to Pittsburgh in 1897 as chief clerk in the general freight office. In 1902, Mr. Gray returned to Columbus as division freight agent and in 1905 went back to Pittsburgh as senior division freight agent. He was later promoted to general freight agent at Pittsburgh, having entire jurisdiction over the lines west of Cumberland, and held that position until his resignation on December 31, 1912, because of ill-health. After a vacation of two months, however, he returned to railway service as general western freight agent of the Western Maryland at Pittsburgh. On November 1 of the same year, he was promoted to general freight agent at Baltimore, which position he will leave to become freight traffic manager on September 1.



D. G. Gray

Engineering and Rolling Stock

A. R. Baldwin has been appointed master mechanic of the Anthony & Northern, with headquarters at Pratt, Kan.

M. P. Northam, office engineer of the Southern Railway at Washington, D. C., has been appointed supervising engineer.

F. B. Tapley has been appointed an assistant engineer of the Canadian Government Railways with headquarters at Moncton, N. B.

T. R. Ratliff has been appointed engineer maintenance of way of the Indianapolis Union Railway, with office at Indianapolis, Ind., effective August 1.

Thomas Windle has been appointed acting master mechanic of the Midland Valley, with headquarters at Muskogee, Okla., vice C. D. Powell, resigned.

Purchasing

G. F. Williams has been appointed general storekeeper of the Midland Valley, with headquarters at Muskogee, Okla.

T. N. Souter has been appointed storekeeper of the Southern Pacific, with headquarters at Houston, Tex., vice R. L. Preis, deceased.

W. F. Castle has been appointed storekeeper of the San Antonio, Uvalde & Gulf, with office at North Pleasanton, Tex., vice G. F. Williams, resigned, to accept service with another company.

OBITUARY

P. E. Dombaugh, division passenger agent of the Wabash, with office at Toledo, Ohio, died in that city on August 20 of heart failure.

Colonel William P. Clough, chairman of the board of directors of the Northern Pacific, died at his home in New York on August 18. William Pitt Clough was born at Freetown, N. Y., March 20, 1845. He graduated from the Northwestern State Normal School at Edinboro, Pa., in 1862 and taught school for two years. He then went into business and at the same time studied law. He went to Rochester, Minn., in 1867 and there began the practice of law. In 1880 he was appointed western counsel for the Northern Pacific, and in 1887 left the Northern Pacific to become assistant to the president—James J. Hill—of the St. Paul, Minneapolis & Manitoba. A few months later he was elected vice-president, and was elected vice-president of the successor company—the Great Northern. When the Northern Securities Company was formed Colonel Clough was made fourth vice-president, and in July, 1912, was made vice-president of the Northern Pacific. When Howard Elliott resigned as president of the Northern Pacific in August, 1914, and J. M. Hannaford was elected president, the new office of chairman of the board of directors was created and Colonel Clough elected to it.



W. P. Clough

Edward Canfield, general superintendent of the New York, Ontario & Western, at Middletown, N. Y., died on August 18, at his home in that city. He was born on May 27, 1848, and began railway work in 1869, with an engineering corps on the Erie & Genesee Valley, now part of the Erie, and subsequently served in the engineering department of different roads. He was appointed an assistant engineer on the New York, Lake Erie & Western in 1879, and later served as roadmaster of the same road. In 1882 he went to the New York, Ontario & Western as division superintendent; five years later he was appointed chief engineer and since January, 1895, was general superintendent of the same road.

New Railway Lines in Russia.—A meeting of the Russian interdepartmental conference on the plan for railway construction in the near future was held on May 25, with the assistant minister of ways and communications as chairman. Several projects for the first and second series of railway construction were submitted. After considering these projects, the conference resolved that, of the first series, the following lines should be built: (1) Polotzk-Novograd-Volynsk, (2) Ryazan-Tula-Baranovichi (for conveying timber from Polyesie); (3) Bala-Ishem-Neftedag (for the naphtha district); (4) Novobolitzy-Tchernigof-Priluki; (5) Tchernigof-Kief; (6) Orsha-Vorogba; (7) Ouman-Nikolaief; (8) Dolginskaya-Pomotshnaya; (9) Pedorovka-Skadovsk-Tchorly (for the beet-sugar and agricultural districts).

Equipment and Supplies

LOCOMOTIVES

The Pittsburgh & Lake Erie has ordered 10 locomotives from the American Locomotive Company.

The New York Central has ordered 10 electric locomotives from the General Electric Company.

The British Government has ordered 45 narrow gage locomotives from the Baldwin Locomotive Works.

Mosle Brothers, of Cuba, recently ordered one Consolidation locomotive from the Baldwin Locomotive Works.

The Italian State Railways have ordered 60 superheater Consolidation locomotives from the American Locomotive Company. These locomotives will have 21¼ by 27½-in. cylinders, 53½-in. driving wheels, and a total weight in working order of 146,000 lb.

FREIGHT CARS

The Pennsylvania Railroad is in the market for 8 caboose car underframes.

The Northern Pacific is repairing 100 box cars in its own shops at St. Paul.

The American Bridge Company is inquiring for 4 40-ft., 50-ton steel box cars.

The Kimberly-Clark Company, Neenah, Wis., has issued inquiries for 20 flat cars.

The Minneapolis, St. Paul & Sault Ste. Marie is in the market for 250 ore cars.

The Loraine Steel Company has ordered 8 light hopper cars from the Pressed Steel Car Company.

The Bureau of Mines has ordered 3 steel rescue cars from the American Car & Foundry Company.

The Pere Marquette has given an order to the Western Steel Car & Foundry Company to repair 500 cars.

The New York, New Haven & Hartford is in the market for 2 insulated box cars and 4 steel underframe transformer cars.

The Kansas City Southern is in the market for 1,900 draft arms to reinforce old cars and not for 1,900 freight cars, as reported in last week's issue.

The Atlantic Coast Line, reported in last week's issue as being in the market for 100 underframes, has ordered these underframes from the American Car & Foundry Company.

The Western Pacific has issued inquiries for 750 40-ft., 40-ton steel center sill box cars, 250 40-ft 40-ton ventilated steel center sill box cars and 150 36-ft., 40-ton steel center sill stock cars. The Western Pacific was reported in the *Railway Age Gazette* of July 21 as having issued inquiries for 1,000 fruit cars.

PASSENGER CARS

The Erie is in the market for 38 passenger car underframes.

The New York, Philadelphia & Norfolk is in the market for 2 coaches.

The Missouri Pacific, reported in the *Railway Age Gazette* of July 28 as being in the market for 6 dining cars, has ordered these cars from the American Car & Foundry Company.

IRON AND STEEL

The Boston & Maine has ordered 150 tons of bridge work from the Boston Bridge Works.

The Chicago, Burlington & Quincy has ordered 1,478 tons of bridge steel from the American Bridge Company.

The Minneapolis & St. Louis has ordered steel for spans for a bridge at Lake street, Minneapolis, from the American Bridge Company.

Supply Trade News

The Squire-Cogswell Company has been incorporated, and will take over the railway supply business hitherto carried on under the name of Willis C. Squire & Co. The company is located in the Ellsworth building, Chicago.

W. H. Stocks, sales representative at Chicago for the Gold Car Heating & Lighting Company, New York, Ill., died in Chicago on August 15, following an illness of several months. Mr. Stocks had been in the service of the company for over 13 years.

Charles M. Terry, Inc., of Sydney, Australia, announces that it has secured the services of C. M. Barron as consulting and purchasing engineer, to be located in the company's offices, 23 Beaver street, New York. Mr. Barron has for the past five years used his efforts in studying and cultivating the Australasian market for railway supplies, machine tools and raw materials.

J. Leonard Replogle, vice-president and general manager of sales of the American Vanadium Company since March 1, 1915, and prior to that vice-president and general manager of sales of the Cambria Steel Company, is understood to be completing negotiations looking to the purchase of the American Vanadium Company for a syndicate of eastern capitalists. The stock of the American Vanadium Company consists of 7,000 shares par value $100. The syndicate proposes to form a new company with the same name. For the $700,000 capital stock of the present company, $7,000,000 will be given, $4,550,000 in cash and $2,450,000 in 6 per cent first mortgage bonds. The new company will issue these bonds, $5,000,000 of 7 per cent preferred and $6,000,000 of common stock. Reports have it that Mr. Replogle will be elected president of the new company, and that James J. Flannery, the present president, will be made chairman of the board.

Pulverized Fuel Locomotives for Brazil

Dr. J. J. da Silva Freire, sub-director and locomotive superintendent of the Central Railway of Brazil, sailed on Thursday, August 17, for Rio de Janeiro. Dr. Freire has been in the United States since about May 1 last on various missions for the Central Railway of Brazil and the Brazilian Government, and attended the railway conventions at Atlantic City during June.

On account of the high cost for imported coal and fuel oil in Brazil, and the coal reaching there in a condition averaging from 30 to 60 per cent fine dust and slack, the government has been investigating as to the use of domestic bituminous coal which is found in the southern part of that country, but which has as yet been very little mined owing to its relatively inferior quality as compared with Cardiff and West Virginia coals.

About a year ago the director of the Central Railway of Brazil noticed in the *Railway Age Gazette* that the use of pulverized fuel for locomotives was being developed in this country, and through Dr. Freire arranged for the latter's assistant, Dr. Joaquim de Assis Ribeiro, chief of traction, to come to the United States to make personal investigation. Dr. Ribeiro came here during November last, remaining about three months, for the purpose of investigating the use of Brazilian domestic coals in pulverized form as well as in gas producers. On his return he made quite an elaborate report on the subject which was issued in printed form by the director, Dr. Miguel Arrajado Lisboa, during June of this year. As a result of the investigation the Central Railway of Brazil has decided to install a fuel preparing and coaling plant, with a capacity of 15 tons per hour, at Barra do Pirahy, which is an enginehouse and shop terminal located north of Rio, according to plans and specifications prepared by the International Pulverized Fuel Corporation, which company will also make the installation. Order has also been placed by this railway with the American Locomotive Company for 12 ten-wheel type passenger locomotives that will be equipped

with pulverized-fuel-burning apparatus as designed and furnished by the International Pulverized Fuel Corporation. This equipment will practically duplicate that which was installed by the Locomotive Pulverized Fuel Company on the Delaware & Hudson Company's Consolidation locomotive number 1200, which was exhibited at the mechanical conventions at Atlantic City last June.

As Barra do Pirahy is located at the junction of the San Paulo East, and Rio North Lines, it will enable these locomotives to make round trips in three directions out of that terminal and fueling station. In this connection it may be well to recall that Dr. Freire, when attending the International Railway Congress, which was held at Washington, D. C., during May, 1905, became much interested in the Mallet articulated compound locomotive that had been put into service by the Baltimore & Ohio, this being the first locomotive of that type to be placed in service in America. As a result of this investiagtion the Central Railway of Brazil ordered three of this type from the American Locomotive Company, which number has since been increased to a total of 29. The Central Railway of Brazil has considerable one and two per cent grade line with relatively high degree curvature and these locomotives have worked out most satisfactorily.

Harrison Railways Specialties Company

The Harrison Railways Specialties Company, incorporated in the state of Ohio, has acquired by purchase the business and good will of the Harrison Dust Guard Company, Toledo, Ohio, formerly owned by Frank B. Harrison, who has severed his connection with the organization. The head executive office of the new company will be at Sandusky, Ohio, and the general sales office at 628-629 McCormick building, Chicago, Ill. Among the devices manufactured by the company are dust guards, journal boxes, car journal lubricators, locomotive cellars, locomotive cellar lubricators. The officers of the new company are as follows: J. J. Dauch, president; Sidney Frohman, vice-president; W. N. Thornburgh, vice-president and general manager; Frank Kennison, treasurer, and W. P. Rude, secretary and assistant treasurer. Messrs. Dauch, Frohman and Rude will have headquarters at Sandusky, Ohio; Mr. Kennison at Toledo, Ohio, and Mr. Thornburgh at Chicago, Ill. J. J. Dauch is president of the Hinde & Dauch Paper Company, the Dauch Manufacturing Company and the Waycleanse Company, and a director of the Frohman Chemical Company. Sidney Frohman has been treasurer of the Hinde & Dauch Paper Company for many years. He is also president and treasurer of the Frohman Chemical Company, treasurer of the Dauch Manufacturing Company, and a director and officer of various other corporations. Previous to entering business, Mr. Thornburgh was in the service of the Baltimore & Ohio successively as telegraph operator and chief clerk in the operating and traffic departments. Since leaving the Baltimore & Ohio he has been consecutively district manager of the Cleveland Stone Company at New York, Boston and Chicago; manager and treasurer of the Thornburgh Coupler Attachments Company, Ltd., Detroit, Mich.; vice-president of the Ohio Quarries Company, Cleveland, Ohio; vice-president and general manager of the Metropolitan Engineering & Construction Company, Kansas City, Mo.; general manager of sales of the Standard Asphalt & Rubber Company, Chicago, Ill.; a member of the firm of Thornburgh & Kinnear, general contractors, Houston, Tex., and manufacturers' representative in the brick, stone and marble business at Pittsburgh, Pa. Mr. Thornburgh will have charge of the general sales office at Chicago, Ill.



J. J. Dauch



S. Frohman



W. N. Thornburgh

Connecticut Electric Steel Company

Edwin L. Willson, for the past five years sales engineer in charge of the railroad department of the Hazard Manufacturing Company, Wilkes-Barre, Pa., resigned on August 1 to become president of the Connecticut Electric Steel Company, Inc. Mr. Willson was born at Baltimore and received his early education in the public schools of that city. In 1905 he graduated from the Baltimore Polytechnic Institute and in 1908 graduated from Lehigh University with the degree of electrical engineer. During his school days he was engaged in railway engineering and construction work with the Westinghouse Electric & Manufacturing Company. Upon leaving school he went with the Hazard Manufacturing Company, at the Wilkes-Barre office, in charge of electrical and chemical testing. In July, 1911, he entered the sales department as sales engineer in charge of railroad work, with offices in New York City, which position he held until August 1. In his new position Mr. Willson has headquarters at 50 Church street, New York, but will shortly remove his office to Hartford-Conn., at which point the foundry is located. The plant is nearing completion and will be in operation early in October. The Connecticut Electric Steel Company, Inc., will manufacture high quality steel castings by the Heroult electric process. On account of the uniformity and high quality of electric furnace steel this product is especially adapted to the manufacture of various locomotive castings. The company expects also to develop manganese steel for making mechanical interlocking parts, such as bell cranks. Some of these castings are subject to great wear and this development it is expected will overcome the necessity of frequent rebushing of these parts.



E. L. Willson

American Railway Equipment in the Far East

Continued interest in the markets of the far east, Australia and South Africa, has led the Bureau of Foreign and Domestic Commerce, of the Department of Commerce, to undertake an investigation of the field for American railway equipment and supplies in that section of the world. Frank Rhea, of the division of valuations of the Interstate Commerce Commission, has been appointed special agent to make the investigation, and is already engaged in making arrangements for conferences with manufacturers, contractors and selling agents, which will be held during a preliminary trip to the principal manufacturing centers in this country. This preliminary trip will be made in September.

When the special agent has learned what information the manufacturers in this country want concerning railway conditions across the Pacific, he will go abroad and make a careful study on the ground of the conditions as they affect railway construction, equipment, traffic, the probable extension or reconstruction of railways, tramways, etc. While all specific opportunities for securing orders will be promptly reported, the real purpose of the investigation is to gather together the fundamental facts and conditions that will enable the American manufacturer to consider intelligently the different fields, and to determine whether it is to his advantage to enter any of them.

Manufacturers and others who wish to get in touch with Mr. Rhea before he leaves this country should address the Division of Commercial Agents, Bureau of Foreign and Domestic Commerce, Customhouse, New York.

The Largest Plate Mill in the World

The Lukens Iron & Steel Company announces that it will have its new plate mill in operation March 1, 1917. The notable feature of this mill will be the 204 in. rolls, the largest in existence, and which will be of different construction from any in use at the present time.

The two working rolls will be 34 in. in diameter and made of chilled iron. On account of their extreme length, supporting rolls will be necessary in order to provide the required strength to prevent undue springing of the rolls resulting in varying thicknesses. The lower supporting roll will be kept in motion by a friction driven spindle to avoid depending alone upon the frictional contact with the working roll for reversing the motion of the mill. This arrangement, which is entirely new to plate mill design and the very heavy proportions used, will secure the stiffness of construction which is necessary to produce uniformity in the thickness of the plate.

This new mill will enable the Lukens Iron & Steel Company to make plates 192 in. wide. These plates will exceed in width by 52 in. any now made in this country, by 36 in. any made in Great Britain, and by 26 in. the plates made at Witkowitz in Hungary, where the largest mill now built is located.

These new facilities for the making of plates, together with other additions to the plant, have necessitated a considerable increase in the number of open hearth furnaces. In addition to the sixteen now in operation, six new ones of 100 tons capacity each are now being built.

TRADE PUBLICATIONS

Chicago & North Western.—The passenger department of this road has published a new pocket map of the lake regions of northern Wisconsin, showing on a large scale thousands of lakes and streams, resorts and automobile roads.

Better Electric Motors. This is the title of a 64-page booklet recently issued by the S. K. F. Ball Bearing Company, Hartford, Conn., dealing with S. K. F. ball bearings for electric motors. The booklet tells of the advantages of ball bearings in motors under such heads as: Reduced maintenance, lubrication, durability, simplicity and cleanliness, compactness, comparative efficiency, improved commutation, etc. It shows the advantages to be obtained by using ball bearing motors for machine tools, woodworking machinery, etc., and a part of the booklet is devoted to rules for applying S. K. F. ball bearings, and directions for mounting and lubrication. The booklet is extremely well illustrated with views of motors, and machinery and diagrams showing how the ball bearings are mounted in motors for various kinds of service.

Railway Construction

Atchison, Topeka & Santa Fe.—This company has let a contract for the construction of a line from Lindsay, Cal., to Porterville, Cal., a distance of 12½ miles.

Atlanta & Anderson (Electric).—Application will be made in Georgia for a charter to build an electric line from Atlanta, Ga., northeast to Anderson, S. C., about 120 miles. J. McCurry, Hartwell, is said to be interested.

Branchville & Bowman.—See Savannah Western.

Canadian Northern.—This company has let a contract for the construction of a line from Kamloops, B. C., to Kelowna. Work on the new bridge over the Thompson river has already been commenced, as well as grading southwest of Vernon.

Canadian Pacific.—A new subdivision has been opened for business on the Ontario division called the Camp Borden subdivision, extending from Ypres, Ontario, to Camp Borden, 4.5 miles.

East Broad Top Railroad & Coal Company.—This company has extended its road from Woodvale, Pa., to Alvan, 2 miles. (May 5, p. 1017.)

Evansville & Indianapolis.—Wm. P. Kappes, receiver, has been authorized by the federal court to negotiate certificates to the extent of $600,000 for a general rehabilitation of this railroad. The money will be apportioned as follows: Rolling stock, $232,550; ties, $27,675; rails, $35,000; realinement, $60,225; bridges, $59,500; ballast, $21,000; terminal facilities, $122,000; miscellaneous, $42,050.

Hampton & Branchville.—See Savannah Western.

Knoxville, Sevierville & Eastern.—See Pigeon River Railroad.

Mississippi Roads.—The Biloxi Vegetable & Fruit Growers' Association has adopted a resolution declaring in favor of building a railroad from Ocean Springs to Biloxi, about 5 miles, and has appointed a committee consisting of W. A. Reno, Hypolite Borries, and J. A. Latimer to solicit donations of right of way in return for stock in a company to build the line.

Missouri, Kansas & Texas.—This company has awarded a contract for widening its roadbed between Osage, Okla., and Wybark, Okla. It is estimated there will be 168,000 cu. yd. of excavation.

Pennsylvania Railroad.—This company has let a contract to the Brown-King Construction Company, Philadelphia, Pa., for grading and track work at Northumberland, Pa., to cost approximately $50,000.

Pigeon River Railroad.—A charter has been filed for the incorporation of the Pigeon River Railroad with $50,000 capital to build a line from Sevierville, Tenn., south to Pigeon Forge and thence via Gatlinburg, to a point at or near the North Carolina line, about 26 miles. It is understood that the line may be leased to, and will form an extension of, the Knoxville, Sevierville & Eastern, a 30 mile line from Knoxville, Tenn., to Sevierville. The incorporators of the Pigeon River Railroad include R. H. Simmonds, L. S. Hall, Frank A. Carpenter, Frank P. Gaut, and John P. Moffett. The Pigeon River Construction Company, which is to finance and otherwise arrange for the construction of the extension, has also been incorporated. The construction will be supervised by L. E. Wooten, general manager of the Knoxville, Sevierville & Eastern. Gen. Frank Maloney, chief engineer, is now engaged in making the survey, and it is expected the construction will begin within a few weeks. It is said that the grade will not exceed one per cent. Extensive iron ore and timber lands will be developed. W. J. Oliver, president of the Knoxville, Sevierville & Eastern, is principally interested.

Savannah Western.—J. A. Vandegrift & Co., New York, are negotiating with the officers of the Savannah Western relative to financing the construction of this line from Estill, S. C., where connection is to be made with the Seaboard Air Line northeast

to St. Paul about 90 miles. At St. Paul connection will be made with the Northwestern Railroad of South Carolina, which extends to Sumter, also on the Seaboard Air Line. The Savannah Western was incorporated in South Carolina in September, 1914, with capital stock of $1,000,000. The incorporators included G. H. Milligan, of Charleston, S. C., and Virgil Walker and Adrian M. Rea, of Newbern, N. C. Reports say that the Hampton & Branchville, 24 miles, and the Branchville & Bowman, 12 miles, may be absorbed and form part of the Savannah Western, in which case about 35 miles of grading will be avoided. The Branchville & Bowman will have to be converted from narrow to standard gage. To finance the proposed construction, $2,000,000 in bonds may be issued.

Terre Haute, Indianapolis & Eastern Traction.—This company has acquired the necessary right-of-way to provide for the double tracking of its line from the Indianapolis (Ind.) city limits to the motor speedway, one mile. No definite plans have as yet been made for construction work.

Washington-Newport News Short Line.—Applications have been filed with the War Department at Washington for approval of this company's plans for bridges over the Potomac, Rappahannock and York rivers. The Maryland Board of Public Works has already approved the Potomac bridge plan. This company was chartered in Virginia last January to build a railroad from Newport News, Va., to Washington, D. C. Frank S. Gannon of Staten Island, New York, is president. (February 4, 1916, p. 228.)

RAILWAY STRUCTURES

Atkins, Iowa.—The Chicago, Milwaukee & St. Paul contemplates the construction of terminal facilities at a cost of about $614,000. The improvements will include a 26-stall roundhouse, 90-ft. turntable, 154-ft. cinder pit, a coal handling plant, a power house 50 ft. by 80 ft., a blacksmith and machine shop 50 ft. by 90 ft., a storehouse 50 ft. by 100 ft., an ice house and other buildings, as well as a modern yard for handling increased traffic. A large amount of grading will be required in the construction of the yard, and it will be necessary to lay a number of miles of water pipe to carry water to the terminals from the Cedar river. Bids have been asked for in connection with the grading. The concrete work will probably be done by St. Paul employees.

Blackshear, Ga.—The Atlantic Coast Line has awarded a contract to Little & Phillips, Cordele, Ga., for building an addition to the station at Blackshear. The work calls for the construction of a brick structure one story high, 40 ft. wide and 50 ft. long.

Charlotte, N. C.—The Seaboard Air Line is reported to have let a contract to the A. M. Walkup Company, Inc., Richmond, Va., to enlarge and remodel its present two-story brick passenger station, and build an 18-ft. one-story addition to the east side and a 35-ft. one-story addition on the west side. The contract also includes the construction of an umbrella shed, granolithic platforms, etc., the installation of new lights, etc. The cost of the improvements will be about $25,000.

Corinth, Miss.—The Mobile & Ohio and the Southern Railway are reported to have awarded a contract to C. M. Ayres, Tuscaloosa, Ala., to erect a joint freight station costing about $20,000.

Danbury, Conn.—The New York, New Haven & Hartford will ask for bids as soon as plans are completed for the construction of a roundhouse, also a shop and an office building at White Street yard. The buildings are to be of frame construction with terra cotta fire wall. The roundhouse will contain eight 95-ft. stalls; the shop is to be one story high, 48 ft. by 100 ft., and the office building is to be two stories high, 42 ft. 6 in. wide by 49 ft. 8 in. long. The improvements will cost about $65,000. In addition there will be a boiler and generator room, 48 ft. by 48 ft.; a storeroom, 36 ft. by 48 ft., with an oil storage system.

Danville, Ill.—The Chicago & Eastern Illinois is erecting a passenger station at Kimball and Meyers streets. The building proper will be 20 ft. high, 78 ft. wide and 100 ft. long. The structure will have concrete foundations, brick walls with stone and terra cotta trimmings and a hollow tile roof. The approximate cost is $95,000; the Clarke Construction Company, of Danville, Ill., has the contract for the train sheds and the structural steel will be furnished by A. Bolter's Sons, Chicago, Ill.

East Aurora, N. Y.—The Pennsylvania Railroad has awarded a contract to Regan & Cleary of East Aurora for the construction of a new brick and stone passenger station with platforms, shelters and driveways. The new station will be on the east side of the main track where the freight station is at present located. The latter will be moved to the west side of the tracks and new carload delivery tracks and driveways will be provided. Work will be started immediately.

Ellaville, Ga.—The Central of Georgia, it is said, will build a new passenger and freight station.

Fort Washington, Pa.—The Philadelphia & Reading has awarded a contract to the J. E. Brenneman Company, Philadelphia, Pa., for a concrete slab bridge over Sandy run south of Fort Washington station.

Jenkintown, Pa.—The Philadelphia & Reading has awarded a contract to the J. E. Brenneman Company, Philadelphia, for a reinforced concrete slab bridge over Tacony creek, north of Jenkintown.

Kansas City, Kan.—The Kansas City Terminal has awarded contracts to the American Bridge Company for a double track, double deck bridge over the Kaw river, and an elevated structure across the river bottoms.

Needles, Ariz.—The Atchison, Topeka & Santa Fe is contemplating moving its division shops at this place to Seligman, Ariz.

New York.—Bids are wanted by the New York Public Service Commission, First district, for the construction of station finish for stations at Twenty-third street, at Twenty-eighth street, and at Canal street, on the Broadway subway, in the borough of Manhattan.

Norfolk, Va.—The Atlantic Coast Line will build a new passenger terminal, it is said, on land recently bought at the foot of York street.

Philadelphia, Pa.—The Pennsylvania Railroad has given a contract to L. H. Smith, Philadelphia, for the construction of a second story office addition on the Shackamaxon street freight station. The work will cost about $15,000.

Port Huron, Mich.—The Grand Trunk has started work on new repair shops, to cost approximately $700,000. There will be eight buildings in the group, which are intended to accommodate 30 passenger and 75 freight cars at one time. About 15,000 ft. of new trackage will be required.

Quakertown, Pa.—The Philadelphia & Reading has awarded a contract to A. L. Carhart, Philadelphia, Pa., for a reinforced slab bridge south of Quakertown station on the Bethlehem division.

Renovo, Pa.—The Pennsylvania Railroad will use company forces to build an extension to its enginehouse at this point, including a small enginehouse office building. The addition will be built of concrete and brick with a timber and asphalt roof.

Shelly, Pa.—The Philadelphia & Reading has awarded a contract to A. L. Carhart, Philadelphia, Pa., for a reinforced slab bridge over Tohican creek, south of Shelly.

South Beloit, Ill.—The Chicago, Milwaukee & St. Paul has commenced the construction of new treminal facilities to cost about $65,000. The work includes the laying of additional yard tracks, the construction of a three or four-stall engine house, with an 80-ft. turntable, a 43-ft. cinder pit, a coaling plant, a power house, 18 ft. by 32 ft., and a water tank. Grading at this point was begun some time ago. (August 18, page 309.)

Sparta, Tenn.—The Nashville, Chattanooga & St. Louis will use company forces to build a new brick passenger and freight station costing about $12,000 at Sparta, Tenn., to replace a station destroyed by fire some time ago.

Russian and Swedish Railways Joined Up.—An agreement between Russia and Sweden regarding the joining up of the Russian and Swedish railway systems by a bridge across the river Tornea was signed at Petrograd on July 15.

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*Illustrated.

Net Operating Income in 1916

The indications are that the fiscal year ending June 30, 1916, will show the highest operating income for many roads of any year in their history. The highest peak in previous years will be for some roads 1913, for others 1910, but the fact that should be borne in mind in comparing the records which are now being made with previous records is that not only must the operating income be compared, but the amount of additional investment in the property since the previous high record must also be taken into consideration. The Atchison, Topeka & Santa Fe earned an operating income—the amount available for interest, rentals, dividends and all other charges—of $43,779,993 the year just ended. This is an increase over 1915 of $7,728,593. The highest previous record for the Santa Fe was 1915, in which year the return on property investment was five per cent. The return on property investment for 1916 is 5.97 per cent; relatively, therefore, the 1916 fiscal year will apparently prove to be the best in the history of the property. Even so, less than 6 per cent is not an extravagantly high return on investment in a banner year. The Southern Railway in the fiscal year ended June 30, 1916, had an operating income of $21,004,005. The balance after paying fixed charges was $9,358,104; this compares with the best previous record, which was made in 1913, of $7,078,625. The operating income of the Pennsylvania System, Lines East and West, was $50,767,754, an increase over the corresponding six months of 1915 of $21,959,004. The return earned on property investment for the entire system for the year ended June 30, 1916, was 6.90 per cent, comparing with 7.41 per cent for the year ended June 30, 1910.

Encourage Your Car Inspectors

The American Association of Railroad Superintendents' Committee on Interchange Car Inspection has emphasized the necessity of giving more attention to the selection and training of car inspectors. Exceptional men are needed to meet the requirements of this position as roughly outlined by the committee. It is to be feared that far too little attention has been given to encouraging and inspiring these men to better efforts, and that there has been too much of criticism and fault finding without constructive suggestions. To give the study which is required to master and keep up to date on the application of the complicated and extensive rules and regulations with which they must be familiar requires encouragement and active interest on the part of the supervising officers. Few men will respond with their best efforts if they are left to themselves or are only approached by their superiors when it is necessary to give them orders or criticise and discipline them. The possibilities of improved efficiency in transportation and savings in the cost of operation because of improved interchange and inspection service are surely sufficiently great to warrant responsible officers in the operating and car departments giving this problem more of their personal attention. A contributor to a recent number of the Railway Mechanical Engineer clearly developed this point in the following words: "Imagine how pleased an inspector would be to have the 'old man' come down to the car yard and thank him for a nice report or good inspection record. Do you know of any more profitable time spent than a little heart to heart talk by the superintendent of the car department with a number of inspectors, letting them know that by close attention and good work the company had saved money?"

Cost of Reproduction New

In the crisp comments which Charles S. Mellen, former president of the New York, New Haven & Hartford, recently made on the Boston & Maine situation the following occurs:

> I do not put the blame of the proposed receivership on the leased lines. Some rentals were exorbitant, but rentals are not too high in most cases. It would be impossible to duplicate these roads at their cost to the Boston & Maine. Some could not be duplicated at 300 per cent of the present capitalization.

He predicts that if the receivership is carried to the bitter end it will result in breaking up the system, and although in the interview, a part of which is published elsewhere in this issue, he does not in so many words say that there is no prospect of separate parts of the system earning anywhere near a fair return on 300 per cent of their present capitalization, he strongly implies it; anyone who knows anything at all about the New England situation knows that this is the

fact and that most of the leased lines if operated by themselves would not be likely to earn even the present guaranteed return on their present capitalization. This throws a sidelight on the present return on what would be the cost of reproduction new of some of the main trunk lines in northern New England. Mr. Mellen blames the bankers in part for the Boston & Maine predicament. His own experience with the bankers was unfortunate, but in the main Mr. Mellen agrees with the opinions expressed in these columns last week, namely, that the fundamental trouble with the Boston & Maine has been that it has had necessarily to be financed by bonds instead of stock, and he implies that it would be far better in the long run if the Boston & Maine earned 10 per cent or more some years on a much larger stock capitalization than it now has if it had a smaller proportion of fixed charges.

THE COST OF WATER

THE cost of providing water for use in locomotives and stationary boilers necessarily differs on the various railroads. Water is more expensive in an arid territory than in a humid one, or in a district where deep wells are required than in one where river or sub-drainage water is available. Aside from the presence of these legitimate sources of difference in cost it is unfortunately true that the water supply department is not conducted as efficiently on some railroads as on others. This fact is appreciated only in a general way; no conclusive data are available to prove this, for in addition to physical conditions which make water more expensive on one road than on another, there are so many operating conditions which affect the relative water consumption that no unit has been discovered thus far which will correctly demonstrate relative efficiency in water service.

The difficulties encountered in investigations along this line are outlined on another page of this issue in an article which makes a comparison of water costs on several different bases.

A study of these results discloses the fact that each of the units suggested is inequitable under one or more conditions, being unfavorable, for example, to the road with the densest traffic or the heaviest grades or the greatest average trainload. Special sources of expense, such as the treatment of water containing excessive quantities of encrusting solids, provisions for prevention of freezing in cold climates or the use of track pans, also introduce factors that ought to be taken into account.

The cost of water in terms of the number of gallons of water pumped will not serve the purpose as it does not take into account the head, both gravity and friction, under which the plant or plants are compelled to work. On the other hand, the unit—gallons of water pumped against a one-foot head—will not meet the conditions, because the economical conduct of water service not only implies the efficient operation of existing plants, but also includes the elimination or replacement of the uneconomical pumping plants, the reduction of water waste and other items not represented by the quantity of water pumped.

The objections to such units as have been proposed up to the present time indicate clearly the difficulties to be encountered in a study of this problem. Notwithstanding these objections a unit which will permit of a fair comparison between the cost of providing water on different railways is highly desirable. The water required on the railways in this country costs more than $16,000,000 annually. That this sum is not all being spent as efficiently as it might be is readily appreciated and the amount of money which can be saved by improved practices and proper supervision is surely large enough to justify not only the determination of a proper unit of cost, but a thorough study of the entire subject of water supply.

THE IMPENDING STRIKE

AT the time this editorial is being written, the United States is confronted with what may prove to be the greatest disaster in its history since the civil war. The labor brotherhoods have ordered a strike on all the railways effective on September 4, and the heads of the railways are unanimously standing firm for arbitration, and making all preparations for fighting the strike. The only agency which seems in a position to prevent the catastrophe is the national government, and thus far it has acted like a body that is paralyzed in all its members.

If the strike comes, who will be responsible for it? How long will it last? What will be the outcome? The second and third of these questions nobody can answer. The first is very easy to answer.

The movement among the train employees which is now about to reach its climax began almost a year ago. From the first the employees announced that they would not arbitrate their demands, but that unless the railways granted them in toto they would strike. The railways and the Chamber of Commerce of the United States repeatedly called the attention of Congress and President Wilson to the fact that an extremely dangerous situation was developing, but the President and Congress sat as still as knots on a log. Before the strike vote was taken the Conference Committee of the railways offered arbitration by the Interstate Commerce Commission or under the Newlands act. It renewed the offer after the strike vote was taken. When the matter got before President Wilson he suggested that the railways grant the so-called "eight-hour day" and defer indefinitely the consideration of other matters in controversy. He did not propose arbitration of the men's demand for time and a half for overtime. He did not propose arbitration of the demands of the railways. The employees accepted President Wilson's plan in its original form, but when later he asked them to agree to arbitrate their demands for time and a half for overtime and the demands of the railways they refused. The railways finally offered to submit the entire matter to arbitration by a commission to be appointed by President Wilson himself, but this suggestion received scant consideration from either the President or the employees. The President consulted Congress about the practicability of promptly getting legislation to deal with the situation, but Congress thought of the possible effect of legislation on the election next November, and stirred not. Not, at least, until the brotherhoods actually ordered a strike for September 4. Then, within six days of the date on which the strike was to occur, the President went to Congress and urged legislative action.

Manifestly, if a strike comes the railways will not be responsible, as they have exhausted every means at their command to secure a peaceable settlement, except complete surrender. The brotherhoods will have the primary responsibility, as they have refused all offers of a peaceable settlement which did not involve granting most of their demands. President Wilson will have to bear the secondary responsibility, because if he had stood for arbitration instead of trying to use the situation to serve his political purposes by declaring himself for an eight-hour day before the case had been presented to him, the chances are there never would have been any strike. Congress must bear the tertiary responsibility, because it has supinely refused to act until apparently it has become too late for any action it may take to do any good.

How long the strike will last is purely conjectural. The prospects are that it will be so gigantic that even our present cowardly, inert and politically-minded government will be forced to do something to bring it to a speedy end.

As to the outcome, one result seems certain. This is, that the strike will lead to legislation that will forever make it practically impossible for the nation's peace and welfare to

be jeopardized in this manner. This is one of the great advantages which, it would seem, must be gained from the determined stand for arbitration which the railways have taken. If they had yielded the nation would have believed that there really never was serious danger, after all, and the country would have continued to be menaced every two or three years by a similar crisis. If a strike comes, the nation will be brought to a full realization of the unscrupulous, desperate and ruthless character of the leadership of the railway brotherhoods, and will take steps to protect itself in future. The threat of force made by these organizations had to be squarely met some time, and the railways were right in deciding that this was the time to meet it.

If the strike comes, it would seem that it must mean the defeat of President Wilson and the Democratic party in November. The course of the President and Congress in dealing with the situation had been up to the time this editorial was written, a long and unbroken series of the most amazing blunders every one of which has contributed directly toward increasing the dangers of the situation. Even if the strike shall yet be prevented, the way the administration has acted must do it great harm. If it gets what will be in effect a compulsory arbitration law, it will enrage the railway brotherhoods. If it gets an eight-hour day law, it will further infuriate the business interests of the country. No matter what it does now it will be blamed by the public for having jumped into a bad situation and by its ill-considered measures made it ten-fold worse.

WAS IT A POLITICAL "FRAME-UP"?

THE nation naturally continues to ask itself what could have caused President Wilson to adopt so extraordinary and unprecedented a course in dealing with the railway wage question. What is back of it? Why did he propose and insist that, without any public investigation of the questions involved, the railways should grant increases in wages amounting to many millions of dollars to men who are already the highest paid working men in America? The burden will ultimately be passed on to the consuming public. Why has the President so strongly favored putting such a burden on the consuming public without giving that public any chance, directly or indirectly, to be heard?

We do not intend to make any charges against Mr. Wilson. We do intend, however, to present a series of facts the knowledge of which has forced us to reach certain conclusions regarding his conduct, and which we are confident will cause most of those who are informed of them to draw from them the same conclusions that we have.

Some of the facts which we will present already have been published. Others have not been. It is those which have not been which are the most important in this connection, because without them the chain of circumstantial evidence is incomplete, while with them supplied it seems to be complete. The courts sometimes have held that circumstantial evidence may sometimes be more conclusive than direct evidence, because the witnesses who give direct testimony may lie while circumstances do not lie.

This controversy between the railways and the labor brotherhoods is not a new development. It began a year ago. It was already acute six months ago. When the brotherhoods announced they were going to demand a "basic eight-hour day" they began by saying they would not arbitrate, but would tie up all the transportation lines of the country if the companies did not concede what they wanted. The railways were determined to give them nothing without arbitration. It was therefore foreseen from the start by all close observers that the danger of a terrible strike was real and serious. The railways spared neither effort nor money to get this fact before the administration, Congress and the public. But the administration and Congress were apathetic. Judge W. L. Chambers of the federal mediation and conciliation board even gave out statements to the effect that this body was watching developments and was confident there would be no strike.

The Chamber of Commerce of the United States, the greatest organization of business interests in the country, became concerned about the situation, and submitted to its members a resolution asking the President and Congress to cause an investigation of the entire wage situation by the Interstate Commerce Commission. Meantime, on April 9, meetings of members of the labor brotherhoods were held at St. Louis in which addresses were made by W. S. Stone, grand chief of the Brotherhood of Locomotive Engineers, and W. G. Lee, president of the Brotherhood of Railroad Trainmen. At one of these meetings both Lee and Stone made the statement "that they were absolutely confident of winning out, but that *they were going to do a certain thing which only the presidents of the four brotherhoods knew about,* one that they did not propose to tell anyone what this was, but that *it would be the deciding factor in winning out in this fight.*" The report of this meeting, containing the words quoted, has been in our possession four months. Until within the last two weeks we were never able to get a clue to the meaning of those words.

On June 10 the conferences between the representatives of the brotherhoods and the Conference Committee of the Railways began in New York. Disagreement resulted, and the railways offered arbitration either by the Interstate Commerce Commission or under the Newlands act. The employees refused both and went out to take a strike vote.

Meantime, the vote of the Chamber of Commerce of the United States was reported, and was found to be almost unanimous in favor of an investigation by the Interstate Commerce Commission. The Chamber of Commerce resolution was sent to President Wilson. He ignored it. It was presented in Congress. Chairman Adamson of the House Committee on Interstate and Foreign Commerce is a close political friend and supporter of President Wilson. On July 12 Mr. Adamson arose in his place and explained that he was opposed to the Chamber of Commerce resolution because he and Mr. Mann, the Republican leader, had "investigated to see whether there would be any strike. I will not say where we went," he added, "but we were assured by the representatives of the employees that there would be no walk out, and they did not mean to stop the wheels." Mr. Mann promptly denied he had talked with representatives of the employees. The strike vote was actually being taken; and yet representatives of the administration and leaders of the brotherhoods continued to give out statements that they were confident that there would be no strike. The spokesmen of the administration gave no reason for the faith that was in them. The spokesmen of the brotherhoods said they were sure there would be no strike *because the railways would yield.*

H. A. Wheeler, chairman of the Railroad Committee of the Chamber of Commerce of the United States, finally sent direct to President Wilson a long telegram pressing upon him the seriousness of the situation and urging action on the Chamber of Commerce resolution. This, apparently, was received at the White House in the same cool spirit as all other representations from the Chamber of Commerce on the subject.

Finally, the strike vote was finished. It was to be presented to the railways in New York on the morning of August 8. Two days before, on the evening of August 6, the brotherhoods held a public meeting in New York at which they were addressed by some more or less distinguished speakers. But the most marked success of the evening was a speech by Dudley Field Malone. And who is Mr. Malone? Well, good people, he was the *personal representative* of President Wilson at the inauguration of the President of

Cuba and, by President Wilson's appointment, he is now collector of the Port of New York. Mr. Malone also advocated the eight-hour day demand of the brotherhoods. When Malone's speech was read by railway officers there was considerable consternation among them. Did he express the views of the administration? The railway officers made one answer then which was creditable to the rectitude and fairness of President Wilson. They don't answer the same way now.

The next day was August 7. On that day a man in Washington who is usually well informed regarding what is going on behind the scenes in that city wrote a remarkable letter to a prominent business man in New York—remarkable because of the accuracy with which it forecast subsequent developments. A copy of this letter was handed to us on August 8, and we kept it to see how good a prophet the writer of it was. We quote from this letter as follows (all italics being ours):

"I believe there is an understanding between Gompers, head of the American Federation of Labor, and the Administration, that this strike which is threatened will not hurt the Administration. *I am further given to understand that Gompers has assured the President that an opportunity will be given him to make capital out of the difficulty.* This is to be done in this way: The men are to reject all compromise offers by the railroads; they are to look askance on the mediation offered by the Board of Mediation and Control (conciliation), *thus giving the President a chance to intervene personally and bring both sides to the White House.* The proposition which he will submit *will in all probability be accepted by the (labor) leaders, thus putting the onus of rejection of his services on the railroad men (officers).* If a commission is appointed under these circumstances it is easy to see how it will not be entirely friendly to the railroads."

Now, then, was the man who wrote that letter a prophet? He certainly was! (1) Gompers is supporting Wilson for re-election, and has been in close touch with both the White House and the labor brotherhoods. (2) The men did reject all offers made by the railways. (3) They did "look askance" at mediation and refused to join with the railways in asking for it. (4) They did give the President a chance to intervene personally and bring both sides to the White House. (5) The President did make a proposition which the labor leaders immediately accepted, thus putting the onus of rejection of his services entirely on the railroads.

But we are getting a little ahead of our story. The Chamber of Commerce of the United States had asked for an investigation by the Interstate Commerce Commission. The railways asked for this before the strike vote, and again during the mediation. President Wilson invited both sides to come to the White House, but on August 11, before doing this, he wrote a letter to the president of the Boston Chamber of Commerce, which was immediately published, opposing the submission of the matter to the Commission. In other words, he publicly rejected the railways' proposition before they had an opportunity to present it to him. Furthermore, he made a proposition indorsing the brotherhoods' demands for a "basic eight-hour day" in the very first stages of the conferences at the White House, and admitted he had decided to do so before the railway officers called on him. And on April 9 Messrs. Stone and Lee were saying in speeches in St. Louis that "they were absolutely confident of winning out, but that they were going to do a certain thing which only the presidents of the four organizations knew about, and that they did not propose to tell anyone what this was, but that *it would be the deciding factor in winning out in this fight!*" The last piece of evidence needed to establish the case was afforded by Chairman Adamson of the House Committee on Interstate Commerce after negotiations between President Wilson and the railway executives and managers had begun. On August 24 the Atlanta Constitution said regarding a conversation between its Washington correspondent and Mr. Adamson which occurred on August 23: "Mr. Adamson said he had a conference *four months ago* with the President, and *a conclusion was reached as to his course at that time.*"

The President has acted throughout like a man who had entered into a previous understanding that he would do certain things and who was anxious to deliver the goods as promptly and in as good condition as possible. If he was playing politics, recent developments have been showing that he has been playing very poor politics. He has done nothing in his administration that has worked him as much harm as the policy he has adopted in dealing with the railway strike crisis.

NEW BOOKS

Mechanical Engineers' Handbook. Lionel S. Marks, professor of mechanical engineering, Harvard University and Massachusetts Institute of Technology, editor-in-chief. Bound in morocco. 1,836 pages. 4½ in. by 7 in. Illustrated. Published by the McGraw-Hill Book Company, Inc., 239 West 39th street, New York. Price, $5 net.

The field of mechanical engineering has become so extended that it is no longer possible for a single individual, or a small group of individuals, to have sufficiently intimate acquaintance with all its branches to permit a satisfactory exercise of critical judgment in the statement of current practice and the selection of engineering data. The only existing reference work for mechanical engineers, compiled by a large group of specialists, is the three-volume German book, "Hütte," now in its twenty-second edition. This book, however, includes civil and electrical engineering, as well as mechanical engineering. It has been continually improved for over fifty years, and is now the accepted authority within its range of topics. This work has been used as the basis for the new handbook. In only a few of the more theoretical sections, however, has the "Hütte" been followed at all closely. The greater part of the book, particularly those portions which deal with engineering practice, is wholly new.

The subject matter groups itself into two main divisions, the first 860 pages being devoted to the more theoretical topics and the last 960 pages to the statement and discussion of current practice. The first portion is divided into seven sections as follows: Mathematical Tables and Weights and Measures; Mathematics; Mechanics of Solids and Liquids (including Friction); Heat; Strength of Materials, Materials of Engineering; and Machine Elements. The portion treating of practice is divided into eight sections dealing with Power Generation; Hoisting and Conveying; Transportation; Building Construction and Equipment; Machine Shop Practice; Pumps and Compressors; and Engineering Measurements, Mechanical Refrigeration, etc. The total list of contributors numbers 50 specialists, each of whom is qualified to speak authoritatively on the subject assigned to him. In order to further increase the accuracy of data and to insure that the subject matter is not solely the practice of an individual, but is truly representative, a number of the contributions which deal with engineering practice were submitted by the editor-in-chief to one or more other specialists, for criticism before finally being incorporated as a part of the handbook.

This book is the most thorough and comprehensive mechanical engineers' handbook adapted to American practice, if not in the English language, and its usefulness is considerably enhanced by certain features of the make-up. Both the front and back end fly leaves contain an index to major topics and an index to the more important tables is given on the inside of each cover. The book is provided with thumb tabs so that the reader, after looking at the index on the fly leaf and finding there the section number, may turn immediately, by use of the thumb tabs, to the section in which he is interested. The index is unusually complete and well arranged.

Convention of Tool Foremen's Association

Annual Meeting Held Last Week in Chicago; Discussion of Heat Treatment of Steel, Special Tools, Etc.

THE eighth annual convention of the American Railway Tool Foremen's Association was held at the Hotel Sherman, Chicago, Ill., August 24 to 26 inclusive, J. J. Sheehan, tool foreman of the Norfolk & Western, presiding. Prayer was offered by Bishop Thomas Nicholson, and the convention was welcomed to the city by John D. Shoop, superintendent of Chicago schools. J. A. Carney, superintendent of shops of the Chicago, Burlington & Quincy at Aurora, addressed the convention. President Sheehan in his address of welcome said:

You have been called from your various roads for the purpose of reviewing the progress that has attended our efforts during the past year, as will be shown by the committee reports, and to gain new ideas from them and the discussions on the floor of the convention. That our association has filled its niche in the railroad field is evidenced by the many favorable comments and references that have come to my notice. This is gratifying, inasmuch as it proves there is a need for the work in which we are engaged and it should stimulate us to put our earnest efforts into that which we undertake. The association is in a healthy condition, both financially and in regard to increased membership.

Address by Mr. Carney

J. A. Carney, superintendent of shops, Chicago, Burlington & Quincy, addressed the convention in part as follows:

I do not want to take up your time in going into the details of how you should hold your file, the construction of tools and things of that sort that you all know more about than I do. What I want to touch on is not so much details as it is the matter of toolrooms in general. The function of a toolroom is to look after the tools which are used by the productive workers in the shop, whether it be a machine shop, a locomotive erecting shop, or a car shop. I have in mind one toolroom which is in charge of one man. He occupies a room about 10 ft. square and his sole duty is to repair cutters for bolt trimming machinery. I have in mind another toolroom that has more machinery in it than we have in the Aurora shops of the Burlington. These are the two limits.

The province of the toolroom is to make the tools that are needed, to maintain them in such a condition that when wanted they are ready to be given out, and to have them at hand so that there will be no delay to the men who call for them.

Heat Treatment of Steel

Henry Otto, A. T. & S. F.: Whether annealing, hardening or tempering, each grade of steel has a definite temperature to which it should be heated in order that it will give the best results. This temperature will also vary according to the use to which the steel is to be put. Slight variations from this proper temperature may do irreparable damage to the steel.

Carbon Steel.—Carbon steel when not heated above 1,350 deg. will be in the annealed state and when heated from 1,350 to 1,500 deg. will be in a hardened state. When heated above 1,500 deg. it will be softer than the second case mentioned, although harder than the first. In the actual heating of a piece of steel several requirements are essential in order to obtain good hardening; first, the small projections or the cutting edges should not be heated more rapidly than is the body of the tool, and second, all parts of the tool should be heated to the same temperature. A tool heated uniformly to as low a temperature as will give the required hardness will produce the best results.

We heat all the tools made of carbon steel in lead pots, the temperature of which is recorded by pyrometers and maintained at the proper degree. To prevent the hot lead from sticking to the tool heated in it, the tool is painted with a mixture of common whiting and wood alcohol. These lead melting pots are made from 6 in. iron pipe and are reinforced with ¾ in. by 4 in. iron rings, the bottom being welded in. They will last when used every day for about three or four months. All tools made of carbon steel are quenched in pure water.

For tempering by the color method, temperatures corresponding to the different colors are given below:

Color.	Deg. Fahrenheit.	Color.	Deg. Fahrenheit.
Very pale yellow	430	Spotted red brown	510
Light yellow	440	A brown purple	520
Pale straw yellow	450	Light purple	530
Straw yellow	460	Full purple	540
Deep straw yellow	470	Dark purple	550
Dark yellow	480	Full blue	560
Yellow brown	490	Dark blue	570
Brown yellow	500		

The modern method of tempering is to heat the tools to the required temperature in a bath of molten lead, heated oil or other liquids. By this method it is possible to heat the work uniformly and to give a temperature close to the proper limit. At Topeka we use an electrically heated oil bath for tempering all carbon steel tools.

High Speed Steel.—Temperatures of from 1,800 to 2,200 deg. are required to harden high speed steel. The usual method of hardening or heat treating planing tools is to heat the cutting end slowly to a temperature of about 1,800 deg. and then more rapidly to 2,200 deg. or until the end is at a dazzling white heat and shows signs of melting. The point of the tool is then cooled either by plunging it in a bath of oil, such as linseed or cottonseed, or by placing the end of the tool in a blast of dry air. The exact treatment of high speed steel varies for the different kinds of steel, and it is advisable to follow closely the directions given by the steel makers.

Heavy high speed tools having well supported cutting edges, such as planer or turning tools, are commonly used after hardening without tempering. If the construction of the tool is such that the cutting edges are comparatively weak they are often toughened by tempering or what is sometimes called "letting down" the hardness. A method recommended by several steel makers is to cover the steel with clean, dry sand and heat it to the required temperature, which should be shown preferably by a pyrometer. Milling cutters are heated to 400 deg., drills and reamers to 440 deg., for the largest sizes, and 460 deg. for the smaller sizes.

In annealing high speed steel the steel should be packed in an iron box or pipe of sufficient size to allow at least ½ in. of packing between the sides of the steel to be annealed and the sides of the box. It is not necessary that each piece of steel be kept separate from every other piece but it should be kept from touching the sides of the annealing box. It can be packed in powdered charcoal, fine dry lime or mica. The annealing box should be made air-tight and the whole thing heated slowly to a full red heat, about 1,475 deg. to 1,500 deg., and held at this heat from two to eight hours, depending upon the size of the pieces to be annealed. It should then be cooled slowly and not exposed to the air until cold.

E. A. Greame, D. L. & W.: The United States Bureau of Standards states that skilled observers vary as much as 100 deg. in the estimation of relatively low temperatures of steel by the color method and beyond 2,200 deg. it is practically impossible to estimate with any degree of certainty.

This would clearly indicate that the color method is not an accurate means to use for the determining of temperatures of steel. Steel can more properly be heat-treated and better results obtained when pyrometers are used. The importance of having proper equipment for the heat treating of steel cannot be overestimated. It is the cheapest equipment in the long run. Most failures in the treating of tool steel have been attributed to the steel but there can be hardly any question but that 90 per cent of the failures result from the lack of knowledge of the proper method of treatment.

A tool to give the proper degree of efficiency should be tempered to give the proper hardness and still have sufficient toughness for the work in which it is to be used. At the Scranton shops of the Delaware, Lackawanna & Western the scleroscope is used to determine the relative hardness of the steel. As a comparative measure of materials it is very accurate, rapid, simple and definite. It consists of a glass graduated tube with a small cylinder of steel which has a diamond point. This cylinder slides in a vertical direction in the tube and is allowed to fall upon a previously polished surface of the material to be tested. The height of the rebound of the cylinder is taken as the measure of the relative hardness. A pyrometer should be used to determine the proper heat treatment given for the steel. This instrument should be frequently tested to insure its accuracy. This can be done by testing with a standard pyrometer, or if low temperatures are used, by a standard mercury thermometer.

When rivet sets are to be hardened and a water hardening steel is used they should be dipped in the tank with shank down and running water directed into the cup of the tool. This treatment avoids the collection of hot water in the cup which would prevent the cup from properly hardening. We find that the vanadium alloy steel is most suitable for these tools.

To avoid cracking large spring dies when they are being hardened they are quenched in a tank of water and oil, the water being sufficiently deep to cover the threaded portions of the dies and the oil on top of the water covering the rest of the dies. By this treatment the threaded portion of the die is hardened while the body of the die is only toughened. The die can then be drawn by the usual method. Care should be taken, however, to give the die a constant circular movement.

All reamers and long slender tools should be heated in lead pots and quenched in the usual manner. This will tend to eliminate the scale on the surface and the warping of the tool. A mixture of two-thirds salt and one-third cyanide of potassium, heated to a red heat for one hour and allowed to cool and harden and then mixed in the lead bath, is a good method to prevent the lead from sticking to the threads and small projections of the tool. The top of the lead pot should be covered with bone black.

Owen D. Kinsey, formerly of the Illinois Central: To obtain maximum efficiency of tool steels the treatment of them must be scientifically handled. The skill of the most experienced operator is inadequate to obtain correct hardening and drawing temperature by observation. The material and labor entering into the manufacture of tools presents an enormous annual expense to every railway system. The high priced steels improperly heat treated increase the cost of manufacture, to say nothing of the delays in production in the shops on account of not properly serving their purpose. Without the use of a pyrometer in the heat treatment of high speed steel there is considerable danger in burning away the cutting edges or warping the tool out of shape.

More than likely the tool will not be brought up to the proper temperature for fear of overheating it, which will cause the workman considerable trouble when it gets to the shop. Then, again, the tool may break on account of the temper not being drawn sufficiently to relieve the strain. This is a matter that should be carefully studied as a tool properly drawn will reduce tool breakage and the chipping away of the cutting edge. A drawing temperature of 450 deg. has been found to give the best results for high speed steel reamers, taps and milling cutters, and a much higher temperature is now being recommended by several of the large steel producers for large tools, such as for planers and other machines.

Special Tools for Steel Car Repairs

W. M. Robertson (Ill. Cent.): When steel freight cars were first introduced car department officers felt considerable anxiety relative to the facilities for maintaining them. It was soon found, however, that the problem was not nearly so troublesome as it first appeared to be. It is the tendency on most roads for the car foreman to rely upon his own resources in the provision of special tools, as he has met with but little consideration from the general tool room and the locomotive department. It seems to be the opinion of the locomotive department that on account of the rough nature of car repair work the requirements in this respect are slight, but the contrary is true; on account of the amount of this work handled it should be given very close consideration. Metal workers in the car department are not using jigs and the tools that were common in the locomotive department ten years ago because of the lack of co-operation among the foreman and the tool department. It seems to me that the tool foreman is the man who can best improve these conditions. [Mr. Robertson then described a number of special tools for use in steel car repairs which have been adopted at the Harahan, La., shops of the Illinois Central.]

J. W. Pike, Rock Island Lines, referred to a holder-on for use on the Boyer long stroke hammer. This device consists of a special head which replaces the usual type of handle on the end of the hammer barrel. In place of the handle the end of the head is fitted with a cylinder of 2½-in. Shelby steel tubing, in which works the mild steel holder-on piston. The length of the piston is increased as desired by a piece of 1¼-in. pipe. The head is fitted with two ⅜-in. air pipe connections, one for the holder-on cylinder and the other for the hammer proper.

E. J. McKernan presented a drawing of a jig for drilling brake staffs, which is used on the Santa Fe. This consists of a block of soft steel through which are holes for the brake staff; at right angles to these are holes bushed with tool steel for guiding the drills. This jig takes care of all the drilling operations on the staff.

Reclaiming Material

E. J. McKernan, A., T. & S. F.: All tool steel on the Santa Fe system is reclaimed. The steel is first returned to our Topeka shop for a general inspection, after which such material as is considered serviceable is held in reserve to be made up into small tools as we deem necessary. The short pieces of high speed steel are made into tips for lathe and planer tools, the tips being gas welded to shanks of tire steel. The short ends of old lathe and planer tools are drawn out and made up into square tools for use in Armstrong holders. Only the small chips that are removed in dressing the tools at the blacksmith's anvil reach the scrap, and at this time there is a good market for this class of scrap steel.

All broken high speed twist drills and reamers are reclaimed whenever the pieces are large enough to make this possible, otherwise they are placed in the scrap. A special effort has been made to reclaim all of this steel, which has worked out very economically. Had such a system not been in effect at this time there would have been difficulty in operating all of our machines, due to the shortage of high speed steel. Large washout plug taps that have become slightly worn are returned to Topeka, where they are annealed and recut to the next smaller size. These taps are all kept to standard, the diameters varying in steps of ⅛ in. All chisels, whether for use by hand or in air hammers, are

made up into center punches when they become too short, the minimum safe length for regular service being four inches. Worn reamers are remilled and made to the nearest smaller size.

W. M. Robertson (Ill. Cent.): An air operated vise has proved to be a very useful arrangement for bolt work at the reclaiming plant. The operating mechanism usually consists of two 10-in. air brake cylinders which may be attached to an 8-in. bench vise by removing the hand operating screw. The latter is replaced by a long rod, to the end of which the two operating pistons are attached by means of an equalizer. It is not advisable to use a vise smaller than the 8-in. size because of the hard usage to which it is subjected. In connection with this we use a special air motor-operated arrangement for removing nuts from the old bolts. The motor is suspended over the vise with the spindle attached to an old flexible shaft used for driving tube cutters in the locomotive front end. When not in use the shaft may be swung out of the way to a bracket conveniently placed on the vise.

Discussion

Mr. McKernan pointed out that it would not be considered economical to use the welded tools if it were possible to secure the high speed steel on the basis of the market existing before the war. The following statement shows the various items entering into the cost of a lot of 432 tools, ranging in size from ½ in. by 1 in. by 8 in. to 1¼ in. by 2 in. by 14 in., which were made at the Topeka shops of the Santa Fe.

1,497 lb. tire steel	$15.91
279 lb. high speed steel	164.03
105 lb. No. 2 welding rods	15.75
35 lb. Norway iron for facing the tips	4.55
Total material	$221.24
Total cost, including labor and overhead	$672.14

Better results have been obtained in the heat treatment of the tipped tools, owing to the smaller size of the piece of high speed steel to be hardened. On the Santa Fe both the oxy-acetylene and the electric welding processes have been tested and it has been found that the results of the former are more satisfactory. The quality of the high speed steel seems to be affected less by the former process.

On the Norfolk & Western the electric spot welding process is being used for this work. The adjoining surfaces of the tip and shank are corrugated and are cleaned before welding. The corrugations facilitate the quick heating of the surfaces by reducing the area of contact through which the current must pass at the beginning of the process. When the surfaces have fused, the tip and the shank are squeezed together and the weld made.

Special Tools for the Forge Shop

George W. Smith, C. & O.: Hundreds of hand hammers have been made in dies under the steam hammer with very good results. A model is made out of open hearth steel on a lathe, and two dies are formed under the hammer. The blocks of the dies are provided with long handles which are connected at the end. The dies are brought up to the proper heat and the former made on the lathe is placed in the center of the dies under a steam hammer. The impressions in the dies are made in this manner, the former being revolved between the strokes of the hammer. The hammers are made in the dies from open hearth steel rods, a large number being turned out in a short space of time. The hammers having thus been formed are reheated and placed in a forging machine and the eye is punched and the sides flattened in one operation. The fins are ground off on an emery wheel. The hammer is then tempered. These are used for general rough work and are produced at a cost of from six to seven cents each, exclusive of the handles.

Scrapped tires are used for making shear blades, large punches, and dies, the steel being cut to proper length by means of the oxy-acetylene cutting process.

Spring steel is used for making S-wrenches. A suitable die and punch are made to form the ends and enough stock is left in the center of the wrench to draw it out under the steam hammer to the required length. The ends are punched to the proper size for the nut, and the wrench is bent in a former.

Grinding Wheels as Applied to Locomotive Repairs

H. B. Miller, Big Four: This subject includes the grinding of all tools or machines which are used in the repairing of locomotives. Successful grinding must start with the condition of the grinding machine, which must have properly fitted bearings and a proper range of speeds and feeds, and must be properly lubricated. The next consideration is the material which we are to grind. The character of this must be known in order that we may select a wheel of the proper grain, size and shape. Much time is saved in grinding by having the proper fixtures with which to do the work. In grinding ball reamers a device that can be moved from the center each way to take care of the radius, the movement being effected by means of a lever, has made it possible to use a ball joint where an angle was formerly used.

In different repair shops the system of handling tools must necessarily be adapted to the working conditions of the shop, but the grinding should be done in the tool room, the tools being placed in the checking room for distribution. As the tools are used and returned they should be checked over, re-ground and re-marked if necessary, after which they should be placed in the checking racks. An essential point in grinding tools is the provision of the proper degree of clearance for the work to be done by the tool. We find a difference in the cutting qualities of straight and spiral reamers with the same degree of clearance. In this case we are using a standard degree of clearance on each tool according to the work for which it is intended, as we have found that too much clearance and no clearance are equally worthless.

A. Sterner (C. R. I. & P.): Although the application of grinding to the finishing of piston rods and crank pins appears to be unlimited, experience seems to indicate that the old practice of turning and rolling is better. This is due to the fact that the tough material of these parts retains particles of the abrasive, the bad effects of which are very well known. Parts which do not have any severe work to do, and which are required to have a finished or semi-finished surface, should always be made with as little stock as possible and may be finished by grinding. Working surfaces should not be ground unless they are carbonized, chilled or tempered.

Discussion

The question arose as to whether or not the grinding of piston rods and air compressor rods affected the life of the packing, especially where metallic packing was used, it being claimed that the grains from the grinding wheel would penetrate the pores of the steel rod and thus score the packing. It was claimed by the representatives of grinding wheel manufacturers who were present during this discussion that this was not true as has been repeatedly proved by tests. Where grinding wheels are used for this purpose, however, care must be taken to have them true to diameter with no high spots and they must be run at the proper speed. Some roads prefer rolling the rods to grinding them, claiming that a smoother surface can be obtained.

Jigs and Devices for the Enginehouse

A. Connell, Kansas City Southern: Until recently the use of special tools and jigs for doing the various kinds of work

in the roundhouse was unknown, with the exception of an occasional tool made by individual workmen. The back shop received all the attention, the workmen there having many useful special tools. Because of this condition the term "roundhouse job" was commonly used to indicate work that was half done or done just well enough to last one trip of the engine, and it was customary for men in the roundhouse to spend several times as long in doing their work without special tools as would have been required with them. Considerable credit is due the Tool Foremen's Association for the development of tools and jigs for the roundhouse.

Discussion

Several of the members spoke strongly in favor of the tool foremen giving their best thought to devising special jigs and tools for use in the enginehouse, for the need of such things in the enginehouse is very great. Every means should be given the enginehouse force to make quick and thorough repairs, for then the power would be kept in service longer and would be able to make a greater mileage between shoppings, all of which means a more efficient mechanical department. It was designated as the "emergency hospital," for the locomotive and the "doctors" therein should be provided with satisfactory tools. The outlying enginehouses should be given even more assistance than those at or near the back shops, for at these points in case of emergency the proper equipment can be borrowed while the outlying enginehouse would have to either hold the engine for a much longer time or send it to the main shop.

Other Business

J. C. Bevelle, El Paso & Southwestern, read a paper on Tool Room Equipment and Tools. This included a number of illustrations.

The following officers were elected to serve for the ensuing year: President, C. A. Shaffer, Illinois Central, Chicago; first vice-president, J. C. Bevelle, El Paso & Southwestern, El Paso, Tex.; second vice-president, W. M. Robertson, Illinois Central, New Orleans, La.; third vice-president, J. B. Hasty, Atchison, Topeka & Santa Fe, San Bernardino, Cal.; secretary-treasurer, R. D. Fletcher, Belt Ry. of Chicago, Chicago; chairman of the executive committee, B. Henrickson, Chicago & North Western, Chicago. The association voted to hold its next convention in Chicago.

WOODS USED BY THE RAILROADS*

By Howard F. Weiss

Director, Forest Products Laboratory, Madison, Wis.

There has existed for some time a rather common belief that our timber supply has become so scarce that it is now almost impossible to secure timber of good quality. This impression is quite misleading. The United States Department of Commerce estimates the amount of standing timber in the United States at approximately 2,900,000,000,000 ft. b. m.

The present total annual consumption of timber in this country approximates 52,000,000,000 ft. B. M., which would indicate that our present stands of virgin timber will last approximately 55 years if the rate of exploitation continues as at present. When we add to this the amount of timber being produced annually, due to new growth, it, of course, very materially lengthens the theoretical period of exhaustion. A consumer can secure just as good timber now as formerly, and, in view of the fact that we now have grading rules based upon accurate scientific data, a customer can secure structural timber which will run even better than timber secured in years gone by when no such grading rules existed. Of course, the price of timber has advanced, just as has the price of many other products, and with the steady cutting of our virgin supply, it will undoubtedly continue to advance.

The improved conditions under which timber is now being used in the United States are making it possible to secure from it a much greater service than was secured in the past. This is excellently illustrated in the wooden cross-tie. Only a few years ago the number of ties impregnated with wood preservatives in this country was comparatively small, but within the last decade the percentage has very rapidly increased, and is continuing to do so. Thus by means of artificially prolonging the life of the natural wood, we are able not only to secure a much greater service from the woods originally used for ties, but it has been found possible to use for the manufacture of cross-ties many woods which were heretofore of little or no value. It is perhaps not far from the truth to say that the average life of untreated cross-ties in the United States is seven years, and that our total annual consumption of ties for renewal purposes alone is around 100,000,000. From the results which have been secured in prolonging the life of wooden ties from decay, there is every reason to expect that with proper treatment an average service of about 17 years can be secured. Should this prove to be true, it will more than cut in half our present annual consumption of cross-ties for replacement purposes.

About 9 per cent of our total annual consumption of 52,000,000,000 ft. B. M. of timber goes into the manufacture of ties, and about 2½ per cent is used in car construction. In addition to these two items, a very large amount of timber is used annually by the railroads in the construction of bridges, stations and other structures. For this reason I believe it would be good policy for them to insure for themselves a plentiful supply of suitable timbers tributary to their property by encouraging the farmers along their rights-of-way to cut and manage their woodlots along approved silvicultural lines, so that these small wooded patches scattered here and there will be made to produce a maximum amount of good timber in a minimum of time and expense. Of course, those railroads which depend on large operators for their supplies of ties are not so vitally concerned in this question.

Much improvement can undoubtedly be made in present methods of inspecting timbers for railroad consumption. In fact, present methods result in much needless confusion and waste. In an attempt to improve this condition, our laboratory has just prepared a bulletin called "The Tie Guide Book," which explains in simple language and with suitable pictures how the different kinds of timber cut for ties can be identified.

A method for classifying structural timbers according to their density by mechanical tests is one of the most interesting and valuable recent results of our investigations. It is found the strength of the wood bears a direct relation to its dry weight or density; that is to say, the denser the wood the greater the strength. For example, a piece of longleaf pine, which has a specific gravity of about .40, has a modulus of rupture of about 4,600 lb. per sq. in., whereas identically the same kind of wood, but with a specific gravity of .60, has a modulus of rupture of about 10,000 lb. per sq. in. From these mechanical tests and observations certain definite mathematical equations for determining the strength of structural yellow pine timbers have been formulated. Progress has so far advanced that practical grading rules have been developed, and these have recently been adopted by the American Society for Testing Materials, the Southern Pine Association, and the American Railway Engineering Association.

*Abstracted from a paper read before the St. Louis Railway Club, May 12, 1916.

NEW BUFFALO, ROCHESTER & PITTSBURGH DOCK AT BUFFALO

The Buffalo, Rochester & Pittsburgh has completed a new dock at Buffalo, N. Y., which was opened to traffic on June 14, when the steamer Cicoa laden with pig iron unloaded at this point. The dock is intended for the handling of pig iron, pulp wood and other heavy materials and the unloading facilities are furnished by a Brown hoist locomotive crane equipped with a magnet and a grab bucket.

The dock is located on the Buffalo river and marks an additional step in the development of this stream, as it is located farthest up stream of any dock for lake-going vessels.



Unloading Pig Iron from the First Boat

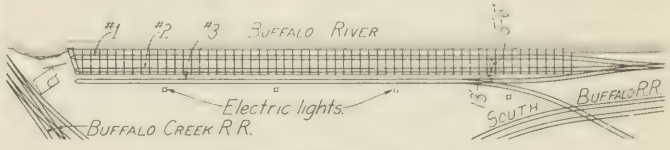
The river improvement is being carried on by the city of Buffalo and provides for a 23-ft. draft at mean low water level to permit the passage of lake-going vessels. This deepening and straightening of the channel is to be extended to the junction of the river and Cazenovia creek, approximately one mile beyond the site of the dock. Incident to this development scheme, lift bridges have been built across the river by the New York Central, the Buffalo Creek, the Delaware, Lackawanna & Western and the New York, Chicago & St. Louis (jointly with the Pennsylvania). Two bridges remain to be built; one by the Lackawanna and one by the city of Buffalo, both of which are above the B. R. & P. dock.

The dock is a timber structure 580 ft. long by 30 ft. wide and is carried on pile bents spaced 10 ft. center to center. Two railroad tracks are carried on the deck, one for the unloader and the other for cars to receive the load from the vessels. These tracks are spaced 15 ft. 6 in. center to center. A third track which parallels the structure for its entire length is spaced 13 ft. from track No. 2, making a 28 ft. 6 in. reach for the locomotive crane. The tracks are connected on the south with the yard of the Buffalo, Rochester & Pittsburgh, and there is also a connection with the tracks of Donner Steel Company. Hercules bumping posts are provided at the ends of the tracks on the dock. To permit the continuous operation of the plant artificial lighting is provided by five 300 watt lamps on 30 ft. wood poles.

The construction of the dock was made particularly difficult because of the soft character of the earth. It was necessary to drive piles 65 ft. long to reach bed rock. The piles are driven in bents of six each, all of them being provided with steel shoes. They were properly spaced to support the tracks, one pile being driven under each rail.

The deck is of standard construction with 12 in. by 12 in. white oak caps carrying 8 in. by 16 in. yellow pine stringers 20 ft. long and laid with broken joints. The white oak track ties are carried on the stringers and the entire deck is planked with oak.

The work was so planned that the timber construction closely followed the driving of the piles, saving the necessity of temporary bracing. The face and second rows of piles



Plan of the Dock

were driven first by means of a water rig equipped with 85 ft. leads. Because of the high winds and to secure stability, the rig was mounted on two scows which were securely lashed together with 12 in. by 12 in. timbers bolted through the deck timbers. The driving was started at the south end and continued to the north. The piles were permanently braced when driven. The longitudinal caps were also applied at the same time, making it possible to utilize this part of the structure as a staging.

A temporary track was then laid on this staging and the locomotive crane was run out on it. When the driving of the face piles was completed the driver was lifted off the scows by the crane and landed on a temporary staging provided for this purpose. The rig, operating as a land driver, was then utilized to place the remaining piles.

As previously stated, longitudinal caps were applied to the face and second rows of piles when driven. These are not tied to the transverse caps of the bents which are free to slide on the longitudinals. This method of construction relieves the main structure of strains caused by the impact of vessels when mooring. To further protect the structure waling strips were placed at mean low water level and just below the longitudinal caps. Filler strips were placed on all face piles between the waling strips to prevent the possibility of any projection from vessels moored alongside catching under the waling strips and raising the piles with the rise of the water level. This precaution is essential at this point as the river is subject to abrupt changes in level depending on the direction of the wind.

Two lines of timber sheet piling were driven to prevent the

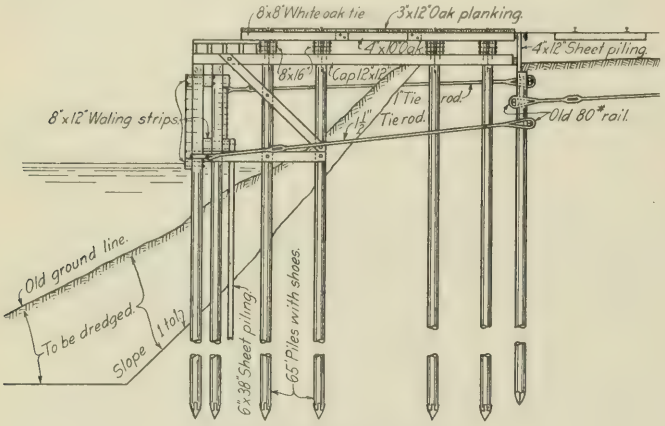


The Dock from the River Side

caving of the earth fill. One line was driven back of the second row of piles and the second on the land side of the structure.

The mooring piles are independent of the structure and are not tied to it in any way. Five piles were driven in a cluster and securely bound together with wire cables. The main pile is 65 ft. long and was driven to rock. It is capped with the bell end of a 12 in. cast iron pipe and concrete. The cluster piles are 50 ft. in length.

The entire structure is securely fastened to three rows of anchor piles. The piles of each row are tied together with



Typical Cross Section

old 80-lb. rails which also provided a bearing for the 1½ in. tie rods that anchor the entire structure to the piles. These rods and the necessary turnbuckles were made by a company blacksmith in a shop provided at the site.

This project was carried on under the direction of E. F. Robinson, chief engineer, and F. A. Benz, division engineer of the Buffalo, Rochester & Pittsburgh. The timber construction was handled by company forces. D. E. Manns, of Buffalo, was the contractor for the driving of the piles.

PUBLIC OWNERSHIP OF RAILWAY SECURITIES

An amount exceeding $2,500,000,000 measured the investment of savings and other state banks and insurance companies alone in railway securities in 1915, according to a compilation by the Bureau of Railway News and Statistics, Chicago. The 19,457 banks held in that year about $1,265,000,000 in railway stocks and bonds, comprising 33.2 per cent of their total investments in government, state, county, municipal, public service and other bonds of any description; these investments together, next to loans secured by real estate, collateral or otherwise, comprising by far the largest item in the assets behind these banks.

This showing of the public interest in railway problems is especially interesting in view of a statement just issued by the four railway brotherhoods, that railways and not the public are owners of railway shares and that therefore the "public" has little interest in the railway problem.

Depositors in savings banks have an interest more vital than have those dependent on any other class of banks, because savings banks in a pre-eminent degree are investors in railway stocks and bonds. In 1915 the depositors in the 2,159 savings banks included above numbered 11,285,755, over 11 per cent of the total population of the United States, everyone of whom was vitally interested in the securities upon which his savings bank was founded. Of all securities held in the assets of these banks in 1913, the comptroller's report showed 41.8 per cent were railway stocks and bonds, against 25.0 per cent for loan and trust companies; 18.7 per cent for state banks and 6.1 per cent for private banks.

Railway securities equal 17 per cent of all deposits in the savings banks alone. One-sixth of the foundation upon which savings banks rest is thus composed of railway stocks and bonds and is endangered when railway welfare is subordinated to either unreasonable wage demands or unreasonable rate reductions.

Besides the 11¼ million depositors in savings banks, there were in 1914, 39,582,673 life insurance policies in force in the United States, representing over 40 per cent of the population, though, of course, one person often holds more than one policy. How vital an interest these millions have in railways was shown by a competent estimate in 1907 that 31 per cent of the total assets of life insurance companies were railway securities. Were that ratio still to prevail the 1914 investment in railways would exceed $1,500,000,000. Even if life and accident insurance companies held no more than in 1907, they, with the banks, would hold today over $2,110,000,000.

The brotherhood statement that the roads themselves and not the investors are the real owners of railway shares is best answered by the Interstate Commerce Commission figures for 1914:

Total capital stock	$8,680,759,704
Owned by railways	2,669,354,781
In hands of public	6,011,404,923

It is this six billions of stock added to $9,708,292,002 bonds that is owned by savings banks, insurance companies and other investors that renders protection from hostile railway agitation, vital to millions of our population. This interest in railway welfare is totally apart from the direct economic dependence of every man, woman and child on healthy railways, the most vital organ of our national life.

EXPORTS OF RAILWAY SUPPLIES INCREASE RAPIDLY

Railway materials and equipment valued at $75,000,000 were exported from the United States in the last fiscal year, according to figures compiled by the Bureau of Foreign and Domestic Commerce, Department of Commerce. The exports of this class have more than doubled since 1914.

Until very recently Canada and Cuba have been the foremost foreign markets for our freight cars. Cuba, Canada and Brazil the largest markets for exported locomotives, and Canada, Australia, Japan, Brazil, Argentina and Cuba the leading markets for our steel rails. At present we are sending unusual quantities of freight cars and other supplies to Russia, chiefly via her Pacific frontier, and important consignments are going also to France and Spain, as well as to our established markets in Cuba, Canada and Central America. The following figures for June exports indicate the present important markets for railway supplies; the total exports of freight cars for the month were valued at $1,613,000, of which $1,086,000 worth went to Russia. Steel rails to the value of $1,730,000 were sold abroad during the month, the exports to France alone amounting to $1,188,000. Of the $721,000 worth of steam locomotives sold abroad, $272,000 worth went to Spain.

The quantities of railway material exported during the fiscal year ended June, 1916, as compared with the fiscal year 1914, are shown in the following table:

Classes of railway material exported.	Fiscal year 1916.	Fiscal year 1914.
Railway cars	$26,660,000	$11,178,000
Rails for railways	17,687,000	10,259,000
Locomotives, steam	12,666,000	3,692,000
Locomotives, electric	455,000	437,000
Engine parts (all kinds)	7,274,000	3,357,000
Switches and other track materials	5,262,000	2,534,000
Ties	2,435,000	2,565,000
Railroad spikes	1,399,000	346,000
Car wheels	742,000	414,000
Telegraph instruments	149,000	137,000
	$74,729,000	$34,919,000

THE ASSOCIATION OF RAILROAD SUPERINTENDENTS

The annual meeting of the American Association of Railroad Superintendents was held at the Hotel Chisca, Memphis, Tenn., on August 16 to 18, inclusive. A number of committee reports were presented and discussed in addition to which papers were presented entitled "The Superintendent," by C. H. Markham, president of the Illinois Central; "Building a Line to the Public," by Anderson Pace, manager, Bureau of Railway Publicity of Illinois, and "Efficiency, the Real Test of Education," by J. L. Taylor, assistant to the chief inspector, Bureau of Explosives, New York City. The first two papers were published in the *Railway Age Gazette* of last week.

The officers of this association for the past year were: President, Charles Burlingame, superintendent Wiggins Ferry Company, St. Louis; first vice-president, W. S. Williams, superintendent, Illinois Central, Carbondale, Ill.; second vice-president, C. E. Rickey, superintendent of terminals, Queen & Crescent, Cincinnati, Ohio; secretary-treasurer, E. H. Harmon, Terminal Railroad Association of St. Louis.

One of the subjects considered related to fraudulent service letters. The manufacture, sale and use of fraudulent service letters has grown to such an extent as to render it entirely unsafe in the employment of men to put trust in service letters presented as credentials. Several suggestions have been offered to throw safeguards around service letters and to serve as guarantees of their genuineness. The one most frequently advanced is to require the secure attachment of a photograph of standard size to the letter. It was, however, thought impossible to guarantee the genuineness of service letters and that other means must be adopted to protect the roads against the employment of undesirable men. The use of a printed form of release signed by the applicant and addressed to the road to which the applicant refers is in use on a considerable number of lines. Several roads depend entirely for references on the replies received to such inquiries. The committee stated that "It does not seem to us that any more secure or efficient method can be devised of securing current records of men seeking employment. As less dependence is placed in the service letters presented, their value will decrease rapidly and make it unprofitable to manufacture them."

The proper method of working under the new per diem rules, 14 and 15, was brought to the attention of the association by Arthur Hale, formerly general agent of the American Railway Association. These rules refer to the method of tendering the transfer of cars between connecting lines. The report stated that arrangements should be made at the larger terminals and interchange points for a daily tender of cars held or to be delivered to a connection before midnight whether there is a congestion or whether the interchange is blocked, or if cars are not being taken currently. It is believed that such a daily tender, made regularly regardless of conditions, will overcome many of the difficulties experienced in the past from disputed reclaims arising from exceptions taken to the tenders of the cars.

One of the subjects assigned to the committee on transportation was that of discipline systems. Attention was called to the fact that the New York Central Lines east of Buffalo are employing the deferred suspension system; also that the Delaware, Lackawanna & Western changed from a record discipline system to an actual suspension system three years ago. The committee was advised that the Baltimore & Ohio has had in effect the straight record system of discipline for two or three years, while the Western Maryland has recently adopted this same system.

A report was presented on the conservation of equipment of which the following is an abstract. Efforts to induce the shipper to load cars to capacity are productive of results. The subject should be brought to his attention at regular intervals and in such a manner that he will appreciate the wastage of equipment. The New Orleans Great Northern issues a monthly statement to the industries located on its line showing a comparison of their loadings. The man in charge of car distribution can do much to stimulate heavy loading by the use of good judgment in filling car orders. By keeping the car supply scant the value of a car is appreciated by all shippers, agents and conductors. All concerned become interested in keeping the cars moving, resulting in a decrease in the average detention to cars. A source of delay to cars that requires watching results from the shipment of company material. All concerned in the handling of such freight should be impressed with the necessity for the prompt release of equipment and the matter should be constantly watched.

Another subject assigned to the transportation committee was the proper charge to make for the return of cars delivered in error. The committee recognized that a line to which a car is delivered in error should be recompensed for the outlay it incurs in returning this car. It likewise appreciated the fact that the most effectual means of minimizing erroneous delivery of cars is to penalize the offender. For that reason it offered for adoption a resolution recommending to the American Railway Association that a charge of $2 for a loaded car and $1 for an empty car, plus any intermediate charge that the receiving road might have incurred, should be made by the receiving line against the delivering line on all such cars delivered to it in error.

A subject submitted to this committee for its consideration was the best method of handling locomotives where two or more are employed on one train. The committee recommended that the proper place for a helper engine on trains of 60 cars or more moving over an entire division with a rolling grade is on the front end.

The question of pooling engine crews as opposed to regularly assigned engine crews also came up for consideration, and was the subject of majority and minority reports, the majority report favoring regularly assigned power, while the minority asked that consideration be deferred until further data was secured.

The question of the reduction of train tonnage during times of heavy traffic and a shortage of motive power to compromise between operating results and the increased engine mileage was a subject for consideration by the transportation committee. Its recommendation was that in road service established maximum tonnage should always be maintained in the direction of traffic.

The association has had under consideration for several years the question of uniform car lettering. The committee on interchange car inspection believed that the benefits to be derived by marking the sides of box cars, to distinguish one side from the other readily, were considerable and urged that the American Railway Association take action to cause box cars to be reweighed and stenciled so that the letter "L" will be stenciled next to the left hand side door stop, facing the "B" end of the car and the letter "R" be stenciled in the same position on the opposite side, "A" and "B" being designated as opposite ends of the car.

The equipment and training of car inspectors received attention from the committee on interchange car inspection. The inspector should be a man of integrity with a common school education, be able to write a repair card in a legible manner and be able to understand and properly make out reports and give in writing a clear statement of what he sees. He should have at least two years' experience in actual car repair work at some important railway shop and in addition to having a general knowledge of the construction and maintenance of all kinds and classes of cars he must know the M. C. B. rules, including those for loading materials, air brakes, etc., as well as the United States

Safety Appliance Rules, those of the Bureau of Explosives and the rules of the Operating Department. These men should be required to pass a written examination on all rules which their duty requires them to know, similar to the examinations of enginemen and trainmen. It was also recommended that the car foremen should hold meetings with these men at convenient times to discuss their problems with them.

The question of extending the jurisdiction of the freight agents at the larger terminals over nearby smaller agencies within a radius of the run of local freights out of these terminals was presented and discussed, as a result of which the association resolved that it considered it inadvisable for the agent of a large station to exercise any supervision beyond his particular terminal.

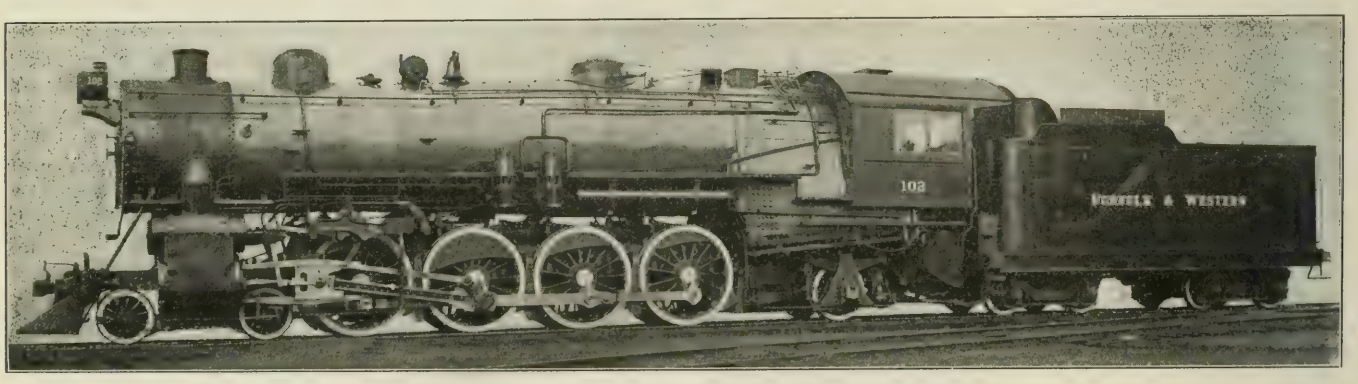
The following officers were elected for the ensuing year: President, W. S. Williams, superintendent, Illinois Central, Carbondale, Ill.; first vice-president, C. E. Rickey, superintendent of terminals, Queen & Crescent, Cincinnati, Ohio; second vice-president, A. G. Smart, division superintendent, Chicago, Burlington & Quincy, Beardstown, Ill.; secretary-treasurer, E. H. Harmon, Terminal Railroad Association, of St. Louis, Mo.

NORFOLK & WESTERN MOUNTAIN TYPE LOCOMOTIVES

In the *Railway Age Gazette* for April 7, 1916, page 799, there was published a description, with drawings, of one of eight locomotives of the Mountain or 4-8-2 type, then under construction at the Roanoke, Va., shops of the Norfolk & Western. These locomotives have since been completed and placed in service and the accompanying engraving from a photograph gives a good indication of their appearance. The weights given in the previous article were necessarily estimated and the actual weights in working order are given below:

Weight on driving wheels	236,000 lb.
Weight on leading truck	52,000 lb.
Weight on trailing truck	59,000 lb.
Weight, total engine	347,000 lb.
Weight of tender loaded	167,500 lb.
Weight, total engine and tender	514,500 lb.

These locomotives are being used in heavy passenger service, hauling trains of 11 steel cars over grades with a rise of 84 feet to the mile at a speed of 30 miles an hour. They have 29 in. by 28 in. cylinders, 16 in. diameter piston valves, and develop 57,200 lb. maximum tractive effort. The boiler is of the conical type, 80½ in. outside diameter at the front end, and carries a working pressure of 200 lb. The firebox is 120⅛ in. long by 96¼ in. wide; these figures give a grate area of 80.3 sq. ft. There are 233 2-in. tubes and 36 5⅜-in. flues, all 21 ft. long. The heating surface of the tubes and flues is 3,607 sq. ft., while that of the firebox is 374, giving a total of 3,984 sq. ft. The superheater heating surface is 882 sq. ft. The driving wheels are 70 in. in diameter and the driving wheel base is 18 ft. 9 in., the total engine wheel base being 40 ft. 5 in. and that of the engine and tender 72 ft. 11 in. The tender has a capacity of 9,000 gallons of water and 14 tons of coal.



Mountain (4-8-2) Type Locomotive Now in Service on the Norfolk & Western

DETERMINING THE PURITY OF CREOSOTE

T. H. Davis has recently described a simple absorption spot test for the determination of the presence in creosote oil of tar, free carbon or dirt as follows: "Allow six drops of a sample of creosote oil to fall upon the surface of clean, white blotting paper. If carbon, tar or dirt is present it is observed very readily, as it segregates quickly at the center. The paper should be laid away in a flat position for a few hours in a place free from dust. If then examined, foreign matter will be observed in a distinct zone at the center of the spot; the outer zone indicates the character of the oil."

Homer Cloukey, of the Forest Products Laboratory, Madison, Wis., has run a series of tests to verify the Davis absorption spot test and to obtain some idea of the sensitiveness of the test for tar, carbon or dirt. In order to make it fairly quantitative, a series of spots were made from carbon-free creosote oil to which free carbon in the form of lampblack had been added in definite graduated amounts. The series comprised six mixtures of creosote and lampblack with percentages of lampblack of 0.0, 0.005, 0.01, 0.05, 0.10 and 0.50.

The results showed an increasing gradation in the density of the free-carbon ring at the center and indicated that 0.005 per cent is easily shown by this test. In heavier percentages than 0.05 per cent the amount in an unknown sample would be difficult to estimate by comparison. The admixture of tar to creosote can be determined roughly from the size of the inner zone and the general character of the spot. The heavy tar does not diffuse with the speed of the lighter creosote oil.

The presence of dirt, tar or free carbon in creosote in very minute quantities is indicated by this test. If the creosote spot shows a dense black center it will probably be necessary to run a free carbon specification. When pure, high-gravity distillate oil is specified and the spot test is used in the preliminary examination of the oil the slightest adulteration with coal tar can be detected instantly.

It will be noted from the determinations made by Mr. Cloukey that percentages of free carbon greater than 0.05 per cent can be estimated only with difficulty. It is apparent that in order to secure a pure creosote of the quality of No. 1 maintenance of way oil, or a pure, high-grade distillate oil, the spot test is practically essential in the preliminary examination.

The city of St. Paul, Minn., adopted the spot test some time ago and made it a part of its specifications for a pure distillate oil for the treatment of its wood paving blocks.

The spot test has also been adopted by the Diesel Engine Users' Association of England for the examination of the fuel oils used in this type of engine.

OPERATING CONDITIONS AND FUEL CONSUMPTION*

By John G. Sullivan

Chief Engineer, Western Lines, Canadian Pacific, Winnipeg, Man.

The cost of fuel is one of the largest items that go to make up the total expense of railway operation, and calculations of the savings that can be made on this account by the reduction of resistance in the line have been figured in various ways by different engineers.

The comparative statistics kept by most roads, based on the amount of coal consumed in hauling 1,000 tons one mile, or some similar unit, are of very little value to the locating engineer. The figures obtained by a few experiments are also of questionable value, for the reason that they generally represent special conditions. It is the writer's opinion that much more reliable information can be obtained from a study of actual operating conditions, taking these studies by the year, therefore introducing into the results the effect that weather conditions have on the fuel consumption for the entire year. Some very good authorities have arrived at the conclusion, after studying annual reports of railways in the United States and Canada, that the fuel consumed in freight service amounts to approximately 7.7 lb. of coal per calculated horsepower hour of work performed. The writer has been of the opinion that this figure is altogether too high to be used in calculating the saving that could be made by cutting out resistance, and he has used in the past a figure of 5 lb. coal per calculated horsepower hour of work eliminated. For the purpose of getting further information on this subject, and to be able to check these conclusions, the writer has made a very extensive study of the statistics of fuel consumption on the Western Lines of the Canadian Pacific for the past 7 or 8 years.

The first results were calculated with the idea of dividing the coal on the straight basis of work done, and in calculating resistance, friction or rolling resistance, it was assumed to average 6 lb. per ton, or equivalent to 15 ft. of rise per mile on level track. This latter figure was found to be too small, as is shown in a more careful study made last year.

The results of the 1915 studies would indicate that 7.7 lb. coal per calculated horsepower hour of work would not be very far from correct, as our studies show an average of 8 lb., but this was based on resistance somewhat too small, as mentioned above. The result of these studies, however, was sufficient to convince the writer that the amount of work done was not a proper basis on which to divide the coal. In other words, the coal burned in keeping up steam in locomotives standing at sidetracks is too large a factor to be ignored.

A more careful study was made in 1916. The resistance was obtained by substituting the number of cars and the gross tonnage in the formula for train resistance for the various months, when the work was figured by the month. When figured by the year, an average formula for train resistance for the year was obtained by taking the propor-

TABLE SHOWING POUNDS OF COAL USED PER ENGINE MILE IN FREIGHT TRAIN SERVICE

Found by deducting 3 lb. in double-track operation, and 3½ lb. in single-track operation, times the number of calculated horsepower hour of work done back of the tender, from the total amount of coal consumed, and dividing the balance by the number of locomotive miles run in that service.

Subdivision	1915			1914			1913			Remarks
	E.B.	W.B.	Loco.	E.B.	W.B.	Loco.	E.B.	W.B.	Loco.	
Fort William	46	52	D. 10	41	44	D. 10	45	43	D. 10	Double track.
Ignace	63	50	D. 10	45	40	D. 10	36	40	D. 10	Double track.
Kenora	74	71	D. 10	61	58	D. 10	57	60	D. 10	Double track.
Brandon	86	83	D. 10	78	69	D. 10	..	..	.....	Double track.
Broadview	70	61	D. 10	64	49	D. 10	..	..	.....	½ D. T., 3¼ lb. coal per hp. h.
Medicine Hat	85	89	P. 1	108	109	P. 1	..	..	.....	Single track.
Calgary	65	55	P. 1	84	79	P. 1	..	..	.....	S. T., about ½ the tonnage of Mountain Subd.
Mountain	102	103	N. 3	96	99	N. 3	..	..	.....	S. T., oil fuel: 160 U. S. gal. = 1 ton coal.
Shuswap	80	81	N. 3	75	78	N. 3	..	..	.....	S. T., oil fuel; 160 U. S. gal. = 1 ton coal.
Thompson	77	78	N. 3	94	101	N. 3	..	..	.....	S. T., coal for fuel.
Cascade	63	75	M. 4	71	89	M. 4	..	..	.....	⅔ D. T., oil fuel; 160 U. S. gal. = 1 ton coal (3¼ lb. coal per hp. h.).

Remarks:—In arriving at the above figures, the resistance was calculated by formula varying from R = 2.2 T + 122 C to R = 4 T + 153 C, giving much more accurate results than assuming 6 lb. per ton regardless of weather conditions or the condition of loading cars.

TABLE SHOWING ANNUAL AVERAGE NUMBER OF POUNDS OF COAL CONSUMED PER HORSEPOWER HOUR OF WORK

(Equivalent to lifting 1,000 tons one foot)

Found by multiplying the total gross tonnage (including the weight of the locomotive) by calculated resistance of the subdivision (exclusive of the work done in acceleration)

Year	Subdivisions: 133.1 M. Brandon		131.4 M. Broadview		134.4 M. Moose Jaw		110.5 M. Swift Current		136.5 M. Laggan		130.2 M. Mountain		128.9 M. Shuswap		Remarks
	E.B.	W.B.	E.B.	W.B.	E.B.	W.B.	E.B.	W.B.	E.B.	W.B.	E.B.	W.B.	E.B.	W.B.	
1915	6.8	6.7	5.7	4.8	6.2	9.3	6.8	6.7	5.8	6.8	5.0	9.0	5.1	7.2	First 6 months
1914	6.4	6.1	6.3	4.8	7.1	9.5	7.4	6.8	6.9	6.5	5.0	8.6	5.0	6.6	.....
1913	6.5	5.9	6.7	5.0	8.2	11.3	10.5	7.8	8.9	7.3	6.0	9.5	6.0	7.7	.....
1912	7.1	6.1	7.2	5.0	7.5	9.8	10.6	7.2	9.6	7.7	6.9	10.8	7.1	8.0	.....
1911	7.0	5.6	8.1	4.7	8.4	8.7	10.9	6.4	8.4	7.2	6.8	10.5	6.4	8.8	.....
1910	7.6	6.1	8.3	5.2	8.1	9.9	9.6	7.0	9.3	7.9	6.3	10.1	6.9	8.5	.....
1909	8.5	7.1	8.5	5.6	7.9	10.9	10.4	7.3	9.3	9.0	6.6	10.2	6.9	9.1	.....
1908	9.2	7.9	11.4	7.8	7.7	11.5	10.5	7.6	...	...	6.7	10.4	7.0	9.0	.....
1907	9.2	8.2	10.7	7.2	9.0	12.1	12.5	8.4	...	...	6.9	11.3	6.8	9.7	.....
Resistance	1513′	2301′	1306′	2784′	2312′	1951′	1052′	2313′	2319′	3937′	6602′	3026′	3202′	2514′	.....
Remarks	D. 10 locomotive. All D. T. 1912 and later. All S. T. 1909 and prior.		D. 10 locomotive. ½ D. T. 1914 and later. All S. T. 1912 and prior.		D. 10 locomotive. ¾ D. T. 1914 and later. All S. T. 1911 and prior.		D. 10 loc. 1909 and later. M. 1 & 2 1908 and prior. D. T. 1914 and later. S. T. 1911 and prior.		N. 3 loc. 1913 and later. M. 4 1912 and prior. S. T. operation. Oil in pushers 1913 & later.		N. 3 loc. 1909 and later. M. 4 1908 and prior. S. T. operation. Oil after July, 1912.		N. 3 loc. 1911 and later. M. 4 1910 and prior. S. T. operation. Oil fuel after July, 1912.		

Note:—From July, 1912, to September, 1914, oil was figured on the basis of 3½ bbl. = 1 ton of coal; after that date 4 bbl. = 1 ton.
Calculated resistance reduced to equivalent rise in feet.
Train resistance assumed in the above calculations equal to 6 lb. per ton, or 15 ft. of rise per mile.

*From Bulletin 187 of the American Railway Engineering Association.

tionate formula for the month, depending as to how the amount of the work done in that month compared with the total done during the year.

The locomotives used are all superheated and have the following general features:

Class	Weight on drivers	Number drivers	Cylinders
P. 1	198,000	8	23½ in. by 32 in.
N. 3	198,000	8	23½ in. by 32 in.
D. 10	142,000	6	21 in. by 28 in.
M. 4	168,400	8	21 in. by 28 in.
M. 2	140,000	8	20 in. by 26 in.

The variation in resistance during the different months has an appreciable effect. The fact that eastbound resistance for February was comparatively high is accounted for by a large number of lightly loaded cars moving east that month coupled with a high rate of resistance on account of the weather. The very low rate in September eastbound traffic is accounted for by the very heavy and full loading of cars.

The monthly variation in fuel consumption is not so easily accounted for. The relatively heavy fuel consumption during July and August on three subdivisions is accounted for by the very small amount of traffic handled. There must of necessity have been considerable light running. The heavy fuel consumption during 1915, as compared with 1914 and 1913, is accounted for by the time of the year the majority of the work was performed. In 1915, during the months of October, November and December, 64 per cent of the entire year's work was performed, while during the same months in the years 1914 and 1913 only 27 per cent and 45 per cent, respectively, was performed.

The large amount of coal consumed on the Mountain subdivision as compared with that on the Shuswap and Cascade subdivisions, is accounted for by the fact that a great number of pushers are used on the Mountain subdivision, and although they are burning oil, they are not efficient for the reason that steam is kept up all day, while possibly the locomotive is not in service one-quarter or at the outside, one-third of the day. In addition to this there is about 50 miles of 2.2 grade against eastbound traffic and about 21 miles against westbound traffic. This heavy grade must be a factor in the fuel consumed and running locomotives over them.

In comparing the fuel consumed on the Cascade subdivision with fuel consumed on the Mountain and Shuswap subdivisions, the weight of locomotives must be taken into account. Had the same amount of work been done on the Cascade subdivision by N. 3 engines, and the same amount of coal burned, there would only have been required 86 per cent as many locomotive miles. If this had been performed, it would have reduced the coal consumed per locomotive mile to 64 lb. We could not hope to get these results, but the writer believes that had N. 3 engines been used on this subdivision, the total amount of fuel consumed would have been reduced, although the amount per engine mile might have been slightly increased, but owing to the large capacity of the locomotives, less locomotive miles would have been required.

The writer's instructions to locating engineers in regard to the item of saving in fuel are as follows: Figure fuel saving for double-track operation at 3 lb. per horsepower hour of work eliminated plus 40 to 60 lb. of coal per engine mile eliminated, depending on the class of water, coal and locomotive used. For single-track operation, on a fairly busy line, figure 3½ lb. of coal per horsepower hour of work eliminated, plus 60 to 80 lb. of coal per engine mile eliminated, depending on conditions.

HENRY W. THORNTON NOW A LIEUTENANT-COLONEL.—Henry Worth Thornton, the general manager of the Great Eastern Railway, and formerly general manager of the Long Island, was recently made a lieutenant-colonel in the engineer and railway staff corps.

CONQUERING THE ALPS BY CABLE RAILWAY

By Our Special European Correspondent.

The teleferica, or cable railway, is as wonderful and as useful in mountain warfare as wireless is on the sea. What the first prairie schooner was to the plains, the teleferica is to the mountains. My friend and writing companion, Will Irwin, called it in his picturesque way a bread basket, or department store bundle carrier. It is the bridge between low mountain and high mountain. The railroad runs in the valley at the foot of these gigantic upright cliffs of the Alps. The freight, however, has to be picked up and distributed from the steam or electric railways through the valley stations by wagon or automobile truck and then it must go up the mountains on mule and manback and finally on manback alone, bit by bit. But here the teleferica steps in and says: "Let me do it. I'm quicker and surer—I can go in all weathers. Avalanches can't stop me."

What the teleferica can do, what it has done and is doing, is a matter of record in the Italian army. Along this 400-mile front it daily does carrying equal to that which could be done by six army divisions of 240,000 men—or 120,000 mules. The last figure is interesting when it is considered that there are but 175,000 mules and horses used for all purely transportation purposes in this gigantic army which the Italians have organized to fight the Austrians.

These bread baskets each month carry into the country of eternal snows 108,000 tons, or enough to equal the capacity of more than 20 ships of 5,000 tons each.

According to the official statistics of the army, there are 125 miles of teleferica scattered along the front, with a total daily carrying power of 3,600 tons. The carrying power of each teleferica built is roughly 30 tons, as in the case of the one I visited. There are roundly some 120 different stations, each with a line a mile or so in length. The one I used in reaching a height of 11,000 ft. on the side of Monte Adamello, in the central Alps, a relatively short distance from the Swiss frontier, did the work of 2,000 men a day.

The operation of the teleferica is not so much more difficult than that of the average electric elevator in a sky-scraper. Once the heavy motors and machinery are gotten up the mountain sides—a big task in itself, however—together with the stringing of the three-quarter inch steel cables across deep valleys and chasms and rivers, then the mounting of the car, two feet wide by four long, upon the overhead cable and the attaching of the pulley cable become simple jobs.

Riding in it as a passenger, however, is not so simple. When anybody is in a war-zone, and especially after he has visited numerous firing lines and been under constant rifle and artillery fire, it borders on the ridiculous to be afraid of anything, as, for example, falling out of a teleferica, or having it go tumbling down, because of a broken cable, a few hundred feet into the ice and through the snow to the hard rock underneath. The sensation of fear originates from unfamiliarity and strangeness.

As a special privilege I was permitted to ride up to the glacier country in the teleferica. Afterwards, I almost regretted I had not climbed up, along with the burros and the soldiers. My sensations could not have been different from those of old country people taking their first ride in a train, though I had perhaps a more clearly defined conception of what would happen to this lone American citizen so far from home should the teleferica decide to drop him in mid-air.

We had been coming up all morning by burro from the valley, the Alpinist colonel and I, riding along narrow roads built on the side of a huge mountain. A mis-step of the burro at any time and I would never have taken that teleferica ride; I would have dropped two or three hundred feet into the cold waters of a stream that sparkled and raced in

the sunlight. But this burro ride merely produced a sensation of uneasiness.

When we came to a small shack blocking the road, the Colonel said: "Now for the teleferica." He dismounted, greeted the officer in charge of the station, and let me take a look around to investigate the teleferica. It didn't look very imposing—just a couple of heavy motors with cables. My eye followed those cables, however, and they seemed to keep going across the valley and up the side of the opposite mountain until the eye, dazzled by the snow, could follow no longer. "Well," remarked the colonel, as he cheerily knocked the snow from his thick, hobnailed boots, "suppose we go up."

We climbed into the basket, the side rails of which were certainly not more than six inches high, though I did not note this when the car was still within two feet of solid ground. A whirring of wheels, and our car ran smoothly into space. "I hope the thing breaks; then I won't have to follow you," laughed Irwin as he waved goodby.

I held on for dear life to those low sides and fervently hoped the colonel wouldn't rock the boat and spill us out. "This thing wouldn't pay as a passenger proposition in peace times," I remember saying to the colonel. Indeed, it would pay about as well as a similar teleferica operated between the top of the Woolworth building, downtown New York, and the Metropolitan tower in Madison square.

"But just suppose we had built more of these telefericas in peace times, up here in these mountains; suppose we had built more steam and electric passenger lines, we would have been vastly better off from a military point of view in the war," answered the colonel, as the car began to run more smoothly on the upclimb part of the cable. The colonel was an enthusiast, like all of the officers of the Italian army. "I'm sorry you didn't build a regular railway line to the peak of Adamello before you decided to take me up there, anyway," I said.

Here the car began to climb upgrade as it approached the mountain side. It ran upgrade, on a 30 degree incline for a couple of minutes and stopped, for we had completed the first teleferica section of the three that would take us to our destination. In seven minutes we had traversed a distance that on foot required an hour. We walked along a reasonably gentle upclimb for a mile towards the second teleferica station, following the five-foot road used by the burro trains and the territorial troops which carry on their backs the material for which there is no room in the teleferica. As the weather was clear and there was no danger of avalanches, the colonel devoted time to informing me on various phases of mountain transportation work.

The quality of all these Italian officers that impresses one is their earnestness and pure joy in their work. In talking with them and listening to them discuss their problems, one forgets they are soldiers and that their ultimate object is to equip and organize the firing line so the enemy may be defeated. "The intent to kill," seems totally foreign to their thoughts, nor, as is popularly supposed, does officer work consist in wearing showy, tailor-made clothes and giving orders to common soldiers. While discipline is maintained, the atmosphere of a great mountain military camp is not much different from that of a place where a big construction job is going on, with all hands interested in its successful completion. That night, after we had been safely carried through more dizzy distances until we had reached the camp built around the old Garibaldi Refuge, we gathered about the officers' mess and there I listened to these men discuss in their own tongue the thousand and one details that take up some 18 of their 24 hours each day.

The mess room was also their work room. Its walls were covered with maps of the mountain country. In one corner was a typewriter for legibly preparing orders to be passed on to the officers on the firing lines. In another corner was the telephone that ran one way further up the mountain, out upon the glacier, and the other way down the mountain to the different camps until it reached division headquarters.

The officer in charge of the station, from which was at this time being launched a series of attacks against the enemy, had just come in that night from a long journey over the snow and ice to the front lines. His face was burned with the sun-burns one gets up here until the skin was almost black, not brown.

He talked of many details, which inevitably fell into four groups—food, clothes, transportation and arms. Men have to talk about primitive subjects when they are dealing with nature in her most primitive and unconquerable aspects. Before reaching the enemy and dealing with him, nature had first to be dealt with. There were questions of more skis for the ski-men, or more white clothes to make them invisible on the snow, of more sleds to drag supplies upon, of making the men wear their yellow snow glasses to keep them from going temporarily blind, of making them protect themselves from the bitter treacherous cold so their feet would not freeze, of keeping them supplied with grease each morning to make their shoes cold and water proof, and of bringing up more steel frames and timber to complete shacks so the soldiers might live better protected against the weather.

Already many heavy pieces had been brought up, but at the expense of months of valuable time. It was stated that to bring from a certain locality a single 149 mm. gun a distance of 20 kilometres it had required two months of time and many gangs of men working 200 to the gang. Twenty days of this time had been lost waiting for snow avalanches to fall. On one occasion the lives of 40 men had been lost and the cannon buried so deep it had to be dug out at great effort. A fair day's work at dragging the cannon was about 100 metres at certain steep places, and "when the snow looks like wheat flour, we take to cover for this means avalanche weather," explained one of the officers. On the whole, to plant cannon higher than they had ever been planted before and to raise a few pieces the difference between 2,000 metres and 3,300 metres above sea level—1,300 metres—great effort, time and ingenuity had been necessary.

"We've got to use the teleferica for such work," declared one officer impatiently. "It has been used for this in the Cadora and Carnia sections of our front and we must do it here."

Out of courtesy to the guests, the commanding officer, with that pleasant way these delightful Italians have, finally stopped the serious conversation, told the soldier waiter to bring in a bottle of wine and there, standing in the smoke stained, cold-beaten refuge named in honor of Garibaldi, Italy's Washington, we drank to "America," to "Italy," to her brave and enduring soldiers, and lastly to the "Alpini," to these hardy mountain men who have pushed up and onward into the treeless heights at sacrifices I despair of ever conveying on cold paper.

After cheery "Good nights" from these officers whose cares never burden them so much they fail to be unpleasant or impolite, they went to their beds and blankets, to get the sleep necessary for the work awaiting them on the morrow.

Irwin and I, having no battles to fight, spent some five minutes clambering along a slippery path a few hundred feet from the refuge to the teleferica station proper where we found the night crew of soldier mechanics keeping it going. One of their jobs was to send down the mountain some soldiers whose feet had gotten frost-bitten out upon the glacier, whence just then we could hear the high blow of the *tormenta*, the cold wind that springs up like the squalls of the Atlantic ocean and torments, harasses, blinds and perhaps freezes the unlucky soldier caught without shelter.

Everywhere one goes on the Italian front, he finds soldiers who have been to America and who have worked on our railroads. The other soldiers spoke of us ever as the *borghese* or the *inglese*, but these greeted us as friends, fellow-citizens,

and in our own tongue. Up there it was the same story, and it was almost pathetic the manner in which these fellows who had been in the United States spoke to us, welcomed us, recalled the good times they had had "in America." One of the mechanics operating the teleferica had learned how to do it handling a steam winch on some railroad construction work. As he sent down the soldiers with frozen feet on the teleferica, he remarked, with the sudden gleam of cheerfulness always leaping out of the hearts of these Italians: "Those tormentas, they are like the Austrians; you can't trust them."

The next morning as we went on foot down the mountain, Alpine stock in hand, we saw some more of these cheerful Italians whose soldiering is not much different from their work as laborers among us. Some time I am going to tell more about these great children who never grow up, who are so easy to handle if one only is kind to them and applies a little of the golden rule. When the war is over, many more will come among us again, and we should better understand these simple-hearted fellows. I am sure if we spoke their tongue, instead of letting them be exploited by their own padrones, we should think differently of them, because we would be able to speak with them, give them a little of the sympathy which their kindness of heart yearns for; nor would we wound the vanity of these people who are proud of their homely virtues.

As we walked we could better see the work of the teleferica overhead. We also met line after line of burros and soldiers afoot doing work that there were not yet enough telefericas in this section to do, and by the very difficulty of their climbing we realized exactly how great was the service of the teleferica that hummed and spun aloft. For a mile above us we saw long lines of soldiers tugging at the ropes of the cannon, trying to pull other cannon upon the glacier positions. For miles below us, as we walked on at a rapid, swinging gait we saw whole miles of the narrow path traversing like a long black cable the snowy white of the valley and upon this path, like crawling ants, kept coming and coming burros and soldiers—all part of the transportation system of a great army, the wonderful link in which was the teleferica.

MILITARY TRAFFIC ON THE GREAT WESTERN RAILWAY OF ENGLAND.—Since the beginning of the war to June 30 last, more than three and a half million officers and men of the military and naval forces, 489,249 horses and mules, 13,334 wagons, 1,627 guns and limbers, and 13,000 bicycles, have been carried by the Great Western Railway.

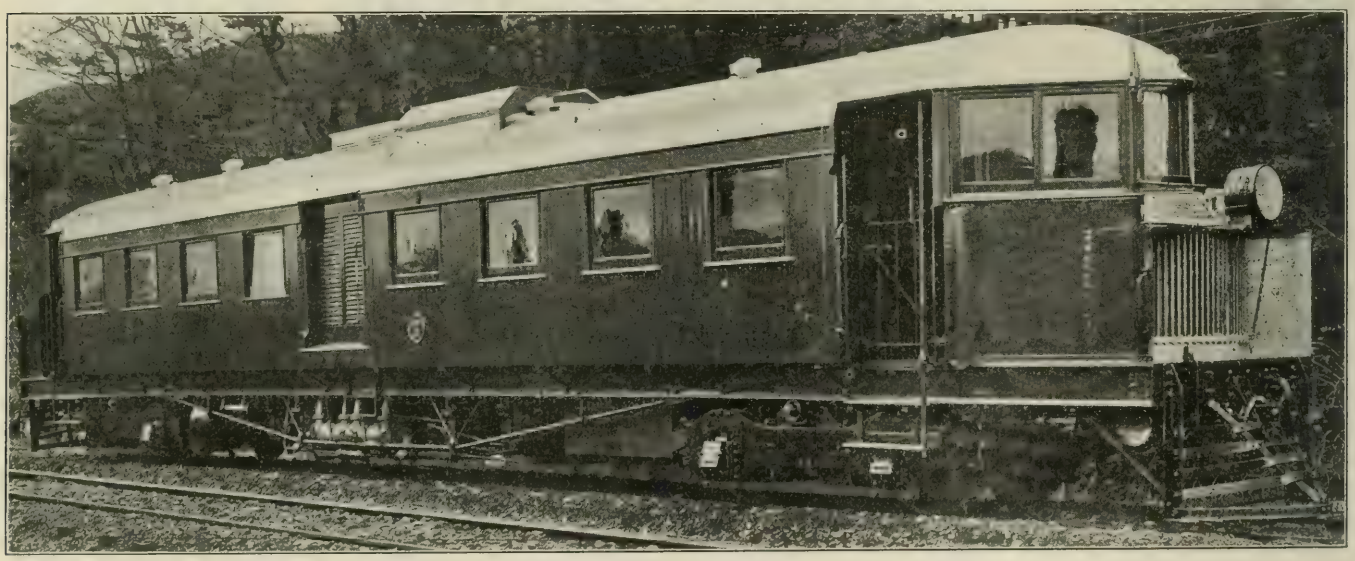
THOMAS TRANSMISSION MOTOR CAR

There has just been completed at the government railway work shops, Petone, New Zealand, a motor coach possessing many striking features. The vehicle, with the exception of the body, was supplied by the Thomas Transmission, Limited, 14 Leonard Place, Kensington, London, W., and the system of transmission is known as the Thomas Transmission.

The main power unit consists of an eight-cylinder gasolene engine of the V type, in two sets of four cylinders each, having a bore of 7 in. with a stroke of 8 in. Opposite cylinders act on the same crank. One cylinder of each pair has a forked connecting rod with bearings on the outside of the brasses of the rod of the opposite cylinder. By this means the length of the engine is kept within reasonable limits. The valves are located on the outside of the cylinder castings for accessibility. One Claudel-Hobson carbureter is fixed to each end of a common induction pipe, and the inlet and exhaust pipes are placed on the outsides of the cylinders. The silencers, one for each set of cylinders, are located on opposite sides of the engine. Dual ignition and separate magnetos for each set of cylinders are provided. The engine is reversible and the rotation of the cam-shaft, which is fitted with small flywheels to minimize backlash, is always in the one direction, irrespective of the crankshaft rotation. This ensures that the oil and water pumps, as well as the magnetos, rotate only one way.



Motor Car Hauling Train of Hospital Cars

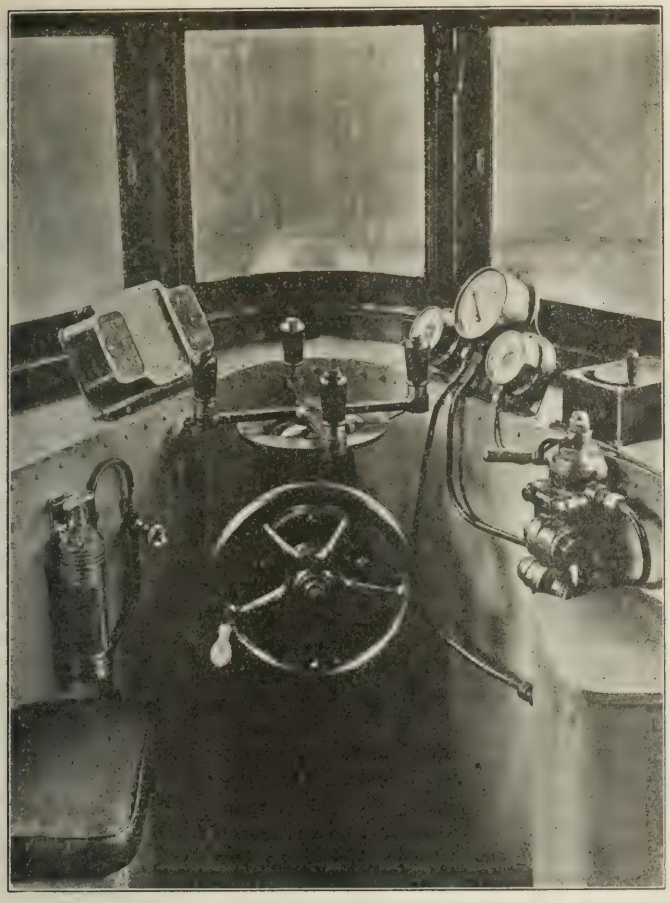


Motor Car with Thomas Transmission for New Zealand Government Railways

Water-cooling radiators are fitted at each end of the car, side ducts allowing a free current of air in whatever direction the car may be running. Oil-cooling radiators are provided, one for cooling the lubricating oil for the engine, and one for the oil which lubricates the planetary or epicyclic gearing. The Thomas electro-mechanical transmission consists of two electrical machines (each of about ⅓ normal hp. of the

gasolene engine) and a planetary gear. The engine is located in the middle of the car, having the planetary gear, and the first electrical machine at one end of the engine and the second at the other end. The first electrical machine, in conjunction with the planetary gearing and two magnetic clutches, forms a rigid unit. The engine drives the casing of the planetary gearing and the latter splits the drive into two paths, one driven shaft providing a mechanical drive to the outside axle of one truck, while the second driven shaft (which is hollow) drives back to the first electrical machine referred to.

Current is transmitted from this first electrical machine to the second electrical machine at the opposite end of the engine, to which it is *not* connected mechanically. This second machine provides an electrical drive to the outside axle of the second truck. A main controller which provides twelve speeds, operates the car. By reversing the direction of rotation of the engine the same speeds in the opposite direction are secured for continuous running. To start the car the control handle is placed in "start engine" position which connects the car battery across No. 1 electrical machine. By closing an auxiliary switch the No. 1 machine is coupled to the engine, thus starting it. Once the engine is working, the auxiliary switch is moved to the "off" position, and the main controller placed in the first speed notch. By slowly operating the auxiliary switch to the "on" position, the free wheeling clutch is gradually engaged, causing No. 1 machine to rotate in the reverse direction to the engine and produce a mechanical drive to one truck and by the transmission of current to the second machine an electrical drive to the other truck. As the car gains in speed the main controller handle is gradually moved to "top speed" position, when the direct drive from the engine to the running wheels is obtained by the engagement of the top speed clutch which locks the planetary gearing solid, and also reduces the current generated to zero. By moving the controller handle to a position beyond "top speed," the battery used for starting the engine (but not for propelling the car) may be recharged. The car can be driven from either end at will.

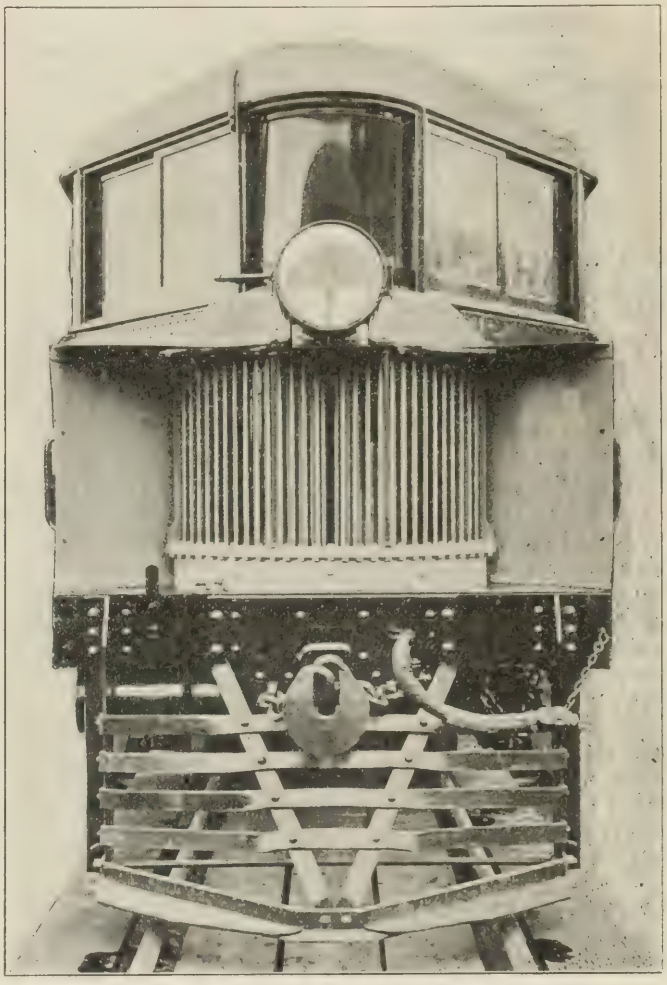


Interior of the Cab of the New Zealand Railways Motor Car

Westinghouse brake equipment is provided; the car is lighted with electric light and has an electric headlight at each end. Hand brakes are used, as well as air sanding apparatus.

The above arrangement is considered ideal for a gasolene-electric coach as a direct mechanical drive on top speed is obtained, as well as the flexibility of a purely electrical drive.

The total weight of the car is 80,600 lb., about 20,000 lb. of which comprises the weight of the engine, transmission gear, radiators and electrical machines. The car is capable of hauling a 33,600 lb. trailer up a grade of 1 in 40 at 15 miles an hour, the gross load being over 112,000 lb. The maximum speed on the level is over 40 miles per hour. The gage is 3 ft. 6 in.



A Front View of the Motor Car

British Railway Unions Ask Wage Increase.—According to a London press report the British railway unions have decided to ask for an increase of ten shillings weekly in the wages of all employees. The increase is declared necessary to meet the higher cost of living. The decision has caused surprise, as under an agreement entered into last October, a small wage increase was granted on the condition that the railway men make no further demands during the war.

COMPARATIVE WATER SERVICE COSTS

By P. M. La Bach
Assistant Engineer, Rock Island Lines, Chicago, Ill.

Various units have been proposed from time to time as a means of comparing the relative costs of the water service of different railroads. The unit most frequently utilized has been the freight ton mile, which is a convenient figure, as it is found in the published statistics of the Interstate Commerce Commission. However, it ignores the question of passenger tonnage. The ratio of the latter to the former varies widely and in addition the amount of water needed to haul a passenger ton one mile exceeds that for a freight ton anywhere from 50 to 150 per cent. It is evident that any figures which have for a common divisor only a part of the work done must necessarily be in error.

The cost of operating a pumping plant, exclusive of fixed charges, involves a constant and two variables. The constant is the pumper's wages and the variables, the cost of fuel and the cost of repairs. To express it mathematically:

Let K = pumper's wages.
Let G = cost of fuel per 1,000 gal. pumped.
Let R = cost of repairs per 1,000 gal. pumped.
Let N = number of 1,000 gal.

Then the total cost per month equals $K + (G + R) N$.

Assigning units which are frequently found in practice, we have:

K = $50 per month.
G + R = $0.01.
N = 500.
$50 + 5 = $55.

Cost of pumping 1,000 gal. = $0.11.

K = $50 per month.
G + R = $0.01.
N = 1,000

Cost of pumping 1,000 gal. = $0.06.

K = $50 per month.
G + R = $0.01.
N = 3,000.

Cost of pumping 1,000 gal. = $0.027.

Where larger amounts are pumped it is frequently found that another pumper is employed. This fact has a direct bearing on statistical studies of this nature. It is important to know how much water the stations furnish as units. The quantity of water used is in direct ratio to the amount of work done by the locomotives taking water at that particular station. Also water stations are spaced as far apart as the tender tanks will permit and are usually constant in number for an engine district. If under these conditions the traffic is doubled the amount of water needed will be doubled, but the cost does not vary in the same ratio. In comparison, therefore, some allowance must be made for density of traffic. This may appear to be hypothetical, but there are many divisions of light traffic on which the pumper's wages exceed the cost of fuel, while on others with more trains the reverse is true. Another factor entering into the question is the question of grades. A railroad having light grades will perhaps haul twice as many tons per unit of water consumed as another with heavy grades.

In looking for another unit attention has been called to the fact that a locomotive develops about the same average horsepower mile after mile. For instance, a Consolidation locomotive of 1,200 hp. will be used to its limit, except on descending grades, no matter what load the ruling grade permits. Assuming that the rated horsepower of locomotives will average about the same on the various railroads, the locomotive mileage could be used as a unit except for the fact that passenger locomotives use about half as much water per mile as freight locomotives. To overcome this difficulty the use of what may be called constructive engine mileage is suggested; that is, one made up of the total freight engine miles plus one-half of the passenger engine miles.

For the purpose of comparing units, the table given herewith has been prepared to show the cost of water on 21 railroads with reference to three units, namely, "mile of road," "1,000 ton miles," and "constructive engine miles." The cost in terms of miles of road gives high values for the line with heavy traffic. The cost per ton mile has the objections enumerated heretofore, while the constructive engine mileage gives relatively higher values for the road with the heavier average train loading. None is, therefore, entirely satisfactory.

Data on the Cost of Water on 21 Railroads Over 950 Miles Long.

	Per Mile of Road		Cost of Water		
	Freight ton miles	Constructive engine miles	Per mile of road	Per 1,000 ton miles	Per constructive engine mile
Eastern Roads	5,430,286	13,586	$282.10	$0.052	$2.08
	2,788,075	9,970	128.10	.046	1.28
	2,997,966	8,422	91.80	.031	1.09
	4,255,513	12,975	142.70	.033	1.11
	3,223,935	8,679	96.60	.030	1.11
	3,011,617	5,022	67.70	.022	1.34
Southern Roads	1,116,491	4,955	43.60	0.039	0.88
	651,835	3,702	37.00	.057	1.00
	1,633,461	5,424	55.30	.034	1.02
	677,129	4,519	48.40	.071	1.07
Middle Western Roads	834,338	3,229	41.20	0.049	1.28
	942,339	3,000	33.20	.035	1.11
	679,184	3,165	43.70	.068	1.38
	1,417,388	5,038	95.10	.067	1.88
	911,648	3,149	41.80	.046	1.32
	609,465	2,642	50.30	.082	1.90
Western Roads	706,150	3,090	70.90	0.100	2.27
	732,032	3,871	63.00	.086	1.63
	788,895	2,516	81.40	.103	3.23
	1,051,899	3,836	72.60	.069	1.89
	531,952	2,989	46.60	.087	1.56

Also any calculations for the cost of water on a railroad, no matter what the unit, which include all water expenses are manifestly unfair to those roads which are treating a considerable portion of their water in water-softening plants. Railroads in a large part of the United States can afford to add considerable amounts to their water service costs by treating the water. While this will result in large economies, unfortunately they will not be reflected in water service costs. The same may be said of track pans. They save costs in fuel and overtime, but add to the cost of water service itself.

In view of this we can never expect to have any true comparison of the efficiency of water service on the various railroads until some means is developed for taking all of these items into account. It might be simpler to subtract the cost of these items from the total water service cost in order that a comparison might be made between figures that give only the cost of pumping the water. On many railroads the cost of water is too high, principally because the water service is without direct supervision by anyone familiar with the problems involved. In consequence a unit for the cost of water on railroads, which will permit of a fair comparison, is sorely needed and an effort should be made to obtain one.

Railway Profits and the Community.—We confess ourselves at some loss to understand the meaning of Sir Guilford Molesworth's recent remark, which has gained wide publicity through quotation in the press, that "the enormous profits of railway companies are a national misfortune." Save for a very few exceptions, due to special local causes, no railways in the world, and least of all those of the United Kingdom, can be said to make "enormous" profits, since it is a platitude that in no other industry whose capitalization is at all comparable is the average level of dividends so low. Moreover, as has so often been pointed out, one of the most expensive luxuries in existence is a poverty-stricken railway, by reason of its inability to meet the demands of the community. England is a striking example of the fact that a railway paying large, or relatively large, dividends gives a better service to the public than one whose shareholders receive only a small average return. The United States also has reason to realize that fact. Incidentally, it might be pointed out that to talk of the "enormous profits" in the case of British railways just now is somewhat unfortunate when they represent the only great industry in the country not earning war profits.—*Railway Gazette*, London.

TRAIN ACCIDENTS IN JULY[1]

The following is a list of the most notable train accidents that occurred on the railways of the United States in the month of July, 1916:

Collisions

Date	Road	Place	Kind of Accident	Kind of train	Kil'd	Inj'd
4.	Florida E. C.	Durbin.	rc	P. & F.	0	0
15.	Pere Marquette	Grandville.	bc	P. & F.	0	15
17.	Virginia & S. W.	St. Charles	bc	P. & F.	0	3
17.	Denver & R. G.	Denver.	rc	P. & F.	0	5
17.	Great Northern	Todd, N. D.	bc	P. & P.	0	3
23.	St. Louis, B. & M.	Bay City	bc	F. & P.	0	8
25.	Norfolk & W.	Belspring.	rc	F. & F.	2	6

Derailments

Date	Road	Place	Cause of Derailment	Kind of train	Kil'd	Inj'd
6.	Gulf & S. I.	Bond, Miss.	washout	P.	2	0
8.	Erie	Lanesboro.	b. rail	P.	0	1
9.	Mobile & Ohio	Sparta, Ill.	unx	P.	0	10
9.	Gulf C. & S. F.	Chriesman.	d. rail	P.	0	1
10.	Western Md.	Montrose.	d. eq.	P.	0	5
13.	Phila. & R.	Hellertown.	unx	F.	0	2
15.	Western Md.	Durbin.	d. eq.	P.	0	7
21.	New York Cent.	Troy.	.....	P.	0	1
22.	Boston & Maine	Rutland.	slide	P.	0	1
23.	Central Georgia	Fitzpatrick.	d. track	P.	1	6
*24.	Denver & R. G.	Goodnight, Colo.	b. wheel	F.	1	1
29.	Balt. & Ohio	Cairo, W. Va.	d. track	P.	0	0
29.	Grand Canyon	Willaha.	flood	P.	1	2

The trains in collision at Durbin, Fla., on the 4th were a southbound passenger and a southbound freight, the passenger running into the rear of the freight. Five freight cars were wrecked. The injuries to passengers and trainmen were all of a slight nature.

The trains in collision at Grandville, Mich., on the 15th were an eastbound electric car and a westbound steam locomotive without a train. Fifteen passengers were injured.

The trains in collision near St. Charles, Va., on the 17th were train extra east, engines 69 and 73 of the Virginia & Southwestern and an eastbound mixed train No. 66 of the Louisville & Nashville. One engineman, one fireman and one conductor were injured. One of the engines was considerably damaged and three freighters were slightly damaged. A brakeman in checking the register, read engine 66 for train No. 66, whereas the register indicated that local freight No. 93, engine 66, had passed the point of register rather than Louisville & Nashville train No. 66.

The trains in collision near Denver, Col., on the 17th were northbound passenger No. 12 and a freight train which was standing on a side track. The engine of the passenger train and 4 cars of the freight were wrecked. Four passengers and the engineman of the passenger train were injured. The collision was due to the thoughtless act of the conductor of the freight, who threw the switch as No. 12 was approaching.

The trains in collision at Todd, N. Dak., on the 17th were a westbound express and an eastbound local passenger train. Three passengers were injured.

The trains in collision at Bay City, Tex., on the 23rd were an extra, southbound, carrying troops, and second No. 4, northbound, carrying homeseekers. Eight passengers were slightly injured. The southbound train had an order giving it the right of road to Bay City only, and until 6:20 a. m.; but it stopped at that point until about 6:50, taking water, and then proceeded southward, and soon met the northbound train, on a curve. It was not visible from the northbound train because of a freight train standing on a side track, on the inside of the curve.

The trains in collision at Belspring, Va., on the 25th were westbound through freights. A train, in which were some camp cars, occupied by an extra gang, standing between the switches on the main line, was run into at the rear by a following freight, wrecking seven cars. Two workmen were killed and six other employees were injured. The collision was caused by a failure in block working. The second train received a clear signal when the block was occupied by another one. The conductor and a brakeman of the standing train are also held at fault for not protecting their train, there being a fog at the time. The engineman of the second train also disregarded the rule to move between switches, during fogs, at restricted speed.

The train derailed at Bond, Miss., on the 6th was a northbound passenger. The derailment was caused by a washout; the engine was overturned, and the engineman and fireman were killed.

The train derailed at Lanesboro, N. Y., on the 8th was eastbound passenger No. 30. The derailment was due to a broken rail, but the engine and two cars passed over in safety. There were no injuries to passengers and only one employee was slightly injured.

The train derailed near Sparta, Ill., on the 9th was southbound passenger No. 1. Ten passengers were injured. The cause of the derailment was not determined. The tender was the first vehicle to leave the rails.

The train derailed near Chriesman, Tex., on the 9th was northbound passenger No. 16 and the whole train, consisting of a locomotive and five cars, was overturned in the ditch. The road was blocked about 12 hours, but the reports say that only one person was injured. The derailment was due to a defective rail.

The train derailed near Montrose, W. Va., on the evening of the 10th was westbound passenger No. 5. One passenger and four trainmen were injured. The derailment was caused by the breaking of a side rod of the locomotive.

The train derailed on the Philadelphia & Reading at Hellertown, Pa., on the 13th was a northbound freight, and twelve cars of ore were ditched. Two trainmen were injured.

The train derailed near Durbin, W. Va., on the evening of the 15th was a southbound passenger. The engine and three cars were badly damaged. Six passengers and one trainman were injurad.

The train derailed near Troy, N. Y., on the 21st was a southbound local passenger, and the engine was overturned. The engineman was injured.

The train derailed near Rutland, Mass., on the 22nd was a westbound passenger. The fireman was injured. The derailment was due to a landslide, which was caused by a sudden heavy rainstorm.

The train derailed at Fitzpatrick, Ala., on the 23rd was a westbound passenger, and the engine and first two cars were overturned. The engineman was killed and three passengers and three trainmen were injured. The derailment is believed to have been due to soft track, following several days of heavy rain.

The train derailed near Goodnight, Colo., on the 24th was eastbound freight No. 84. A number of cars were ditched, and the wreck took fire, consuming eleven cars. On the train there were a number of trespassers, of whom one was killed and one injured. The derailment was caused by a broken wheel.

The train derailed near Cairo, W. Va., on the 29th was eastbound passenger No. 12, and the cause of the derailment is said to have been the spreading of the rails. The derailment occurred in a tunnel and eight cars ran off the track.

The train derailed near Willaha, Ariz., on the 29th was a southbound passenger. The fireman was killed and the engineman and one trainman were injured. The train broke through a bridge which had been weakened by a flood, and the engine and the baggage car were precipitated into the stream.

Electric Car Accidents.—A butting collision of interurban cars, one carrying passengers and the other a work car, at Youngstown, Ohio, on the 8th injured 13 persons. In a butting collision near Chicopee, Mass., on the 23rd one man was killed and 6 were injured.

[1]Abbreviations and marks used in Accident List:
rc, Rear collision——bc, Butting collision——xc, Other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc.——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

Railway Strike Ordered for September 4

President Wilson Addresses Joint Session of Congress to Recommend Legislation to Prevent Walk-Out

THE scene of activity in the railway wage controversy and the efforts to avert a nation-wide strike of train service employees was transferred to Congress on Tuesday of this week when President Wilson went before a joint session of the Senate and House and asked the enactment of legislation not only for the purpose of relieving the present situation but also as a remedy against the recurrence of similar problems.

This action was taken after the railway executives who had been in Washington for over a week conferring with the President had declined to accept the President's plan that they concede the eight-hour basic day without arbitration, but had offered a counter-proposal providing for an investigation of the questions involved by a special commission, and after the brotherhoods had practically terminated the negotiations without warning by issuing an order calling a strike for the morning of Monday, September 4, Labor Day.

Shortly after the President had presented his message to Congress most of the railway executives who had been in Washington left the city to return to their properties to make preparations for a strike if it should come.

In his address to Congress, President Wilson recommended the following legislation:

Provision for the enlargement and administrative reorganization of the Interstate Commerce Commission.

The establishment of an eight-hour day as the legal basis for both work and wages for railway employees in interstate commerce. The authorization of the appointment of a special commission to study the results in experience of an eight-hour day, its effect on operating costs and in other aspects, to report to Congress without recommendation.

Approval by Congress of the consideration by the Interstate Commerce Commission of an increase in freight rates to meet the additional expense should the facts justify the increase.

A provision for a public investigation before a strike or lockout may lawfully be attempted.

Lodgment in the hands of the President of power, in case of military necessity, to take control of the railways and to draft into service such train crews and officials as may be required.

In asking for this legislation the President also took occasion to make a public explanation of his course in the controversy.

The proposals for increasing the size of the Interstate Commerce Commission, for authorizing it to take the cost of wage increases into consideration in fixing freight rates, for an investigation by a special commission, and for the requirement of an investigation before a strike can be called are very closely in accord with suggestions made to the President by the railway executives. The suggestion for an eight-hour law has been advanced by the brotherhoods, but their leaders have given out public statements strongly opposing the plan for a compulsory investigation.

Tentative drafts of bills embodying the suggestions made by the President have already been made.

PROGRESS OF THE NEGOTIATIONS

As reported in last week's issue, a large number of the leading railway executives of the country had been in Washington conducting the negotiations with President Wilson since August 17. On that date the President asked the executives to confer with him after the National Conference Committee of the Railways had declined to accept his plan providing for the concession by the roads of the eight-hour day and the postponement of all other issues pending an investigation by a special commission. Other executives arrived in Washington nearly every day for a week afterward until this week there were nearly 100 railway executives and managers, representing most of the railway mileage of the country, in the city. In addition to those mentioned last week, Samuel Rea, president of the Pennsylvania Railroad, Howard Elliott, president of the New York, New Haven & Hartford, and A. J. Earling, president of the Chicago, Milwaukee & St. Paul, have taken part in the conferences.

The basis of settlement proposed by the President at his first meeting with the National Conference Committee is in terms as follows:

> "Concession of eight-hour day.
>
> "Postponement of the other demand, as to payment for overtime, and the counter suggestions of the railway managers until experience actually discloses the consequences of the eight-hour day.
>
> "In the meantime the constitution, by authority of the Congress, of a commission or body of men, appointed by the President, to observe, investigate and report upon these consequences, without recommendation.
>
> "Then such action upon the facts as the parties to the present controversy may think best."

The principal developments during the first week of the negotiations were outlined in last week's issue.

After the executives had informed President Wilson that they could not accept his plan, and that they must insist on the principle of arbitration, almost continuous conferences were held by the sub-committee of eight, with Hale Holden, president of the Chicago, Burlington & Quincy, as chairman, in the effort to work out a feasible counter-proposition. This committee considered numerous plans, which were then submitted to the other executives and to the National Conference Committee for full discussion, while a special committee of three, consisting of Mr. Holden, Robert S. Lovett, chairman of the Union Pacific, and Daniel Willard, president of the Baltimore & Ohio, held several conferences with the President to discuss certain phases of the situation. While these conferences were pending Mr. Holden gave out a statement explaining that the executives were proceeding as rapidly as practicable with their work, but that the problem with which they were wrestling was the most important and gigantic ever presented to any body of men in the industrial history of the country, and that they could not consistently with their duty reach a final conclusion without much discussion, great study and profound thought.

All of the plans discussed, however, seemed open to serious objection. The President had insisted on the concession of the eight-hour day, as a basis for the computation of wages, "even where the actual work to be done cannot be completed within eight hours." Any plan embodying such a concession, using the present rates of pay for 10 hours, would involve an increase in wages, it was estimated by the conference committee of managers, of about 21 per cent, or approximately $50,000,000 a year. The brotherhoods were unwilling to submit to arbitration the question of the rate of pay per hour on an eight-hour basis, and although the President in his statement to the public had suggested the possibility of an increase in rates if it were found necessary to meet the increased expense he could give no assurance of such a result.

The President's plan, moreover, gave no definite promise that it would effect a permanent settlement of the questions at issue. The proposed commission was to have no power except to investigate and report. There was no assurance that the brotherhoods, after having received the eight-hour basic day, would not repeat their demands for time and one-half for overtime, accompanied by a strike threat at some later

date, nor that, having had their pay increased by the change in the basis without any change in their hours of work, they would not return with a demand for a real eight-hour day.

Meanwhile the railroad officers and the President were receiving hundreds of telegrams from commercial organizations, shippers, manufacturers, farmers and individuals from all parts of the country protesting against the idea of increasing freight rates for the purpose of paying higher wages and also against any surrender of the principle of arbitration. A large proportion of the newspapers throughout the country were also supporting the position of the railways editorially.

The railway officers were also confronted with the problem of the effect of the concession of either the eight-hour principle or an increase in wages for the benefit of the train employees, or their other employees.

"I hope," said F. D. Underwood, president of the Erie, in a statement to the newspapers, "that the public does not think we are standing out against the payment of $50,000,000 or even $100,000,000. That is a mere bagatelle to what the proposal really means. Figure out what granting this $50,000,000 to the four brotherhoods and other millions to other unions that will seek the eight-hour day will mean to the railroads in the next 20 years. Why, it means a sum that would make the national debt insignificant."

The difficulty of the problem was increased after President Wilson had held several conferences with Senator Newlands and Representative Adamson, the chairman of the congressional committees on interstate commerce, as a result of which it was indicated to the roads that there was little chance of obtaining new legislation at this session of Congress.

A new possibility was held out for a time about the middle of last week when the railroads were informed that the brotherhood leaders had indicated to W. L. Chambers, of the United States Board of Mediation and Conciliation, that they were willing to arbitrate the railroads' contingent proposals, regarding the elimination of certain arbitrary allowances in case of any change in the wage basis, which under the President's plan were to be postponed. On Thursday, August 24, Messrs. Holden, Lovett and Willard held a short conference with the President at the White House, at which they were informed that there had been a misunderstanding and that the brotherhoods would make no such concessions.

This left the situation as hopeless as ever and it was reported that the brotherhoods had told the President that they would not wait any longer than Saturday night for any counter-proposition from the railways. It was given out that "a new phase of the situation of some importance was being discussed and the railway executives held several more conferences.

On Friday noon a statement was given out by the railway executives saying that they were studying the form of a communication to the President and later in the day the special committee of three had another conference at the White House. After long meetings Friday evening and Saturday morning the railway executives agreed upon the form of a counter proposition to be made to the President, as a basis for a settlement, together with a final notice that could not concede the eight-hour day without arbitration.

The sub-committee of eight asked for an appointment with the President, but after they had waited for some time they were notified that the President could not see them until Monday morning. News of the nature of the new plan leaked out and was published in some of the newspapers on Saturday morning. Whether or not this affected the President's plans, in the afternoon he made a sudden trip to the Capitol and conferred with the Senate leaders on the subject of legislation. He was also understood to be in communication with the railway executives and members of Congress through Franklin K. Lane, Secretary of the Interior, and a former member of the Interstate Commerce Commission. On Sunday the executives marked time while the President was reported to be active in conferences regarding proposed legislation which might effect a settlement and avert a strike. The President went to the Senate office building on Sunday afternoon and talked with Senator Kern, the Senate leader.

While many rumors were being circulated regarding the nature of the proposed legislation most of the 600 general chairmen who compose the brotherhood committee left Washington on Sunday evening for their homes, taking with them sealed orders and instructions for the carrying on of a strike. A sub-committee of 24, in addition to the four executives of the brotherhoods, was left behind with instructions, it was reported, not to accept any plan of arbitration.

Strike Order Issued

On Monday the railway officers learned that the sealed orders for a strike, which it had been understood were to be released by a cipher message giving the date, in fact carried instructions for the calling of the strike at 7:00 o'clock a. m., on September 4, Labor Day, and that the printed blank forms, on which the strike date had been filled in with a rubber stamp, bore the date of August 14, the day on which the railroad and brotherhood committees had been summoned to Washington by the President.

President Wilson had postponed his engagement with the railroad presidents from 10:00 a. m., until 2:30 p. m., on Monday. When the committee of eight called at the White House in the afternoon they did not present their counter-proposal, but instead suggested to the President the immediate enactment by Congress of a law similar to the Canadian Industrial Disputes Investigation Act, to prevent the calling of a strike before an investigation by the government. This suggestion was left with the President, but before leaving the committee pointed out to him that if the reports that the date for declaring the strike had been fixed for September 4, were true, it would force an early conclusion of the negotiations and compel the presidents to return to their properties to prepare for the issue. This was the first news President Wilson had that a strike had been called.

After another conference with the Democratic steering committee at the Capitol the President called the brotherhood leaders to the White House and asked them about the strike call. They acknowledged that the order had been issued for September 4, and declined his request that it be rescinded, saying that it was beyond recall.

Railroads Make Counter-Proposal

Meanwhile the railroad officers made preparations for leaving the city and for meeting a strike. The fact that the brotherhoods had refused to recall the order was conveyed to the executives during the evening by the President's secretary and the executives and managers held a long meeting, to consider the entire situation. On Tuesday morning the sub-committee of eight again went to the White House and were advised that the brotherhoods had declined to accept the proposal made the day before for the enactment of a law requiring an investigaiton before a strike could be called. The railroad executives then submitted their formal proposal which they had expected to present on Saturday, providing for an account to be kept of the wages that would accrue to the men under both the eight-hour and the ten-hour bases, and for investigation of the entire subject by a commission. Soon after leaving the President they were informed that the brotherhoods had also rejected this plan whereupon the railway executives gave out a lengthy statement to the public of their convictions and of their plans submitted to the President for a peaceful settlement, including a summary by Chairman Holden, of the statement made to President Wil-

son at Monday's conference. This summary was as follows:

"We have been giving most earnest and respectful consideration to the suggestions of the President as to a means of avoiding the national catastrophe of the present strike. While our own minds are clear as to the facts and as to the consequences of granting the demands of the men, either as a whole or in substantial part, our statements have not been acquiesced in and our conclusions have been questioned.

"In addition, we have been met by a strong and insistent protest from shippers against any further effort to put on them in the shape of increased rates the financial burdens of an adjustment. Under these circumstances, it seems to us wise that there should be an investigation by some governmental authority—by a commission appointed by the President, by Congress itself or by any other means deemed appropriate by the President—of all the facts in the case, at which investigations the three parties in interest—the employees, the railroads and the public—shall be heard, and the facts reported without recommendation.

"When the facts are thus ascertained and beyond dispute, the railroads will be in a position to make prompt answer to the suggestions of the President and then answer can be measured by the ascertained facts. Meanwhile, it seems clear that the situation should remain unchanged and the disaster to the public interests, incident to an attempted interruption of commerce, should not be permitted by either party or by the government, it being understood that the interests of no party to the controversy shall be prejudiced by the delay.

"We suggest the enactment by Congress at once of a law within the policy of the Canadian Industrial Disputes Investigation Act, which in itself will furnish a guarantee against hasty action now and against the recurrence of such an unfortunate situation in the future. We call attention to the fact that the principles of the proposed act do not involve an impairment of the freedom of action of either party after the facts have been reported."

To this was added a statement of the formal proposition which had been made by the railroads, with their reasons therefor, as follows:

The Railroads' Final Proposal

"We are unable after the most earnest consideration to agree with the proposal of the President of the United States, which is that we accept without arbitration 'the substitution of an eight-hour day for the present ten-hour day in all of the existing practices and agreements.' This is the main point in controversy and we cannot surrender it without an opportunity to be heard in some form of fair arbitration.

"We do not assent to the statement that 'the eight-hour day now undoubtedly has the sanction of the judgment of society in its favor.' We believe that society has not yet recorded its judgment upon this subject.

"We are not in this controversy, however, dealing with the conditions relating to the eight-hour day in the industrial world. The difference between the eight-hour day in business and manufacturing interests and in the railroad train service day has been fully explained. The railroad day is a basis for computing pay and overtime, the length of daily service being controlled by variable conditions.

"The demands involved in this controversy have not been presented, in our judgment, for the purpose of fixing a definite daily period of labor nor a reduction in the existing hours of labor or change in methods of operation, but for the real purpose of accomplishing an increase in wages of approximately one hundred million dollars per annum, or 35 per cent, for the men in railroad freight train and yard service represented by the labor organizations in this matter.

"After careful examination of the facts and patient and continuous consultation with the Conference Committee of Managers and among ourselves, we have reached a clear understanding of the magnitude of the questions and of the serious consequences to the railroads and to the public involved in a decision of them.

"As trustees for the public served by our lines and for the great mass of the less powerful employees (not less than 80 per cent of the whole number) interested in the railroad wage fund—as trustees also for the millions of people that have invested their savings and capital in the bonds and stocks of these properties and who through the savings banks, trust companies and insurance companies are vitally interested to the extent of millions of dollars, in the integrity and solvency of the railroads of the country, we cannot in conscience surrender without a hearing, the principle involved nor undertake to transfer the enormous cost that will result to the transportation of the commerce of the country. The eight-hour day without punitive overtime involves an annual increase approximating in the aggregate sixty millions of dollars, and an increase of more than 20 per cent in the pay of the men, already the most highly paid in the transportation service. The ultimate cost to the railroads of an admission in this manner of the principle under contention cannot now be estimated; the effect upon the efficiency of the transportation of the country now already under severe test under the tide of business now moving, and at a time when more instead of less effort is required for the public welfare, would be harmful beyond calculation. The widespread effect upon the industries of the country as a whole is beyond measure or appraisement at this time, and we agree with the insistent and widespread public concern over the gravity of the situation and the consequences of a surrender by the railroads in this emergency.

"In like manner we are deeply impressed with the sense of our responsibility to maintain and keep open the arteries of transportation, which carry the life blood of the commerce of the country, and of the consequences that will flow from even a temporary interruption of service over the railroads, but the issues presented have been raised above and beyond the social and monetary questions involved, and the responsibility for the consequences that may arise will rest upon those that provoke it.

"The questions involved are, in our respectful judgment, eminently suitable for the calm investigation and decision by the public through the agency of fair arbitration, and cannot be disposed of, to the public satisfaction, in any other manner. The decision of a commission or board of arbitration, having the public confidence, will be accepted by the public and the social and financial rearrangements made necessary thereby will be undertaken by the public but in no less deliberate nor orderly manner.

"The railroads of the country cannot under present conditions assume this enormous increase in their expenses. If imposed upon them, it would involve many in early financial embarrassment and bankruptcy and imperil the power of all to maintain their credit and the integrity of their securities. The immediate increase in cost, followed by other increases that would be inevitable, would substantially appropriate the present purchasing power of the railroads and disable them from extending and improving their facilities and equipment, to keep abreast of the demands of the country for efficient transportation service.

"For these reasons we are with deep regret unable to accept the suggestion made by the President of the United States.

"We propose, however, as a basis of settlement, the following:

"(a) The railroads will, effective September 1, 1916, keep the time of all men represented in this movement, upon an eight-hour basis and by separate account, monthly, with each man, maintain a record of the difference between the money actually earned by him on the present basis and the amount that would have been earned upon an eight-hour basis—overtime on each basis to be computed pro rata.

"The amounts so shown will be subject to the decision of the commission provided for in Paragraph (c) of this memorandum and payable in money as may be directed by said commission in its findings and decision.

"(b) The Interstate Commerce Commission to supervise the keeping of these accounts and report the increased cost of the eight-hour basis, after such period of actual experience as their judgment approves or the President may fix, not, however, less than three months.

"(c) In view of the far-reaching consequences of the declaration made by the President, accepting the eight-hour day, not only upon the railroads and the classes of labor involved directly in this controversy, but to the public and upon all industry, it seems plain that before the existing conditions are changed, the whole subject insofar as it affects the railroads and their employees, should be investigated and determined by a commission to be appointed by the President, of such standing as to compel attention and respect to its findings. The judgment of such a commission would be a helpful basis for adjustments with labor and such legislation as intelligent public opinion, so informed, might demand.

"The railroads will accept the findings of such a commission upon the issue of an eight-hour basis of pay as compared with the present basis, as well as upon any other matters now in controversy that may be submitted to it by either party.

"The commission should consist of not less than five members and should also be authorized to hear and determine all questions that may arise in the application of the findings of said commission or in the working out of such plan as it may propose.

"The presidents of the railroads are prepared to continue negotiations on the subject with genuine anxiety, within the limits of their conviction above expressed, to find a solution of the situation."

This statement was signed by 51 chairmen, presidents and vice-presidents.

Final Statement of Railway Executives

After having made their final proposal the railway executives prepared to leave the city and before evening most of them had gone. Before their departure they authorized the following statement of their position:

"The situation created through the issuance of the strike order by the brotherhoods makes it necessary that the railroad executives return to their homes to protect their properties in the emergency impending; as a consequence they are planning for an early departure.

"In leaving Washington they are unanimous in their expression of satisfaction with the results of their conference so far as the position of the railroads is concerned. Briefly summarized the important points developed by their deliberations here are :

"1. A renewed insistence upon the principle of arbitration as the only proper method of settling labor disputes. The railroads have given the employees every possible consideration in this respect, by offering to arbitrate their differences either through the Interstate Commerce Commission, under the Newlands Act, or by a commission to be selected by the President of the United States.

"2. An increased realization of the responsibility of the railroads toward their other employees, the shippers, the industrial, commercial and general public, which they have been made to feel by thousands of telegrams insisting upon the maintenance of their position.

"The railroad executives came to Washington upon the invitation of President Wilson, and in good faith have worked continuously and earnestly in a sincere effort to solve the problem in justice to all the parties at interest. These efforts were still in progress when the issuance of the strike order showed them to be unavailing. Responsibility for the threatened strike does not rest with the executives.

"The counter proposition made at the request of the Presi-

dent last week and presented to him formally today represents the unanimous sentiment of the railroads, and is the utmost concession to the demands of the men in the interest of peace which they feel able to make.

"Any other course would involve the surrender of a vital principle and impose undue burdens upon industry and commerce, impair railroad credit and prevent railroad progress to meet the rapidly increasing commercial demands of the country.

"The strike, if it comes, will be forced upon the country by the best paid class of laborers in the world, at a time when the country has the greatest need for transportation efficiency. The problem presented is not alone that of the railroad or business world, but one involving democracy itself, and sharply presents the question whether any group of citizens should be allowed to possess the power to imperil the life of the country by conspiring to block the arteries of commerce."

A Brotherhood Statement

The executives of the four brotherhoods, W. S. Stone, A. B. Garretson, W. S. Carter and W. G. Lee also issued a statement explaining their oppositon to any legislation for a law similar to the Canadian act. They said:

"Since the abolition of slavery no more effectual means has been devised for insuring the bondage of the workingmen than the passage of compulsory investigation acts of the character of the Canadian industrial disputes act. The writers speak from their personal experience thereunder, as these organizations are all international in their jurisdiction. To cite an actual occurrence:

"In 1910 the men upon 80 railways in the eastern territory presented to the railway companies of that territory a demand for increase in wages. The companies refused to deal concertedly with the proposition, and it was therefore taken up with the individual roads. Three of the properties were Canadian, and two days after negotiation was opened, January 7, on the first road in the United States negotiations opened on the three Canadian properties. The negotiations in the United States included federal mediation in the first instance and arbitration in the third case.

"On the 19th day of July following, settlement was made on the last of the 77 American lines involved. On the same date, at 6 p. m., a strike took place on the Grand Trunk Railway, one of the Canadian railways, settlement not having yet been effected on any one of the three, this growing out of the delays which the employers were able to interpose under the industrial disputes act.

"Moreover, the period of investigation is eternally utilized by the employer to entrench himself in his effort to defeat the demands of the men, no matter how just their cause may be, and in a majority of instances where a verdict by an investigating commission has been favorable to the men it has been repudiated by the employer. In consequence of this attitude, disregard for and the ignoring of the provisions of that law has led to placing thousands of men in the attitude of lawbreakers, and the passage of laws which induce men to open violation thereof is a deadly injury to a nation because it breeds universal contempt for law.

"In the present strife, if such an act were passed, all that would be necessary would be for the power of attorney to be withdrawn from the national conference committee of managers by the individual roads to be created, or, if only a limited number were provided for, men would be compelled to remain for years in involuntary servitude if they obeyed the provisions of such a law."

The affairs of the railways in Washington, with reference to the strike situation, were left in the hands of the Railway Executives' Advisory Committee, of which Frank Trumbull, chairman of the Chesapeake & Ohio and of the Missouri, Kansas & Texas, is chairman, and of the National Conference Committee of the Railways, of which Elisha Lee, assistant general manager of the Pennsylvania Railroad, is chairman. Most of the members of these committees had left Washington by Wednesday night.

President Wilson's address to Congress on the strike situation follows in full:

PRESIDENT WILSON'S ADDRESS TO CONGRESS

I have come to you to seek your assistance in dealing with a very grave situation which has arisen out of the demand of the employees of the railroads engaged in freight-train service that they be granted an eight-hour working day, safeguarded by payment for an hour and a half of service for every hour of work beyond the eight.

The matter has been agitated for more than a year. The public has been made familiar with the demands of the men and the arguments urged in favor of them, and even more familiar with the objections of the railroads and their counter-demand that certain privileges now enjoyed by their men and certain bases of payment worked out through many years of contest be reconsidered, especially in their relation to the adoption of an eight-hour day. The matter came some three weeks ago to a final issue and resulted in a complete deadlock between the parties. The means provided by law for the mediation of the controversy failed and the means of arbitration for which the law provides were rejected. The representatives of the railway executives proposed that the demands of the men be submitted in their entirety to arbitration, along with certain questions of readjustment as to pay and conditions of employment which seemed to them to be either closely associated with the demands or to call for reconsideration on their own merits; the men absoutely declined arbitration, especially if any of their established privileges were by that means to be drawn again in question. The law in the matter put no compulsion upon them. The four hundred thousand men from whom the demands proceeded had voted to strike if their demands were refused; the strike was imminent; it has since been set for the fourth of September next. It affects the men who man the freight trains on practically every railway in the country. The freight service throughout the United States must stand still until their places are filled, if, indeed, it should prove possible to fill them at all. Cities will be cut off from their food supplies, the whole commerce of the nation will be paralyzed, men of every sort and occupation will be thrown out of employment, countless thousands will in all likelihood be brought, it may be, to the very point of starvation, and a tragical national calamity brought on, to be added to the other distresses of the time, because no basis of accommodation or settlement has been found.

Just so soon as it became evident that mediation under the existing law had failed and that arbitration had been rendered impossible by the attitude of the men, I considered it my duty to confer with the representatives of both the railways and the brotherhoods, and myself offer mediation, not as an arbitrator, but merely as spokesman of the nation, in the interest of justice, indeed, and as a friend of both parties, but not as judge, only as the representative of one hundred millions of men, women, and children who would pay the price, the incalculable price, of loss and suffering should these few men insist upon approaching and concluding the matters in controversy between them merely as employers and employees, rather than as patriotic citizens of the United States looking before and after and accepting the larger responsibility which the public would put upon them.

It seemed to me, in considering the subject-matter of the controversy, that the whole spirit of the time and the preponderant evidence of recent economic experience spoke for the eight-hour day. It has been adjudged by the thought and experience of recent years a thing upon which society is justified in insisting as in the interest of health, efficiency, contentment, and a general increase of economic vigor. The whole presumption of modern experience would, it seemed

to me, be in its favor, whether there was arbitration or not, and the debatable points to settle were those which arose out of the acceptance of the eight-hour day rather than those which affected its establishment. I, therefore, proposed that the eight-hour day be adopted by the railway managements and put into practice for the present as a substitute for the existing ten-hour basis of pay and service; that I should appoint, with the permission of the Congress, a small commission to observe the results of the change, carefully studying the figures of the altered operating costs, not only, but also the conditons of labor under which the men worked and the operation of their existing agreements with the railroads, with instructions to report the facts as they found them to the Congress at the earliest possible day, but without recommendation; and that, after the facts had been thus disclosed, an adjustment should in some orderly manner be sought of all the matters now left unadjusted between the railroad managers and the men.

These proposals were exactly in line, it is interesting to note, with the positon taken by the Supreme Court of the United States when appealed to to protect certain litigants from the financial losses which they confidently expected if they should submit to the regulation of their charges and of their methods of service by public legislation. The court has held that it would not undertake to form a judgment upon forecasts, but could base its action only upon actual experience; that it must be supplied with facts, not with calculations and opinions, however scientifically attempted. To undertake to arbitrate the question of the adoption of an eight-hour day in the light of results merely estimated and predicted would be to undertake an enterprise of conjecture. No wise man could undertake it, or, if he did undertake it, could feel assured of his conclusions.

I unhesitatingly offered the friendly services of the administration to the railway managers to see to it that justice was done the railroads in the outcome. I felt warranted in assuring them that no obstacle of law would be suffered to stand in the way of their increasing their revenues to meet the expenses resulting from the change so far as the development of their business and of their administrative efficiency did not prove adequate to meet them. The public and the representatives of the public, I felt justified in assuring them, were disposed to nothing but justice in such cases and were willing to serve those who served them.

The representatives of the brotherhoods accepted the plan; but the representatives of the railroads declined to accept it. In the face of what I cannot but regard as the practical certainty that they will be ultimately obliged to accept the eight-hour day by the concerted action of organized labor, backed by the favorable judgment of society, the representatives of the railway management have felt justified in declining a peaceful settlement which would engage all the forces of justice, public and private, on their side to take care of the event. They fear the hostile influence of shippers, who would be opposed to an increase of freight rates (for which, however, of course, the public itself would pay); they apparently feel no confidence that the Interstate Commerce Commission could withstand the objections that would be made. They do not care to rely upon the friendly assurances of the Congress or the President. They have thought it best that they should be forced to yield, if they must yield, not by counsel, but by the suffering of the country. While my conferences with them were in progress, and when to all outward appearance those conferences had come to a standstill, the representatives of the brotherhoods suddenly acted and set the strike for the fourth of September.

The railway managers based their decision to reject my counsel in this matter upon their conviction that they must at any cost to themselves or to the country stand firm for the principle of arbitration which the men had rejected. I based my counsel upon the indisputable fact that there was no means of obtaining arbitration. The law supplied none; earnest efforts at mediation had failed to influence the men in the least. To stand firm for the principle of arbitration and yet not get arbitration seemed to me futile, and something more than futile, because it involved incalculable distress to the country and consequences in some respects worse than those of war, and that in the midst of peace.

I yield to no man in firm adherence, alike of conviction and of purpose, to the principle of arbitration in industrial disputes; but matters have come to a sudden crisis in this particular dispute and the country had been caught unprovided with any practicable means of enforcing that conviction in practice (by whose fault we will not now stop to inquire). A situation had to be met whose elements and fixed conditions were indisputable. The practical and patriotic course to pursue, as it seemed to me, was to secure immediate peace by conceding the one thing in the demands of the men which society itself and any arbitrators who represented public sentiment were most likely to approve, and immediately lay the foundations for securing arbitration with regard to everything else involved. The event has confirmed that judgment.

I was seeking to compose the present in order to safeguard the future; for I wished an atmosphere of peace and friendly co-operation in which to take counsel with the representatives of the nation with regard to the best means for providing, so far as it might prove possible to provide, against the recurrence of such unhappy situations in the future—the best and most practicable means of securing calm and fair arbitration of all industrial disputes in the days to come. This is assuredly the best way of vindicating a principle, namely, having failed to make certain of its observance in the present, to make certain of its observance in the future.

But I could only propose. I could not govern the will of others who took an entirely different view of the circumstances of the case, who even refused to admit the circumstances to be what they have turned out to be.

Having failed to bring the parties to this critical controversy to an accommodation, therefore I turn to you, deeming it clearly our duty as public servants to leave nothing undone that we can do to safeguard the life and interests of the nation. In the spirit of such a purpose, I earnestly recommend the following legislation:

Legislation Proposed

First, immediate provision for the enlargement and administrative reorganization of the Interstate Commerce Commission along the lines embodied in the bill recently passed by the House of Representatives and now awaiting action by the Senate; in order that the Commission may be enabled to deal with the many great and various duties now devolving upon it with a promptness and thoroughness which are with its present constitution and means of action practically impossible.

Second, the establishment of an eight-hour day as the legal basis alike of work and of wages in the employment of all railway employees who are actually engaged in the work of operating trains in interstate transportation.

Third, the authorization of the appointment by the President of a small body of men to observe the actual results in experience of the adoption of the eight-hour day in railway transportation alike for the men and for the railroads; its effects in the matter of operating costs, in the application of the existing practices and agreements to the new conditions, and in all other practical aspects, with the provision that the investigators shall report their conclusions to the Congress at the earliest possible date, but without recommendation as to legislative action; in order that the public may learn from an unprejudiced source just what actual developments have ensued.

Fourth, explicit approval by the Congress of the consideration by the Interstate Commerce Commission of an increase of freight rates to meet such additional expenditures by the railroads as may have been rendered necessary by the adoption of the eight-hour day and which have not been offset by administrative readjustments and economies, should the facts disclosed justify the increase.

Fifth, an amendment of the existing federal statute which provides for the mediation, conciliation, and arbitration of such controversies as the present by adding to it a provision that in case the methods of accommodation now provided for should fail, a full public investigation of the merits of every such dispute shall be instituted and completed before a strike or lockout may lawfully be attempted.

And, sixth, the lodgment in the hands of the Executive of the power, in case of military necessity, to take control of such portions and such rolling stock of the railways of the country as may be required for military use and to operate them for military purposes, with authority to draft into the military service of the United States such train crews and administrative officials as the circumstances require for their safe and efficient use.

This last suggestion I make because we cannot in any circumstances suffer the nation to be hampered in the essential matter of national defense. At the present moment circumstances render this duty particularly obvious. Almost the entire military force of the nation is stationed upon the Mexican border to guard our territory against hostile raids. It must be supplied, and steadily supplied, with whatever it needs for its maintenance and efficiency. If it should be necessary for purposes of national defense to transfer any portion of it upon short notice to some other part of the country, for reasons now unforeseen, ample means of transportation must be available, and available without delay. The power conferred in this matter should be carefully and explicitly limited to cases of military necessity, but in all such cases it should be clear and ample.

There is one other thing we should do if we are true champions of arbitration. We should make all arbitral awards judgments by record of a court of law in order that their interpretation and enforcement may lie, not with one of the parties to the arbitration, but with an impartial and authoritative tribunal.

These things I urge upon you, not in haste or merely as a means of meeting a present emergency, but as permanent and necessary additions to the law of the land, suggested indeed, by circumstances we had hoped never to see, but imperative as well as just, if such emergencies are to be prevented in the future. I feel that no extended argument is needed to commend them to your favorable consideration. They demonstrate themselves. The time and the occasion only give emphasis to their importance. We need them now and we shall continue to need them.

STRIKE INSTRUCTIONS

The instructions for the strike, sent to all members and officers of the four brotherhoods, order that no man in road service involved in the strike shall perform any service after the hour set, unless he has already begun a trip and actually left the terminal, in which case he is to complete the trip. Men in other than road service are to leave the service at the appointed time. All men on strike are ordered to keep away from the company's property except those "assigned to certain duties by order of the organization." Local representatives are directed to arrange for halls for meetings to be held twice a day for the election of officers for a joint organization of the four brotherhoods and for roll calls twice a day.

Among the other instructions are the following:

"So far as your legal right to strike is concerned, there is no difference between a mail train and a freight train. You have identically the same right to refuse to perform service on a mail train as you have to refuse to perform service on a freight train.

"Every man should understand that the laws of the land must be obeyed. Acts of violence of any nature will not be tolerated by the organizations."

The grand officers of the four organizations are to be assigned to certain districts and will have general supervision over the strike in those districts. The general chairman will be responsible for the conduct of the strike on their railroads while the local chairmen will have jurisdiction over divisions.

Officers of many roads in various parts of the country have announced their intention of attempting to run trains in spite of the strike and many have said that they will have a very considerable number of men at work. Plans for the operation of service during the strike have been worked out in detail by individual roads, many of whom have been preparing for a long time in advance. It has been planned to give special attention to milk trains and trains carrying other food products.

The National Conference Committee has made some general suggestions to the various roads, such as that they prepare against a possible congestion of their yards and lines by turning over as much freight as possible to connecting lines in advance and making every effort to clear up all accumulations of freight, but in general the conduct of the strike will be left to the managements of the roads themselves. Some roads have already declared partial embargoes.

VIEWS OF RAILWAY EXECUTIVES

While the negotiations between President Wilson and the railway officers and brotherhood representatives regarding the proposed strike of the train employees have been pending at Washington, both sides have issued numerous statements to the public explaining various phases of the controversy. Some extracts from statements made by railway executives are as follows:

Samuel Rea

Samuel Rea, president of the Pennsylvania Railroad, said in part:

"For the managements of the railways to yield to the demands and threats of the labor organizations, and to accept President Wilson's proposal, would be to destroy at one blow the principle of arbitration as the paramount and recognized method of settling labor disputes. What would be gained by this tremendous sacrifice of sound principle which involves the rights and interests of the railways, of the great majority of their employees not embraced in the present controversy, and of the American people? The threatened strike would be postponed, it is true, but we would have no assurance that it would be permanently prevented. Except that the principle of an eight-hour pay day would be conceded, the issues of the very controversy now pending would be left unsettled, while the future of the railways would indeed be rendered dark and uncertain.

"These, in brief, are the reasons why the heads of the railways, with a full appreciation of the solemn and weighty responsibility resting on them, as well as of their duty to the public and to their shareholders, have been forced to the conclusion that it is better to face the alternative of a strike than to surrender.

"The great labor movements culminating in the present one began a decade ago, almost simultaneously with the adoption of effective regulation. From that time the managements have been engaged in a desperate struggle to prevent and completely stop their development. After the first large increase in wages was made, appeal was made to the Interstate Commerce Commission for advances in rates, which the commission in 1911 denied. Even in the face of this, railway managers were undaunted and in good faith applied all their

energy and ability to increasing efficiency. Never in the history of any industry was more hard, conscientious, able and successful work done to increase efficiency than has been done on the railways of this country during the last ten years.

"What has been the result? The labor movement has continued, and one arbitration board after another has awarded advances in wages. In spite of increased efficiency the companies could not stand the strain, and in 1914 again appealed to the Interstate Commerce Commission. This time the Commission decided that their earnings were not adequate, and granted some advances in rates, but before this relief was accorded there were more miles of railway in the hands of receivers than ever before, and new construction had reached the lowest ebb since the civil war.

"This period of profound depression has been followed by a year of comparative prosperity in the railway business, due almost entirely to an abnormal increase in traffic which it is recognized cannot be permanent. And now, after this brief period of prosperity, it is proposed that the roads shall make sacrifice of principles and grant wages which would cause an increase in expenses that would wipe out all of the advances in rates that have been granted and sweep away the economies that have been achieved by the exertion of ten years.

"The railways know that if they yield to the present demands of a comparatively small percentage of the total numbers of their employees they will receive like demands from the rest, and that these concessions to all employees will cost at least $200,000,000 and probably $300,000,000 a year. They know, too, that if they submit now to the proposition made to them by the President they will be denounced by the business interests of the country for having given up the principle of arbitration when every factor in the dispute points to the justice of their cause.

"Confronted by such conditions, and borne down by a solemn sense of their responsibility to their employees, to business interests of all kinds, to the one hundred million people of the United States, and to their stockholders, what could the heads of the railways do but refuse to yield, and then calmly but resolutely face the possibilities of the situation in full confidence that their action will receive the unqualified endorsement and support of the business interests of the country and the public at large, who have as yet been denied all opportunity to be heard."

L. F. Loree

L. F. Loree, president of the Delaware & Hudson, gave out an interview in which he said:

"President Wilson has laid great stress on the condition in which the country was likely to find itself at the end of the European war; that we would then be exposed to the sharpest competition known in the history of the country; and that everything ought to be done that could possibly be done to prepare ourselves for this industrial conflict. As a means of doing so, he has urged that we come to an accommodation with the trainmen, whose demand for an increase of 35 per cent in their wages has been refused by the National Conference Committee of Managers by the acceptance of his suggestion of a modus vivendi carrying with it an increase of 20 per cent in wages. Owing to the incidence of the two plans, the amount of the additional expense would be in the first case $100,000,000 and in the second case $50,000,000 and whether borne directly by the railroads or passed on as he suggested to the producers must add to the cost of production.

"The end of the European war will mean the end also of our extraordinary exports and the return to normal. It will mean keen competition in those foreign markets which we now hold. To hold even normal exports we must be prepared to meet prices lower than we have ever had to compete against. To do so we must reduce our cost of production to a minimum. Are we going to prepare for competition by further increasing wages and substantially increasing the cost of production?

"Are we preparing to hold our home markets when the war is over and imports increase? Germany and Austria are today selling no goods in our market. Will they not make a tremendous effort to regain their old position when peace is declared. It is obvious that they will. It is also obvious that the other nations now at war with them will fight for the American market. If the present tariff is maintained, what is going to be the effect on our manufacturers? Can they hold even their own markets with the present abnormal cost of production in this country?

"During the fiscal year ended June 30, 1916, with the war in Europe at its height, imports into the United States amounted to $2,197,883,510. During the fiscal year 1913, the last year of the Payne tariff law, imports were $1,813,008,234. Thus the imports in 1916 were $384,875,276 greater than in 1913, and during 1916 Europe was ablaze with war, shipping was limited and two of the greatest competitors in our home market were doing nothing. How much will imports increase during the twelve months succeeding the declaration of peace? What must we do to meet this competition? Assuming a continuance of the present tariff it is plain that we must reduce sharply our cost of production.

"Is this the time, therefore, to take a step which will sharply increase the cost of production? Is an increase of 21 per cent in railroad wages without increased efficiency or increased productivity a step in the direction of that preparedness which the President is seeking?

"The evil effects of conceding an increase in wages of 21 per cent is not fully measured by the injury to the roads or to the manufacturers by the increased cost of operation or production thus imposed. It will inspire industrial unrest and demands for similar concessions throughout all industry.

"According to the census there are at present about 30,000,000 workers in the United States, including all over the age of ten. Figures submitted by the secretary of the American Federation of labor shows that in 1912 there were about 1,847,000 persons working under an eight-hour basis in the United States, and of this number 475,000 were either federal, state, county or municipal employees. Therefore, at that time there were less than 1,400,000 of the general workers of the country operating on an eight-hour basis and about 28,000,000 whose hours ranged from nine to twelve. Is it difficult to figure the loss in productive energy of this country if these 28,000,000 workers were put on an eight-hour basis? The increase in production cost would paralyze our competitive power. But this is the possibility raised by the President's demand that the railroads shall ignore the cost and grant a 21 per cent increase in wages to their highest paid employees, on the theory that the eight-hour day is a social concept. I have not dwelt on the fact that the men want an eight-hour day merely to compel the payment of overtime. The public understands that by this time.

"There is the additional problem of revenue. I have quoted the figures showing that in 1916 there was an increase in imports of $384,875,276 over 1913. But comparing customs receipts we find that there was a decrease in 1916 from 1913 of $107,025,173. This decrease was in part made up by $83,000,000 collected under the war tax. On the conclusion of peace this war tax is to be repealed. It is said that it will be made up from increased customs receipts. The increase would have to be approximately 40 per cent. Total imports in 1916 were almost $2,200,000,000. An increase of 40 per cent would mean additional imports of $880,000,000. Do not these figures suggest competition and the necessity of preparedness, particularly of industrial preparedness?"

HOWARD ELLIOTT

President Howard Elliott of the New York, New Haven & Hartford, said:

"Personally, as well as officially, I have believed and I still believe that a question of such great importance as the eight-hour one should be settled only after all its aspects have been carefully considered by a tribunal free from predjudice and partisanship. The 100,000,000 of our people can have, of course, the kind of laws, working hours, and railroads they desire; also, if they want growing and efficient railroads, and believe they can have them on the basis of an eight-hour day they must be willing to pay the bills. The danger is that the people will not be willing to continuously pay higher rates for transportation and in that event the development of the railroad systems of our country will be checked. With a decline in our railroad development all other industrial as well as agricultural growth will be checked. To my mind the true patriotic policy for the welfare of the whole country at this time is for every man to do all he can to advance its growth rather than to check it and to reduce its output. We are far behind other countries in many ways and we have a great task before us in the next ten years to keep our proper place in the world. I hope, therefore, very much that in the interest of all our 100,000,000 people some solution of the present situation may be found, rather than it should be settled off-hand and solely in the interest of the 400,000 who are now pressing their demands."

E. P. RIPLEY

"There would be no trouble about granting the train service employees an eight-hour day of eight hours," said E. P. Ripley, president of the Atchison, Topeka & Sante Fe. "A good many people have given support to the brotherhood leaders in the belief that the latter are fighting to establish the principle of the eight-hour day. Speaking for myself only, I do not hesitate to say that if the brotherhoods would indicate that they are willing to work eight hours for a day's pay, this controversy could be settled in twenty minutes. What the brotherhood leaders have said to the public is not in tune with the demands they made of the managers' committee. They tried to give the public to understand that they were endeavoring to establish an eight-hour work-day. Of the managers' committee they demanded pay for eight hours for work done in less than that time—seven, six, five and as short a period as three hours, with time and a half for service performed after eight hours. The brass tacks of the situation is this: Let the men declare for an eight-hour day of eight hours work, and I will take off my hat and coat and put in my best licks for their cause."

JULIUS KRUTTSCHNITT

Julius Kruttschnitt, chairman Southern Pacific, said in part: "The President's proposition that the railways grant the eight-hour day demanded by the employees and that their demand for time and a half for overtime and other questions be submitted to arbitration, reminds us of the settlement proposed by a common friend to two men who quarrelled about the ownership of a terrier, that the dog be turned over by the recognized owner to the claimant, who stubbornly refused arbitration, and that the claimant's title to the tail be made the subject of future arbitration.

"The railways believe that the eight-hour day as understood by the employees is extremely unfair to the carriers. They believe its adoption would unduly favor a class who are now the highest paid workingmen in America, and place an unreasonable burden on the railways, and an unreasonable burden of increased rates on the public, which ultimately would have to pay the bill. There can be no social or economic justification for fixing a basis of wages which would enable men in train service to earn a day's wage for an average of much less than eight hours' work. The railway employees know, the railway managers know, and the public ought to know that train employees are asking for an enormous increase in wages in return for a counterfeit eight-hour day."

FAIRFAX HARRISON

Fairfax Harrison, president of the Southern Railway, said today: "I gave my individual adherence to the unanimous determination of the railway presidents recently in conference in Washington only after taking the advice of many representative men in various walks of life in all parts of the South, and with all other manifestations of public opinion of the South constantly in view. I include in this my knowledge that the employees of the Southern Railway who are involved, and who still have my respect and whose welfare is of the utmost personal concern to me, have not had reason to be, and in fact have not been, discontented as a class. I did not take action hastily or with prejudice, but after my own best and most deliberate judgment and with full consciousness of my responsibility. The easiest course would have been to have accepted the proposals made to the railways; to have waived the principle of arbitration and to have imposed a heavy, new, and, in my opinion, unnecessary burden on southern commerce, with the inevitable consequence of postponement of the full development of the railways for the largest service of the whole people of the South. There are some who believe that immediate and temporary peace at such a price is desirable. I am not one of them, though God knows I am for peace, and have no illusions as to what industrial war means when threatened on the scale of the present crisis. In my judgment the time has come to test again whether the American people are to be governed by unregulated force or by law. I risk my own reputation on that issue, and I count on the support of all sound and conservative opinion in the South to counsel patience and endurance of temporary inconvenience while the test is being made. The decison must lie with deliberate and advised public opinion crystallized in law. Whatever it may be when so declared, I will, of course, abide by it."

THE SITUATION IN WASHINGTON

President Wilson held conferences Tuesday evening with the leaders in Congress of both parties. Wednesday the Senate Committee on Interstate Commerce held a meeting to consider the legislation proposed by the President and adopted a resolution providing for a hearing Thursday at which the brotherhoods, railway officers and shipping and other public interests would each be given three hours.

Tentative drafts of proposed bills were laid before the committee. One bill provides that beginning on a date to be fixed eight hours shall be deemed standard for a day's work for purpose of reckoning compensation; also for the creation of a commission to be appointed by the President, one member of which shall be recommended by railways and another by the employees to study the working of the eight-hour day in effect and report to President and Congress. The report to be transmitted to the Interstate Commerce Commission, which shall accept the findings of the wage commission unless clearly erroneous and reach a decison as to what extent the change in the standard work day necessitates an increase in freight rates. Pending these investigations the compensation of the employees shall not be reduced below the standard day's wage at present and for all overtime pro rata rates shall be paid. The wage commission also to report whether in its opinion power to fix wages of railway train employees ought to be vested in some public body. The penalty for violation of the section prohibiting the reduction of wages to be $100 to $1,000. Another bill proposes an amendment to the present mediation arbitration law to provide for compulsory investigation in advance of a strike and provides a penalty for strike or lockout pending investigation. The third bill empowers the President to take over the operation of the roads when in his judgment it is necessary for military purposes.

Senator Blair Lee of Maryland on Wednesday introduced the following resolution, which was referred to the Senate Interstate Commerce Committee:

Resolved, That in order to afford sufficient time for the intelligent consideration of the legislation in the President's message to Congress on August 29, the Senate of the United States hereby requests the representatives of the railroad employees who have fixed September 4 for the commencement of a general strike, to postpone the date for the beginning of such strike for one week, and that a copy of this resolution be immediately forwarded by the Secretary of the Senate to the said representatives having the matter of a strike in their charge.

Senator Lewis introduced a resolution Wednesday providing for a reorganization of the Interstate Commerce Commission and authorizing the railroads to apply to the commission for rate increases to meet the cost of increases in wages.

House leader Kitchin and Chairman Adamson of House committee interstate commerce have made plans for legislation in the House.

R. T. Frazier Jr., who has secured 105,000 signatures to the petition to the President on behalf of the unorganized employees asking him to avert a strike, has written a letter protesting because only the train employees are included in the proposed eight-hour law.

While railroads were striving to prepare for the strike, manufacturers of the Middle West gathered in Chicago in an eleventh hour attempt to find means of averting it. At a conference called by the Illinois Manufacturers' Association and attended by representatives of similar associations from many states, resolutions were introduced urging that President Wilson insist on the principle of arbitration. A committee of fourteen has gone to Washington to present the resolution to President Wilson.

PREPARATIONS FOR THE STRIKE

As soon as it became evident that a strike was imminent the railways, as well as the public, hurried to make final preparations for it. Passenger traffic is usually exceedingly heavy at this season because of returning vacationists. Indications were that it would be much lighter in the east this year because of the infantile paralysis epidemic and the delayed school openings. To offset this, however, business houses are ordering their representatives home and the railways generally have warned travelers that they will be liable to more or less inconvenience and delay after 7 a. m. next Monday morning.

Thirty presidents of roads centering in Chicago gave out the following statement Wednesday:

"To the Public: In view of the announcement of certain employees of this company to engage in a strike, to become effective at 7 a. m. Monday, September 4, agents are hereby instructed:

"First, to notify intending travelers that the company will not be responsible for any delays that may occur after the time above mentioned.

"Second, to notify all shippers that perishable freight only will be received, and that subject to delay, and all bills of lading will be endorsed accordingly.

"Third, it will be the purpose of the company, so far as it may be in its power to do so, to provide transportation necessary for the health and subsistence of the communities dependent upon it.

"Fourth, to move at least one train each way daily for the transportation of passengers, mail and express.

"Fifth, to gradually expand these activities, so far as may be practicable.

"Agents have been advised to notify all parties interested in accordance with the foregoing programme and will notify officers of municipalities that the ability to carry out our present intentions will be largely dependent on their willingness and ability to afford protection to the company and its property in so doing."

Freight Embargoes

As early as Tuesday the New Haven gave notice of an embargo on freight which could not be delivered at destination at such a time on September 3 as to permit placing before the 4th. An exception was made of fuel, supplies and material for the operation of the railroads. In arranging for delivery of freight now on the road or at junction points, preference is being given to live stock, perishables and foodstuff for human consumption.

The Pennsylvania announced Wednesday afternoon that an embargo had been placed on all freight shipments over its own and allied lines. The embargo affected explosives and inflammables beginning Thursday, perishable freight beginning Friday, and all other freight beginning Saturday. As soon as practicable after Labor Day the embargoes will be modified to permit resumption of the movement of foodstuffs and perishable freight. It was stated that "the purpose of the embargoes is to clear the lines up as far as possible so that congestion and confusion will be avoided at the opening of the strike, and the management will have the best possible opportunity to reorganize the service with the greatest practicable speed."

The Pennsylvania statement referred to express shipments in the following words: "The management of the Pennsylvania Railroad has notified the Adams Express Company that after today all shipments over the lines of the Pennsylvania Railroad must be accepted subject to delay, and that no live stock or perishables should be accepted that cannot be delivered on or before September 2. Notice is also given that developments of the next day or two may determine whether or not it will be necessary to place express shipments under a complete embargo, pending the result of the strike call.

The Atchison, Topeka & Santa Fe Railway on Tuesday placed an embargo on all shipments of perishable goods and live stock, effective at once. The order also stated that the company will not take the responsibility on other shipments.

The Southern Pacific Steamship Company decided Wednesday not to accept any perishable merchandise, and that all other freight be taken subject to considerable delay. Ships of the line connect at Galveston, Texas, with rail service from the Pacific Coast over the Southern Pacific.

Similar embargoes have been declared by the other roads, many of them refusing perishable freight which will not reach its destination by Saturday.

The Lehigh Valley announced on Wednesday: "At the moment we do not contemplate shutting off the general movements of freight in anticipation of trouble. Should there be a considerable interruption in train service, our first thoughts will be regarding the milk supply of New York City and near-by towns. No effort will be spared to continue our part of the service of transporting milk to the city. Second only to the milk will be the prompt movements of food for human consumption, and then food for public purposes. Such passenger trains as may be necessary will be operated, but milk and food will come first."

Warnings to Employees

The railroads generally have issued warnings to their employees against striking. The Erie statement, among other things, includes the following paragraphs:

To those employees who have to decide what their action will be in response to the call to strike it is fair to say that this company's purpose will be as follows:

Employees who remain continuously in the service will be placed at the head of the respective service rosters in the order of their present relative position thereon and will hereafter be considered the senior employees of the company.

Employees who join in the strike do by such action leave the service of the company, and in so doing all rights and privileges as employees cease.

Employees who leave the service may reënter same only at the option of the division superintendent, and then only as new employees; their position on the roster dating from the date they are permitted to resume duty. Before again entering the service they will be required to pass the physical examination prescribed for new employees, and will also be required to pass the examination on rules as prescribed for employees of the class of service which they enter.

President E. P. Ripley, of the Santa Fe, issued a statement to employees on Wednesday, notifying them that the places of those who failed to report for work next Monday would be declared vacant, and that employment of new men would be permanent, barring ill behavior. He notified

those who obey the strike order that they would lose all rights of seniority and benefits from insurance and pensions.

Injunction Against Strike

Judge Willis E. Sears, of the District Court of Douglas County, on Wednesday issued an order restraining the general and local officials of the Order of Railway Conductors calling or enforcing a strike on the lines of the Union Pacific. The order was issued on petition of Edwin A. Hamilton, a conductor on the Union Pacific and a member of the Order of Railway Conductors, who declares that he and many other employees of the road are anxious to continue at work. Hearing on the petition for a permanent injunction was set for September 2. One of the brotherhood leaders is reported to have said that: "The strike order is issued, and the court's injunction is not retroactive. The Union Pacific men will go out if the other men do."

The Food Situation

The authorities in the larger cities are greatly disturbed over the food supplies. The police department in New York City is canvassing the situation to determine the exact amount of provisions on hand or available, and has also taken steps to prevent extortion if food becomes scarce. Motor trucks in conjunction with boat service may prevent conditions from becoming acute.

General Funston is reported to have said that the border troops are provisioned for 60 days ahead, but that forage for the horses and mules would soon be exhausted. The War Department has rushed food and provisions southward in large quantities since the strike situation has become threatening. Picking of California deciduous fruits for Eastern shipment was practically discontinued Tuesday because of the threatened strike.

Motor Cars for the Emergency

Plans are being made to use motor trucks for many classes of traffic between nearby cities, and even for long distances. Pittsburgh shippers, for instance, are said to be looking to motor trucks to solve many of their troubles, particularly those handling provisions and produce, while some of the more important war munition factories were said to have arranged for motor truck lines to carry their completed shells to the nearest points on Lake Erie, where they can be sent to Canada by water, and from there to Europe.

Detail Arrangements

Each road is making detail preparations to operate trains and protect the property in accordance with its facilities and the local conditions. Many employees from other branches of the service and former employees have volunteered their services. Pensioners who are in physical condition to do service have also been called in some cases. As fast as possible these men are being examined and coached and instructed in the duties which they will be called upon to perform.

Both the railroads and the brotherhoods published large display advertisements, stating their respective positions, in Thursday's newspapers.

Freight Handlers Strike at Chicago

Freight handlers employed by railways entering Chicago have been ordered to strike by their union. A few hundred struck as early as Monday, others followed Tuesday; by Wednesday afternoon over 1,000 had quit on a general order. Only two roads so far are exempt, the Rock Island and Monon having conceded the demands. The roads affected say no interruption to business will result and that they are prepared. Those lines having men out are the Burlington where the trouble originated, 450; Baltimore & Ohio, 200; Grand Trunk, 150; Soo, 125; Lake Shore, 100; Nickel Plate, 100. The cause of the strike was the refusal of the railways to permit the business agent of the union to collect dues and solicit membership in working hours. The union claims 6,000 men will eventually go out. The roads say no more men will follow and the situation will adjust itself.

A DESK TO HOLD 12,000 CARDS

The desk herewith illustrated is one in use by a card-index clerk in the stores department of the Pittsburgh Railways Company, Pittsburgh, Pa., and by means of which the work of filling out and keeping track of the cards has been materially cheapened in cost. J. E. Wharton, chief clerk in the Stores Department, who sends us the photograph, says:

"Previous to the summer of 1915, it had been our practice to maintain our price records on cards, in a 16-drawer filing section. When this work was first started, one man had been doing the work, which consisted of pricing requisitions for material issued to the shops, and manifests covering material shipped to points on the road. One man took care of the pricing and also helped with other work in the office; but as business increased it became necessary to give him some assistance at certain periods of the month.

"In the early summer of 1915 we were also confronted with a lot of additional work, that of pricing requisitions for a shop cost system, and also for a way department cost system. At first our only recourse seemed to be to hire an additional clerk, but our first effort was to make sure that our system was just what it should be, and after considerable thought we put the cards into the desk, shown in the illustration.

"The space directly in front of the clerk had always been used for drawer room and writing purposes; but we utilized this, as shown in the picture, and thus made it possible for



Desk for Card Catalogue

the clerk to reach and work with all of the records contained in the desk without getting up from his chair. Under the old system it was necessary for the clerk to stand at the card file when pricing, and, on account of the cards being in a closed file, it was necessary constantly to keep opening and closing the drawers and to walk back and forth in front of the cases. This was not only slow and very inconvenient, but the continual opening and closing of the drawers wore out the index cards, and as a consequence the file was always more or less untidy. "With this special desk we were able to get all of our price records in one desk, the desk having a capacity of approximately 12,000 cards; and we take care of the increased amount of work, without increasing our clerical force. The price clerk is able to take care of all of our pricing and spend a portion of the day helping out with the other work.

"There are approximately 5,000 new prices posted on the cards from shippers' invoices each month, and approximately 20,000 items priced from the cards during the month. Figuring an average on the 20,000 items, based on 25 working days in a month, at nine hours a day, would make an average of about 89 items an hour, or 1.5 items a minute. As it is not necessary that the clerk spend all of his time each day on pricing, our average would be considerably higher.

"From our experience we believe that the ordinary price books, loose-leaf or otherwise, cannot be compared with the card system and the open desk."

W. C. NIXON

Following the incorporation of the new St. Louis-San Francisco Railway to succeed the St. Louis & San Francisco Railroad, a temporary board of directors was elected which chose the following officers: W. C. Nixon, president; W. B. Biddle, first vice-president; E. D. Levy, second vice-president and general manager; N. M. Rice, third vice-president, and C. W. Hillard, fourth vice-president.

The new St. Louis-San Francisco Railway will have an authorized capital stock of $450,000,000, of which $200,000,000 will be 6 per cent preferred and $250,000,000 common stock. At present only $7,000,000 will be issued of the preferred, and only $48,480,000 of the common. The bonded indebtedness of the company for the present will total $117,882,500, exclusive of equipment trust certificates amounting to $5,306,000. In addition to these there will be bonds amounting to $75,739,818 on which there will be contingent interest charges. The total issued capitalization, inclusive of the bonds on which there are contingent charges, will be $264,408,318, as compared with a capitalization for the old company of $302,076,386. The fixed charge obligations on the bonds and equipment trusts, and for rentals and sinking funds, will total $6,341,069. There will also be $2,817,120 representing fixed charges in connection with the Kansas City, Fort Scott & Memphis bonds, rentals, sinking funds, etc., or a total in fixed charges of $9,158,190. The contingent charge obligations total $4,544,389; or, in other words, there will be fixed and contingent charges together of $13,702,579. The total fixed charges alone of the old company were $14,886,325. It will show further how the new company should succeed in solving its problem, to note that the gross income of the St. Louis & San Francisco in the fiscal year ended June 30, 1915, was $11,670,767; in the year ended June 30, 1914, $10,158,945; and in the four years from 1912 to 1915, inclusive, an average of $12,029,918. The operating income in the fiscal year ending June 30, of this year, was $13,434,112.



W. C. Nixon

Mr. Nixon, as president, will be able to count most upon the good will, and, one might say, habit of co-operation of the officers and employees who have worked with him. Under the direction of Mr. Nixon as chief operating officer, W. B. Biddle, as chief traffic officer, and Judge James W. Lush—these three being the receivers—a remarkable record was made in improving and bringing up the standard of the property which was entrusted to them. Not much money was available, and it was early realized that it would be necessary to improve the efficiency of operation and effect marked economies in order to secure from the earnings sufficient to put the property on a substantial condition for safe and profitable operation. In other words the problem was a man problem, coupled with the conservation and better use of materials. These men thoroughly believed that the average employee was anxious to give his best efforts, and that the problem was largely one of educating him as to exactly what was required. Then, too, cheerful, satisfied employees could be a large factor in cultivating the public and getting it to see the railroad's side of the question—and public opinion did not greatly favor the railroads of the Southwest when the receivers took charge. Readers of the *Railway Age Gazette* are already familiar with what the receivers have accomplished.

Striking progress has been made in car and train loading. Although the average tractive effort of locomotives increased 22 per cent in the nine years prior to 1915, the average revenue train load was increased nearly 41 per cent. This showing, and the reductions in operating expenses brought about thereby were largely the result of an organized campaign in which everybody concerned was reached by educational meetings, and his interest aroused by the encouragement of co-operation and friendly rivalry.

The Frisco agency plan, started in the spring of 1912, is, in its simplest terms, a plan to recognize the importance of the station agent. The theory is to make the agent the railroad's representative at his station. In fact he is given opportunity under the guidance of an assistant on the staff of the division superintendent to prove his ability as a business promoter, claim agent and general manager in his territory.

Economical locomotive performance has received considerable attention on nearly every railroad. Wise and careful supervision of this matter on the Frisco resulted in a saving of almost $1,000,000 in three years of operation.

The Frisco is one of the relatively small number of roads on which the handling of freight loss and damage claims is an operating matter. It started a campaign to reduce this waste at a time when freight claim payments were running at almost $490,000 yearly, or at a ratio of 1.67 per cent of the gross freight revenue, and when payments figured out at about $17 per $1,000 revenue. The educational campaign started with the slogan of "A $100,000 reduction in freight claim payments for the fiscal year." The results obtained were so remarkable that soon the $100,000 became $200,000, and in the first eight months of 1914-1915 claims paid amounted to only $181,000, or 0.97 per cent of the gross revenue, and at the rate of $9.68 per $1,000 revenue.

The work of the development department has produced remarkable results during the period of receivership. As a result the road receives hearty co-operation from bankers and farmers on its lines, and has secured an enviable success from the standpoint of locating suitable and strong industries in the territory served by it, the development of agricultural pursuits and attracting of desirable settlers. During the year ended June 30, 1916, 328 industries were located on the Frisco, an increase of 34 over the previous year. These 328 industries employed on an average 19,627

men, who are paid wages aggregating $12,776,000 yearly, and who have directly dependent on them almost 1,000,000 people. During the ended June 30, 1913, 3,633 families were located with a total acreage of 466,169. In the six months ended January 1, 1914, an area equal to that of half the state of Rhode Island was taken up by farmers. The agricultural department secured its greatest success by establishing demonstration farms, and in many cases proved that the production of lands already in cultivation might be increased 75 per cent. The farms were unique in that they were not run by the railroad, but were in the hands of farmers who had been persuaded to set aside from five to ten acres of land under the direction of a Frisco demonstrator.

The reorganization of the purchasing and stores departments has resulted in marked economies in the purchase and utilization of materials.

Mr. Nixon was born in February, 1858, in Illinois, and entered railway service at the age of 20, in 1878, with the Burlington & Missouri in Nebraska. After nine months with this road he became connected with the Atchison, Topeka & Santa Fe, and was consecutively watchman, clerk, cashier, agent, chief clerk in the superintendent's office, trainmaster, material agent, division superintendent and superintendent of terminals at Chicago. From July, 1896, to January, 1897, he was general agent of the freight department, and from 1897 to January, 1900, superintendent of the Chicago division. He was then for two years general superintendent of the Gulf, Colorado & Santa Fe; from January, 1902, to June, 1904, general manager, and from June, 1904, to August 1, 1906, second vice-president and general manager of the same road. On August 1, 1906, he left the Santa Fe to become vice-president and general manager of the St. Louis & San Francisco. In May, 1911, his title was changed to vice-president in charge of maintenance and operation, which office he held until July, 1913, when he was appointed chief operating officer and receiver.

SHALL RAILWAY PROFITS BE LIMITED?*

By Geo. A. Post

President Railway Business Association.

Those who have been so enthusiastic in enacting restrictive measures to avert what they deemed the national danger that the railways *might earn too much,* little dreamed that the time would soon come when a really grave national danger would be that the railways *might not earn enough* in the public interest.

The great, crucial question pressing for solution is whether earnings are sufficient for railroad needs? Those needs are created by the demands of the growth of the country, by the demands of labor, which generally appeal to the sympathies of the public, or their fears lest transportation movements may be interrupted by strikes. These financial needs of the railway are created further by the demands of government for improvements in facilities, safety appliances, taxes, conveniences, sanitary precautions, valuation appraisals, a multiplicity of costly inspections and special reports upon a myriad incidents of operations.

When the railroads have gone to the body from which alone they may secure permission to augment their resources and plead their necessities, elaborate and long drawn-out debates have ensued as to the authority of the Interstate Commerce Commission to consider the financial results of operation in determining rate cases. The whole process of readjusting rate fabrics in the various regions has been retarded by the expressed belief of at least some of the commissioners that the commission had no authority to sanction advances for the sole purpose of increasing revenues.

Notwithstanding that lawyers of high prestige believe that the act creating the commission and those acts enlarging its powers, as interpreted by the courts already, bestow upon the commission all needed power, yet as some of the commissioners, undoubtedly honest in their convictions, reject this view the process of invigorating the roads and restoring their active development lags.

Such a dispute ought not to continue. So long as the commission doubts its power it will not act. It derives its existence and powers from Congress, of which it is an arm, and Congress can and should by statute declare it the policy of the government to permit such a system of rates as will yield earnings sufficient to attract investment for improvements and extensions.

Congress would thereby in effect announce the rule fair to all railroads: "If you fail on rates which enable the average road to live and prosper you ought to fail, and the government will not protect you against failure; if on rates under which the average road can live and prosper you can earn large dividends your right is to earn them, it is in the public interest that you should earn them, and the government will protect you in their enjoyment." Public opinion brought to bear upon Congress can bring about such an enactment.

Financing of Public Utilities

I know that many thoughtful minds are giving voice to conflicting theories regarding the proper financing of our public utilities. Some would absolutely limit all profits, while making no guarantee against loss. Some would limit profits, but guarantee a minimum dividend by the government to subscribers to stock, the government to take all above the maximum dividend allowed. The guaranteed minimum has been suggested as three per cent and the maximum as six per cent.

Such theories are repugnant to what I conceive America to be. My soul revolts at the thought that this country, the land of opportunity, the land of great risks and great rewards, shall say to investors, inventors, executives and the rank and file of workers in the railway realm: "We insure you against *failure,* but we estop you against *great success!*" If that is to be the shibboleth of America regarding its railroads, soon all enterprises of importance would be included in the propaganda. We may no longer tell our children that illimitable opportunities beckon them to a future of adventure, fortitude, courage and hard work, with risks appalling but reward possible that shall make them famous and rich.

How shall we spur on the naturally lazy and shiftless or curb the reckless if they are sure of being three per centers without determined effort or the exercise of prudence? How shall we keep blazing the fires of ambition in eager souls if naught of brilliance, indefatigable energy, thrift and self-denial can overleap the hurdle of a beggarly six per cent return for the best there is in them? How can capital be lured from its hiding places in vaults to build railroads and factories, tunnel the mountains or develop mines if the possible rewards are not commensurate with the risks? How can we raise industrial giants and inculcate intrepidity of commercial spirit on a six per cent diet?

Roast Beef for the Lifters

It is no part of the function of the government to endeavor to protect the individual against failure. It cannot be done. Nothing will protect from failure the man who hasn't it in him to make good. Nothing should limit the reward of him who possesses the rare faculty for the service of mankind.

*From an address before the New York State Bankers' Association, June 9, 1916.

Chinese Eastern Railway.—A settlement has been arrived at between Japan and Russia respecting the price for the purchase of the Harbin Changchun section of the Chinese Eastern Railway.

General News Department

President Wilson on August 29 signed the bill of lading law fixing the liability of railways for bills of lading issued by them.

Railways entering Galveston, Tex., have declared an embargo on freight for movement through Galveston by the Morgan Line steamers and the Mallory Steamship Company.

The engineers of Minnesota are attempting to bring about closer co-operation through the formation of the Minnesota Joint Engineering Board. The constituent societies represented on the board are the Northwestern Association of the members of the American Society of Civil Engineers; the Minnesota section of the American Society of Mechanical Engineers; the Minnesota section of the American Institute of Electrical Engineers; the Minnesota Surveyors' and Engineers' Society; the Engineers' Club of Minneapolis, and the Civil Engineers' Society of St. Paul. It is hoped that through this central organization the activities of the engineers of Minnesota may be more closely correlated and more accomplished for the public welfare. George W. Rathjens, of St. Paul, Minn., is the secretary of the board.

The Southern Pacific has awarded 78 gold watch fobs, suitably engraved and bearing the company's safety emblem, to employees who did the most towards furthering "safety first" work during the past fiscal year. C. H. Rippon, piecework inspector at the general shops at Sacramento, Cal., headed the list with a score of 1,293 points. Ten and one-half points are granted for each safety suggestion made involving a change in standard practice to correct a defect the practical working out of which requires actual labor, and indicates the thoughtful attention of the employee. For each suggestion which warrants the issuance of instructions to employees, but does not involve physical labor in its application, five points are given. One credit is granted for each suggestion not involving actual labor in its application, and which heretofore has been covered by instructions.

Advances in pay of 9,216 employees in transportation service, including all classes from car cleaners to superintendents, and totaling $650,000 annually, were announced by the Brooklyn Rapid Transit Company August 30, to take effect on September 1. The new scale establishes a minimum of 34 cents an hour and a maximum of 42½ cents an hour for motormen in subway and elevated service, as against 30 cents minimum and 40 cents maximum at the present time, but provides that the men must work ten years to receive the higher rate of pay. Conductors and motormen on the surface lines who have been receiving a minimum of 25 cents an hour and a maximum of 29 cents an hour, will hereafter be paid from 26 cents to 34 cents an hour, the maximum not to go into effect, however, until after fifteen years of service. Conductors on the elevated and subway lines who now receive from 23 to 25 cents an hour will be advanced from 26 to 28 cents an hour, and guards from 20 to 23 cents an hour to 22 and 25 cents an hour.

The Long Island's Life Saving Bulletins

The Long Island's latest attempts to prevent grade crossing accidents include the use of Life Saving Bulletins now appearing as advertisements in New York City and Long Island papers. The advertisements are about 4 by 5 in. in size. Bulletin No. 6 reads as follows: *"He smashed through the gates* and stalled his engine on the tracks—" reads the official report telling of an occurrence at one of the Long Island Railroad's grade crossings. In this case the oncoming train whirled a few inches past the automobile's mud-guards.

"Providence was kind to this reckless driver, but his existence is proof of the necessity for the manifold warnings issued to automobilists by this railroad.

"In 1915, 82 automobilists drove their cars through Long Island Railroad crossing gates, lowered to protect the public. *Stop before you cross."*

Valuation Progress

Thomas W. Hulme, general secretary of the Presidents' Conference Committee on the federal valuation of the railroads, has issued a statement giving the progress of the field work up to July 31, 1916, as follows: From this it is noted that 73,478 miles of roadway and track have been inventoried, or less than 30 per cent of the total. The inventories of other portions of the property fall considerably below this figure.

PROGRESS OF FIELD INSPECTION, JULY 31, 1916.

Road	Date division valuation forces began work	Miles of road	Total miles inspected and inventoried to date: Road and track	Bridges	Buildings	Signals	Telegraph and telephone	Total miles "adjacent similar land" inspected
EASTERN GROUP								
Boston & Maine	4-29-14	2,456	2,456	2,020	2,350	2,456	2,456	2,200
Chicago & Eastern Illinois	5- 2-14	1,140	1,140	1,140	1,140	1,140	1,140	1,140
Cleveland, Cincinnati, Chicago & St. Louis	8-24-14	2,262	2,262	2,262	1,988	2,262	2,262	.....
Pennsylvania Railroad	12- 1-14	6,167	2,764	3,028	2,028	1,525	2,446	1,247
New York, New Haven & Hartford	3-31-15	2,046	1,480	927	523	...	1,004	411
Boston & Albany	4-21-15	392	392	389	392	139	392	310
Chicago, Indianapolis & Louisville	5-25-15	610	610	610	610	610	610	.....
Ann Arbor	6- 1-15	375	361	301	301	301	361	301
Chicago, Terre Haute & Southeastern	7-26-15	362	362	...	...	362	362	.....
Maine Central	8-14-15	1,147	516	341	260	154	309	297
Bangor & Aroostook	8-16-15	626	404	626	418	626	626	.....
Vandalia	8-16-15	851	791	814	80	476	805	.....
Long Island	11- 3-15	397	353	...	...	...	159	88
Philadelphia & Reading	11- 4-15	1,582	225	178	225	...	225	.....
Central Railroad of New Jersey	12- 8-15	638	301	237	237	...	638	.....
Chesapeake & Ohio	1-13-16	2,346	286	...	...	...	...	.....
Pittsburgh, Cincinnati, Chicago & St. Louis	2-28-16	1,424	648	444	397	316	1,134	.....
Pennsylvania Company	3-27-16	1,684	597	...	...	...	335	.....
New York Central (West)	4- 1-16	2,105	499	...	...	298	...	.....
Portland Terminal Railroad	4- 4-16	31	31	31	...	31	31	.....
Delaware & Hudson	5-13-16	881	114	114	114	...	...	.....
Bridgeton & Saco River	5-24-16	21	21	21	21	...	...	.....
Sandy River & Rangeley Lakes	6- 6-16	104	104	...	...	...	47	.....
Bessemer & Lake Erie	6-17-16	204	58	56	56	...	...	.....
Total to July 31	.....	29,851	16,775	12,539	11,140	10,696	15,342	5,994
WESTERN GROUP								
Texas Midland	1-12-14	111	111	111	111	111	111	111
New Orleans, Texas & Mexico	1-22-14	173	173	173	173	173	173	173
Kansas City Southern	1-26-14	878	878	878	878	878	878	878
San Pedro, Los Angeles & Salt Lake	2-10-14	993	993	993	993	993	993	993
Elgin, Joliet & Eastern	6- 1-14	211	211	211	211	211	211	211
Western Pacific	7-24-14	984	984	984	984	984	984	984

PROGRESS OF FIELD INSPECTION, JULY 31, 1916.

Road	Date division valuation forces began work	Miles of road	Total miles inspected and reported to date: Road and track	Bridges	Buildings	Signals	Telegraph and telephone	Total miles "adjacent similar land" inspected
Western Group (Continued)								
Quincy Western	9- 5-14	5	5	...	...	...	...	...
Missouri Southern	11- 1-14	54	54	54	54	54	54	54
Mississippi River & Bonne Terre	12-15-14	54	54	54	54	54	54	54
Arizona & Swansea	2- 9-15	21	21	...	...	...	...	...
United Verde & Pacific	3-15-15	26	26	...	...	...	...	...
Cape Girardeau & Northern	2- 1-15	106	106	106	106	106	106	...
Spokane & British Columbia	10-20-15	36	36	...	...	...	...	...
Butte, Anaconda & Pacific	10- 9-15	68	68	...	...	...	...	...
Chicago, Milwaukee & Gary	5-11-15	99	99	99	99	99	121	...
Trinity & Brazos Valley	12- 1-15	303	303	303	303	...	303	...
Arizona Eastern	1-28-15	398	398	398	398	None on line	371	398
St. Louis Southwestern	11-12-14	1,575	1,575	1,575	1,575	...	1,575	1,517
Texas & Pacific	11-15-15	1,851	851	352	352	...	...	...
Great Northern	5- 1-14	7,127	6,839	6,283	6,283	7,127	7,127	...
Minneapolis & Rainy River	5- 6-16	76	76	...	...	...	76	...
Illinois Central Yazoo & Mississippi Valley Chicago, Memphis & Gulf	11-18-14	6,120	4,441	3,673	3,673	2,982	5,892	3,040
Atchison, Topeka & Santa Fe	12-13-14	11,391	8,199	1,702	1,702	...	9,634	2,040
Chicago, Milwaukee & St. Paul	5-22-15	10,509	2,749	1,462	1,462	...	2,799	578
Southern Pacific (Pacific System)	1- 3-15	6,935	1,838	1,313	1,313	468	5,097	1,410
Chicago, Rock Island & Pacific	8- 3-14	7,673	7,673	5,191	5,191	5,525	7,673	2,578
Minneapolis, St. Paul & Sault Ste. Marie	5- 1-14	4,177	3,149	1,409	1,409	11 Plants	2,721	1,470
Chicago & North Western Chicago, St. Paul, Minneapolis & Omaha	9- 2-14	10,177	922	91	91	91	4,652	91
Oregon-Washington Railroad & Navigation Co.	3-30-16	2,272	690	10	10	...	...	...
Oregon Short Line	6- -16	2,256	...	...	...	...	...	141
Arizona Southern	.....	22	22	...	...	...	...	...
Bullfrog Goldfield	.....	85	85	...	...	...	...	...
Death Valley	.....	20	20	...	...	...	...	...
Hall & Hall	.....	1	1	...	...	...	...	...
Holton Interurban	.....	10	10	...	...	...	...	...
Las Vegas & Tonopah	.....	118	118	...	...	...	...	...
Montana Western	.....	20	20	...	...	...	...	...
Montana Eastern	.....	84	84	...	...	...	...	...
Northern Dakota	.....	21	21	...	...	...	...	...
Pacific Coast	.....	56	56	...	...	...	...	...
Ray & Gila Valley	.....	9	9	...	...	...	...	...
San Diego & Arizona	.....	46	46	...	...	...	...	...
St. John & Ophir	.....	9	9	...	...	...	...	...
Tonopah & Goldfield	.....	97	97	...	...	...	...	...
Tonopah & Tidewater	.....	174	174	...	...	...	...	...
Tooele Valley	.....	7	7	...	...	...	...	...
Riverside Rialto & Pacific	.....	10	10	...	...	...	...	...
Farmer's Grain & Shipping Co.	.....	53	53	...	...	...	...	...
Crandon, Devils Lake & Southern	.....	13	13	...	...	...	...	...
Total	.....	77,514	44,377	27,425	27,425	19,856	51,605	16,721
Southern Group								
Norfolk Southern	2-27-14	903	903	903	903	903	903	903
Atlanta, Birmingham & Atlantic	2-19-14	658	658	658	658	658	658	658
Central of Georgia	7- 8-14	1,972	1,972	1,972	1,972	1,972	1,972	All except terminals
Savannah & Northwestern	2-18-15	109	109	109	109	...	109	109
Charleston & West Carolina	5-29-15	341	341	341	341	...	341	286
Georgia Southern & Florida	1- 2-15	392	392	392	392	392	Unknown	Unknown
Hawkinsville & Florida Southern	3- 3-15	96	96	96	96	96	33	Unknown
Macon & Birmingham	1-25-15	97	97	97	97	97	67	Unknown
St. Johns River Terminal	1-21-15	7	7	7	7	7	Unknown	Unknown
Mobile & Ohio	6-15-15	934	934	934	934	934	934	848
Southern Railway in Mississippi	9-15-15	292	292	292	292	292	292	292
Okolona Branch, Southern Railway	10-12-15	38	38	38	38	38	38	38
Southern	7-14-15	7,000	3,011	1,250	None	6,544	3,373	459
Virginian	9- 8-15	488	470	470	460	470	468	460
Winston-Salem Southbound	11-16-14	89	89	89	89	89	89	89
Nashville, Chattanooga & St. Louis	1- 1-16	1,230	1,230	737	1,213	1,230	152	None
Florida East Coast	9-25-15	744	744	744	744	...	744	616
Norfolk & Western	1- 3-16	2,020	238	...	...	...	...	...
Richmond, Fredericksburg & Potomac	1- 3-16	80	80	None	None	None	80	80
Washington Southern	2-18-16	32	32	None	None	None	32	32
Potomac, Fredericksburg & Piedmont	4-17-16	38	38	38	38	38	38	38
Georgia Railroad	1-15-16	307	307	307	307	307	307	All except terminals
Augusta Belt	2- 5-16	5	5	5	5	5	...	All except terminals
Augusta & Summerville	2-11-16	3	3	3	3	3	...	None
Augusta Union Station	2-10-16	1	1	...	1	...	...	None
Milledgeville Railway	2- 9-16	5	5	5	5	...	...	None
Lexington Terminal	1-14-16	3	3	...	3	3	...	3
Union Point & White Plains	1-14-16	12	12	...	12	12	...	12
Monroe Railroad	12-28-15	10	10	10	10	10	10	10
Danville & Western	5- 6-16	78	None	None	None	None	78	None
Virginia & Southwestern	2-24-16	210	None	None	None	23	191	None
Augusta Southern	4-19-16	83	83	83	None	83	83	None
Blue Ridge	3-25-16	34	34	None	None	34	34	None
Hartwell Railway	1-12-16	10	10	None	None	10	None	None
Lawrenceville Branch	2-18-16	10	10	None	None	10	None	None
Tallulah Falls	2-22-16	58	58	None	None	58	None	None
Carolina & Tennessee Southern	10- 8-15	14	14	None	None	14	14	None
Total	.....	18,433	12,326	9,580	8,729	14,332	11,040	4,933
Total—All Roads	.....	125,798	73,478	49,544	47,294	44,884	77,987	27,648

Mr. Mellen on the Boston & Maine Situation

C. S. Mellen, former president of the New York, New Haven & Hartford, in an interview in the Boston Post, characterizes the move for receivership of the Boston & Maine as a fight between bankrupt and leased line interests, and declares neither can afford a fight.

"The bankrupts," he said, "the same who in former years bled Boston & Maine by piling up its debt, want to take the only thing of value that remains, the leased lines, to make something they have of more value. Why should leased lines' stockholders be asked to sacrifice a guaranteed security any more than the bondholders, who are the bankers?" He predicts that if the receivership fight is carried to the bitter end it will result in breaking up the system. "The matter ought to be patched up by friendly negotiation rather than a fight from which the public, as well as various interests financially involved, would suffer.

"The trouble has always been that fixed charges over-balanced capitalization. The dividend on its stock at 10 per cent amounts only to about $4,000,000, and fixed charges in leased line rentals and interest on debt two or three times that.

"Charges must be reduced, but cannot be reduced with a club. Floating debt of $13,000,000, notes which directors have announced it is inexpedient to renew, should be wiped out.

"It could be done by raising new money in stock, giving common stockholders new preferred to the amount of $13,000,000. I believe they would subscribe to every bit of it. Leased line interests should be persuaded to accept contingent rather than guaranteed returns; to get dividends when earned.

"I do not put blame of proposed receivership on leased lines. Some rentals are exorbitant, but rentals are not too high in most cases. It would be impossible to duplicate these roads at their cost to Boston & Maine. Some could not be duplicated at 300 per cent of present capitalization.

"Hustis has made good. If New Haven had been as efficiently managed as the Boston & Maine by Mr. Hustis, New Haven would be paying 10 per cent or 12 per cent today.

"If the bankers would let Hustis alone, he would show New England something with Boston & Maine. But some day Boston & Maine's finances may go wrong, and they will try to make him the goat, as they tried to do with me.

"Boston & Maine could go on as it has for the past sixteen years. In prosperous years it would earn a dividend, but in times of depression would have a struggle to meet charges. The only way is to change those fixed charges to contingents and wipe out the debt."

General Foremen's Convention

The twelfth annual convention of the International Railway General Foremen's Association, was held at the Hotel Sherman August 29 to September 1 inclusive. L. A. North, superintendent of shops, Illinois Central, presiding. Rev. Dr. Frank W. Gunsaulus opened the convention with prayer. The association was welcomed to the city by Daniel Webster of the Prosecuting Attorney's office of the City of Chicago. Letters from various railway officers were read in which it was stated that it was impossible for them to welcome the association on account of the impending trainmen's strike. The following is a list of exhibitors at the convention:

Abrasive Company, Bridesburg, Philadelphia, Pa.—Grinding wheels. Represented by C. W. Blakeslee and J. C. Dillenbeck.

American Flexible Bolt Company, Pittsburgh, Pa.—Flexible staybolts. Represented by C. A. Seley, H. T. Frauenheim, R. W. Benson, L. W. Widmeier, Wm. Heacock, Mr. McAllister, Mr. Kenyon and Mr. Payton.

American Steel Foundries Company, Chicago.—Miniature brake beams, Simplex adjustable shelf coupler pocket, Ajax third point brake beam support and Atlas safety guard. Represented by W. C. Walsh and H. J. Melchert.

Anchor Packing Company, Chicago.—Air pump and throttle packing and power plant packings. Represented by J. O. Waterman.

Armstrong Brothers Tool Company, Chicago.—Tool holders and machine shop specialties. Represented by Joseph C. Fletcher.

Ashton Valve Company, Boston.—Safety valves, gages, gage testers and wheel press recording gages. Represented by J. W. Motherwell, F. Fettinger and Joseph F. Gettrust.

Baldwin Locomotive Works, Philadelphia, Pa.—Photographs of locomotives. Represented by A. S. Goble and Charles Gaskill.

Barco Brass & Joint Co., Chicago.—Engine tender connections, air reservoir joints, car steam heat connections, roundhouse blower fittings and joints. Represented by F. N. Bard, C. L. Mellor and L. W. Millar.

Boss Nut Company, Chicago.—Represented by W. G. Willcoxson and J. W. Fogg.

Carborundum Company, Niagara Falls, N. Y.—Abrasive grinding materials. Represented by C. C. Schumaker, H. P. Frost and E. P. Ritzmar.

Celfor Tool Company, Buchanan, Mich.—Twist drills, reamers, countersinks, flue cutters and lathe tools. Represented by Mr. Montague.

Chicago Pneumatic Tool Company, Chicago.—Portable pneumatic and electric tools, Represented by J. C. Campbell and J. L. Canby.

Cleveland Twist Drill Company, Cleveland, Ohio.—Drills. Represented by Herbert White.

Crerar-Adams Company, Chicago. — Joyce-Cridland jacks, Favorite wrenches, Walstrom automatic drill chuck die starters and Desmond-Stephan grinding wheel dressers. Represented by R. W. Wallace, W. I. Clock, Arthur Martin and Geo. Bassett.

Crucible Steel Company of America, Chicago.—Represented by F. Baskerfield and J. T. Stafford.

Dearborn Chemical Company, Chicago.—Literature on feed water treatment. Represented by Geo. R. Carr, I. H. Bowen, O. H. Rehmeyer, F. C. Fosdick and J. H. Cooper.

Detroit Lubricator Company, Detroit, Mich.—Flange oilers of the pendulum and the ball type and bull's-eye cylinder lubricators. Represented by A. G. Machesney and Mr. Lindaman.

Detroit Twist Drill Company, Detroit, Mich.—Drills. Represented by M. F. Crawmer.

Duff Manufacturing Company, Pittsburgh, Pa. Jacks. Represented by C. N. Thulin.

Economy Devices Corporation, New York.—Casey Cavin reverse gear and the Ragonnet reverse gear. Represented by Joseph Sinkler.

Edna Brass Manufacturing Company, Cincinnati, Ohio.—Injectors, lubricators and various locomotive appliances. Represented by H. A. Glenn, J. Kirkpatrick and J. E. Jacobson.

Franklin Railway Supply Company, New York.—Franklin fire doors. Represented by H. M. Evans and C. W. F. Coffin.

Gardiner Machine Company, Beloit, Wis.—A disc grinder. Represented by E. L. Beisel and E. B. Gardiner.

Garlock Packing Company, Palmyra, New York.—Special locomotive and shop packings.—Represented by W. G. Cook and C. W. Sullivan.

Goldschmidt Thermit Company, New York.—Thermit. Represented by H. S. Mann, A. F. Beaulieu, W. Aldrich and C. D. Young.

Grip Nut Company, Chicago.—Grip nuts. Represented by W. E. Sharp, H. H. Hibbard, W. E. Fowler, Jr., and Bradley S. Carr.

Hardy, F. A., & Company, Chicago, Eye protectors and safety glasses. Represented by C. S. Wells.

Hunt-Spiller Manufacturing Company, Boston, Mass.—Cylinder and valve bushings and packing rings, piston heads, rod bushings, shoes and wedges and crosshead shoes of Hunt-Spiller gun iron. Represented by V. W. Ellet, E. J. Fuller and J. M. Monroe.

Imperial Brass Manufacturing Company, Chicago.—Oxy-acetylene welding outfit. Represented by J. Schroeter.

Independent Pneumatic Tool Company, Chicago.—Pneumatic tools. Represented by H. F. White, C. E. Mackin, J. W. Smith and H. F. Finney.

Ingersoll-Rand Company, New York.—Little David pneumatic tools. Represented by Robert C. Cole, Everett J. Welsh and Leon Schnitzer.

Jenkins Brothers, New York.—Jenkins valves. Represented by B. J. Neeley.

Keystone Equipment Company, Philadelphia, Pa.—Keystone wedge bolts, driving box, triple valve grinder and tool holders. Represented by M. R. Shafer, V. F. Shafer and F. H. Slee.

Locomotive Superheater Company, New York.—Illustrations of the superheater and instruction books on the operation and maintenance of the superheater pyrometer. Represented by J. E. Mourne.

Mahr Manufacturing Company, Minneapolis, Minn.—Rivet forge, car repair torches and boiler torches. Represented by J. A. Mahr and H. B. Hazerodt.

Manning, Maxwell & Moore, New York.—Ashcroft gages, Consolidated safety valves and Hancock inspirators. Represented by C. L. Brown.

Miner, W. H., Chicago.—Models of friction draft gears, safety hand brakes, side bearings, coupler yokes, center pins, etc. Represented by B. S. Johnson and J. H. Mitchell.

Mooso, C. A., Laboratories, Chicago.—Monarch tempering compound and oil of salt antiseptic. Represented by F. H. Jack.

Nathan Manufacturing Company, New York.—Non-lifting, simplex hot water injector and boiler check valve. Represented by J. S. Seeley, H. Neville and Richard Welch.

National Railway Devices Company, Chicago.—Shoemaker fire door. Represented by J. G. Robinson, E. J. Gunnison and N. M. Auerbach.

National Tube Company, Pittsburgh, Pa.—Kewanee Union and N. T. C. regrinding valve. Represented by H. Phillips and H. Weber.

Norton Company, The, Worcester, Mass.—Grinding wheels. Represented by H. K. Clark.

Ohio Injector Company, Chicago.—Injectors, lubricators, flange oilers, boiler checks, water glass protectors, hose strainers and drifting valves. Represented by Wm. S. Furry and A. C. Beckwith.

Okadee Company, Chicago.—Blow-off valves, hose couplers, reflex gages, water glasses and drain valves. Represented by A. G. Hollingshead, G. S. Turner, W. H. Heckman, Harry Vissering and M. E. Keig.

O'Malley-Beare Valve Company, Chicago.—Multiplate service system of valves. Represented by Thomas O'Malley, Edward O'Malley, Blake C. Hooper, E. A. Woodworth, William Leighton and J. N. Gallagher.

Oxweld Railroad Service Company, Chicago.—Oxy-acetylene welding and cutting apparatus. Represented by F. W. Petersen and S. R. Oldham.

Paxton-Mitchell Packing Company, Omaha, Nebr.—Model of Mitchell metallic rod packing, and Leighton balanced and lubricating piston packing rings. Represented by J. T. Luscombe.

Pilliod Company, New York.—A model of the Baker-Pilliod valve gear. Represented by F. S. Wilcoxen.

Pyle-National Company, Chicago.—Headlights, generators, and Young improved piston valves. Represented by George E. Hass, William Miller and J. Will Johnson.

Racine Tool & Machine Company, Racine, Wis.—Power hack saw. Represented by J. M. Jones.

Railway Equipment & Publication Company, New York.—Exhibiting the Pocket List of Railway Officials. Represented by C. L. Dinsmore.

Railway Review (Inc.), Chicago.—Exhibiting the Railway Review.

Rich Tool Company, Chicago.—High speed tools. Represented by R. C. Neysenburg.

Ryerson & Son, Joseph T., Chicago.—Staybolt iron. Represented by E. S. Pike and Horace Hench.

Simmons-Boardman Publishing Company, New York.—Copies of the *Railway Age Gazette* and the *Railway Mechanical Engineer*. Represented by F. H. Thompson.

Smith-Totman Company, Chicago. High pressure insulation. Represented by H. A. Varney.

Squire-Cogswell Company, Chicago.—Staybolts, water service supplies, rivet forges, portable burners and furnaces. Represented by W. C. Squire and C. P. Cogswell.

Street, R. R., & Company, Chicago.—Machine shop specialties and power transmission appliances. Represented by A. H. Taylor.

Union Draft Gear Company, Chicago.—Cardwell friction draft gear. Represented by H. Barnard, J. E. Farelton, J. W. Hathaway and C. J. Gorman.

United States Metallic Packing Company, Philadelphia, Pa.—Ring piston rod, valve stem and air pump packing. Represented by Morris B. Brewster and Robert R. Wells.

Vissering, Harry, Company, Chicago.—Crescent piston rod and valve stem packing, Viloco sander and Leach type sander. Represented by A. G. Hollingshead, G. S. Turner, W. H. Heckman, Harry Vissering and M. E. Keig.

Wells, R. W., Chicago.—Geometric die heads and taps, Sweetland lathe chucks, Jarvis high speed tapping devices and Hisey-Wolf electric drills and grinders. Represented by R. W. Wells.

Westinghouse Air Brake Company, Pittsburgh, Pa. Represented by A. K. Hohmyer.

Exhibitors at the Tool Foremen's Convention

The following is a list of exhibitors at the convention of the American Railway Tool Foreman's Association held at the Hotel Sherman, Chicago, August 24-26 inclusive:

Abrasive Company, Bridesburg, Philadelphia, Pa.—Grinding wheels. Represented by C. W. Blakeslee and J. C. Dillenbeck.

Allen & Co., Ltd., Edgar, Sheffield, England.—Tool steel. Represented by G. R. Bennett and F. C. Steen.

Armstrong Brothers Tool Company, Chicago.—Tool holders and machine shop specialties. Represented by Joseph C. Fletcher.

Besly & Co., Charles H., Chicago.—Besly helmet temper taps. Represented by C. A. Knill and Ralph W. Young.

Brown & Sharpe Manufacturing Company, Providence, R. I.—Cutters and tools. Represented by R. E. Doras, P. A. Topel and T. A. Day.

Brown & Co., Tom, Chicago.—Jacks, flue expanders and cutters. Represented by Tom Brown and Harry W. Standard.

Carborundum Company, Niagara Falls.—Abrasives and grinding materials. Represented by C. C. Schumaker, E. P. Ritzma and H. P. Frost.

Celfor Tool Company, Buchanan, Mich.—Twist drills, reamers, countersinks, flue cutters and lathe tools. Represented by Mr. Montague.

Chicago Eye Shield Company, Chicago.—eye protectors. Represented by H. J. Brennecke.

Chicago Pneumatic Tool Company, Chicago.—Portable pneumatic and electric tools. Represented by J. C. Campbell and J. L. Canby.

Cleveland Twist Drill Company, Cleveland, Ohio.—Drills. Represented by Herbert White.

Colonial Steel Company Chicago.—High grade tool steels. Represented by C. O. Sternagle.

Dale-Brewster Machinery Company, Inc., Chicago.—Cutting oils and compounds, high power hack saw, portable electric tools, drills, grinders, and Victor hack saws. Represented by James J. Dale and James W. Barbour.

Desmond-Stephan Manufacturing Company.—Complete line grinding wheel dressers. Represented by F. M. Riggs.

Detroit Twist Drill Company, Detroit, Mich.—Drills. Represented by M. F. Crawmer.

Duff Manufacturing Company, Pittsburgh, Pa.—Jacks. Represented by C. N. Thulin.

Faessler Manufacturing Company, J., Moberly, Mo.—Boiler makers' tools, flue expanders and cutters. Represented by G. R. Maupin.

Galena Signal Oil Company, Franklin, Pa.—Represented by W. J. Walsh, L. Gleason, R. L. Webb, Frank Walsh and J. A. Graham.

Independent Pneumatic Tool Company.—Pneumatic tools. Represented by H. F. White, C. E. Mackin, J. W. Smith and H. F. Finney.

Ingersoll-Rand Company, New York.—Little David pneumatic tools. Represented by Robert C. Cole, Everett J. Walsh and Leon Schnitzer.

Mosso Laboratories, C. A., Chicago.—Monarch tempering compound oil of salt antiseptic. Represented by F. H. Jack.

Niles-Bement-Pond Company, Pratt & Whitney Company, Hartford, Conn.—Taps, dies, reamers and milling cutters and gages, miscellaneous small tools. Represented by John M. Howett.

Norton Company, Worcester, Mass.—Grinding wheels. Represented by H. K. Clark.

Nye Tool & Machine Works, Chicago.—Pipe dies. Represented by C. W. Nye.

Oxweld Railroad Service Company, Chicago.—Oxy-acetylene cutting and welding apparatus. Represented by F. W. Petersen and S. R. Oldham.

Racine Tool and Machine Company, Racine, Wis.—Power hack saw. Represented by J. M. Jones.

Railway Equipment & Publication Company, New York.—Exhibiting the Pocket List of Railway Officials. Represented by C. L. Dinsmore.

Rich Tool Company, Chicago.—High speed tools. Represented by R. C. Neysenburg.

Simmons-Boardman Publishing Company, New York. Exhibiting the *Railway Age Gazette* and the *Railway Mechanical Engineer*. Represented by F. H. Thompson.

Street & Co., R. R., Chicago.—Machine shop specialties, power transmission appliances. Represented by A. H. Taylor.

Taft-Pierce Manufacturing Company, Woonsocket, R. I.—Tool room special tools. Represented by C. O. Cromwell and E. R. Abbott.

R. W. Wells, Chicago.—Geometric die heads and taps, Sweetland lathe chucks, Jarvis high speed taping devices, Hisey-Wolf electric drills and grinders. Represented by R. W. Wells.

Whitman & Barnes Manufacturing Company, Akron, Ohio.—Drills, wrenches, reamers and cutters. Represented by A. O. Wange and J. C. Scanlon.

Wilson-Maeulen Company, New York.—Multi-Record, Multi-Color pyrometer recorder and indicating instruments for both high and low temperatures. Represented by Otto Bersch.

Traveling Engineers' Association Convention Postponed

On account of the controversy now going on between the railroads and the four train service brotherhoods, the executive committee of the Traveling Engineers' Association has postponed the annual convention. The meeting was to have been held September 5-8. The new date will be announced later.

Railway Signal Association

In case the railway strike materializes the annual meeting of the Railway Signal Association, which it was planned to hold at the Grand Hotel, Mackinac Island, Mich., September 12-14, will be postponed until some time in October. If the strike does not take place the convention will be held as originally planned.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meetings.

Air Brake Association. F. M. Nellis, Room 3014, 165 Broadway, New York City.

American Association of Demurrage Officers. F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, 1916, New Orleans, La.

American Association of Freight Agents.—R. O. Wells, Illinois Central, East St. Louis, Ill. Next meeting, June, 1917, Denver.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, New Willard Hotel, Washington, D. C.

American Association of Railroad Superintendents.—E. H. Harman, Room 101, Union Station, St. Louis, Mo.

American Electric Railway Association.—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.

American Electric Railway Manufacturers' Association.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Railroad Master Tinners', Coppersmiths' and Pipefitters' Association. W. E. Jones, C. & N. W., 3814 Fulton St., Chicago.

American Railway Association.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Denver, Colo.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, 1916, New Orleans, La.

American Railway Engineering Association.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 20-22, 1917, Chicago.

American Railway Master Mechanics' Association.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June, 1917.

American Railway Tool Foremen's Association.—Owen D. Kinsey, Illinois Central, Chicago.

American Society for Testing Materials.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., New York.

American Wood Preservers' Association.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

Association of American Railway Accounting Officers.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Annual meeting, May 30, 1917, San Francisco, Cal.

Association of Manufacturers of Chilled Car Wheels.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

Association of Railway Claim Agents.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J. Next meeting, May, 1917, Louisville, Ky.

Association of Railway Electrical Engineers.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago.

Association of Railway Telegraph Superintendents. W. L. Connely, superintendent of telegraph, Indiana Harbor Belt, Gibson, Ind.

Association of Transportation and Car Accounting Officers.—G. F. Conrad, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

Bridge and Building Supply Men's Association.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club. H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION. Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Annual convention, June 19, 1917, Banff, Alberta.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next annual meeting, August, 1917, Chicago.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago. Next meeting, May, 1917, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, August 29 to September 1, Hotel Sherman, Chicago.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 12-14, 1916, "The Breakers," Atlantic City, N. J.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June, 1917.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago. Next convention, March, 1917, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Annual meeting, December, 1916, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—H. O. Hartzell, B. & O. R. R., Baltimore, Md. Next meeting, November, 1916, Chicago.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Office of the President's Assistant, Seaboard Air Line, Norfolk, Va. Annual meeting, October 3-5, 1916, New York.

RAILWAY REAL ESTATE ASSOCIATION.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 10, 1916, Chicago.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 12-14, 1916, Grand Hotel, Mackinac Island, Mich.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Associations.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings. 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Washington, D. C.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next meeting, June 19, 1917, Fresno, Cal.

TRAVELING ENGINEERS' ASSOCIATION. W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next meeting was to have been September 5-8, 1916, Hotel Sherman, Chicago, but postponed on account of train employees' wage controversy.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

Traffic News

Farmers' organizations in Nebraska have filed with the Interstate Commerce Commission complaints against the discontinuance of peddler-car service by western and northwestern lines. It is charged that discontinuance of the service gives preference to wholesale grocers and commission firms to the disadvantage of the grower and consumer.

Southwestern passenger agents are anticipating the largest passenger business in the history of roads in that section, in the event that troops are maintained upon the border through the winter, and have filed with the Interstate Commerce Commission an application to have cheap round trip rates made effective. The presence of the troops has also caused a large increase in freight traffic in the movement of equipment and supplies.

As a result of a conference of traffic heads of Texas roads held at Austin on August 22, the Texas commission rates between points in Texas will be ignored and those prescribed by the Interstate Commerce Commission in the Shreveport case observed. There seems inevitable a trial for supremacy between the Texas commission and the federal authority. When the roads begin to ignore the Texas-made rates it is anticipated the Texas commission will institute penalty suits, which the roads can prevent by federal injunctions and then compel a fighting out of the issue in the federal courts, ultimately bringing the matter again to the supreme court of the United States.

The South will be advertised as the ideal farming country at more than 25 fairs and expositions in the northern states this fall by the Southern Railway and its affiliated lines. Exhibits containing a full representation of the grains, grasses and forage crops, fruits, vegetables and miscellaneous farm and orchard products of the southern states will be displayed, and literature about the South will be distributed. A special exhibit will be moved from place to place where the county and district fairs are held, but larger exhibits will be made at the Rochester, N. Y., Exposition, September 4-9; the New York State Fair at Syracuse, September 11-16, and at the National Dairy Show, Springfield, Mass., October 12-21.

A textile directory, recently issued by the industrial and agricultural department of the Southern Railway, shows that there are 827 textile plants, with 9,865,248 spindles and 214,467 looms in operation on the lines of the Southern Railway, the Mobile & Ohio, the Georgia Southern & Florida and associated lines. The directory shows a total of 635 cotton mills, 152 knitting mills, 33 woolen mills and 7 silk mills, with eleven new textile plants under construction at the time the information was compiled. The knitting mills have 23,579 knitting machines and 2,635 sewing machines. The names and location of the different plants, with information as to equipment, power used and character of product, are given. Five-sevenths of all the spindles in the cotton growing states, and almost one-third of all the cotton spindles in the United States, are on the lines of the Southern Railway.

At a joint meeting of the Central and Western Passenger Associations, held recently at Chicago, the railroads of Illinois decided to raise passenger fares within the state from 2 cents a mile, the statutory rate, to 2.4 cents per mile. The new tariffs are now being prepared, and will be filed before September 15, to take effect 30 days thereafter. The opinion prevails that the railroads are entitled to increased rates under the recent decision of the Interstate Commerce Commission that an interstate rate of 2.4 cents between St. Louis and points in Illinois, plus a toll over the Mississippi river bridges, was a reasonable maximum, and that rates between East St. Louis and points in Illinois lower than those maintained between St. Louis and the same points were discriminatory against St. Louis. It is expected that the State Public Utilities Commission of Illinois will enjoin the increase and carry the case to the Supreme Court, if necessary.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended from August 31 to December 30 new freight tariffs filed by the transcontinental roads proposing increases in their rates to the Pacific Coast.

The Interstate Commerce Commission has suspended until December 18 proposed advances by Southwestern roads in rates on butter, eggs, dressed poultry and other commodities from points in Oklahoma and Texas to Kansas City, St. Louis and other points.

Rates on Wool from Chicago

Chicago Wool Company et al. v Chicago, Milwaukee & St. Paul. Opinion by Commissioner Clements:

Upon complaint that the rates on wool, scoured, washed, combed, or brushed, and wool combings and wool noiles, from Chicago to points in Wisconsin, Minnesota and Iowa, which generally are any-quantity rates governed by the western classification, are unreasonable and discriminatory, the commission holds that the commodities in question should be given lower rates and ratings when in carloads than when in less than carloads. The carriers will be expected to establish promptly the carload ratings proposed by them. (40 I. C. C., 101.)

Bunker Icing Charges on Oysters

Charles Platts v. New York, New Haven & Hartford et al. Opinion by Commissioner Clark:

Effective February, March and April, 1915, defendants filed tariffs providing, in effect, that they would thereafter discontinue the absorption of bunker icing charges on shipments of oysters from the Atlantic seaboard to western points. Upon complaint that the resulting increased rates are unreasonable and discriminatory, the commission holds that the defendants have justified the increased charges on carload shipments of shucked oysters, but that the increased charges on shipments of shucked oysters in less than carloads, and of oysters in the shell in carloads, have not been shown to be reasonable. An allegation of discrimination is found not to be sustained. (39 I. C. C., 690.)

Steamer Lines from Norfolk to Baltimore, New York and Richmond.

Opinion by Commissioner Clements:

The holdings of the Southern Railway, the Chesapeake & Ohio, the Norfolk & Western, the Seaboard Air Line Railway, and the Atlantic Coast Line constitute a majority of the stock of the Old Dominion Steamship Company, which company owns all of the stock of the Virginia Navigation Company. The stock of the Chesapeake Steamship Company is owned by the Southern Railway and the Atlantic Coast Line, and that of the Baltimore Steam Packet Company by the Seaboard Air Line.

The Old Dominion Steamship Company operates a daily service in each direction between Norfolk, Va., and New York, N. Y., and between Norfolk and Richmond, Va. The Virginia Navigation Company operates a triweekly service in each direction between the latter two points and serves numerous landings on the James river. Both the Chesapeake Steamship Company and the Baltimore Steam Packet Company operate a daily service in each direction between Norfolk and Baltimore, and the former operates in addition a daily except Sunday service between West Point, Va., a point on the York River, and Baltimore.

The commission holds that the applicants may and do compete with the steamer lines in which they have an interest. It finds, however, that the present operation of the steamer lines is in the interest of the public and that the carriers, with the exception of the Norfolk & Western, may continue their interest in the water lines. In connection with the Norfolk & Western, however, it is held that that carrier does and may compete with the Old Dominion and that the showing made by the applicant does not warrant a finding that a continuance of its participation in the operation of said company will not exclude, prevent, or reduce competition on the route by water, (41 I. C. C., 285.)

STATE COMMISSIONS

The Railroad Commission of Louisiana on September 14 will consider the adoption of Western Classification No. 54 and Supplements Numbers 1 and 2, for use on business moving between points west of the Mississippi river, and between points east of the Mississippi river, and points west of the Mississippi river.

The Railroad Commission of Louisiana will hold a hearing on September 14 to consider the amendment of the car service and demurrage rules to provide for a charge of $1 per car per day after the expiration of free time, except during the months of October to March inclusive, when a charge of $2 per car per day will be made.

The Railroad Commission of Louisiana will hold sessions on September 13, 1916, to consider the application of several carriers for the withdrawal from sale of interchangeable penny scrip books, form "P. S." The railroads do not believe there is any good reason why both the penny scrip books and the interchangeable individual mileage books, form "Z," should continue to be sold, and therefore agree to sell the interchangeable individual mileage books only, if the commission grants their application.

PERSONNEL OF COMMISSIONS

Ross Miller has been appointed engineer of the South Dakota Railroad Commission to succeed Joseph E. Love, resigned to go into other business.

COURT NEWS

Contributory Negligence of Child

The Michigan Supreme Court holds that a boy, 10 years old, of fair intelligence, is guilty of contributory negligence as a matter of law in attempting to crawl through a freight train, blocking a highway crossing, in reliance on its alleged custom to ring its bell before starting.—Lahnala v. Mineral Range (Mich.), 158 N. W., 838.

Switchyard Accident

An engine with a water tank attached was backing through a switchyard. There was a footboard across the front of the engine, and one across the rear of the tank. Two men were stationed, one on each end of the engine footboard, so that one could look ahead on each side of the engine. In an action by a switchman for injuries received by collision with the tank, the Minnesota Supreme Court held there was no negligence in failing to have another lookout on the tank footboard.—Beecroft v. Great Northern (Minn.), 158 N. W., 800.

Transportation of Liquor Into Dry Territory

In a penal action against a carrier under the Kentucky statute prohibiting the delivery of falsely marked packages of intoxicating liquor, or liquor intended for sale in "dry" territory, the Kentucky Court of Appeals holds that the carrier is liable only if its agent knew the package to be falsely marked or the purpose for which the liquor was to be used; and is not required to ascertain the purpose for which the liquor is to be used. "Knowingly," as used in the statute, means only such information as would cause a person of ordinary prudence to believe that the liquor was intended for sale contrary to law. In such an action evidence of the reputation of the consignee as an illicit vendor of intoxicating liquors is admissible; but evidence that he had a United States revenue license is inadmissible, unless accompanied by proof that the carrier's agent who made the delivery knew of such license. Knowledge of the carrier's agents at other points is insufficient.—American Express Co. v. Commonwealth (Ky.), 186 S. W., 887.

Railway Officers

Executive, Financial, Legal and Accounting

William B. Biddle, who has been elected first vice-president of the St. Louis-San Francisco Railway, was born on November 12, 1856, at Beloit, Wis. He was educated at Beloit and began railway work in 1878 as a freight brakeman on the Atchison, Topeka & Santa Fe, and was later station agent on the same road. In 1882 he was appointed chief clerk in the general freight office of the Atlantic & Pacific, now a part of the Santa Fe Coast Lines, and four years later became assistant general freight agent. The next year he was appointed division freight and passenger agent of the same road, and in 1888 he was appointed assistant general freight agent of the Atchison, Topeka & Santa Fe. From 1890 to 1894 he was assistant freight traffic manager, and later was made freight traffic manager of the same road. He was elected third vice-president of the Chicgo, Rock Island & Pacific on March 1, 1905, and in January, 1906, his jurisdiction was extended over the St. Louis & San Francisco, and the Chicago & Eastern Illinois. In December, 1910, when the Rock Island-Frisco properties were separated, he became vice-president of the St. Louis & San Francisco and the Chicago & Eastern Illinois, and later, with the receivership of the Frisco, Mr. Biddle was appointed one of the receivers and chief traffic officer with headquarters at St. Louis, Mo.



W. B. Biddle

The St. Louis-San Francisco Railway was incorporated on August 24, to succeed the St. Louis & San Francisco and the following officers were elected: W. C. Nixon, president, as commented on elsewhere in this issue; W. B. Biddle, first vice-president; E. D. Levy, second vice-president and general manager; N. M. Rice, third vice-president and C. W. Hillard, fourth vice-president.

Operating

C. J. Kavanagh has been appointed superintendent, District 2, of the Canadian Pacific, Eastern division, with office at Montreal, Que., vice J. M. Barrett, resigned.

W. M. Bacon has been appointed general manager and acting president of the Colorado, Wyoming & Eastern, with headquarters at Laramie, Wyo., vice J. M. Herbert, resigned to accept service with another company.

J. H. Nuelle, assistant general superintendent and chief engineer of the New York, Ontario & Western at Middletown, N. Y., has been appointed general superintendent, with headquarters at Middletown, succeeding E. Canfield, deceased.

J. A. Blackburn has been appointed assistant superintendent of the Western division of the Atchison, Topeka & Santa Fe, with headquarters at Dodge City, Kan., and B. G. Krebbs has been appointed acting trainmaster on the Western division, with headquarters at Dodge City.

O. R. Teague, superintendent of the Alabama division of the Seaboard Air Line at Savannah, Ga., has been appointed superintendent of the Florida division with headquarters at Tampa, vice T. W. Parsons, resigned to accept a position with another company. C. S. Patton, master mechanic at Savannah, has been appointed superintendent of the Alabama division with headquarters at Savannah, vice Mr. Teague, and S. M. Dutton has been appointed terminal trainmaster, with headquarters at Savannah.

Traffic

Frank H. Moser has been appointed coal freight agent of the Lehigh Valley, with office at New York.

J. T. Bowe has been appointed acting freight and passenger agent of the Trinity & Brazos Valley, with headquarters at Teague, Texas, to replace John A. Hulen, granted an indefinite leave of absence.

F. W. Myers has been appointed division freight agent of the Atchison, Topeka & Santa Fe, with headquarters at Pueblo, Colo., succeeding W. O. Skinner, and E. C. Kitching has been appointed general agent with headquarters at Atchison, Kan., succeeding Mr. Myers.

Donald Wilson, special agent in the traffic manager's office of the Long Island Railroad, has been appointed general freight agent, with headquarters at New York, and George F. Sump, chief clerk to the traffic manager, has been appointed assistant to the general freight agent.

George W. French, commercial agent, of the New York Central Fast Freight Lines, at Indianapolis, Ind., has been appointed commercial agent, with headquarters at Duluth, Minn. Vice S. J. Bigelow, deceased. Albert Stein has been appointed commercial agent, with headquarters at Indianapolis, vice Mr. French, and Kenneth A. Moore, has been appointed commercial agent, with headquarters at Cincinnati, Ohio.

A. L. Langdon, traffic manager and general freight agent of the Long Island Railroad, retired on August 31, under the pension rules of the company. The position of traffic manager has been discontinued, and the duties of that office will in future be performed by the general freight agent and the general passenger agent. Mr. Langdon was born in August, 1846, at Sugar Grove, Pa., and graduated from Randolph Academy, in June, 1863. He began railway work in November of the same year, as a clerk in the freight station of the Atlantic & Great Western, at Corry, Pa. He was promoted to agent of the same road in September, 1867, and in April, 1869, was appointed agent of the Empire Line. Five years later he was appointed soliciting agent of the Empire Line at Hagerstown, Md., and also soliciting agent of the Pennsylvania Railroad's fast local freight in September of the same year. He was promoted to general freight agent of the Cumberland Valley, at Chambersburg, Pa., in August, 1875, and in July, 1891, was transferred to Harrisburg in the same capacity. He then served as general freight agent of the Cumberland Valley and interior agent of the Great Southern Despatch at Harrisburg, Pa., and later as general freight agent and general eastern agent of the Great Southern Despatch. On June 15, 1903, Mr. Langdon was transferred to the Long Island Railroad as general freight agent, with headquarters at New York, and on February 1, 1905, he was promoted to traffic manager of the same road, from which position he now retires after nearly 53 years of continuous railway service.



A. L. Langdon

M. H. Jacobs, assistant general freight agent of the Western Maryland, at Pittsburgh, Pa., has been appointed general freight agent with office at Baltimore, Md., succeeding D. G. Gray, promoted. S. J. Lamoreux, commercial freight agent at Pittsburgh, succeeds Mr. Jacobs. T. H. Fee, freight tariff agent at Baltimore,

has been appointed assistant general freight agent, with headquarters at Baltimore. W. S. Burton has been appointed freight tariff agent with office at Baltimore, succeeding Mr. Fee. J. A. S. Wallace, commercial freight agent at Youngstown, Ohio, has been appointed commercial freight agent at Pittsburgh, Pa., succeeding Mr. Lamoreux and J. E. Sterling, freight agent at Pittsburgh, has been appointed commercial freight agent at Youngstown, Ohio, succeeding Mr. Wallace.

Engineering and Rolling Stock

J. A. Basiner has been appointed master mechanic of the Chicago, Aurora & DeKalb, with headquarters at Aurora, Ill., to succeed William E. Jones.

L. G. Wallis has been appointed engineer of construction of the Jacksonville Terminal Company, Jacksonville, Fla., and will be in charge of the erection of the new union station at that city, which is to cost $1,000,000.

R. E. Jackson, master mechanic of the Virginian Railway at Victoria, Va., has been appointed superintendent of motive power, with headquarters at Princeton, W. Va., vice F. T. Slayton, assigned to other duties.

Edmund Gelwix, formerly assistant engineer of the St. Louis & San Francisco, with headquarters at Springfield, Mo., has been appointed valuation engineer of the Kansas City, Clinton & Springfield with office at Springfield, Mo.

C. H. Norton, master mechanic of the Erie at Avon, N. Y., has been transferred as master mechanic to Susquehanna, Pa., and F. G. Wallace, general foreman at Dunmore, Pa., has been appointed master mechanic with office at Avon, succeeding Mr. Norton.

R. E. McCuen, assistant master mechanic of the Louisville & Nashville at West Lexington, Ky., has resigned to go into other business. B. W. Blue, mechanical foreman at West Lexington, has been appointed acting assistant master mechanic, vice Mr. McCuen. Effective September 1.

P. O. Wood, superintendent of locomotive performance of the St. Louis & San Francisco, has been appointed assistant general superintendent of motive power with headquarters at Springfield, Mo., and W. H. Malone, assistant superintendent of locomotive performance at Springfield, has been appointed superintendent of locomotive performance, succeeding Mr. Wood.

Purchasing

Hugh Greenfield has been appointed acting purchasing agent of the Duluth, Missabe & Northern, with headquarters at Duluth, Minn., succeeding Fred H. White, deceased.

THE SPANISH RAILWAY STRIKE.—The strike on the Northern Railway of Spain ended on July 20, the company agreeing to restore their posts to all men presenting themselves for duty before midnight on that date. The origin of the strike dates back to May, when the company voluntarily granted all hands a bonus of one month's pay. This was refused by the men, who demanded instead a 10 per cent increase in pay, which the company agreed to with effect from July 1. Later, further dissensions arose, the men's leaders alleging that the promised advance was in addition to the bonus, and rejecting the condition imposed by the company, that the advance should be contingent upon a continuance of prosperity. Strike notices were given, and expired on July 12, when a reduced service of trains was arranged and maintained with the aid of naval and military drivers and firemen, while the Government called upon all military reservists serving on the railways. On the 13th the Cortes were closed, and a state of siege was declared in Madrid, Barcelona and other large towns, constitutional guarantees being suspended. By the 15th, nearly all the main line mail and passenger services were being run, but goods traffic was seriously disorganized. Eventually, the Premier, Count Romanones, induced the men to submit their grievances to the Institute for Social Reforms and to return to work. The company has so far maintained its position and will give the advance previously offered while denying the men's pretended right to a fixed participation in the earnings. The outcome of the strike will be, it is said, a revision of the strike law tending to prevent stoppage of public services.

Equipment and Supplies

LOCOMOTIVES

THE PERE MARQUETTE is in the market for a number of locomotives.

THE NEW YORK, NEW HAVEN & HARTFORD has asked for prices on 28 Santa Fe type locomotives.

THE BOSTON & MAINE has ordered 2 electric locomotives from the Westinghouse Electric & Manufacturing Company for use in the Hoosac Tunnel.

FREIGHT CARS

THE CHICAGO & ALTON is reported as inquiring for 300 furniture cars.

WILSON & CO., Chicago, are in the market for 75 to 100 8,000-gal. tank cars.

THE NEW YORK CENTRAL has ordered 1,000 gondola cars from the Standard Steel Car Company.

THE MICHIGAN CENTRAL has ordered the Western Steel Car & Foundry Company to repair 500 freight cars.

THE MAHONING & SHENANGO has ordered one 36-ft. overhead line construction car from the Niles Car & Manufacturing Company.

THE ROBINSON CLAY PRODUCTS COMPANY, Chicago, has ordered 2 ore cars from the Western Steel Car & Foundry Company.

RUSSIAN GOVERNMENT.—Newman Erb, president of the Minneapolis & Saint Louis, is reported to be negotiating for the sale of a large number of second-hand box cars to the Russian Government.

PASSENGER CARS

THE NEW YORK, NEW HAVEN & HARTFORD has authorized the Osgood-Bradley Car Company to proceed with the construction of 60 coaches.

IRON AND STEEL

THE GRAND TRUNK has ordered 200 tons of bridge steel from the American Bridge Company.

THE CANADIAN PACIFIC has ordered 10,000 tons of rails from the United States Steel Corporation.

THE HAVANA CENTRAL has placed orders with the United States Steel Corporation for 10,000 tons of rails.

THE SOUTHERN RAILWAY has ordered 1,500 tons of steel from the McClintic Marshall Company for its Seneca river bridge.

THE BALTIMORE & OHIO has ordered 275 tons of steel from the American Bridge Company for a bridge at Defiance, Ohio.

THE BOSTON & MAINE has ordered 325 tons of steel from the American Bridge Company for shops at East Deerfield, Mass. It has also ordered 150 tons of bridge work from the Phoenix Bridge Works.

THE NEW YORK PUBLIC SERVICE COMMISSION for the First district will open bids on September 8 for the supply of special work for the Southern boulevard and Westchester avenue branch of the Lexington avenue subway.

MISCELLANEOUS

THE CHICAGO, BURLINGTON & QUINCY is in the market for 7,000,000 ft. of fir and other timber.

THE NORTH TEXAS & SANTA FE, a subsidiary of the Atchison, Topeka & Santa Fe, will be in the market for 320,000 cross ties, when its charter, now applied for, is granted.

Supply Trade News

The Chicago office of the Ashton Valve Company, Boston, Mass., will be located in the Transportation building on and after September 1.

Burton W. Mudge, president of Mudge & Co., Chicago, has also been elected president of the Safety First Manufacturing Company, Chicago.

Walter Chur, president and general manager of the American Railway Supply Company, New York, died Tuesday at his home in East Orange, N. J., after an illness of five months, of heart disease.

William E. Sharp, vice-president of the Grip Nut Company, Chicago, has been elected president of the company, succeeding E. R. Hibbard, retired. Howard H. Hibbard has been elected vice-president succeeding Mr. Sharp.

The Waynesboro Foundry & Machine Company, Waynesboro, Pa., is contemplating installing a new line of foundry equipment for the manufacture of a brass specialty. The company operates a brass, bronze and aluminum foundry.

W. E. Greenwood, whose appointment as assistant manager of the railway sales department of the Texas Company, with headquarters at New York, has already been announced, was born in New Orleans, La He was educated at Roanoke College, Salem, Va., and entered railroad service in 1894 as clerk in purchasing department of the Terminal Railroad Association of St. Louis. He left there January, 1898, to accept service in purchasing department of the Missouri, Kansas & Texas at St. Louis, Mo., as voucher clerk, becoming chief clerk in 1901. He left railway business in April, 1912, to accept the position of eastern representative of the railway sales department of the Texas Company, and was later appointed assistant manager of the railway sales department as above noted.



W. E. Greenwood

The Selby Safety Flag Company, St. Louis, Mo., is in receipt of orders from the Chicago, Peoria & St. Louis, the Southwestern (Texas), and the Kansas City, Mexico & Orient, for improved flagmen's signal outfits.

Directors of the American Locomotive Company have declared a quarterly dividend of 1¼ per cent on the common stock. This restores the common stock to a five per cent basis and is the first dividend to be paid since August, 1908.

W. L. Hayes, formerly assistant manager of the Cleveland, Ohio, district of the American Steel & Wire Company, has been appointed manager of the Chicago district, to succeed F. C. Gedge, deceased. W. C. Stone, formerly assistant manager of the Chicago district, has been appointed manager of the Cleveland, Ohio, district to succeed Mr. Hayes.

At the recent annual meeting of the stockholders of the United States Light & Heat Corporation, Niagara Falls, N. Y., the following board of directors were elected: Egbert H. Gold, J. Allan Smith, Ralph C. Caples, Henry W. Farnum, A. Henry Ackermann, Chauncey L. Lane, Keene H. Addington, James A. Roberts, Conrad Hubert, George G. Shepard, Edwin K. Gordon. The vote of confidence in favor of the present management was 371,079 out of 425,245 votes cast.

C. Furness Hately has been elected president of the National Surface Guard Company, Chicago, builders of steel surface railway cattle guards, succeeding the late James T. Hall. Mr. Hately was born in January, 1876, at Brantford, Ont. He received his preliminary education at Sidcut School, England, from 1886 to 1889. He attended Trinity College, Port Hope, Canada, from 1889 to 1893 and Shattuck School, Faribault, Minn., from 1894 to 1896. He then entered the banking business and was engaged in this line of endeavor until 1912 when he became interested in railway building in North Dakota. Later he became connected with the Midland Continental and remained until last February when he resigned. The business of the National Surface Guard Company will be considerably expanded, Mr. Hately having already let contracts for building and materials which will permit the company to increase its output to three times its present capacity.



C. F. Hately

TRADE PUBLICATIONS

Overhead Carrying Devices. The New Jersey Foundry & Machine Company, New York, in catalogue 88, gives illustrations, descriptions, capacities and price lists of its line of overhead carrying devices. There are included tracking, trolleys, hoists, cranes, buckets, cars, etc.

Locomotive Cranes.—The Brown Hoisting Machinery Company, Cleveland, Ohio, has just issued a booklet of 64 pages, which describes in detail its locomotive cranes and the various attachments which may be added for special uses. The book is illustrated with over 125 photographs showing this type of equipment engaged in a wide variety of operations.

Structural Timber.—The National Lumber Manufacturers' Association has issued a 70-page book by C. E. Paul on heavy timber mill construction buildings. The book describes mill construction, and the manner in which it is built and gives information concerning the cost. The book should be of much value to those interested in this character of construction.

Chicago, Burlington & Quincy.—The passenger department of this company has issued two illustrated booklets describing the points of interest to the traveler in Yellowstone Park, and giving definite information as to rates, accommodations and routes. One pamphlet is a general description of the park, and the other describes the attractions of the Cody road to the park.

American Steel Foundries.—This company has just issued an attractive 24-page booklet entitled "Making Davis Wheels." In substance it describes a trip through the plant, viewing the processes of work on car wheels from the raw materials to the finished product. The pamphlet is not only interesting and informative, but is well printed, the illustrations being especially interesting.

Taps and Dies.—The Greenfield Tap & Die Corporation, Greenfield, Mass., has issued a booklet relative to the "Gun" tap which it has recently perfected and put upon the market. This tap is especially strong and efficient. Its cutting edges at the point are ground at an angle to the axis of the tap in order to cut with a shearing action. This throws the chips, unbroken, ahead of the tap instead of allowing them to collect in and clog the flutes. A two or three flute construction is thus possible and much shallower flutes are possible than in the ordinary tap. The tap may be reground again and again on the angular cutting edges and may be used until only two or three threads remain to maintain the lead. A description of the tap appeared in the Railway Mechanical Engineer for August, page 429.

Railway Construction

CHARLESTON SOUTHERN.—Seaboard Air Line.

DENVER & RIO GRANDE.—This company is building a new classification yard at Salt Lake City, Utah. There will be six tracks each 4,350 ft. long. About six miles of new tracks will be laid. The excavation, amounting to between 30,000 and 40,000 cu. yd., will be done by the company's own forces.

HILLSBOROUGH-PINELLIS INTERURBAN.—A contract has been let to make surveys, it is said, for a proposed line from Tampa, Fla., to Tarpon Springs and other points in Hillsborough county, in all, about 60 miles. M. Carabello, secretary, Tampa.

NEW YORK SUBWAYS.—Bids will be opened by the New York Public Service Commission, First district, on September 13, for the construction of Section No. 1-B of Route No. 12, a part of the Brighton Beach connection between the Fourth avenue subway and the Brighton Beach Railroad in the borough of Brooklyn.

The commission will open bids on September 8 for the installation of tracks in the Seventh avenue branch of the Seventh Avenue-Lexington Avenue Rapid Transit Railroad, from Times square in the borough of Manhattan to the Battery, and through a number of streets, and under the East river to Clark street, in the borough of Brooklyn, thence up Clark and other streets to a connection with the first subway in Brooklyn near Fulton and Joralemon streets. Bids are also wanted on the same date for the supply of special work, order No. 10 (calling for frogs and switches) for use in the construction of the Southern boulevard and Westchester avenue branch of the Lexington avenue subway.

NORTH CAROLINA ROADS.—Plans are being made to build a line from Kinston, N. C., south towards Wilmington, under a charter granted some time ago. F. I. Sutton, secretary, Kinston Chamber of Commerce, may be addressed.

RICHMOND, FREDERICKSBURG & POTOMAC.—A contract has been let to Winston & Co. for excavation work on the James River branch. The estimated cost of the work is $150,000.

RICHMOND, RAPPAHANNOCK & NORTHERN.—Announcement is made that nearly all the money needed to insure the construction of the line from West Point, Va., northeast to Urbanna, 17 miles, has been subscribed, and it is expected that construction work will be started at once. A contract for building the line has been given to Winston & Co., Richmond. (December 24, page 1,218).

SEABOARD AIR LINE.—The Charleston Southern, building from Charleston, S. C., southwest, to Savannah, Ga., 88 miles, has track laid on 83 miles. Approaches to nearly all the bridges have been finished, and it is expected that the line will be open for business in October. The Jefferson Construction Company, Charleston, is carrying out the construction work.

SOUTHERN PACIFIC.—This company is building an extension from Crafton, Cal., to Greenspot, Cal., a distance of three miles.

SOUTHERN RAILWAY.—A contract is reported let by this company to Robert Russell, Charlotte, N. C., to build about 1.3 miles of revised line at Belmont, N. C.

TENNESSEE ROADS.—A logging line, to be between three and four miles long, will be built in Stewart county, Tenn. John K. Ferguson, Paducah, Ky., may be addressed.

WEST COAST ELECTRIC.—Rights of way are being secured, it is said, for an electric line to be built from Tampa, Fla., south via Palmetto, Bradentown, Sarasota and Bee Ridge to Venice, about 75 miles. A. E. Townsend, general manager, Sarasota.

RAILWAY STRUCTURES

BALTIMORE, MD.—The Philadelphia, Baltimore & Maryland has given a contract to the Singer-Pentz Company, Baltimore, to build a station at Edmondson avenue and Bentalou street. It will be 30 ft. by 70 ft. and will be constructed of tapestry brick with green Spanish tile roof and composition floor. The cost of the work will be $17,500. (August 18, p. 309.)

BELMONT, N. C.—The Southern Railway has given a contract to Robert Russell, Charlotte, N. C., it is said, to build a deck plate girder bridge over the Catawba river at Belmont.

CHARLOTTE, N. C.—Work has been started by the Seaboard Air Line on improvements, including an extension to the Charlotte passenger station. The A. M. Walkup Company, Richmond, has the contract for the work, which will be pushed to completion. (August 25, page 350.)

CORINTH, MISS.—A contract has been given to A. H. Patrick, Corinth, to build a brick station at Corinth, for the joint use of the Southern Railway and the Mobile & Ohio. The structure is to be two stories high, 50 ft. wide and 256 ft. long. The improvements will cost about $25,000.

ELLAVILLE, GA.—The Central of Georgia is building a new freight and passenger station at Ellaville. The work is being carried out by company forces. (August 25, page 350).

GLENN'S FERRY, IDAHO.—The Oregon Short Line will erect a 5-stall addition to its roundhouse at this point.

GRAND RAPIDS, WIS.—The W. A. Hansen Construction Company of Chippewa Falls, Wis., has been awarded a contract by the Minneapolis, St. Paul & Sault Ste. Marie for the erection of a new freight and passenger depot at this point. The estimated cost is $45,000.

MT. HOLLY, N. C.—The Piedmont & Northern has let contracts to the Virginia Bridge & Iron Company, Roanoke, Va., for the steel work, and to Porter & Boyd, Charlotte, N. C., for the concrete foundation of a bridge, to be built over the Catawba river, at Mount Holly. There will be 2 60-ft. and 6 90-ft. deck plate girder spans. The work will cost about $83,000.

OGDENSBURG, N. Y.—The New York Central is building, with its own forces, a pile and timber car ferry slip with a protecting stone crib, on the St. Lawrence river at Ogdensburg. The slip will be 40 ft. wide, 215 ft. long and the work will cost about $22,000.

UNION, MISS.—Land has been secured by the Meridian & Memphis in Union, it is said, to be used as the site of a new station.

ARGENTINE-BOLIVIAN RAILWAY CONSTRUCTION.—By a decree of June 24, 1916, the Argentine Government has approved the plans and estimates prepared by the administration of state railways for the extension of the Central Norte line to the Bolivian frontier to meet the La Quiaca-Tupiza line. The plans call for the construction of 1,568 feet of track, a culvert and a stone bridge across the La Quiaca river, and an expenditure of $30,109. This includes one-half of the cost of the bridge, as the Bolivian Government will pay the other half.

NORTH SIBERIAN RAILWAY.—A project was recently approved by the Russian Government for the construction of a privately-owned railway to serve the big timber areas of Northern Russia and the mining regions of the Northern Ural Mountains. The new line will run from Archangel, the Russian White Sea port that has come into such prominence during the present war, through Pinega, across the Urals, and through Northern Siberia to Chenshevsky on the River Ob. There will also be a branch from the Ural chain to Nadezhdinsk. The length of the line will be about 1,000 miles. Owing to the difficult nature of the region to be traversed, the estimated cost of construction is $50,000,000.

PASSENGER CARS FOR THE AUSTRALIAN TRANSCONTINENTAL LINE.—The federal minister for home affairs is making preparations for the provision of the requisite rolling stock required for the Australian East-West Transcontinental Railway when it is opened next year. His intention was that the coaches should be wholly of steel, and a deputation was sent to the United States to study the subject. In deference to the wishes of manufacturers in Australia, the idea of securing the equipment in the United States was abandoned, and tenders are shortly to be asked for 20 cars with steel underframes. The bodies are to be of wood, as the minister recognizes that the material for all steel bodies could not be obtained in Australia.

Railway Financial News

Boston & Maine.—In an interview in the Boston Post, President Hustis is quoted in part as follows:

"The reorganization committee has no new plan to offer; the leased lines have not submitted any new proposition; we have received no assurances that the noteholders would consent to another extension of the notes nor that the bankers would recommend it again. It is my personal opinion that the notes will not be extended again. I see no hope for anything but a receivership. This is no bluff nor threat.

"I am not surprised that the leased lines interests regard it as a bluff, for the notes have been extended again and again, 11 times already, I think it is, and it is only natural that they should expect another extension.

"But it is not merely a matter of extending the notes. The Boston & Maine cannot go on forever with its present unsound financial structure, nor with its physical condition as it is today. Why postpone the evil day?

"The offer of certain leased lines to accept a reduction in their fixed rentals and their proposition that they be given first preference in the stock of the new corporation were both impracticable. The former would not reduce the annual fixed charges of the system more than $400,000 a year, and would fail to give the Boston & Maine the necessary credit. And it would be impossible to secure underwriters if the first preference stock plan were accepted."

C. W. Crooker, junior counsel for the Boston & Maine Minority Stockholders Association of Boston, is quoted as follows:

"We shall fight any such petition from the drop of the hat to the last ditch. There is no excuse for the directors' refusal to make some effort to secure a renewal of credit. The application for a receivership and a receivership are two quite different things, and the proceedings will give us a splendid opportunity to present our case."

Judge William L. Putnam, of the United States Circuit Court at Boston, on August 29, allowed an order for a temporary receivership, and appointed as receiver, President James H. Hustis.

Judge Putnam ruled that the Boston & Maine Minority Stockholders' Association was not entitled to intervene in the case. Judge Putnam also withdrew from the case because of an affidavit, which he stated attacked the integrity of the court. This bill which was filed by Asa P. French, counsel for Francis V. Streeter, of Medford, Mass., a minority stockholder, asserted that Judge Putnam's personal relations with directors of the road were so close and friendly that his decision would naturally be tinged with bias. Judge Putnam ordered the bill sent to the federal district attorney, with directions that it be placed before the grand jury for investigation.

Chicago, Indianapolis & Louisville.—Stockholders are to vote on September 10 on the question of taking over the Indianapolis & Louisville, the Indiana Stone Railroad and the Chicago & Wabash Valley. These companies are now subsidiaries of the Chicago, Indianapolis & Louisville.

Chicago, Rock Island & Pacific.—N. L. Amster, in the Wall Street Journal of August 25, denies emphatically that the article, "Reorganization by Anaesthesia," by Theodore Prince, mentioned in these columns in the issue of August 18, has any foundation in truth. Mr. Amster points out that the Chicago, Rock Island & Pacific is not now bankrupt in the sense of not being able to earn its fixed charges, nor ever has been.

A statement given out by the banking interests, which have been working on the plan for reorganization, is in part as follows:

The report that Speyer & Co. and Hayden, Stone & Co. have served notice that they will withdraw as underwriters of the Rock Island reorganization plan is officially denied. There have been no changes in the situation. The Prosser-Speyer-Hayden reorganization plan has received a check by the decision of Judge Geiger of Chicago allowing the Peabody committee for the railway's refunding bonds to file a foreclosure bill. This does not imply, however, that the plan has been abandoned, and it is anticipated that the reorganization committee will oppose the Peabody committee if a foreclosure bill is filed.

Connecticut River Railroad.—Voluntary receivership for this company was sought in a petition filed in the United States Circuit Court at Boston on August 30. The Connecticut River is leased to the Boston & Maine for a period of 99 years, beginning January 1, 1893, under a 10 per cent rental agreement. See also Boston & Maine.

Grand Trunk.—Blair & Co., New York, who recently bought from the Grand Trunk $2,000,000 5 per cent two-year collateral notes, are offering them at 98½, yielding about 5.80 per cent interest on the investment. The notes are secured specifically by the deposit of $3,265,000 par value Grand Trunk 4 per cent consolidated debenture stock.

Los Angeles & Salt Lake.—See San Pedro, Los Angeles & Salt Lake.

New York, New Haven & Hartford.—Kissel, Kinnicutt & Co., New York, are offering 4 per cent debenture bonds, due April 1, 1922, of the New York, New Haven & Hartford, at 98¼, yielding about 5 per cent interest on the investment. These bonds have been issued in exchange for the 4 per cent 15-year European loan of 1907, par for par. This issue is limited to $27,985,000, and at present there are $12,225,000 outstanding.

As counsel for five Massachusetts stockholders of the New Haven, Henry A. Wise began, August 30, in the United States District Court at New York, a liability and restitution suit in equity for more than $160,000,000 against ex-officers, directors, and counsel of the New York, New Haven & Hartford. The suit is based on testimony taken at the recent Sherman law criminal prosecution in the dissolution suit, and at hearings before the Interstate Commerce Commission and various state commissions.

Plaintiffs in the suit hold New Haven stock worth $1,250,000. They are Edwin Adams, Julius C. Morse, George C. Fisk, James F. Ray, and Mary M. Clark.

Among the defendants are: William Rockefeller, Charles M. Pratt, Lewis Cass Ledyard, George Macculloch Miller, James S. Hemingway, A. Heaton Robertson, Frederick F. Brewster, Charles F. Brooker, James S. Elton, Henry K. McHarg, Edward D. Robbins, John L. Billard, Robert W. Taft, and Charles S. Mellen, J. Pierpont Morgan, Herbert L. Satterlee. William P. Hamilton and Lewis Cass Ledyard are named defendants as executors under the will of J. Pierpont Morgan. Florence A. V. Twombly is named a defendant as executrix under the will of Hamilton McK. Twombly, deceased. The railroad company is also named as a defendant.

St. Louis-San Francisco Railway.—A new company bearing this name was incorporated in Misosuri, August 24, to succeed the St. Louis & San Francisco Railroad, the properties of which were sold under foreclosure, July 19, to representatives of the reorganization managers. The authorized capital stock of the new company is $450,000,000, of which $200,000,000 is to be preferred and the remainder common stock.

San Pedro, Los Angeles & Salt Lake.—This company has changed its name to the Los Angeles & Salt Lake.

French Helmets.—French armor steel helmets are stamped out of the best sheet steel; four pieces make up a helmet—the cap, the peak, the neck protector, and the crest; and they are riveted together and sprayed with a grey-blue paint, just sufficient to prevent rust. Each helmet requires about 2 lb. of steel and a little aluminum to stiffen the lining. Over 3,500,000 helmets have been made.

The Suez Canal.—The tonnage passing through the Suez Canal last year decreased to 4,143,340 tons, as compared with 4,767,729 tons in 1914. The revenue collected declined from $25,000,000 in 1913 to $24,000,000 in 1914 and $17,000,000 in 1915. The number of ships which passed through the canal last year was 3,708 or 904 less than in 1914. The number of British vessels which used the canal in 1914 was 3,078, of an aggregate of 12,910,278 tons; in 1913, 2,736 vessels, aggregating 11,656,038 tons, passed through the waterway. The German tonnage using the canal declined from 3,352,287 tons in 1913 to 2,118,946 tons in 1914; while in 1915 there was, of course, a complete cessation of German traffic.

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*Illustrated.

"We must all hang together, or assuredly we shall all hang separately."—Benjamin Franklin, at the signing of the Declaration of Independence, July 4, 1776.

The Day of Reckoning Will Come

Was the sentiment embodied in the words of Benjamin Franklin responsible for the wild scramble of the Congress in its efforts to meet the peremptory demands of the President of the United States and the leaders of four labor organizations? What a pity that in this great industrial crisis there was not at the seat of government one man who had the courage to put aside his political aspirations, as he saw them, to defend the public against the pillage of its treasury—because it is the public who must replace the additional millions that will now automatically flow into the pockets of men who are at this moment the highest paid workingmen in America. It is inconceivable, however, that those who were seemingly ready to sell their respective birthrights for a few thousands of votes should profit from their act which, while aimed at the railways, in effect amounts to an undermining of the whole industrial structure of the country. The reckoning will be far more serious than would have been the results from a strike.

Good Work by the Conference Committee

The railway managements of the United States would be guilty of base ingratitude if they did not feel and manifest profound appreciation of the work done by the Conference Committee of the Railways in handling the recent wage controversy. Under the chairmanship of Elisha Lee this committee had to conduct the most important negotiations with organized labor ever carried on, and it did its work with a unity, a skill and a courage that merit the warmest admiration and praise. From the beginning to the end of the negotiations it kept the leaders of the labor brotherhoods on the defensive, and at last so completely outgeneraled them that they had to go to Congress with their threat of a strike. The fact that, with the unexpected assistance of the President of the United States, the brotherhoods finally managed to get their counterfeit "eight-hour day" enacted into law, reflects credit rather than discredit on the Conference Committee of the Railways, for it shows that without the assistance of the government they were unable to win. It required great ability and great courage to deal with the situation efficiently; and it may be said without exaggeration that the committee did deal with it as efficiently as it is conceivable any committee could have done.

Locomotive Boiler Design

While much has been done in recent years to increase the capacity of the locomotive boiler, only a comparatively small amount of attention has been given to the necessity for improvement in firebox design and arrangement. That this particular feature has been to a large extent overlooked is undoubtedly due to a lack of understanding as to exactly what takes place in the firebox. For instance, J. T. Anthony, in an article on Locomotive Boiler Efficiency, in the September issue of the Railway Mechanical Engineer, points out that with a low rate of combustion—60 lb. of coal per square foot of grate per hour—a locomotive with 70 sq. ft. of grate area will require 14,000 cu. ft. of air per minute. A little consideration of what this means ought to act as a spur in encouraging mechanical department officers to give more attention to the percentage of air openings through the grates; on many roads the losses are great because of incomplete combustion caused by inadequate air openings. Mr. Anthony points out that if the gases leave the fuel bed at a temperature of 2,200 deg. F., approximately 75,000 cu. ft. of gas will be liberated per minute, with a velocity which will probably approach 7,500 ft. per minute, or 125 ft. per second, which is equivalent to 85 miles an hour. At higher rates of combustion these figures would be doubled and even tripled. The seriousness of the problem is also indicated by approaching the situation from a somewhat different angle. With the same low rate of combustion, Mr. Anthony points out that in the firebox with 70 sq. ft. of grate and a volume of 300 cu. ft. the products of combustion arising from the fuel bed have a volume sufficient to fill the firebox completely four times per second. This means that the average time available for the burning of each particle of gas or coal dust under favorable conditions is only one-fourth of a second. While the problem confronting mechanical department officers is a big one, increased efficiency in combustion

will add to the earning power of the locomotive, as well as improve the economy of operation, and is therefore an object much to be desired.

Demurrage in California

The Pacific Car Demurrage Bureau, with its three-dollar rate as a potent factor in keeping cars moving, continues to give lessons to the rest of country in freight-car efficiency. A special report, covering four months' business, is noticed in another column. While the demurrage problem continues difficult, there should be some comfort for the weary station agent in figures, like those for California, which show that it is possible in a movement of 10,000 cars to dispose of 9,826 of them within two days. And of the 174 cars detained, 106 were held only one day beyond the free time. Detention by consignees, however, has not been reduced to this encouraging percentage for, as appears from this report, no less than 52 per cent of the cars making up the total of nearly half a million in California were reported at the loading (not the unloading) station. And nearly 30 per cent of all cars were released before the counting of time began—that is, before the clock hand had had time, following the placing of the car, to reach the hour of 7 a. m. The greater part of this superior promptness was, no doubt, shown in loading, not unloading, for of 10,000 cars placed for loading only 64 were held beyond the free time. For unloading, 282 in 10,000 were held beyond the free limit. California has a marked advantage in its complete freedom from the wasteful "average agreement," which, in distinction from "straight" demurrage is here naively characterized as the "crooked rule." On the Coast, as everywhere, the European war has introduced abnormal conditions; but Manager E. E. Mote expresses the determination to keep up his campaign until the overtime cars are reduced to less than one in a hundred.

THE TRIUMPH OF MOBOCRACY

THE Reign of Terror is ended, at least temporarily, and the curtain has been rung down on the most disgraceful scene ever enacted in the drama of American government and American life. The labor brotherhoods were unable, by their threats, to overawe the presidents and managers of the railways. There is still some courage, manhood and civic spirit left in this country. But most of these qualities seem to have departed from the city of Washington when the presidents and managers of the railways went away to prepare for the strike. There were a few men in Congress who had the bravery and patriotism to arise and tell the truth about the proceedings leading up to and attending the passage of the so-called "eight-hour" law, but the number was pitifully few. It was insufficient; and democratic government fell, and there was erected where it stood a servile autocracy headed by Gompers and the heads of the railway labor unions. When any body of men get enough power to coerce a government they themselves become the real government.

Have the American people enough sense to realize what has taken place? Have they enough intelligence to appreciate that so long as such odious class legislation remains on the statute books orderly democratic government will be in abeyance? Have they enough energy, patriotism and understanding of their own interests to arise, rescue the nation from the vile clutches which have seized upon it and mete out punishment for what has occurred to the weak, the unscrupulous and the desperate men, both inside and outside the government, who are responsible for it?

The struggle ceased weeks ago to be a contest between the railways and a part of their employees. It became then, and it still is, and it will continue to be, until it is finished, a contest between reason and brute strength, between order and disorder, between fairness and unfairness, between light and darkness, between courage and cowardice, between democracy and mobocracy. Thus far the forces of darkness have prevailed over the forces of light, the principle of coercion has triumphed over the principle of reason, the principle of disorder over that of order, and mobocracy has been enthroned. But the struggle is not over. We believe the American people understand what has been done, and why and how it has been done, and that the forces of darkness in winning this battle have lost a campaign.

It is unnecessary to review the developments which led up to the recent crisis. The train service employees, constituting less than one-fifth of the employees of the railways, and only a fractional part of the workers of the country, demanded an enormous increase in wages. To avarice they added hypocrisy, and to hypocrisy deceit, by claiming that they were asking for an eight-hour day. The railways refused the demands, but repeatedly offered to arbitrate. The employees as repeatedly refused to arbitrate and threatened to strike; and all the circumstances now indicate that throughout they were encouraged and abetted in their course by high officers of the present national administration, who, the circumstances indicate, had conspired to make political capital out of this awful menace to the nation's welfare, and even to its life. Almost the moment the controversy reached President Wilson he threw overboard the principle of arbitration, although it had been sanctioned by a national law which he himself had signed, and insisted that the railways should grant—a real eight-hour day? No; the counterfeit eight-hour day the train employees were demanding. Did he decide to take this step after hearing both sides? On the contrary, he told the railway officers he had decided on what he would do before he ever saw them.

The railway presidents who had refused to yield to the menaces of the labor unions, also refused to cower before the President's doctrinaire declamations or his attempts to exercise a coercive power not constitutionally belonging to his office. They determined to stand to the last for the principle of arbitration; and they were gratified and strengthened by soon finding that the intelligent public opinion of the country with practical unanimity supported them.

As soon as the decision reached by the railway presidents became known, the heads of the brotherhoods, without the slightest warning to President Wilson, issued the order for a strike to occur in less than 10 days.

Then was witnessed the most shameful performance in American history. About one hundred years ago the British soldiery captured and burned the city of Washington, while the President, his cabinet and Congress fled and hid in the surrounding woods. That was the most shameful event in American history up to this time. But at least those who then captured the national capital, chased out the President and Congress and burned the capital were a foreign foe and the government did not under their coercion pass laws that outraged the sense of justice and the rights, and burdened the resources, of the American people. In every particular the recent capture of the national capital and its consequences were more disgraceful and terrible than its destruction by the British. A handful of men representing about 400,000 of our own citizens descended upon the capital and the halls of legislation. They surrounded them with the menace of force as truly as if they had had guns in their hands. They threatened to destroy the property of every man and concern in the country by stopping railway transportation. Would not a factory be as truly destroyed by cutting it off from its raw materials and its markets as by dropping explosive shells upon it? They threatened to put to death thousands of unoffending men, women and children? May not people

be as truly murdered by starving them as by shooting or bayoneting them?

Let us not deceive ourselves as to what occurred. It was an insurrection of 400,000 men who threatened to ruin and starve the nation unless the nation's Congress within a week passed a law to promote the selfish interest of the insurrectionists at the expense of the rest of the people. It was a revolution; for it was successful and successful insurrection is revolution.

That Congress understood the true significance of the situation is shown by its own conduct. While the terrorists, led by a reincarnation of Robespierre in the person of the arid, loquacious, lean and tearful Garretson, and a reincarnation of Marat in the person of the strike-thirsty Carter, stood over Congress with a stop-watch in one hand and a threat of national ruin, starvation and anarchy in the other, that "august deliberative body" lashed itself into breathlessness and lather by feverish and desperate efforts to pass the "eight-hour day" law before the time-limit fixed should expire! Occasionally one of the Four Tyrants, or perhaps Dictator Gompers himself, would prick the "greatest legislative body in the world" in the seat of the pants, and the way in which, under this form of inspiration, it accelerated its "deliberations" was a wonder to all observers.

What a spectacle! And what have the President and Congress done to prevent a repetition of it? Nothing. Two years ago a strike was imminent which would have tied up all the railways west of Chicago. Only the intervention of President Wilson, and the withdrawal of the railways from their position, for patriotic reasons, and at the urgent request of the President himself, prevented that strike. But nothing was done to prevent strikes on railways. On the contrary, something was done that greatly increased the danger of them. This was the passage by Congress and the signing by President Wilson of the provision of the Clayton act expressly exempting labor organizations from the operation of the anti-trust law. Thus encouraged, the train service brotherhoods formed the most gigantic conspiracy against the peace and welfare of the United States that has been entered into since the Civil war, and by it brought the country to the brink of ruin. After the order for a strike was issued, President Wilson went to Congress for legislation to prevent it. He asked for a law to forbid strikes or lockouts in train service prior to public investigations of the merits of the controversies, for a so-called "eight-hour day" law, and for a law to provide for any increase in railway rates which the increase in wages might necessitate. Congress passed the bill to establish a fraudulent eight-hour day and, without protest from the President, ditched the rest of his program. In other words, it passed the legislation demanded by and for the benefit of those who were threatening to wreck the nation's industry and starve its people, while it gave scant considerations to the bill intended to prevent such crises from recurring. And why did Congress do this? Because our Robespierre, our Marat and their fellow terrorists objected! They said that to provide that controversies must be investigated on behalf of the public before strikes were called, with the resulting wreckage of the nation's industry and murder of its women and little children, would be to reduce to "involuntary servitude" those who prefer to strike first and investigate afterward. One hundred million people must be left forever at the mercy of 400,000, rather than that when the 400,000 happen to feel like striking they shall be required to postpone doing so until some governmental body shall ascertain what they feel like striking about. This is fit logic to be used in a home for the feeble-minded; and yet it might be thought, from the developments in Washington, that it convinced Congress.

But it did not convince Congress. Congress was working with a pistol at its head. Nor, in view of the recent developments, does all this idiotic talk about "involuntary servitude" convince the American public. The practice of putting restraints on those who disturb the public peace and threaten the public welfare is not unknown in civilized countries; and in every country which is to remain civilized the restraints imposed must be proportionate to the demonstrated need for them.

With a pistol at its head and a bayonet between its coat tails, Congress, with an unprecedented celerity, rushed through the so-called "eight-hour day" bill. The defects of this measure are so palpable and vital that it is inconceivable it can ever go into effect. First, it was passed under duress. Everybody in the United States knows that Congress never seriously considered enacting such a law until President Wilson demanded that this price be paid instantly to buy off those who were threatening a strike. Second, the law does not provide for an eight-hour day. It merely provides that the railways shall pay employees in their train service a day's pay for eight hours' work. It does not provide that train employees shall give the railways eight hours' work for a day's pay. It does not provide that any train employee shall quit work at the end of eight hours, but by requiring them to be paid overtime after eight hours it clearly contemplates that they shall work any number of hours up to the 16-hour limit fixed by the hours of service act. Third, it attempts to provide that the wages paid for the basic 10-hour day shall be the minimum paid for the basic eight-hour day. Is there a lawyer in the United States who believes such a provision is constitutional? It is certainly the first law of such a character relating to the hours and wages of any class of employees of private business concerns ever passed in the history of the world. Fourth, the law discriminates between the 18 per cent of railway employees who come within its terms and the 82 per cent who do not, for it says nothing about the work or wages of the latter.

Confronted with such a statute, passed under such conditions, the course which the railways should and must adopt is plain. They should and must take it into the courts at the first opportunity and carry it, if necessary, to the Supreme Court of the United States. An unconstitutional "law" is no law. It is merely a piece of paper on which printers' ink has been wasted.

If the inconceivable should happen, and this measure should be upheld, the second step which the railways should take also is plain. Their present contracts with the train employees are based on miles run as well as hours worked. In other words, any employee whose train runs 100 miles receives a day's wage, even though the run takes only two or three hours. The employees having got a law passed which bases their wages entirely on hours, the railways, if this measure is upheld, should promptly cancel all provisions in the schedules pertaining to the mileage basis of compensation, and require all their men in train service, passenger and freight, to work or hold themselves in readiness to work at least eight hours a day. These employees have seen fit to refuse to accept arbitration of their demands and to threaten to tie up all the railways of the country and to prostrate its commerce and industry in order to gain their end. Their threat of a strike having proved futile, they went to Washington and coerced the government. The railway managements thus far have met the issue squarely. They should continue to do so. Since these employees are so anxious to have their wages based on hours they should be given full opportunity, if this law is upheld, to work at least eight hours a day.

Doubtless, if the railways attempt entirely to abolish the

mileage basis of pay the country will be confronted again with a threat of a strike. Very good. It is unfortunate from the standpoint of both the railways and the country that the strike was averted this time, since it had to be averted by the destruction of our form of government and the substitution of a mobocracy. The managements are confident that if the strike had come they would have won it, and if the train employees should strike rather than work eight hours a day there can be no doubt that the railways would whip them. The railways should take the stand from now on that if they must pay a day's wage for eight hours' work they must be given at least eight hours' work for a day's pay, and they should maintain this stand regardless of consequences.

There are those, including President Wilson, who talk ominously about government ownership if the railways defend their rights. Better far, from the standpoint of the managements and owners of the railways, that we should go to government ownership, than that they should be subjected to the sort of government to which they have been subjected within the last month. If organized labor and the government are to unite to despoil the railways of every right which has been supposed to be inherent in private property, then the sooner, from the standpoint of the owners of the railways, that government ownership comes the better. If the public can believe that the ownership and management of the railways by a government which will do what the government of the United States has done in this instance is desirable, then the public has so little intelligence and sense of fairness that the railways are bound to be ruined under private ownership, anyway. And what, in heaven's name, must we expect to be the results of the ownership and management of the railways by such a mobocracy as that now in the saddle?

When the presidents and managers of the railways were engaged in a desperate struggle with the railway brotherhoods and the government at Washington, they were adjured by the press and the business interests of the entire country to stand fast for sound principles and for their own rights and those of the public. Now that the principle of voluntary arbitration has been overthrown, what are the business interests and the people, who in the long run will be the most injured, going to do about it? A handful of men organized into labor unions and headed by Gompers, Garretson, Stone, Carter and Lee, are in control of the government. The organized labor led by Gompers is not employed on the railways. It is employed in other industries. If the railway labor unions, aided by Gompers and his crowd, can do to the railways what they have done, then Gompers and his crowd, aided by the railway labor unions, can do the same thing to the other industries of the country. Furthermore, if this fraudulent eight-hour day law applying to train service stands the burden of the increased expense of railway operation which it will cause it will be passed along to the travelers and shippers of the country, and finally to the consuming public. Are the business interests of the country and the public generally going to supinely sit down and let the mobocracy keep control of their government, or are they going to rise in rebellion and rescue their government? Are they going to leave the law in such shape that conspiracies on the part of capital to restrain commerce and industry will continue to be pronounced and punished as illegal, while far more gigantic and harmful conspiracies of labor to restrain commerce and industry will continue to remain legal and to receive even the open, active support of the President and Congress? Are they going to leave the law in such shape that railway employees, whenever they feel like it, can stop the operation of the railways, prostrate commerce and industry and starve the people?

The spokesmen of organized labor, Gompers and the rest of them, already are making public speeches, boasting of the successful outrage which they have perpetrated. The nation, on the other hand, seems to feel so relieved that the strike has been averted as to be disposed to go to sleep again and do nothing to prevent the early recurrence of a similar crisis. If the mobocracy is to be overthrown and the government is to be restored to the people, the people must have leadership. Is there enough statesmanship left in the country to afford this leadership, or has the country so long been dominated by cheap, weak, cowardly, self-seeking politicians that statesmanship has ceased to exist, and that under the mobocracy the nation will continue to sink lower and lower until government of the people, for the people and by the people, contrary to Lincoln's prediction, will perish from the earth?

CANADIAN PACIFIC

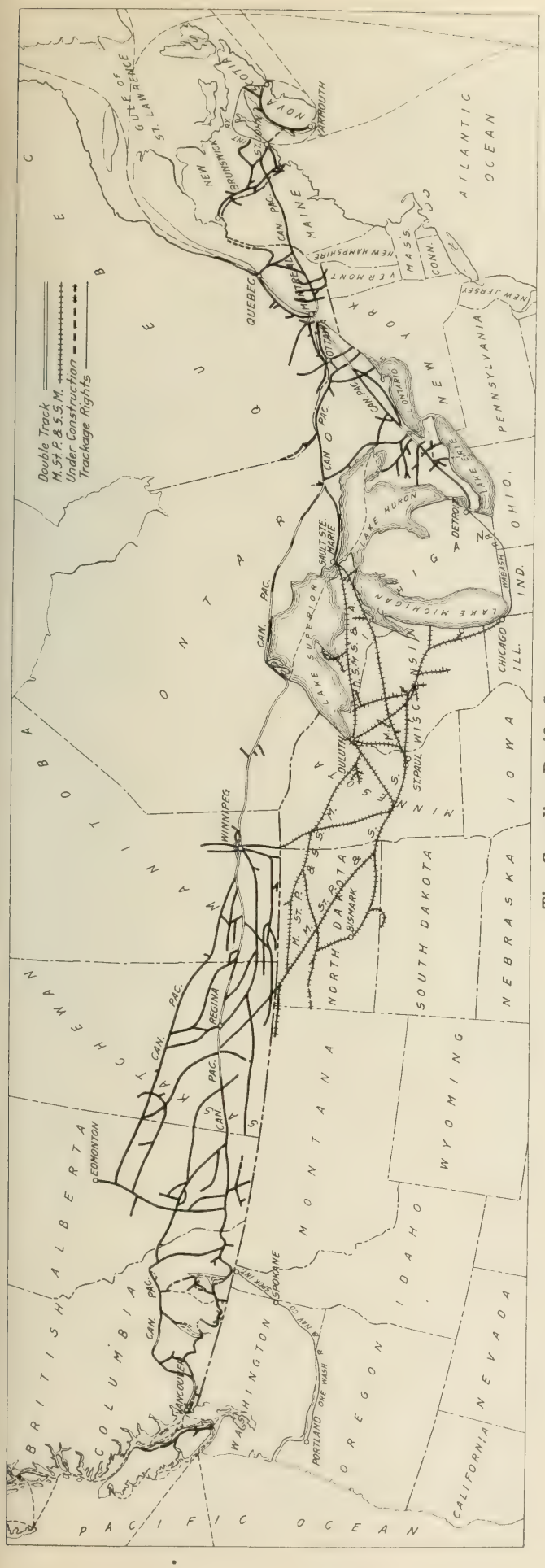
DURING the first year of the war there were doubts as to the ability of the Canadian Pacific to continue to earn its 10 per cent dividends. It was only by the most drastic economies, amounting to what might be called a *tour de force* in railroad operation, that a surplus of less than $90,000 over dividend requirements was shown for the fiscal year ended June 30, 1915. The contrast between this barely scraping through and a surplus after the payment of dividends for the fiscal year ended June 30, 1916, of $15,444,000 is striking.

Total operating revenues, including revenues from sleeping cars, express and telegraph, amounted to $129,482,000 in 1916, as against $98,865,000 in 1915. Passenger revenue was about the same in both years. The gain of nearly $29,000,000 was all in freight revenue. Maintenance expenses were abnormally low in 1915. In 1916 maintenance of way and structures cost $14,672,000, comparing with $11,401,000 spent on this account in 1915. Maintenance of equipment cost $16,696,000 in 1916, comparing with $11,308,000 in 1915. It will be seen therefore that approximately $8,500,000 more was spent on maintenance in 1916 than in 1915. Total operating expenses in 1916 amounted to $80,256,000, comparing with $65,291,000 in 1915, a difference of about $15,000,000. In other words, doing the same passenger business and earning $29,000,000 more from freight, the Canadian Pacific spent only about $6,500,000 more on transportation—the out of pocket cost of handling the business.

But this does not begin to tell the story. The average ton-mile receipts in 1916 were but 6.41 mills, as compared with 7.73 mills in 1915, a decrease of 17.08 per cent. The ton mileage of revenue freight was 78.71 per cent greater in 1916 than in 1915. With this increase of 78.71 per cent in ton mileage of freight there was an increase of about 25 per cent in transportation expenses. This is one of the most remarkable showings ever made by an American railroad management.

The two most important factors in the attainment of the results which were secured in 1916 were slower movement of freight trains and heavier car loading. No new locomotives were bought, there was no grade reduction. Since by far the greatest increase in tonnage came in the tonnage of grain and of manufactured articles and of lumber, presumably the proportion of unbalanced traffic in 1916 was almost, if not quite, as great as in 1915. The average trainload in 1916 was 503 tons, as again 411 tons in 1915, an increase of 93 tons, or 22.61 per cent.

The slower movement of freight trains undoubtedly contributed very much toward this phenomenal gain in train loading and was also a very important factor in holding down many of the transportation expenses other than those caused directly by the movement of additional trains. The man-



The Canadian Pacific System

agement put in force a rigid rule that freight trains should not run a mile in less than two minutes. The speed of freight trains was checked not only by division and district officers, but special checks were made continuously. To enforce an order such as this on a railroad operating 12,993 miles means the most remarkable driving power by the officer in charge of operation that can be conceived of. Whether or not the Canadian Pacific was anywhere near 100 per cent perfect in getting this order enforced is questionable, but that a really wonderful measure of success was attained is self-evident from the figures in the 1916 annual report. Prior to the control of speed the average number of cars derailed from broken wheels or other causes in one derailment was six. After the speed control order had been put into effect, out of 152 instances of broken wheels, axles, running gear or other defects the average number of cars derailed was half a car.

The average number of tons of revenue freight per loaded car was 22.90 in 1916 and 19.15 in 1915. This is an increase of nearly 20 per cent in loading per loaded car. In carrying 78.71 per cent more ton miles in 1916 than in 1915 there was an increase of only 49.34 per cent in loaded car mileage. There was an increase of 94.06 per cent in empty car mileage, which goes to bear out the supposition that the increase in trainload was not helped in the slightest by a better balanced traffic.

In all probability the Canadian Pacific management was helped to a very appreciable extent in obtaining both the enforcement of the low speed order for freight trains and the heavier loading of cars by the fact that the patriotism of both employees and shippers could be appealed to for help. Employees are more than ordinarily desirous of co-operating with their officers—the spirit of military obedience to rules was probably easier to enforce on the Canadian Pacific in both 1915 and 1916 than ever before or than it ever has been on any large railroad system in the United States. Shippers also felt the necessity of co-operating with the Canadian Pacific management to the end that the country as a whole might benefit. Making full allowance, however, for the outside help that the management would not have had had it not been for war conditions, the drastic cutting down in expenses in 1915 and the enforcement of two rules, simple in themselves, but for that very reason extraordinarily hard to enforce, on a system of nearly 13,000 miles of railroad running from the Atlantic Coast to the Pacific, will go down in American railroad history a monument to the men at the head of the management which achieved it.

The balance sheet at the end of 1916 looks again like the balance sheet which in the years previous to 1915 was expected in a Canadian Pacific annual report. Cash on hand amounted to $41,582,000 with no loans and bills payable and, what is unique for a great railroad company, practically no mortgage bonds outstanding.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Mileage operated	12,994	12,917
Passenger revenue	$24,690,652	$24,044,283
Freight revenue	89,654,405	60,737,737
Total operating revenues	129,481,886	98,865,210
Maint. of way and structures	14,671,791	11,400,539
Maintenance of equipment	16,695,956	11,307,965
Transportation expenses	38,915,382	32,083,170
Traffic expenses	2,798,699	2,990,164
General expenses	4,014,754	3,963,203
Total operating expenses	80,255,965	65,290,582
Net operating income	49,225,920	33,574,627
Fixed charges	10,306,196	10,446,510
Net income	38,919,724	23,128,117
Transferred to special income	1,923,289	1,494,151
Dividends*	21,427,277	22,419,051
Surplus	15,444,759	$6,915

*Following its regular practice the Canadian Pacific declared in both 1915 and 1916 three per cent on the ordinary stock out of special income not included in dividends in the above table.

Letters to the Editor

DR. DUDLEY DESERVING OF THANKS

PITTSBURGH, Pa.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Dr. P. H. Dudley deserves thanks for disclosing to the rail manufacturers the results of his extended investigations of some of the causes of transverse fissures in rolled steel rails. Dr. Dudley advises reheating the bloom as a help which, of course, is correct and partially effective. There is, however, considerable doubt as to that factor regularly controling the transformation activity of a heterogeneous condition of the metal through the head during completion, or absolutely eliminating the transmitted effect of the gag.

On January 31, 1908, the writer contributed an article to the *Railroad Age Gazette* entitled "A Compound Rail." In that article certain effective progressive remedies in rail rolling were recommended, mainly for the purpose of minimizing irregular transformation of the metal in the rail head. While certain physical fundamentals were implied—but not explained at length—they can be read into almost all recent developments in rail betterment. For instance, it is well known that during rolling the heat works outward as the metal is progressively reduced, and when a metal reduction is equal to and accompanied by a corresponding equal drop in temperature, the workable state of the metal is naturally extended to a state in rolling where absolute control of the granular transformation is secured (because there is no longitudinal tension) and a homogeneous structure is "traped" before enlargement of grain takes place; thus internal strain is avoided. Therefore, a figure of symmetrical proportions will always admit of a regular progressive reduction at a satisfactory natural relation in temperature. That is why an unbalanced figure must be finished hurriedly, before figurative distortion is excessive and at the expense of good structural attainment.

Our standard type of rail is a continual aggravator of discrepancies that mystify the investigator who would eliminate the troubles without altering the general shape of the section.

A. W. HEINLE.

THE GRAPHIC TRAIN SHEET

HAILEYVILLE, Okla.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

"The Graphic Train Sheet." These words have passed through my mind several times since I read them in the *Railway Age Gazette* of June 23. Can it be that after 15 years of train despatching a new form of train sheet with a few squares and templets will afford me substantial aid?

When an engineer dropped off of his engine and told the operator that his engine was leaking badly and he did not know whether he could get her in, could I lay down a templet and tell when he would be at the terminal?

If a drawbar was pulled out on the main track and held a fast passenger train, could I, by laying down a templet, secure any information as to when the track would be clear and how to change the meeting points? Nay, verily. Neither would such action assist in making better meeting points between the local and a drag, or between a light engine and one with half a train. As far as making temporary schedules is concerned, it would be of no value because the despatcher, keeping in mind a certain speed, frames his schedules in his mind; and that process is followed closely by the mechanical process of distribution to the offices. Very few despatchers of experience, and who have worked on a division long enough to become acquainted with it, stop to figure out a schedule on paper before putting it out.

As for checking speed schedules, the time at the different stations shows for itself, and any one familiar with speed would readily discover any violation of restrictions. Again, where the telegraph offices are far apart, as at night, the use of the templet would not show that the engineer did not violate speed restrictions at some place where there was good track or a favorable descending grade. No mechanical device will ever be invented that will improve train despatching.

J. L. COSS.

ACCURACY IN CAR RECORDS

SHREVEPORT, La.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

At one time our office was burdened and overworked, due to so many incorrect car numbers and initials shown on the conductors' wheel reports, and agents' interchange reports. These errors had to be corrected; this often necessitated sending out tracers, all of which consumed time. For the past two years we have been keeping close check of errors, bulletining the performance made by our people.

During March, 1916, there was shown on the conductors' wheel reports the initials and number of 15,389 cars handled; out of this number we found but 20 incorrect numbers and initials, which figures about .0013 of one per cent imperfect records.

Our situation with interchange reports was equally as creditable for March; 8,471 cars were actually handled through the interchange, with only 5 open, or imperfect, records, or .00059 of one per cent.

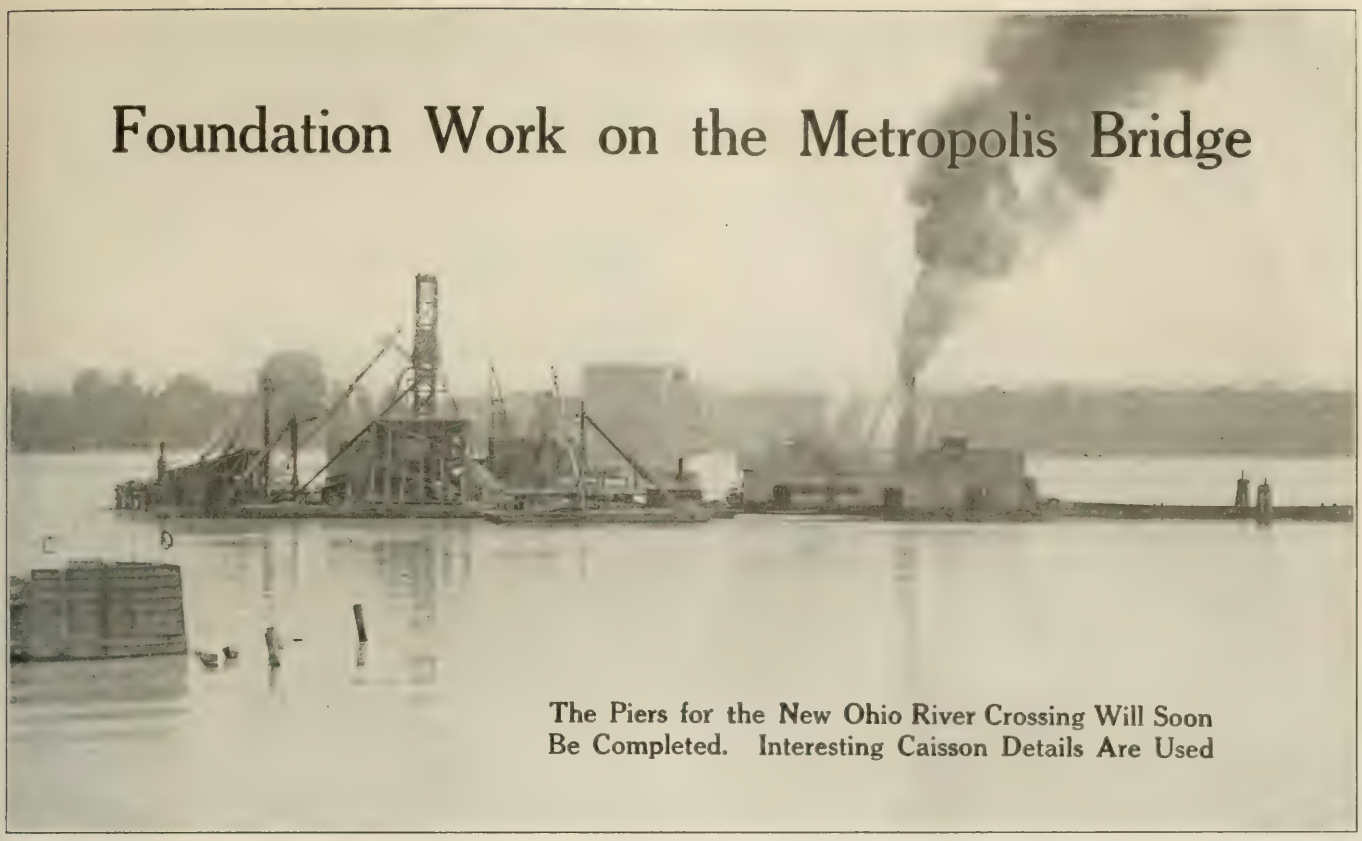
Our campaign against wrong numbers and initials has, as above stated, been in effect during the past two years, and has resulted in receiving almost perfect information to post our records. Good records are the fundamental starting point in car accounting work. The rest of the duties are predicated on and emanate from car records. If they are accurate and complete it has the tendency of minimizing the necessity for corrections in per diem settlements, and all car accountants are aware that the per diem situation, as a whole, is deplorable. And this without any reference to the colossal amount of labor involved in handling the per diem claims, and the fact that the car owner is deprived of from one month to five years of the earnings on his car while in possession of the handling line which is unable to make proper adjustments because the records are incorrect; meanwhile a lot of time and letter writing are wasted without results or accomplishing closing out the open, or wrong record. We dare say unsettled per diem in the United States and Canada will exceed four million dollars.

Good records are essential and are the prime factor in avoiding a voluminous amount of work.

E. F. BUCHANAN,
Car Accountant, Louisiana Railway & Navigation Company.

ROUTE FOR NEW RAILWAY IN COLOMBIA.—The Minister of Public Works of Colombia has adopted for the proposed railway from Cali to Popayan the route recommended by a committee of the Colombian Society of Engineers in a recent number of the Diario Oficial. This route, which is almost wholly in the valley of the Cauca river, was found to be the shortest and most practicable of the various routes suggested by the Pacific Railway in a report to the Colombian Government in 1915. With the completion of the railway to Popayan, the capital of the Department of Cauca and the terminus of an old commercial road running south through Ecuador, an important region would be opened to shipping through the port of Buenaventura.

Foundation Work on the Metropolis Bridge



The Piers for the New Ohio River Crossing Will Soon Be Completed. Interesting Caisson Details Are Used

Construction Plant at Pier 4

THE work on the Metropolis bridge across the Ohio river, which is being built jointly by the Chicago, Burlington & Quincy and the Nashville, Chattanooga & St. Louis, is progressing rapidly. The viaduct approaches at each end have been completed, the caissons of all but one of the piers for the substructure of the river bridge have been sealed, the shafts of piers 1, 2, 6, 7 and 8 have been completed, the neatwork on piers 3 and 4 is well up and the sinking of the caisson for pier 5, the last one to be started, is now in progress. The steel for the deck span between piers 7 and 8 is erected and swung and work on false work for the record-breaking 720-ft. clear span, between piers 6 and 7, has been started. A brief general description of this bridge appeared in the *Railway Age Gazette* of July 23, 1915, and more detailed information with respect to the viaduct and the steel work was given in the *Railway Age Gazette* of May 12, 1916, page 1025. Like other large bridges over the Mississippi river or any of its larger tributaries, on which work has been under way during the last two years, the progress has been hampered materially on account of the unprecedented duration of high water conditions.

An accompanying drawing shows the outline and dimensions of pier 6, the largest one in the bridge. It is 173 ft. high from the cutting edge of the caisson to the top of the coping and contains about 15,700 cu. yd. of concrete. The top of the pier is 65 ft. long by 19 ft. wide. The shaft has ends of a semi-circular section for a distance of 42 ft. from the top of the coping down to the top of the starling and the length of the pier just under the starling coping is 77 ft. 7 in. At the bottom, the pier spreads by a series of offsets to a footing having a length of 110 ft. and a width of 60 ft. This great bearing area is necessary to keep the pressures within limits consistent for the material available for the support of the piers. The foundation is sand and gravel. Bed rock in this locality could not be utilized for the foundations as it is located at an average distance of about 250 ft. below low water level.

The piers are entirely of concrete, no stone masonry being used although for the sake of appearance they are given a bush-hammer finish. The entire surface of the piers is reinforced with a net work of one-inch bars, placed two feet center to center both horizontally and vertically. These bars are anchored into the body of the pier at intervals of 2 ft. horizontally and 4 ft. vertically by hook bars extending into the piers. Above the starling these hook bars are continuous from face to face.

The Caissons

Owing to the large dimensions of the footing the caissons are of large proportions and had to be designed and built to transmit the vertical load of the piers, which is distributed over a smaller central area, to the friction surfaces of the four sides. The distribution of the load thus imposed on the caissons before sealing is taken care of by a reinforced concrete slab, 19 ft. in thickness, which completely fills the space inside of the shell above the roof of the working chamber. This slab is reinforced by a grillage of 1¼-in. reinforcing bars at the bottom and by a frame work of steel trusses placed vertically in both longitudinal and transverse directions with a spacing of 11 ft. center to center. However, the principal office of the steel frames was to stiffen the caisson and support the roof of the working chamber until the concrete was placed and had set.

The accompanying drawing shows the details of the caisson for pier No. 5. This was the last one sunk and embodies certain modifications from those previously used as a result of the experience gained in the sinking of the earlier caissons. The greatest difference was made in the side walls. The caisson shown in the drawing has walls consisting of three thickness of 12-in. by 12- in. timbers, which are placed vertically in the outer and the inner layers and horizontally in the middle layer. The superimposed load from the trusses is applied by means of large cast iron distributing shoes of a design commonly used for the bearings of short span girder

bridges. This load is taken by the middle or horizontally-placed layer of timbers and is transmitted to the outer layer by means of mortices formed by offsetting two courses of the horizontal timbers 2 in. into the outside layer.

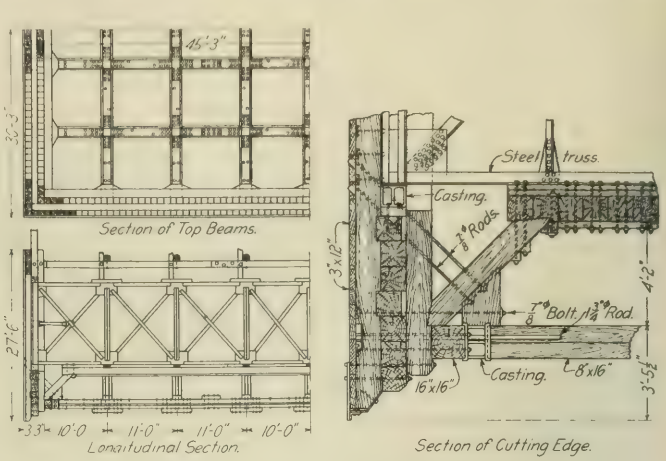
In the earlier caissons the walls consisted of two thicknesses of timber, the outer layer horizontal and the inner one vertical, the load being applied to the inner layer. The change in design was made because of some difficulty experienced in the earlier design through a tendency of the horizontal joints between the outside timbers to open as a result of the skin friction.

The roof of the working chamber consists of 12-in. by 12-in. timbers supported by bolts from the bottom flanges of the



Piers 6 and 7

steel trusses and is connected to the side walls by a solid wall of 12-in. by 12-in. knee braces framed to the roof and the side walls. The walls are bridged by a system of transverse and longitudinal struts spaced 11 ft. center to center in each direction. These struts consist of 8-in. by 16-in. timbers 12-in. timbers, braced in the plane of every fourth course by a system of longitudinal and transverse struts, 11 ft. center to center. The removal of the walls as soon as the concrete work had been completed above the water line was accomplished by sawing off the struts that passed through the concrete work of the pier and by removing the bolts that held the cofferdam down. Cables were provided to prevent the

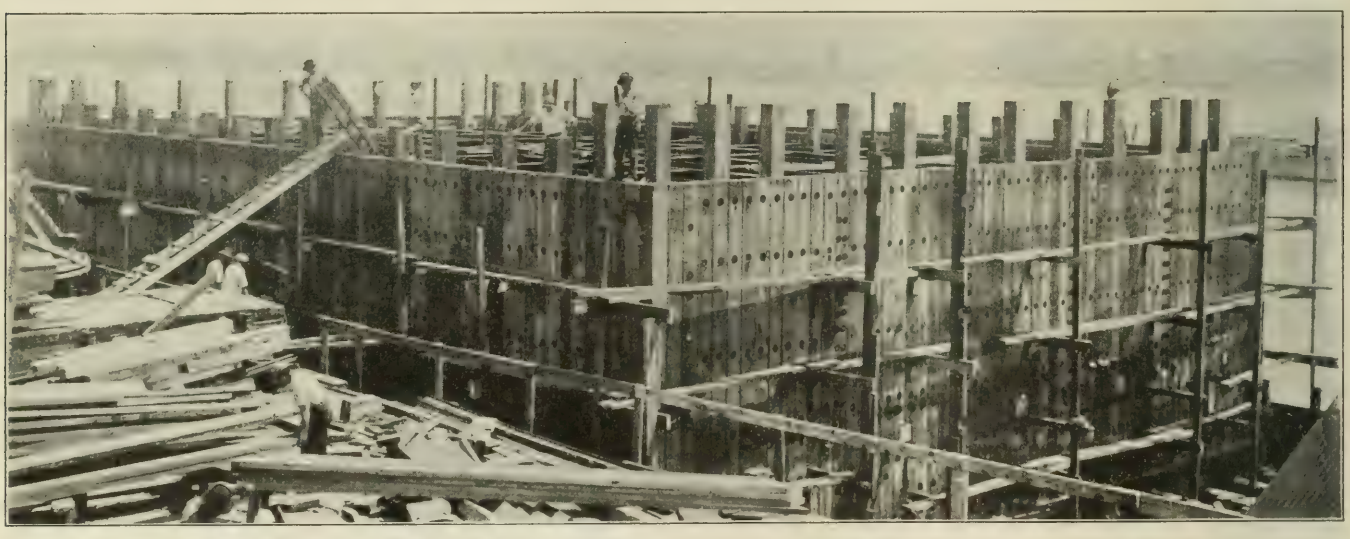


Details of the Caisson for Pier 5

floating of the cofferdam until the workmen, who were removing the fastenings, could reach a place of safety. The use of cables also made it possible to float the cofferdam slowly.

Construction Methods and Plant

With the exception of the caisson for pier 1 where the ground surface is above water at ordinary stages, all of the caissons were built in a floating dry dock or pontoon, in which they were towed into position. One of the accompany-



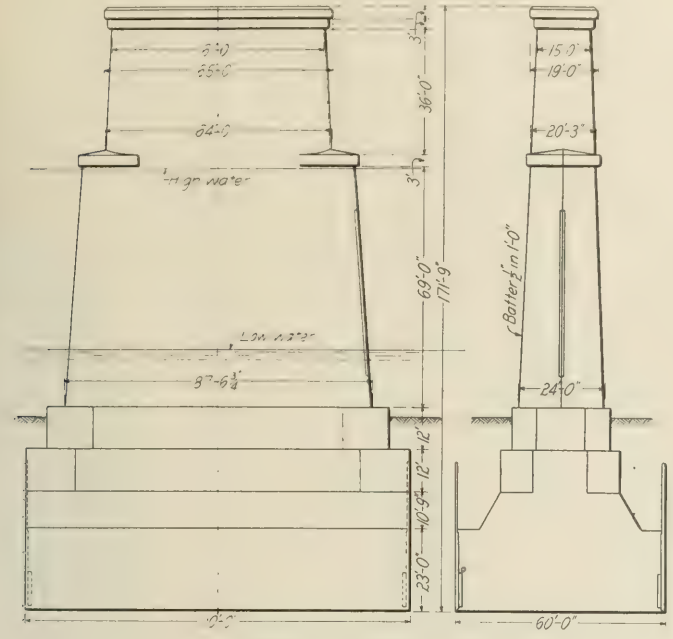
Building the Caisson for Pier 5 at the Construction Dock

laid flatwise one on the other and taking bearing on a 16-in. by 16-in. girt through cast iron bearing shoes similar to those used for the vertical loads. A tie rod 1¾ in. in diameter is provided on each side of each strut.

A cofferdam of the same horizontal dimensions as the caisson extends for a height of 32 ft. above the top of the latter. Advantage was taken of the fact that the pier above the top of the caisson slab does not occupy the full section of the cofferdam to build the cofferdams in such a way that considerable portions could be saved and re-used. They consisted of horizontal courses of 12-in. by 12-in. and 8-in. by

ing photographs shows the caisson for pier 5 in the pontoon, the latter being a barge with a hold of sufficient depth to obtain the desired bouyancy. For the purpose of sinking the pontoon to permit the caissons to be floated out, the former was equipped with six narrow wooden tanks, three on each side, that could be filled with water. They were supported on posts at a height sufficient to keep them out of the water when the pontoons had been submerged a sufficient amount to release the caissons. About 90 tons of water was required for this purpose. While the caissons are being built, the pontoons are moored at a construction dock, extend-

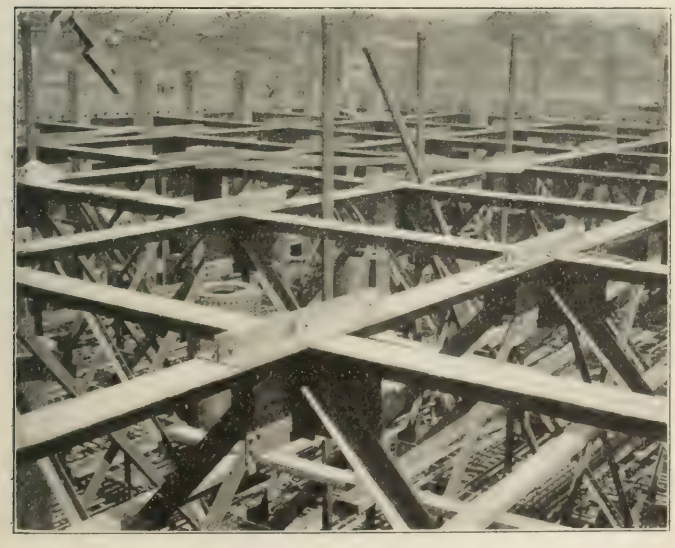
ing some 400 ft. out into the river from the Illinois side. This dock and the track serving it are supported on a pile trestle structure at a sufficient elevation to keep it out of the water at high stages of the river. The trestle passes in close proximity to piers 1 and 2 and its presence greatly facilitated the work on these two piers. An accompanying photograph



Outline of Pier 6

shows the stiff-leg derrick erected on the trestles to facilitate the concreting of pier No. 2.

Two of the photographs show work in progress on pier 4 and indicate the character of the plant provided, nearly all of which is carried on barges. One barge is equipped with a power plant which contains boilers, air compressors, gen-



Steel Framework for the Caisson Slab

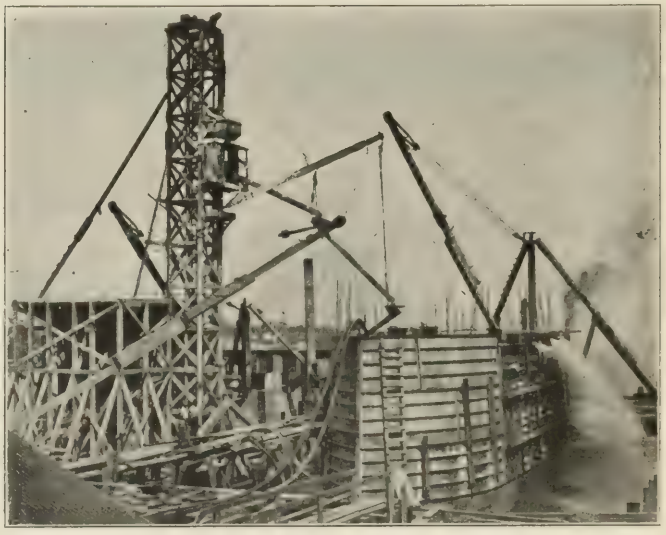
erators for electric lights and the hospital lock. The second is fitted as a double deck barge for the accommodation of the sand hogs and a third is fitted with a complete concrete plant. In addition two auxiliary stiff-leg derricks are provided, one supported on a barge and the other on a pile falsework surrounding the pier. These derricks are used to handle the form sections, piping, lock sections, etc.

The concrete plant is on a barge 36 ft. by 110 ft., in the middle of which a one cubic-yard mixer is mounted under a large bin for the storage of the concrete aggregate, which in this case is a bar-run Tennessee river gravel. A 75-ft. tower is provided adjacent to the gravel bin for elevating the concrete to a spout hopper, a derrick boom being mounted on the side of the tower for the support of and shifting of the concrete spout. At one end of the barge a house is provided containing a 60-hp. boiler and a hoisting engine for operating a stiff-leg derrick used to unload gravel from the gravel barges to the storage bin. This hoisting engine also operates a self-dumping cement car which runs on a track at the other end of the barge to transport the cement from the cement barge to a charging platform located just above the mixer. This concrete plant has made runs of 700 cu. yd. of concrete in 12 hours.

Several of the photographs show the character of the forms used, most of which are Blaw sectional flanged steel forms, braced by steel studs and wales. The forms for the two battered faces of the pier are universal and could be used on any pier at any height. The sections for the starling could be used only once on each pier but were re-used on the several piers in turn. The circular section portions of the pier above the starlings were built with wooden forms lined with sheet metal.

Construction Progress

Seven of the piers have pneumatic foundations. Pier 8 on the Kentucky end of the bridge stands back a considerable

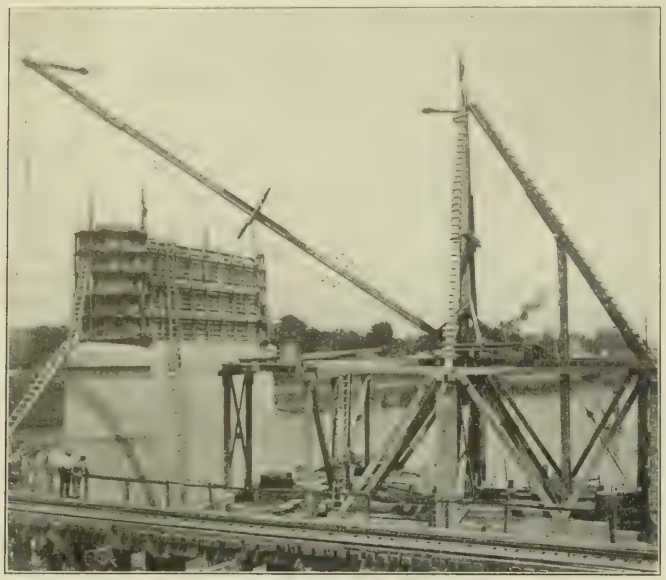


Sinking Pier 4, Concrete Plant at the Left

distance from the normal shore line and was sunk by means of an open caisson. Work was commenced on pier 1 in July, 1915, and the sinking of the last caisson, that for pier 5, is now in progress. Pier 1 was landed and sealed in the middle of September, 1915, pier 7 on the opposite bank of the river, was commenced shortly afterward and landed early in December. The work on pier 6 was commenced early in October and work on piers 2 and 3 was started in December, but operations of all three of these piers had to be discontinued about the end of the year on account of the high water. At pier 6 the water was 60 ft. deep, and the penetration was 33½ ft. giving a total immersion of 93½ ft. The stage of the water, which went to 43 ft. on the gage during January and February, did not drop to a stage that made it feasible to recommence the work until about the first of March, when work was resumed on piers 3 and 6. The sinking of these was completed about the first of April and for pier 2 in the latter part of May. On June 7 work was started on pier 4 which was landed on July 22 of this year with a maximum immersion of 113.2 ft., the depth of penetration

being 73 ft. and the depth of water 40.2 ft. The greatest penetration was obtained at pier 2 which went 96 ft. below the bed of the river at the site of the pier.

This bridge was designed under the direction of the late C. H. Cartlidge, chief engineer of the Paducah & Illinois Railroad, and the construction was prosecuted under his direction until the time of his death. The bridge work is now under the direction of Ralph Modjeski, who had served as consulting engineer on the project, with the construction



Construction Plant at Pier 2

under the immediate direction of C. R. Fickes, chief engineer of the Paducah & Illinois Railroad. A. Engh, assistant bridge engineer, Chicago, Burlington & Quincy, has been in direct charge of the designing. The Union Bridge & Construction Company, Kansas City, is the contractor for the substructure.

FOUR MONTHS' DEMURRAGE RECORD IN CALIFORNIA

E. E. Mote, manager of the Pacific Car Demurrage Bureau, San Francisco, Cal., has prepared for the American Railway Association a special report on the doings of his bureau for the four months ending May 31, 1916, in which he shows that the number of cars held beyond the free time at the stations under his authority, was 2.21 per cent of the whole number reported, this being the record of 632,006 cars recorded during the four months.

In the state of California, where, on nearly all traffic, the demurrage rate is $3 per car per day, the percentage was only 1.74. The average percentage held overtime in Arizona was 3.55, in New Mexico 4.06 and in Oregon, 8.37. The report calls attention to the fact that these percentages are based on the total number of cars subject to demurrage rules, including those released before the free time expired.

The special temporary rate of $2 a car, after the fifth day, double the ordinary rate, which was allowed by the Interstate Commerce Commission because of freight congestion, was in force during the period covered by this report.

The demurrage records take account of a car from 7 a. m. on the day after the car is placed; but cars are often released by consignors and occasionally by consignees, prior to that hour, and these are included in the statement contained in the report, so that the table includes 8 time items, namely: released before the beginning of free time; released the first day; released the second day; released the first charge day; second charge day; third charge day; fourth charge day; and fifth charge day or later.

Mr. Mote says that by keeping careful records of all cars, including those released within the free time, sums aggregating thousands of dollars in demurrage have been collected which would have been lost if agents had not been required to report these cars.

In California, Arizona and New Mexico, oil tanks are allowed only 24 hours' free time. In California $3 is the rate on all commodities, but no demurrage is charged on traffic going to ocean steamers. In Arizona the rates are the same as in California. In New Mexico the rate is $3 on tank cars, but is only $1 on all other cars. In Oregon the rate is $2 on intrastate traffic and $1 on interstate traffic. In Oregon the average agreement is allowed on both intrastate and interstate traffic.

In California more than half the total number represents cars held for loading; but less than 1 per cent of these cars were held overtime, whereas 2.82 per cent of the cars held for unloading were held overtime. The 1.74 per cent of all cars reported held overtime is made up from three classes, namely, cars held for loading, cars held for unloading and cars held for reconsignment, the latter being 3.31 per cent of all cars reported. Of cars released before the expiration of the free time, in California 29.45 per cent were released before the free time began to run; 50.99 per cent on the first free day; 19.56 on the second free day. Of the cars held overtime, 60.89 per cent were released on the first charge day, 20.40 per cent on the second charge day, 8.67 per cent on the third charge day; 3.90 per cent on the fourth charge day and 6.14 per cent on the fifth charge day or later.

A separate table is given, showing the number of cars containing freight to be delivered to coastwise and trans-Pacific steamers. On coastwise freight a period of five days is allowed free. In this traffic the total number of cars was 4,907, of which 213 were held 599 days overtime, and collections were made amounting to $1,737. Of trans-Pacific freight, the number of cars was 7,352, of which 5,453 were released within 15 days (average number of days 4.48), while the number of cars held over 15 days was 1,899. If demurrage had been charged after 15 days the collections on this trans-Pacific freight would have been $242,856. This sum, however, does not represent the whole of the loss on these cars, as it was nothing unusual for freight to be held 100 days before reaching the port of exit. In many cases export freight was unloaded and stored in order to secure the use of the cars, or to avoid the payment of per diem. There has been a movement to limit the free time on trans-Pacific business to 15 days, but it has not yet been agreed to by all of the competing lines.

The very much larger detention in Oregon than in California—8.37 per cent of the cars as compared with 1.74 per cent—is attributed to the lower rates and to the average agreement.

In California 34 per cent of the cars held overtime contained hay, potatoes, grain, fruits and vegetables; commodities held for market conditions. Sand, rock, cement, etc.—articles used in building highways—made up 41 per cent, and 3 per cent of the cars contained coal. Many coal dealers found it cheaper to pay $3 a day and sack the coal in the car rather than unload and rehandle it. Four per cent of the cars contained automobiles; and sums of $60, $90, and in one case $132, have been paid in demurrage on cars containing automobiles. One dealer interested in this traffic says that there ought to be a rate of $10 a day on such cars.

The commodities just referred to make up 82 per cent of the California record; the other 18 per cent includes all sorts of commodities. The smallness of the number of cars detained with miscellaneous freight is held by Mr. Mote to prove that the high demurrage rate has forced the general public to

provide facilities necessary to unload their freight promptly.

On intrastate traffic, except in New Mexico, demurrage has to be cancelled whenever there is inclement weather during the first two days; and within the period of four months, $3,143 has been refunded, but interstate cars at the same places and during the same time have been released promptly.

Freight business has been disturbed very generally by the lack of ocean vessels due to the European war, and to the blockade of the Panama Canal. These two factors caused some increase in the number of cars held overtime.

Mr. Mote repeats his conviction that a high demurrage rate is necessary; that the average agreement, which he calls the "crooked rule," should be abolished; that allowances on account of weather conditions should be abolished; and that ocean carriers should accept responsibility for the detention of freight cars.

LIGHT SIGNALS ON 440 MILES OF ROAD

The Chicago, Milwaukee & St. Paul, in electrifying 440 miles of its main line in Montana, an extensive and unique work with which the readers of the *Railway Age Gazette* are already well acquainted, has adopted lights for its block signals, both for the day and the night indications, doing away entirely with motion or shape signals (semaphores), and the installation, the longest single installation of light signals ever made, is now nearing completion. Work on the electrification had progressed sufficiently in the early part of 1915 for a decision to be reached as to the signaling required. The existing signals, worked by direct-current apparatus, had to be replaced by a. c. equipment. In order to rearrange the signals for more satisfactory operation, and



Typical Signal Location; Line Transformers, Cable Post, Impedance Bond

also because of the obstruction to the view of signals by the electrification pole line it was decided to adopt light signals. The materials for 130 miles of the new signaling, covering the two existing installations of semaphores and an extension of 16 miles on one of them, was ordered from the Union Switch & Signal Company in 1915, and early in 1916 similar orders were placed for an additional 250 miles and for the reinstallation on non-electric sections of the road, farther west, of the d. c. equipment removed on the electrified zone.

At present a total of 134 miles of the electrified line has been signaled, comprising two stretches between Lennep and Three Forks, and between Piedmont and Finlen, crossing respectively the Big Belt and the Rocky mountain summits. Work is under way on the remainder of the installation, which will cover the entire electric zone, with the exception of a 38-mile section in the Bitter Roots, where the staff system now in service will be retained. On this section there are numerous tunnels. The completion of this work will provide continuous block signaling from Harlowton to Seattle and Tacoma, a distance of 877 miles.

There are usually eight signals between sidings, an average distance of 7 miles. The circuits are so arranged that a permissive feature is obtained for following movements, allowing a shorter overlap than for opposing moves. The light signals are the three-light model 14 type, having white, green and red indications. These three colors correspond to the several positions of a three-position semaphore. Red indicates stop. Green indicates proceed, prepared to stop at the next signal. White indicates proceed; and that the next signal may be expected to show green or white.

Each lens is illuminated by a main lamp and a pilot lamp, burned at a lower voltage, which gives an indication in case the main lamp burns out. The signal is also provided with a small red marker lamp (below the number plate), which is staggered with regard to the main lenses. This marker is designed to locate the signal at night if for any reason the indication should not be displayed. The range of the signal light in daytime is 3,000 ft. on tangents under normal conditions and 2,000 ft. under the most unfavorable conditions, with the sun shining directly into the face of the lens. In the clear atmosphere of this region the sunlight is intense.

For use on curves the lenses are provided with special deflecting prisms which give the light beam a wider spread and allow the indication to be observed for a much greater distance around the curve than would otherwise be possible. Some of these signals were in service last winter, and it was noted that the indication could be seen during a driving snow storm in the daytime several times farther than it would have been possible to have seen a semaphore blade.

Provision was made for dimming the light signals at night, but it was found that the day indication, while very bright at night, was not too glaring to be uncomfortable, nor was it confusing to the enginemen, and so it was decided not to dim the lights at night. The reports from the enginemen and trainmen with regard to the light signals have been very favorable. They say that they can pick up the indication at a greater distance and with less effort than was possible with the semaphore signals.

The power required for the signaling system is transmitted at 4,400 volts, 60 cycles, on a line consisting of No. 4 solid copper wire. Oil sectionalizing switches are provided at the passing sidings, so that in case of line trouble power may be supplied up to each side of the trouble from the adjacent sub-station. Normally one sub-station will handle the entire load between it and the next one. Under this condition the maximum line drop will be between 3 and 4 per cent.

The line transformers at each signal location are 4400-110 volt General Electric type H, with a capacity of 0.6 or 1.0 k. v. a., depending on whether one or two track circuits are fed from the particular location.

There are usually five track circuits between sidings, the average length of these circuits being 6,000 ft. They are fed from 0.5 k. v. a. U. S. & S. track transformers having a primary of 110 volts, and a secondary of 18 volts, with taps. A reactor is used in the transformer leads to track. Model 15 two-position vane track relays are used, the normal voltage on the track element of the relay being about 1 volt, thus allowing a margin for wet weather conditions. The local element of the track relay is wound for 110 volts. The track rails are 90-lb. and are bonded to capacity. The impedance bond for the propulsion current has a capacity of

1,500 amperes per rail at the 2 per cent grades. On the lesser grades, impedance bonds having a capacity of 500 amperes per rail are used. The ballast is disintegrated granite, which resembles gravel in character. The ballast is free from the rails and well drained with a few exceptions in yards, making very favorable track circuit conditions.

A supplementary negative feeder is connected to the neutral points of the impedance bonds, usually at every other track circuit, although at shorter intervals in some cases. This negative feeder offers a path for the return of propulsion current when it becomes necessary to remove rails. This cross bonding to the negative feeder is so laid out that broken-rail protection will still be provided by the track circuits.

The line relays are either three-position model 15 vane or two-position single-element vane. The single-element vane and both elements of the model 15 vane line relays are wound for 110-volt operation.

The signals, relays, track transformers and reactors were made by the Union Switch & Signal Company and the mechanism cases were wired complete at the Swissvale shops.

THE RELATION OF RAILWAY PERSONNEL TO MILITARY DEFENSE

By George Duncan Snyder

Deputy Chief Engineer, Hudson & Manhattan Railroad, 1st Lieutenant, 22nd Engineers, N. G. N. Y.

It did not require the great European war to teach the United States that those engaged in transportation could serve their country in a better way than by carrying a rifle, for in the first Militia Act, that of May 8, 1792, ferrymen and pilots were exempt from its provision.

The mobilization, concentration, feeding and supply of armies of the tremendous size of to-day, is only made possible by railway transportation, and it follows that, in the creation of these armies, to obtain the maximum of efficiency, the railways forming the arteries of supply should not be restricted by unnecessary drafts on their personnel. In developing the resources of the country to their maximum of efficiency in war, the railways must perform their part, both in preparing prior to the event and during the war, and a study of the relation of their personnel to our defensive organization may prove of interest.

We can dismiss the relations of the railway personnel to the regular army in time of peace, as the recruiting officers do not draw materially from the men on the railway payroll. The relations of the railway employees to the National Guard and volunteers is a different matter that deserves careful attention. Some railroads have taken a very liberal attitude towards their employees serving with the militia, and this is commendable. The railroads can well afford to do this, in view of the small proportion of their number who enter the military service. But with the proposed increase in the National Guard the proposition to create a force of volunteers in time of peace, with the possibility of both these forces as well as the Regular Army being very much augmented in time of war, the question as to how far the railway personnel can be drawn on, without impairing its efficiency at the time when it should be at its best, becomes serious.

Railway employees may be divided into two classes:

1st—Those who are actively engaged in operation and maintenance and whose places cannot be filled from the general population.

2nd—Those who are not employed in the direct operation of the roads, such as the clerical staff, etc., and whose places can be filled by those past the military age, or by women.

Those in the first class should not be interfered with, while those in the second class should be treated the same as the employees of any other business.

The ordinary line regiments—the infantry, cavalry and artillery—which form the bulk of the army, should not be recruited from the railway personnel; but there is one arm of the service in the recruitment and training of which the railways should assist, and that is the Corps of Engineers.

This corps, among other duties, is charged with the construction, operation and maintenance of the railways within the zone of hostilities. The corps of engineers of the regular army has no opportunity for practical experience in railway work in time of peace, and reliance would, therefore, have to be placed in time of war on the National Guard organizations composed of experienced railway men, or on volunteer railway troops organized and trained after the commencement of a war.

Recognizing our deficiencies in this respect, the Division of Militia affairs has been encouraging the organization and training of a proper proportion of engineer troops in the National Guard, who would be trained in their railway, as well as their other duties, and with a proportion of practical railway men among their personnel.

It has not been the practice in the training of engineer troops of the regular army to have them specialize as railway, pontoon or pioneer companies, but to train all alike. In the case of the volunteers, or National Guard, however, it will probably be wise to permit the railway troops to specialize at least so far as to have their personnel selected from practical railwaymen. An organization composed of competent railroad men would be able to perform with credit almost any duty assigned to it, whether in its specialty or not. The officers of an organization of railway troops should either be technical men from the civil or mechanical engineering department or officers of the operating or transportation department. The enlisted men should come from practically all departments of a railway. There should be a few young civil engineers, draftsmen, surveyors and topographers, but the bulk should be skilled mechanics of various sorts—enginemen, firemen, trainmen, carpenters, machinists, trackmen, linemen, and men with experience on the wreck crew.

As the engineer troops only form about five per cent of the strength of the mobile army, and as only a portion of them need be railroad men, it would seem that the railroads can well afford to encourage their men to enlist in engineer organizations. It will prove of little value, no matter how well the railways of the interior are organized and equipped for their war time duties, if the men are not provided to extend and operate the railway lines within the war zone.

The railways of the country should also, by co-operation with the War Department, provide facilities for the practical training of selected groups of engineer officers and soldiers from the regular army, militia and volunteers, in railway construction, maintenance and operation.

It would, therefore, seem that the attitude of the railways should be to encourage enlistment and assist in the training of officers and men who will be engaged in working the military railways in time of war, but that they should only furnish men for other regiments as long as they can reserve an ample staff to operate their lines to meet the demands of wartime conditions.

AEROPLANE EXPORTS FIVE MILLIONS.—Aeroplane exports for the fiscal year ended June 30, 1916, were 269, against 152 to June 30, 1915, and only 34 to June 30, 1914. The valuation of the exports of aeroplane parts for the fiscal year ended June 30, this year, was $4,843,610, but only $583,427 and $37,225 for the fiscal years of 1915 and 1914.—*Iron Age.*

Convention of the General Foremen's Association

Among Subjects Considered at Chicago Were Car Department Problems and Relations of Foremen to Men

THE twelfth annual convention of the International Railway General Foremen's Association was called to order by the president, L. A. North, on Tuesday morning, August 29, 1916, at Hotel Sherman, Chicago. After the divine invocation by Doctor Frank W. Gunsaulus, the association was welcomed to the city by Daniel Webster from the prosecuting attorney's office, the response of the association being made by W. W. Scott. President North then made his address. He said in part:

"This association was formed for educational purposes and in the selection of subjects this point has not been lost sight of. We realize that it is only by the careful study and the expressions of the members that the points are brought out which are of value in the handling of men and materials. It is also well to keep before the members of the association the idea that their advancement and promotion depends on their ability to look ahead and prepare for the future. As general foremen, you are leaders; the examples you set will largely govern the actions of your subordinates. By using tact and good judgment you can secure their confidence and loyalty."

After a brief address by Dr. Angus Sinclair in which he spoke of the important part which the influences surrounding the apprentice have on his success in after life, the report of the secretary-treasurer was presented. The association has a total membership of 229, of which 200 are active members, and there is a balance in the treasury of $86. Secretary Hall called attention to the growing influence of the association, as proof of which he stated that requests have been received for copies of the proceedings from Tokio, Japan; Bolivia; Peru; Manchester, England, and from South Africa.

On Wednesday morning the association was addressed by Frank McManamy, chief boiler inspector of the Interstate Commerce Commission, the following being an abstract of his remarks:

Mr. McManamy's Address

The purpose of the regulations or inspection rules which were established as provided by the locomotive inspection law of March 4, 1915, is to more definitely show when a locomotive is "in proper condition and safe to operate" as required by Section 2, and to guide the railroad company and its employees and the Federal inspectors so their compliance with and enforcement of the law may be along uniform lines. Broadly speaking, the law requires locomotives to be maintained in "proper condition and safe to operate" and provides for an organization to see that it is complied with. The rules are more specific and definitely fix the responsibility for the performance of certain tests, inspections and repairs required by them. I shall not attempt to explain or define each rule, but will try to make clear those that are somewhat general in their terms and with respect to which numerous questions have been asked.

Rule 2 is identical with rule 7 of the boiler inspection rules. It definitely fixes the responsibility for failure to make inspections as required by the rules and requires the mechanical officer in charge at each point to know that inspections and repairs are made in accordance with the rules.

The general purpose of Rule 4 is to require the present practice of inspecting locomotives daily to be continued and to avoid, if possible, the necessity of requiring additional sworn reports of inspection. Form 2, which is required by Rule 4, was intended to accomplish two definite purposes: first, to insure an inspection of each locomotive at certain prescribed periods, and, second, to require the foreman or officer in charge to know the condition of the locomotive, and to say why defects reported were not repaired before the locomotive is returned to service.

This rule will assist in definitely fixing the responsibility for operating defective locomotives. It will also require the foreman to exercise more careful supervision over the work, so that he may properly sign the report. These inspection reports must be filed in the office of the railroad company where they can be checked if necessary.

I have no doubt that many of you feel that these rules have placed additional burdens upon the foreman, but such was not the intention and a proper observance of them will result in just the opposite. They will require each man to shoulder the responsibility that rightfully belongs to him.

If the foreman uses the report as was intended and makes it show the exact reason why repairs were not always made, the responsibility will be placed exactly where it belongs. If proper material is not provided, or if the appropriation is exhausted, or if the transportation department refuses to let him hold the locomotive, that fact should be noted on the report so that it may be considered in determining the reason why the repairs were not made. If the foreman attempts to cover up all such conditions by showing repairs made, which, in fact, were not made, he will be shouldering a burden that he will soon find himself unable to carry.

The locomotive inspection law has not been in force long enough to show any material results. In fact, during the first year or two that any such law is in force the principal thing that can be accomplished is to investigate accidents and classify the causes so that we may determine just what remedies to apply. Enough data has already been obtained, however, to justify a word of warning and advice with respect to the inspection and repair of certain parts where in the interest of safety former practices should be improved. Draw gear between the locomotive and tender, including safety chains or bars with their fastenings, should be frequently and carefully inspected, 22 accidents resulting in 2 killed and 21 injured having already been reported due to failure of the draw gear.

Reversing gear has caused 38 accidents, most of which could have been prevented by proper inspection and repair and by providing sufficient clearance around the reverse lever to prevent injury when handling it.

Failures of rods and crank pins have caused 23 accidents, resulting in 1 killed and 25 injured. There is no doubt that a better method of inspecting these parts can and should be followed, although it must be admitted that the defects which cause failures are usually of a character which are difficult to detect. However, better maintenance of rods and boxes will do much to prevent such defects from developing and thereby aid in preventing accidents.

Failure of springs and spring rigging, which is frequently said to be of little importance from a safety standpoint, has killed 2 and injured 7 since such accidents have been reported to us. These parts should be given more attention and in no instance should a washout plug with a projecting square head be used where it can be struck by springs or equalizers in case of failure. Many similar matters might be enumerated, but enough has been said to direct attention to the causes of some of the most frequent and serious acci

dents and to give a general idea of the purpose and scope of the work of the Locomotive Inspection Bureau.

Car Department Problems

E. E. Griest, master mechanic, Pennsylvania Lines West, Fort Wayne, Ind.—It is the tendency on most roads to rely on the car foreman entirely for all matters connected in any way with the car department, the general foreman confining his activities entirely to the locomotive department; consequently, when he is promoted to a master mechanic, he has only a hazy conception of the nature of the work and importance of the car department. It is the purpose of this paper, through a discussion of some of the problems encountered, to call attention to the necessity for a more complete and accurate knowledge of car work.

There are operating today on the railroads of the United States approximately 2,000,000 freight cars, the cost to maintain each of which is estimated at from $80 to $100 per year. Assuming $90 as an average figure, the total amount expended annually in the United States for repairs and inspection of cars is approximately $180,000,000. This is no inconsiderable part of the total spent for the maintenance of equipment. A recent comparison made of the car and locomotive department payrolls on a certain part of one of the large railroads showed that the car department averaged 40 per cent of the total, and the locomotive department 60 per cent. The following itemized cost of operating a freight train of 50 cars 100 miles furnishes another indication of the relative amount of money spent in each department:

Locomotive maintenance	$12.97
Fuel	10.44
Freight car maintenance	55.10
Total	$78.51

Although the nature of the work is considerably rougher and can be handled to a large extent by unskilled labor with a smaller investment for equipment, it does not necessarily follow that the problems that must be met and solved are any the less important or any the less difficult to solve. In a number of ways the larger problems are very similar to those in the locomotive department.

However, in at least one important feature car work varies from locomotive work entirely, and that is in the repairs to foreign cars. The M. C. B. Association has formulated a code of rules governing the interchanging of and repairs to freight cars. Each railroad company is expected to give to foreign cars while on its line the same care as to inspection, oiling, packing, adjusting brakes, and repairs that it gives its own cars.

Considering that approximately $180,000,000 is expended annually by the railroads of the United States for repairs to freight cars, and that conservatively estimated 20 per cent of this amount, or $36,000,000, involves repairs to cars on foreign roads, and considering also that this enormous sum of money is exchanged between railroads without any definite means of checking against the work performed by repairing lines, it will be realized that the repairing of foreign cars and billing for the repairs occupies a unique position in business. There is perhaps no other line of business where such large sums of money are exchanged merely on the basis of common honesty. In order to protect the car owner, and that the principles upon which this important branch of railroad work are founded may be safeguarded, two things are necessary: First—adequate supervision; second—a thorough and efficient system of preparing original records and compiling charges from such records.

Training Car Inspectors.—It is no small part of a car foreman's duty to assure himself that his inspection forces are thoroughly familiar with and able to apply the M. C. B. rules governing the interchange and inspection of cars, the United States Safety Appliance Act, the Loading Rules of the M. C. B. Association, and the Tank Car Specifications. The best and easiest method to accomplish this is to see to it that the men who are promoted to inspectors have received proper training. A car inspector must be able to discover the parts which have actually broken down and defects which may develop into subsequent failures.

A car inspector should know something of the way in which repairs are handled on the repair track, and inasmuch as he must make repairs himself, it is almost a necessity that he be a proficient repairman. After being picked out as a prospective inspector, he should be moved about on various classes of work, so that when the time comes to use him as an inspector he will have had some training on every class of work, on truck work, on steel cars, on wooden car repairs, on light repairs to loads and empties. Some roads hold written examinations on the M. C. B. rules and all other rules governing the inspection of cars at stated intervals. Other roads have a division general car inspector whose duty it is to go from point to point where inspectors are stationed and by questioning ascertain whether or not the inspector has a reasonable working knowledge of the rules, and whether he is able to apply them. The training of a car inspector is by no means a simple task. It requires thought and careful attention. Once it is accomplished in a satisfactory manner, it requires more careful attention on somebody's part to see that the inspector does not become lax and inattentive.

Car Apprentices.—The apprenticeship system in the car department on some roads has declined to a point where there are few, if any, apprentices enrolled. The exact reason for this is not apparent. The need of apprentices is fully as great today and even greater than it was 10 years ago. If the ever-increasing cost of repairs is to be cut down to any appreciable extent, it must come about through the efforts of a more capable and better trained force than our present one. Old methods and old ideas must give way to improved ones.

An adequate apprenticeship system should provide for:

1. A sufficient amount of time spent in each department to give the apprentice a clear idea of that part of the work.
2. A rate of pay which would attract boys of some education.
3. Promotion for the better grade of apprentices.

The scheme adopted in most locomotive repair shops of having a definite schedule, according to which an apprentice serves a set amount of time in each department, ought to be just as applicable in the car department. A proposed schedule of this kind is given below.

First Year	
Freight car repair tracks	6 months
Passenger car repairs	6 months
Second Year	
Pipe shop	3 months
Tin shop	3 months
Smith shop	3 months
Planing mill	3 months
Third Year	
Car machine shop	3 months
Paint shop	3 months
Air brake work	6 months
Fourth Year	
Inspection of freight cars	6 months
Inspection of passenger cars	6 months

Dismantling Cars.—With the increase in prices paid for scrap material, both for lumber and metal parts, the question has again arisen as to whether more economy could not be shown if cars were torn down and all material saved than if they were burned down, and some material wasted to save the increased labor cost of tearing down the cars. Up to this time it has always been felt that it would cost more in labor to reclaim such material than it was worth. Recent investigations seem to show that this is not the case. A study made on the comparative saving effected in burning and tearing down a number of box cars shows a distinct saving effected through tearing down the cars, as follows:

	Car cut up by hand	Car burned
Value reclaimed metal material	$33.592	$33.592
Lumber reclaimed	23.25	7.56
Scrap credits	23.12	23.12
Total value of all material reclaimed	$79.962	$64.272
Cost to destroy	9.00	8.64
Net value of reclaimed material	$70.962	$55.632
Saving effected by tearing down cars, Per car torn down	$15.33	

The work of tearing down these cars was all done day work with considerable room for improvement in methods and in the amount of material saved. The proposed plan of handling the work was as follows: Secure enough cars to fill one or more tracks with from 10 to 20 cars each, spacing them about 10 ft. apart; assign four men to each car, two of them to begin stripping off the roof and two to removing grab irons, brake staff and outside metal. The men removing the roof could, before leaving the top of the car, loosen the siding. After removing the roof, outside metal and doors, the four men could then take down the lining, loosen the belt rail and remove the siding. The upright rods should be cut at the floor level, the longitudinal rods should be taken out, the frame work thrown to the ground and the rods still remaining in the frame driven out. Two men could then remove the deck, while the other two men take down the draft rigging and remove the air brake material.

The work of cleaning up the track, assorting the metal, classifying and piling the lumber should be done by another gang of two men to each car. With this organization it was estimated that a gang of six men ought to tear down and pile and assort all the material from one car in eight hours.

There are a variety of uses to which reclaimed lumber can be put. The siding can be used for roof boards and for sheathing of buildings; car lining can be used for sheathing car sills for foundation work and framing. Car decking can be used for platforms. The scrap lumber is worth about $2 a cord in the market, or about $1 per car. The second-hand lumber can be estimated at about $10 per 1,000 ft. reclaimed. The metal parts are in much better condition for use when cars are torn down instead of being burned. From all figures available, it appears that considerable economy can be effected by abandoning the practice of burning condemned cars.

Discussion.—The paper and the discussion all indicate a growing appreciation on the part of locomotive department foremen of the importance of the car department. As the general foreman of the locomotive department is usually in line for promotion to the position of master mechanic he should endeavor to become familiar with car department matters by keeping in touch with the car foremen. The work of the car department not only involves the actual mechanical work of repairing cars, but also requires a knowledge of the Master Car Builder's rules, the safety appliance standards, rules for loading material, etc., about all of which the general foreman should acquire some knowledge.

The opinion was expressed that sufficient interest has not been taken in the subject of car department apprentices. An apprenticeship system is needed to develop the right kind of material for foremen in this department.

Several suggestions were made for the prevention of hot boxes. A case was mentioned in which considerable trouble from hot boxes was found to be due to the practice of the car repairmen of putting new wheels in service without scraping the paint off the journals. It was thus impossible to detect slight burrs or rough spots which might be on the journals before they were placed in service. By scraping off the paint and inspecting the journal it is possible to smooth up any rough spots which may be found, with a file and emery cloth.

Locomotive Counterbalances

H. E. Warner, New York Central West.—There are two forms of driving wheel counterbalance in general use—the style commonly used on wheels of large diameter, where it is possible to obtain sufficient weight far enough from the center of the wheel to obtain the required balancing effect, is the one cast solid with the wheel centers. On wheels of small diameter, where it is impossible to obtain enough weight in the required space, the counterweights are cored hollow and then filled with lead. It is the practice in some of the large shops to pour the lead into open chambers, which are covered with a steel plate bolted on, or the core holes are tapped and plugged. This prevents any possibility of the lead being lost out or shaken loose and rattling around as the wheels revolve, which might occur in improperly cleaned and filled closed chambers.

This weight in the wheels must balance all the revolving parts, and a portion of the reciprocating parts. The greater the proportion of reciprocating parts that are balanced, the smaller will be the longitudinal disturbance of the engine, but the greater will be the vertical disturbance. This unbalanced vertical component causes the pressure of the driver on the rail to vary during its revolution, and if the engine is running at high speed the effect on the rail is like the blow of a heavy hammer. On the other hand, if too little of the reciprocating parts is counterbalanced there will be an excessive longitudinal disturbance of the engine.

On the Chicago & North Western the practice is to make the final adjustment of weight in the counterbalance after the axle and crank pins have been pressed in. The wheels, with crank pins, nuts and washers in place, are so arranged that the journals can roll on level straight edges. On main wheels of outside hung valve gear engines both eccentric cranks must be in place. On the side opposite to the one being weighed a weight equal to the weight of the back end of the eccentric rod must be hung on the eccentric crank pin; the crank pin on the opposite side from the one being weighed should be alone and in a vertical line drawn through the center of the axle. Weights are hung on the crank pin until the wheels are balanced, and will remain in any position. The sum of these weights should equal the required unbalanced weight, which is composed of that portion of the main rod and side rod plus the reciprocating weight, which belongs to the wheels being balanced. If the sum of the weights does not equal the required unbalanced weight at the crank pin, then additional weight must be added, or, as the case might be, weight should be removed from the counterbalance until the wheel does balance. All the revolving weights belonging to each wheel and all the reciprocating weights on one side, less the total weight of engine divided by 400, are balanced. This weight is to be equally divided among all the wheels on one side.

The practice of the New York Central corresponds to the rule adopted by the American Railway Master Mechanics' Association, except that the weight of the reciprocating parts minus 1/400 weight of engine is changed when necessary to come inside the following limits: For wheel centers under 58 in. in diameter the minimum is 55 per cent, and the maximum is 66 per cent of the total reciprocating parts. For wheel centers over 58 in. in diameter the minimum is 60 per cent, and the maximum is 66 per cent of this weight.

Discussion.—B. F. Harris, So. Pac., stated that the two-thirds rule is used on that system, the overbalance in any wheel being limited to an amount which, when multiplied by 38.4 times the radius in feet of the center of gravity of the counterbalance, will not exceed 75 per cent of the static wheel load. The following method is used in correcting counterbalances: To ascertain the weight in the driving wheels which is unbalanced by the weight of attached parts, take two horses of convenient size and on these place two rails weighing not less than 72 lb. per yd. The upper surfaces of the rails should be made perfectly smooth and covered with a thin lubricant. Place the mounted wheels so that the journals will rest on the rails, which must be parallel and perfectly level both longitudinally and transversely.

Draw one line across the face of one of the wheels, through the centers of the axle and crankpin, and another line through the center of the axle at right angles to the first one. The second line indicates the position of the pin and counterbalance on the opposite wheel. On a line midway between these two, viz., 45 deg. from each, fasten a 10-ft. wooden straight edge. Measure off from the center of the wheel on the straight edge a distance of 60 in. and, with the straight edge level, place a vertical support at this point with its lower end resting on a platform scale. This will weigh both counterbalances at the same time. Ascertain the weight of the vertical support and the end of the straight edge resting on the scale, the other end being supported at a distance of 60 in. from the scale or at the center of the axle. Subtracting this weight from the former weight the remainder will be the weight of both counterbalances corrected for a distance of 60 in. from the center. To find the effective counterbalance for one wheel at crankpin distance multiply this remainder by the length of the lever, that is 60 in., and by 1.4142 (secant 45 deg.) and divide by twice the crankpin radius in inches. This method is based on the assumption that the weights in the two wheels are alike, as both are weighed together and no means is provided for correcting for differences between the two wheels.

Several members objected to the practice of distributing the overbalance for reciprocating parts among the drivers other than the main wheel. This leaves the main wheel light and if the amount of the overbalance thus distributed is large it will cause the rod bushings to pound out and may lead to the fracturing of the rods. The use of counterbalance bobs placed on the main axle inside the frames has effected a reduction in the wear on rod bushings in such cases.

Fitting Up Shoes and Wedges

W. E. Warner, New York Central West.—The importance of having the shoes and wedges properly adjusted on a locomotive frame cannot be overestimated. A set of shoes and wedges improperly adjusted may cause an endless amount of trouble in the operation of the engine, as, for instance, the breaking of side rods and main frames, the cutting of flanges and numerous other defects to the locomotive mechanism. In order to lay out shoes and wedges correctly it is necessary that the frames be correctly laid out and machined. They should be set up in a square and level position properly adjusted, the binders in place and bolted as tightly as possible without setting up any unnecessary strain. The pedestal jaws should be chipped and filed to a plane surface, because the shoes and wedges must have a solid bearing against the jaws. Otherwise they are liable to break when too great a force is applied to them.

[A method of laying out shoes and wedges was here explained in detail.]

Discussion.—The discussion indicated that the practice of laying out shoes and wedges which was given in the report is generally followed. Exception was taken, however, to the use of lines through the center of the cylinders as a means of squaring the boxes on the two sides of the engine, because of the ease with which these lines may be knocked out of proper adjustment. The use of the fishtail tram is preferred in some cases for this reason. Although the proper laying out of shoes and wedges is necessary to prevent cut driving wheel flanges, there are other causes for this trouble. Where it exists and difficulty has been found in locating the cause, it will often be disclosed by calipering the tires. On the El Paso & Southwestern, where considerable trouble has been experienced from cut flanges due to track conditions a water rail washer is being used with success. Water is piped from the boiler to points in front of the leading truck wheels and back of the rear drivers, so that it is delivered to the head of the rail. The use of this device has proved more successful than flange oilers in reducing cut flanges and in keeping engines on the track on certain mine branches.

Classification of Locomotive Repairs

C. S. Williams, shop superintendent of the Pere Marquette, described the classification in use on that road as follows:

Repairs are based upon a certain assigned mileage, the number of miles the engine is expected to make being regulated by the class of the locomotive and the service in which it is used. The following table shows the assigned mileage according to the service and class of locomotive:

Class	Service	Assigned mileage	Gets flues if needed on
4-6-2	Passenger	125,000	100,000
4-4-2	Passenger	90,000	80,000
4-6-2	Freight	75,000	65,000
4-3-0	Passenger	75,000	65,000
0-6-0	Switch	75,000	65,000
2-8-2	Freight	60,000	50,000
2-8-0	Freight	60,000	50,000
2-6-0	Freight	50,000	45,000

The classification of repairs to engines is as follows:

Class A—New boiler and general repairs to machinery and tender.

Class B—New firebox and general repairs to machinery and tender.

Class C—One or more new firebox sheets with renewal of tubes and general repairs to the machinery and tender.

Class D—Renewal or resetting of a majority of tubes and general repairs to the machinery and tender. This class to include cases where boilers or fireboxes are repaired, but no entire new sheets applied.

Class E—Where locomotives have tires turned or partial renewal of tubes or both together with light repairs to machinery and tender.

Class E-F—Repairs to the machinery and tender similar to Class *E* repairs made necessary on account of breakage or failure of some important part of the locomotive not due to accident or collision, where tires may not need turning or tubes require partial renewing.

Class F—Slight repairs to the machinery and tender.

Accident repairs are classified under the letter indicating the approximate cost corresponding with the necessary repairs given the locomotive. The report of such accident repairs shows the classification letter assigned on the above basis with the prefix "Acc."

It is impossible to give the costs of the various repairs as classified above, due to the fact that the classification letter of repairs covers all classes of locomotives receiving that repair; however, the shops are allowed a repair credit if the total cost of such repairs, labor and material inclusive, costs over $25. Any repair work that costs more than $1,000, regardless of class of locomotive or class of repairs, is itemized on a form used for that purpose and authority is obtained to make the repairs, unless the engine to be repaired has made the mileage assigned according to the table above.

When an engine is due for the shop the road foreman of engines makes a report showing the repairs needed. This is sent to the shop when the engine is taken out of service and advises the man in charge at the shop just what is to be done when the engine arrives for repairs. When the engine arrives at the shop it is examined and if the assigned mileage has not been made an itemized report of the repairs needed is made up and authority is asked to make the repairs. This statement must show the cost of the repairs.

W. W. Scott, general foreman of the Delaware, Lackawanna & Western, described the classification of repairs used at the Buffalo terminal of that road as follows:

Class No. 1. Rebuilt.
Class No. 2. New firebox and general repairs to machinery.
Class No. 2A. New firebox sheet or sheets and general repairs to machinery.
Class No. 3. General repairs to machinery to cost $500 or over.
Class No. 4. Repairs to machinery to cost $100 to $500.
Class No. 5. Light repairs, labor to cost $50.

It will be noted that full credit is given for all classes of repairs made at shops or enginehouse terminals. The light repair classification is often done at enginehouses without calling upon the back shop for labor assistance and the forces so employed receive credit for output and the work is not chargeable to running repairs.

It has been my experience on other railroads to handle light repairs in enginehouses with the regular force where the cost has run up to $350 and no output credit given for the operation. It does not seem fair to charge such an amount to running repairs. The cost of enginehouse expense should include only such expense as is necessary to maintain a locomotive in a safe and revenue producing con-

dition ready for service after reasonable detention at the enginehouse for repairs, grooming, coal, water and inspection.

In order that the mechanical department may obtain complete information relative to the condition of the power and the amount of service it is possible to obtain from each engine before the shopping period, the master mechanic calls a meeting each month of the general foremen, the general boiler foremen, the boiler inspectors, the division roundhouse foremen, the road foremen of engines, the traveling foremen and the chief clerks, all of whom come prepared with detailed information on each locomotive in general and its appurtenances in particular. A medical doctor is no more critical in his diagnosis of a patient's condition than is the mechanical department in determining the condition of its locomotives. After these reports have been received the locomotives are divided into six classes, as follows:

Class 1 locomotives are serviceable for a period of 9 to 12 months.
Class 2 locomotives are serviceable for a period of 6 to 9 months.
Class 3 locomotives are serviceable for a period of 3 to 6 months.
Class 4 locomotives are serviceable for a period of 1 to 3 months.
Class 5 locomotives are in the shops at Buffalo.
Class 6 locomotives are locomotives belonging to the Buffalo division in the shops at Scranton.

From this engine condition report the proper classification of the repairs is given to each engine before it enters the shops. The department foremen are given a copy of this report so that each one knows what material will be needed when the engine does come into the shop, and the storekeepers are advised as to the material that will be needed. Every mechanical foreman has a convenient and intelligent report of the condition of each locomotive on the division, and there is no occasion to fear the inspection of the Federal and State authorities.

Discussion.—From the discussion of this report it appears that there is a wide diversity in the methods of classifying locomotive repairs used on different roads. The methods outlined in the report are those most generally used, but on some roads repairs are divided into as high as 12 or 14 different classifications.

Relation of Foremen to Men

T. E. Freeman, Duluth & Iron Range.—There are two very important factors in getting out work: First, the man's ability to do the job. Second, his willingness to do it. To get the best results, the foreman should be in close touch with his men. Study, if possible, the character and disposition of the men. This will help in distributing the work to the best advantage. Nationality, religion, politics, or personal friendship should have no place in the shop. All men should be treated the same. The foreman should be firm, but kind and just, letting his men know what he wants and what is expected of them. Never countenance or encourage talebearing. A foreman's character should be such as will appeal to his men in everything that stands for good, pure and upright manhood. When orders are issued it should be seen that they are obeyed. If at any time it is necessary to correct or call any of the men to account for neglect of duty, do it privately, never publicly or while angry. Never swear at the men. To punish or make unkind remarks to men in the presence of others, lowers the standing of the foreman in the estimation of the men, and nothing will be accomplished.

In answer to the question: "Should a foreman be a 'leader' or a 'driver'?" some may say, it is necessary to be both, for there are men who have to be driven, as mules are driven, in order to get them to work. I do not agree with this assertion, first, because I do not believe it is in harmony with human nature, and, second, I do not believe it is true. The very essence of good foremanship—as of good leadership—is co-operation. Men like to work with—not for—a man who shows some regard for them, who is fair with them, who is thoughtful for their welfare. And where men like to work the best results are obtained. The swearing, driving foreman has no place in modern efficiency. Modern methods are to get the best out of workmen by bettering the men themselves.

The foreman who is a leader, who possesses and exercises the essentials of leadership, will have a loyal and, usually, efficient following. His men will be with him rather than under him. They will do their best for him because he does his best for them. They will respect him because he respects them. They will be fair with him because he is fair with them. They will advance him because he advances them. And in thus treating his men he puts himself in the surest way for still wider and more important activities, for a still higher and more responsible trust.

The foreman who is a "driver" must keep on driving to get results. He cannot expect loyalty, for loyalty comes voluntarily; it cannot be compelled. He need not look for co-operation because his methods arouse antagonism. He must remain always back of his men rather than have his men back of him. As a "driver" he is likely to be kept on the lower levels where driving is supposed to be needed. His methods are most likely to stand as an effective bar to his own advancement. The leader is always at the head of his men. The driver, of necessity, must remain in the rear. When opportunity for advancement comes the man in front has the first chance. The same friendly relations should exist between the foreman and his men as between the master mechanic and the foreman.

Lack of attention to details by foremen is a contributory cause of mental disturbance in employees, which in turn interferes with their capacity for production. I refer particularly to the failure of foremen to interest themselves in the matter of conveniences for employees in the handling of their work, as well as providing for their bodily comfort. It is a common condition in many shops to find employees trying to make headway with defective tools.

Great claim is generally laid on the importance of a large shop output, the common basis of measurement being the number of locomotives a month which can be repaired in a given shop. The ability of a foreman to increase the output of a shop is very commonly used as an indication of his value as a manager. No doubt this is a reasonably good method of arriving at an estimate of a man's ability; but there is a question of the advisability of using this as the only basis for arriving at such an estimate. Quantity is desirable and even essential in shop output. Economy demands that locomotives spend as large a proportion of the time as possible in earning money, which means that they must spend as little time as possible undergoing repairs. But there is more to the repair question than the heavy repairs made in the back shop. Most locomotive repair work is done in enginehouses and it is at this point that the effect of laying too much stress on general repair shop output or quantity with a neglect of the quality of the work done makes itself most directly felt.

There are many shops in this country which are rated entirely on the number of locomotives turned out per month in determining the output, when the railway company would be money in pocket if the output were reduced as far as numbers are concerned and steps taken to materially improve the work turned out. If the little things are not done in the general shop they will have to be done in the enginehouse and they may develop into larger things that will compel the return of the engine to the general repair shop long before it has made its full mileage. This is a matter which demands serious attention from higher railway officers as well as shop superintendents and foremen. The maximum possible output of any shop is desirable provided it can be accomplished by the highest quality of workmanship. Quantity without quality will invariably result in increased maintenance charges and decreased mileage between shoppings; quantity and quality combined will tend toward economy in locomotive maintenance and train movement.

There is wide opportunity for economy in bringing railway men in general and shop employees in particular to

realize that time and material which they can save in their personal work can have a direct and considerable bearing on the condition of the company's treasury and consequently on their own prosperity. While means should be taken to instill these ideas into the older employees, the place for the most earnest efforts is in the apprentice school, and in this connection the simpler the explanation can be made the better. In many instances the lesson will be kept in mind and while it seems a hopeless task to bring all employees to a correct understanding of such matters, a continued process of education and enlightenment will result in a surprising increase in the efforts of individual employees toward economy.

Discussion.—One of the difficulties which confront many general foremen today is the handling of foreign labor. It has generally been the practice to work the various nationalities in gangs by themselves, but this has often led to a shortage of labor owing to the difficulty of keeping sufficient men. If one man became dissatisfied it was not unusual for an entire gang to quit in a body. In shops on two different roads, each confronted with the problem of handling several nationalities, this trouble has been solved by breaking up the solidarity of the gangs and mixing the various nationalities. Some trouble was experienced in putting the change into effect, but after the practice had been established no further difficulty was experienced in keeping men.

Other Business

The following officers were elected to serve for the ensuing year: President, L. A. North, Illinois Central, Chicago; first vice-president, W. T. Gale, Chicago & North Western, Chicago; second vice-president, J. B. Wright, Hocking Valley, Columbus, Ohio; third vice-president, George H. Logan, Chicago & North Western, Clinton, Ia.; fourth vice-president, W. H. Warner, New York Central, Elkhart, Ind.; secretary-treasurer, William Hall, Chicago & North Western, Winona, Minn.; chairman of the executive committee, E. E. Griest, Pennsylvania Lines, Ft. Wayne, Ind.

The by-laws were amended to make the office of secretary-treasurer permanent instead of elective annually.

The following are the topics for consideration at next year's convention: (1) Engine Failures, Their Causes and Responsibility, and What Constitutes an Engine Failure; (2) Methods of Meeting the Requirements of Federal Inspection Laws; (3) Alinement of Locomotive Parts to Insure Maximum Wear, and (4) What Interest Has the Locomotive Foreman in Car Matters?

TRAIN DESPATCHERS AS OFFICERS

W. H. Smith, a train despatcher on the Virginian Railway, beginning his letter with the query, What is a train despatcher, an officer or merely an employee, or a cross between the two writes to answer this question, as to his own road, with the information that since March 3, by an order recently issued, the despatchers on the Virginian sign their own initials to all train orders. The order making this change was accompanied by a letter, saying, in part:

"The principal object in taking this step is to give proper recognition to the fact that the train despatcher is acting in an official capacity for the company insofar as is consistent with his duty. While it may not have been generally understood by the despatchers that they are part and parcel of the official family, we have always intended that they should consider their relations were such with the company.

"We fully realize that to a very great extent indeed the success of the division is dependent on the faithfulness, ability and intelligence displayed by the chief and the regular train despatchers in carrying on their work, and we desire to have it fully understood by them that their responsibility is recognized and their work appreciated."

Continuing, Mr. Smith says:

"The effect of this should be two-fold. The despatcher, issuing orders on his own authority, may naturally be expected to exercise a greater degree of caution as to the ultimate effect of such order, since he would be held to a more rigid accountability in case of miscarriage or bad results. He should realize that his work is more subject to criticism, properly placed, when his own name is affixed to an order, rather than criticism made at random and directed at no one in particular.

"The Virginian grants its despatchers a vacation of fifteen days each year, and encourages their attendance at the annual conventions of the Train Despatchers' Association by allowing them their expenses while thus engaged. One despatcher from each division makes a trip over the line each month without loss of time and with expenses paid. The trip is usually made in company with other local officers on what is known as the supply train. This train stops at all stations, and frequently between stations, so that it is particularly adapted to investigating purposes."

The following letter concerning the status of despatchers on the Northern Pacific is reprinted from the Train Despatchers' Bulletin for March. It is addressed to superintendents and is signed by M. H. Clapp, superintendent of telegraph, with the approval of the two general managers.

"St. Paul, Minn., Jan. 28, 1916.

"The following suggestions and instructions are intended to cover briefly the subject of the proper treatment of despatchers and the matter of handling the promotions, changes and laying off of despatchers, all with the view of improving present conditions both from the standpoint of the company and the men. It is felt that in times past some of our despatchers have not been treated with proper consideration and that injustice has been done to them by employing men from the outside, both in making promotions and filling the positions of trick despatchers when there were available men in our employ or men whom we had recently laid off. In general, there appears to be a tendency on each division to consider the division as a unit without regard to the available despatchers on other divisions.

"Despatchers should be treated as officials in fact as well as in theory; they should be ranked more than mere employees; they should be given every practicable consideration relative to transportation, both railroad and Pullman; when traveling on the business of the railway company they should be allowed reasonable unlimited expense accounts; they should be allowed every opportunity to explain mistakes and errors that may arise in connection with their work, and, finally, they should be allowed the privilege of resigning in case it is necessary to relieve them from the service.

"When making promotions or adding to the despatching force, it is desired in the future that each superintendent consider all the despatchers employed on the system and despatchers who may be working extra or laid off temporarily. I am arranging to keep in my office at St. Paul a list of all the despatchers at present employed or on the extra list, the names to be arranged according to the dates of employment, and will on request make suggestions to the divisions as to men available and eligible. Please advise Mr. Johnson, Superintendent of Employment Bureau, and myself promptly, by telegraph if necessary, of despatchers who are being laid off and available for use on other divisions.

"It is believed that the foregoing plans, if properly carried out, will serve to make the despatchers more satisfied and contented. . . .

"I also desire to ask that this matter be discussed thoroughly with the chief despatcher and by him with the despatchers, so that the general plan that we have in mind will be generally known and appreciated."

THE EMPLOYEES AND FEDERAL VALUATION

The August issue of the Baltimore & Ohio Employees' Magazine contains an article describing the manner in which the employees of that road can assist the valuation department in gathering data of use in preparing for the federal valuation, particularly with reference to hidden quantities and methods of handling work in the earlier days. This statement is abstracted below.

It is most important that this valuation be accurate and show the true value of the property, but there are many items of property and elements of cost that are not visible, or are forgotten or unknown. Our road will have a representative with the Government party, whose duty it will be to point out these hidden items, so that they may be valued.

The newly organized valuation department is charged with the duty of gathering and classifying this information. In order that no fact of inportance may be overlooked, information is requested from officers and employees having a personal recollection of conditions attendant upon the construction, improvement or operation of the property such as abandoned lines and property of every description; streams and roads that are changed; temporary bridges and trestles built to accommodate traffic during construction; trestles, culverts and drains that have been filled or covered up; sink holes and slides; wells dug and abandoned for any cause; expensive foundations of bridges and buildings; drains or other improvements built on farms or adjacent property by the railroad company; wet, sticky or otherwise troublesome material in cuts during construction; rock in cuts disintegrated or covered up so that it looks like earth, or other items such as those in the list that follows.

Names and addresses of contractors or of any other persons (whether employees or not) who can give valuable information are requested. Here is a chance for some of our veterans to render the company a valuable service by telling what they know of the construction and early operation of our railroad. A partial list of items about which information is desired follows:

Note books, maps, profiles, plans and records of construction, final estimates, vouchers, reports of engineers, "authority for expenditure" reports or similar records in the offices of the company, in the possession of contractors or others, whether or not in the employ of the company.

Surveys made before or during construction.

Requirements and expenses in the acquisition of right-of-way, such as drains, cattle passes, bridges or other improvements built or grading done on adjacent land; bonuses paid in addition to deed consideration; consideration for abandonment of crossings or relinquishment of other requirements in deed; annual or perpetual passes granted; or other considerations of value not mentioned in deed; transportation and subsistence of witnesses, witness fees, court costs, etc.; and fences or crossings constructed either by provision in deed or otherwise.

Special construction under roadbed embankments through swamps and marshy ground, such as log and brush mattresses, corduroy, etc.

Sink holes, filling or settlement of abandoned mines, embankments that have slid away into rivers or otherwise out of place or slowly sliding or settling embankments requiring occasional refilling.

Slides, washouts, fires, wrecks, injuries to persons, equipment lost or damaged, calamities, etc., during construction.

Hills that have been entirely removed, or hollows that have been filled in grading, either in connection with the roadbed, station grounds or yards.

Unusually difficult materials encountered in grading, not now evident, including frozen material excavated or unloaded.

Cuts originally wet but afterwards dried out.

Solid rock, loose rock, hard pan, quick sand, cemented gravel, or other special classification of materials excavated, especially when such material is not distinctly visible.

Borrow pits, not easily discoverable, from which material has been taken for roadbed or ballast. Waste banks.

Clearing and grubbing originally done that might be overlooked on account of the adjacent land now being cleared.

Special construction for roadbed protection, such as piling cribs, mattresses, rip rap, sea walls, retaining walls, etc., not now visible or easily discoverable.

Changes in highways and roads.

Changes in channels of streams and canals to reduce the number of bridges, to prevent overflow, to make room for roadbed, etc., and dredging in channels.

Temporary tracks, trestles, etc., on account of highway or channel diversions or to take care of traffic during construction.

Buildings, bridges or other structures moved or torn down during construction.

Rock, corduroy or other special material under ballast in cuts or elsewhere or special construction of any kind due to soft material under track.

Materials employed to prevent the formation of water pockets in widening or raising grade or for other purposes.

Materials exceptionally employed in raising track under traffic.

Approaches to grade crossings, over or under crossings or highway bridges not easily seen to be a part of the construction of the railroad.

Streets or structures raised or lowered to obtain greater clearance or for other reasons.

Old excavations filled up.

Rock excavated while adjacent track was in use.

Night work done during construction.

Bonuses to contractors.

Grade revisions where no changes of alinement was made.

Exceptionally long hauls on earth, ballast, etc.

Abandoned roadbeds or other property not easily seen.

New lines or structures begun and not completed.

Construction or improvements on which work was suspended and then resumed.

Extra watchmen, switch tenders, signalmen, etc., employed during construction.

Difficulties and unusual conditions experienced in the construction of tunnels.

Dikes, rip rap, dams and other work on streams for the protection of bridges or rip rap around piers and abutments, which might be overlooked.

Enlargement of government or other levees.

Difficulties and unusual conditions experienced in the construction of old bridges, culverts and buildings, especially in the foundations for the same, as in case of striking quicksand, etc. Coffer dams, caissons, etc.

Foundations of old structures which are of unusual depth or size or contain piles or other forms of construction which would not ordinarily be suspected.

Culverts, drains, conduits, sewers, water pipes, etc., which are not readily discoverable, and especially those built by the company which are outside the right-of-way. Subdrains in cuts and elsewhere which would likely be overlooked.

Wagon bridges, not over tracks.

Water-proofing of masonry.

Preliminary investigations with reference to foundations, test pits, borings, etc.

Foundations or other construction done for future development.

Girder rail or other rail of special weight or section, put in on account of street paving or other special conditions, and not readily distinguishable from ordinary rail.

Materials, originally ballast, which have settled below subgrade.

Track changes during construction.

Gage widened or reduced.

Third rail (compromise gage) laid or removed.

Second, third or fourth main track constructed.

Curbing, paving or repaving of streets, construction of side walks, water lines and sewers or drains in towns and cities done or paid for by the railroad company and other special assessments against the railroad company.

Trestles filled in, culverts covered up, bridges shortened and partly replaced by embankments, bridges lengthened, requiring rebuilding of piers or abutments, etc.

Wells dug or drilled and afterwards abandoned on account of poor quality or insufficient quantity of water obtained.

Dredging channels in navigable water-ways or elsewhere.

Bulkheads not visible on account of new bulkheads being built farther out in stream.

Conduits, underground cables, submarine cables, etc.

Gage of equipment changed.

Antiquated equipment or machinery stored in out-of-the-way places.

Temporary yards for storage of construction material.

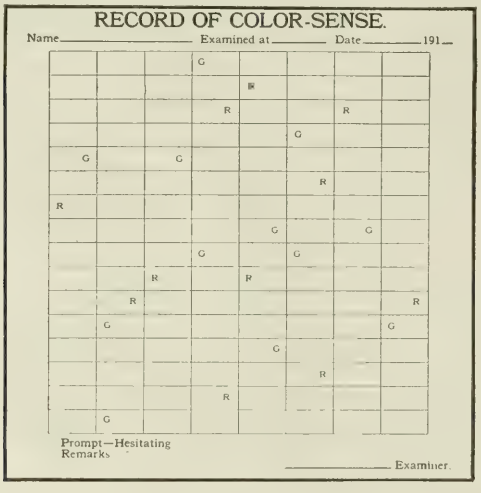
Temporary leases of property in connection with construction.

Franchise payments.

Records, papers or memoranda relating to the organization or construction of the railroad.

THE JENNINGS COLOR TEST

The Jennings color test was originated by Dr. J. E. Jennings of St. Louis, to correct several defects in tests commonly used for investigating the color sense of railway employees. As the tests are commonly conducted, small skeins of yarn are laid out on a table and the candidate is instructed to pick out all the shades of a given color or separate the several colors into groups. This implies constant handling of the yarns and they soon become soiled so that the color values

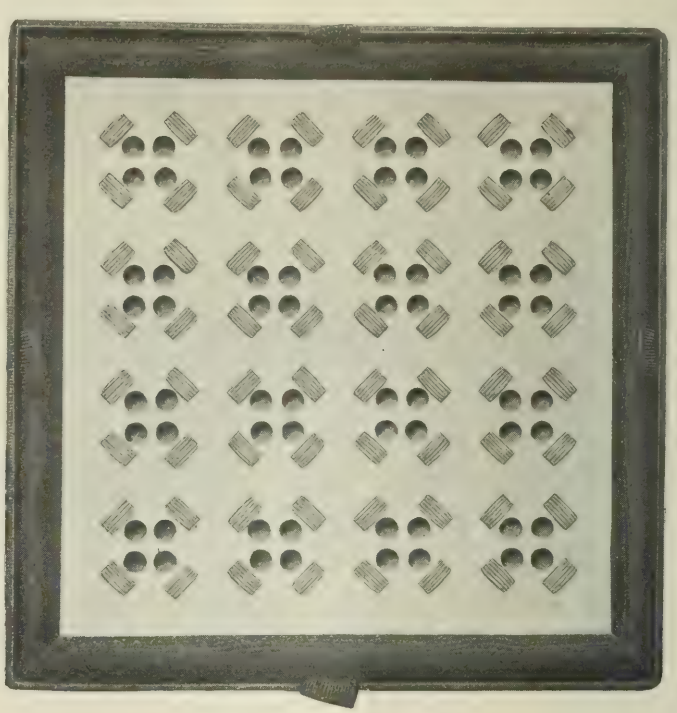


The Sheet Used for Recording Both the Green and Rose Tests

are impaired. The proper conduct of the tests requires also that the candidate be observed closely by a scientifically trained examiner, a requisite which is frequently not fulfilled. In the Jennings test there is no need for the candidate to touch the colored pieces and the test is automatic, requiring no skill or technical knowledge on the part of the examiner.

This test consists of a square box divided into an upper and lower half, each half containing a color board like the one shown in the accompanying photograph. One of these is marked Test No. 1 Green and contains all the colors, shades and tints likely to be mistaken by a person color-blind for green. The other is marked Test No. 2 Rose, and contains colors likely to be mistaken by those color-blind for rose. Each color board contains 64 patches of worsted of various colors and shades placed adjacent to small circular openings provided for registering the particular patches of color chosen by the candidate. This is done by inserting a pointed pencil of wood or metal through the circular opening and punching a hole in a record sheet placed underneath.

A clever scheme has been used to make the test absolutely independent of the memory or the use of a specially prepared card or other record designed to permit the candidate to pass the examination dishonestly. Each color board is perfectly square, and symmetrical about both axes and can be placed in the box in any of four positions. Consequently the candidate has no way of telling which side of the card is the top. The device has also been so arranged that one record card is used for both the green and the rose tests, the card being first in-



The Color Board

serted under the green chart and after this test is completed it is withdrawn and placed under the red chart. This has the advantage that a single sheet of paper shows the record of the man, and virtually constitutes a complete report, which is independent of the individual who conducts the test.

As the test is conducted a skein of standard green is fastened to the inside of the opened box car cover and placed at a distance of 2 ft. from the green test chart. The candidate is given the pointed pencil and requested to look along each row of colored patches and register each color which is the same as the standard green or a lighter or darker shade of the same. The test is conducted in the same manner for the rose chart.

Among advantages of this system which were not previously mentioned are the following: No important color can be lost; the small size of the color patches, while ample to show the color to the normal eye, may lead to the detection of a central color scotoma. The large number of colors used, 128, gives free scope in the detection of all cases of color-blindness. There is no opportunity to compare colors by holding two side by side. The worsteds are divided into two groups; those commonly mistaken for green and those commonly mistaken for red. This color test is manufactured and sold by A. S. Aloe Company, St. Louis, and has been adopted as standard by the Frisco System.

THE MANILA RAILROAD

The government of the Philippine Islands, on February 4, took final action in the acquisition of the Manila Railroad Company, and the ownership of the stock is now vested in the government. This transaction has been made necessary largely or mainly by reason of circumstances growing out of financial difficulties encountered, because of the war in Europe, by the contractors who are building the company's new lines.

By an Act of Congress, approved February 6, 1905, the Philippine government was authorized to guarantee the interest on bonds issued by railroad companies which might be authorized by that government to build and operate railways in the islands. The Philippine Commission by an act (No. 1510) passed on July 7, 1906, granted the Manila Railroad Company (chartered in New Jersey) concessions in perpetuity for certain lines on the island of Luzon, including the then existing lines of the Manila Railway Company, Limited (the English company), which had been granted a concession by the Spanish government in 1887. This concession was without guaranty as to interest on the bonds by the government. In 1909 the Philippine government, by act No. 1905, granted the railroad company concessions for further lines, and under this supplemental concession the lines of the company were divided into two systems, designated as the northern lines and the southern lines. On the southern, including all lines south of Manila and a branch line to Baguio, the government agreed to guarantee interest on the bonds at the rate of 4 per cent yearly. The length of these southern lines in operation, according to the last issue of Poor's Manual, was 175 miles.

The Manila Railroad Company, in order to carry on the new construction required by the last mentioned concession, entered into a construction contract with the old Manila Railway Company, Limited. Under the terms of this agreement the construction company accepted the 4 per cent guaranteed bonds issued by the railroad company, at par, and in turn was required to find the money to carry on the new construction.

The new lines were needed for the development of the territory, and, in 1911 and thereafter, the government, to hasten construction, found it necessary to make large loans to the railroad company. But when the great war broke out the construction company, an English concern, found itself unable to raise funds with which to carry on its work; and it was forced to dispose of its property in such a way as to meet its indebtedness or else submit to being placed in the hands of a receiver. Its relations with the railway company were such that a receivership would inevitably be followed by a receivership of the railroad company. The Philippine government therefore had to face the problem of whether it would find greater advantage in taking over the railroad company at a fair valuation or in allowing it to go into the hands of a receiver, with the possible indirect losses to the islands arising therefrom and a possible direct loss of a considerable part of the indebtedness of the railroad company to the government, which would certainly have ensued if the bonds of the railroad company had had to be disposed of under such circumstances.

After mature consideration and extended negotiations between the Governor General of the islands and the railroad company, an agreement for the purchase of the stock of the railroad company was entered into on December 18 last. This agreement was subject to approval by the Philippine Legislature, and this approval was granted by an act (No. 2574) passed on the fourth of this month.

The agreement provides, in substance, that the government shall acquire all the capital stock of the railroad company for the sum of $4,000,000, 51 per cent payable in cash on the date of sale, and the balance within eighteen months, with interest at 5 per cent. It further provides that, with the consent of Congress, the maturity of the outstanding guaranteed bonds of the company may be extended twenty years, or until May 1, 1959, and provides a sinking fund for their retirement. This fund is to be met from such funds of the company, if any, as may be available for such purposes, and to be supplemented, so far as necessary, by continuing annual appropriations by the government. The indebtedness of the railroad to the construction company is to be paid in bonds of the railroad company. The railroad company is also required to retire certain outstanding 6 per cent and 7 per cent bonds, for which purpose it is authorized to issue 5 per cent bonds of equal face value, to be secured by first mortgage on the northern lines and a second mortgage on the southern lines, the latter to be subject to the mortgage securing the 4 per cent guaranteed bonds.

The total length of the northern and southern lines is about 500 miles; and the bonds outstanding amount to $22,621,000. There is some press criticism in Manila of the action that has been taken, and an appeal may be made to the secretary of war, at Washington, to veto the action of the Philippine Government. The criticism is based mainly on the argument that the project is too large; that it is so great a burden as to imperil the credit of the Islands.

HIGHWAY CROSSING PROTECTION ON CHICAGO GREAT WESTERN

The Chicago Great Western has taken the initiative in a movement of considerable importance in the matter of highway crossing protection. The safety committees on this road have in the past from time to time recommended crossing bells at certain crossings, but at the suggestion of the management they made a general study last summer of crossing bell protection on the entire system, as the result of which recommendations were made and approved to install this year 79 additional crossing signals. The expenditure for these installations was deemed justified on account of the satisfactory experience this road has had with 67 signals heretofore in service. When the installations approved for this year have been completed, there will be a total of 146 highway crossings protected with crossing alarms on this company's lines.

Orders have been placed with the Chicago Railway Signal & Supply Company, Chicago, for these signals, and they are being installed by the company's forces, at the rate of from one to two signals per day. The bell is a "Chicago" style G, 18-in. locomotive type. The signal is equipped with a large double relay box and an illuminated danger sign. The bell is operated by Edison primary batteries, located in the wood lined iron battery box at the foot of the bell pole; the bell pole and the iron box are securely bolted together, making a single unit, thus utilizing the large battery box as the foundation for the signal. The bells in all cases will be operated by 6 volts, but the electric lamps in the signs where power current is available will be operated from special contacts on the relays using 110-volt alternating current.

Many of the signals are located in automatic block signal territory and in such cases "Chicago" style C neutral shelf type relays controlling "Chicago" style B interlocking relays will be used. In isolated cases, style B interlocking relays, with extra front and back contacts operating the illuminated danger signs, are used. The track circuits, which extend 2,500 ft., or more, in each direction from the highways, are fed from caustic soda batteries, located in "Chicago" short battery chutes designed to hold four cells of R. S. A. caustic soda battery.

ANCIENT L. C. L. FREIGHT HANDLING METHODS*

By W. L. Campbell

Office of Third Vice-President, Baltimore & Ohio, Baltimore, Md.

We handle l. c. l. freight today the same way Pharaoh did. Means for transportation to destination have changed from the ox-cart to the 8,000-ton train, yet we still load and unload with a two-wheeled truck, only a slight variation from the simple roll and lever. Mechanical aids have been tried and found wanting, as in the new M. K. & T. station at St. Louis.

Starting with the receipt of freight at the freight house, we have the two methods of delivery, "lump" and "peddle," the former prevailing in the majority of cases. In very few cities will the teamsters take the slight additional time for "peddle" delivery, a fact which tends to prevent many reductions in station costs. A variation in the "lump" type is the "drop wagon." Here a wagon is driven to the house, the team unhitched and the wagon left to be unloaded at convenience. This, of course, makes for utilization of equipment by the transfer companies, but blocks the doors, increases the congestion of teams, and adds a little more to the station agent's troubles. The best way to eliminate congestion of teams is proper and speedy information as to where wagons shall deliver their contents. If the "lump" system of receiving is in use, quick headwork is required in selecting the door which will give the shortest amount of trucking for the whole consignment. At large stations it has been found profitable to station a man at the driveway entrance, to do nothing but give proper door locations.

Trucking to the car is where all mechanical improvements seem to have failed so far. One installation of telphers trebled the cost per ton and another saves money by lying idle. Electric trucks can only be used in special cases. Practically the same requirements apply here as in the substitution of auto trucks for horses and wagons—long haul, moving a large proportion of the total time, and a full load. Hence in most cases, the two-wheel hand truck easily holds its own. The economical weight of the hand truck is worthy of study in a large station, just as Mr. Taylor considered the weight of the shovel in some of his first efficiency studies. In some instances, four-wheeled trucks can be used to advantage where a large part of the freight is in small packages.

One of the easiest ways to increase the speed of trucking and the size of the load carried is to provide a smooth floor. One station showed a saving by covering the trucking floor with sheet iron, although this is slippery for the men. Proper runs between the cars are essential. An excellent one is made of 3/16-in. iron, slightly bent 6 in. from one end, which prevents the run from slipping where the cars vary in height. Good loading of the trucks by the truck loaders is a cardinal element in securing economic operation.

Many systems of ticketing are in vogue for the reduction of the number of astrays, any of which is good and will serve the purpose if rigidly carried out. The manner of stowage is chiefly responsible for loss and damage. A good stevedore is an artist, with his principal aim in through cars to place the largest tonnage so as to ride without breakage, and in local cars to have everything in station order, each station lot being blocked so as not to fall when the lot in front is removed. A competent man will also save many claims by watchfulness in tearing down and closing cars before departure.

The next factor is transportation to destination. If it is a through car the process is comparatively simple. The chief consideration is for the way car which is handled by the local freight. Promptness and speed in getting the local freight over the road without overtime solves many of the operating problems on a division. Well loaded way cars are a means to this end. Despite numerous objections from other points of view, members of the local crews riding in the cars between stations and having freight ready and checked at the car door on arrival at stations, will afford a material saving in time as well as furnishing an additional check of the packages delivered. A good conductor will save many dollars by the utilization of the time on sidings at meeting points in transferring freight to make set-out cars. It is almost axiomatic that ten minutes saved early in the run will often mean hours before reaching the terminal.

Cars sent to a transfer station present a special problem. Here the economic operation requires the leaving of the largest amount of freight in the cars. The question of how much freight should pass through the transfer stations rather than use straight cars, is a matter for very accurate cost analysis and is always a bone of contention between the operating and traffic departments. On the one hand we have the greater utilization of equipment, a matter of many times increased value in periods of car shortage, and economy in the cost of operation due to the decrease in the dead weight per ton of revenue freight. On the other hand we have an increased cost of at least 25 cents a ton for transfer labor. Also every transfer means additional liability to loss and damage. Finally, it means later delivery, which becomes a very important consideration under present competition.

This raises the vital topic of loading orders. Arbitrary minima of 5,000 to 10,000 lb. per car seem to fail to meet many cases. The ideal loading order would be an equation in which the local condition values could be substituted with the resultant minimum for the particular case. This would be based on accurate costs of handling per ton to destination and would show just where and how much is the loss or profit in forwarding light cars for traffic reasons.

The problem of the large terminal is to reduce costs. Bonus and tonnage systems of pay speed up the platform force. The use of the "drop truck" and, where shippers permit, of the "peddle" method of receiving from wagons, increase the efficiency of the truckers. Lost motion in the office force can be reduced by a proper study of each man's work. When business is sufficient, organize bureaus; if not, then have the organization so mobile as to allow concentration on the different classes of work as the peak loads come during each day. A daily balance of accounts has reduced the work of the cashier's department. Labor-saving devices are also profitable in the office. Machines with experienced operators turn out twice the number of way bills that can be made out by hand. Adding machines, comptometers and slide rules all show savings where the volume of business is large. To eliminate errors one road in Chicago found that the savings justified the salary of a man who looked over every way bill just before forwarding.

Finally, we come to the human element, the agent. The personal factor enters into station work to such an extent and the mechanical occupies so small a place, that proper selection, training and incentive to show improvement are cardinal points in economic station operation and dealings with the public. Accurate daily cost records in sufficiently small separations to enable immediate notice of fluctuations in any department are invaluable to the agent. One case comes to mind where a large station handles freight at from 21 to 22 cents per ton, because of the personal element of the agent and house foreman, and all modern efficiency systems are unable to show appreciable savings, even on paper, if installed there. So, as originally stated, we handle freight today as Pharaoh built the pyramids, and he might have had a few methods for eliminating O. S. & D.'s.

*Received in the contest on The Handling of L. C. L. Freight.

Railway Strike Averted by Legislation

Congress Passes Temporary Law for Eight-Hour Basic Day Pending Investigation by Special Commission

THE threatened strike of the railway train service employees, which had been ordered for the morning of Monday, September 4, was called off on Saturday evening after both houses of Congress had hurriedly passed a bill establishing eight hours as the standard for a day's work and a day's wage for employees engaged in the operation of trains on interstate railways, effective on January 1. The bill provides for the creation of a commission to observe the effect of the introduction of the eight-hour basis and to report to the President and Congress, and also provides that pending the report of the commission and for 30 days thereafter the compensation of the employees for eight hours shall not be reduced below the present standard day's wage; overtime to be paid at pro rata rates.

The bill was passed by the House on Friday, September 1, and by the Senate on the following day without amendment, after the officers of the four brotherhoods of train employees had announced that they would call off the strike only in case the House bill were passed without amendment. Telegrams rescinding the strike order were sent out by the brotherhood leaders about two hours after the bill was passed and President Wilson had promised to sign it; and the bill became a law with the affixing of the President's signature on Sunday morning. The railroads which had declared partial embargoes in anticipation of the strike rescinded them either just before or just after the passage of the bill.

To avoid any question of the legality of signing the bill on Sunday, the President signed it again on Tuesday evening.

Of the six recommendations made by President Wilson in his address to Congress on August 29, for legislation to avert the strike and to effect a permanent means of settlement of such controversies, only two were adopted, and the measure as passed was frankly declared to be an emergency measure only. The other proposals made by the President, which were disregarded, provided for the enlargement and reorganization of the Interstate Commerce Commission; for the explicit approval by Congress of the consideration by the Interstate Commerce Commission of an increase in freight rates to meet additional expenditures made necessary by the adoption of the eight-hour day; for an amendment to the mediation-arbitration law to require a public investigation before a strike or lockout may lawfully be attempted, and for the lodgment in the hands of the President of the power to take control of railways for military purposes.

Bills embodying the President's recommendations were drafted by the Attorney General's office and furnished to the congressional leaders, but the provisions above referred to were defeated in committee by the protests of the brotherhood leaders against the compulsory investigation feature and of representatives of the shippers against the idea of increasing freight rates. An amendment exempting from the provisions of the act independently owned railroads of less than 100 miles in length, except switching and terminal railroads, was adopted at the request of Bird M. Robinson, president of the Short Line Railroad Association of the Southeast.

Various amendments proposed on the floor of the Senate after the bill had been passed by the House were defeated, after it had been announced that there was not a quorum of the House in the city and that if the bill were amended in the slightest particular it could not be passed in time to prevent the strike. A strong effort was made by Senator Underwood and others to secure an amendment giving the Interstate Commerce Commission the power to prescribe wages and hours of service for all employees of railways engaged in interstate commerce, but they accomplished nothing.

The text of the bill in the form in which it became a law is as follows:

Text of the Eight-Hour Law

"An act to establish an eight-hour day for employees of carriers engaged in interstate and foreign commerce, and for other purposes.

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That beginning January 1, 1917, eight hours shall, in contracts for labor and service, be deemed a day's work and the measure or standard of a day's work for the purpose of reckoning the compensation for services of all employees who are now or may hereafter be employed by any common carrier by railroad, except railroads independently owned and operated not exceeding 100 miles in length, electric street railroads, and electric interurban railroads, which is subject to the provisions of the act of February 4, 1887, entitled 'An act to regulate commerce,' as amended, and who are now or may hereafter be actually engaged in any capacity in the operation of trains used for the transportation of persons or property on railroads, except railroads independently owned and operated not exceeding 100 miles in length, electric street railroads, and electric interurban railroads, from any state or territory of the United States or the District of Columbia to any other state or territory of the United States or the District of Columbia, or from one place in a territory to another place in the same territory, or from any place in the United States to an adjacent foreign country, or from any place in the United States through a foreign country to any other place in the United States: Provided, That the above exceptions shall not apply to railroads though less than 100 miles in length whose principal business is leasing or furnishing terminal or transfer facilities to other railroads, or are themselves engaged in transfers of freight between railroads or between railroads and industrial plants.

"Sec. 2. That the President shall appoint a commission of three, which shall observe the operation and effects of the the institution of the eight-hour standard workday as above defined and the facts and conditions affecting the relations between such common carriers and employees during a period of not less than six months nor more than nine months, in the discretion of the commission, and within 30 days thereafter such commission shall report its findings to the President and Congress; that each member of the commission created under the provisions of this act shall receive such compensation as may be fixed by the President. That the sum of $25,000, or so much thereof as may be necessary, be, and hereby is, appropriated, out of any money in the United States Treasury not otherwise appropriated, for the necessary and proper expenses incurred in connection with the work of such commission, including salaries, per diem, traveling expenses of members and employees, and rent, furniture, office fixtures and supplies, books, salaries and other necessary expenses, the same to be approved by the chairman of said commission and audited by the proper accounting officers of the Treasury.

"Sec. 3. That pending the report of the commission herein provided for and for a period of 30 days thereafter the compensation of railway employees subject to this act for a standard eight-hour workday shall not be reduced below the present standard day's wage, and for all necessary time in excess of eight hours such employees shall be paid at a

rate not less than the pro rata rate for such standard eight-hour workday.

"Sec. 4. That any person violating any provision of this act shall be guilty of a misdemeanor and upon conviction shall be fined not less than $100 and not more than $1,000, or imprisoned not to exceed one year, or both."

President Wilson's efforts to bring about a peaceful settlement of the controversy through personal negotiations with the railway executives and the brotherhood leaders, on the basis of his plan that the railroads concede the eight-hour basic day and that all other points in controversy be postponed pending an investigation by a commission, were outlined in last week's issue, as were the President's recommendations for legislation presented in an address before a joint session of Congress on August 29. The legislative machinery was immediately put in motion to pass a bill as rapidly as possible and the President, through personal visits to the Capitol and conferences with the Democratic party leaders and the chairmen of the committees on interstate commerce of the two houses, exerted his personal influence and kept constantly in touch with the efforts to secure its enactment.

Bills embodying the President's recommendations were considered at a meeting of the Senate Committee on Interstate Commerce on Wednesday, August 30, and it was decided to hold a hearing on the following day at which representatives of the brotherhoods, the railways and the shipping and consuming public should be allowed to express their views.

Hearing Before Senate Committee

At the opening of the hearing Senator Newlands, chairman of the committee, called attention to the fact that none of the legislation proposed involves compulsory arbitration. "It simply provides," he said, "in case of the failure of voluntary mediation and arbitration, for a government inquiry and a stay of the action of all the parties to the controversy until investigation and report shall be made, leaving them free thereafter to act as they may be advised." He said that the time for legislation was so limited as to preclude the deliberation essential to such important legislation and that the committee trusted that before the conclusion of the hearing the heads of the brotherhoods, "realizing that Congress is about to enter with serious and continuous purpose upon the most important questions affecting their interests, will, by a postponement of the strike, enable Congress to act with the care, deliberation and temperance which the importance of the questions involved demands."

"The present complication," he added, "if carried to its logical results, will involve domestic civil war in the United States, the consequences of which cannot be measured. Thus far no tribunal has been established for the purpose of settling the differences between employers and employees; the whole question has been left largely to the doctrine of force, and the question is whether we cannot by some orderly process of law create a system which will do justice as between employers and employees without resort in any degree to force."

A. B. Garretson, president of the Order of Railway Conductors; W. G. Lee, president of the Brotherhood of Railroad Trainmen; W. S. Carter, president of the Brotherhood of Locomotive Firemen and Enginemen; Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers, and Samuel Gompers, president of the American Federation of Labor, spoke in behalf of the employees. Mr. Garretson made the principal statement for the employees, saying the organizations had always been opposed to the settlement of such questions by legislation, but that if a settlement could be effected by Congress "it would be considered desirable and have the reasonable aid of both parties." He said that there was no actual sentiment against arbitration in the organizations; that three of them are on record as favoring it, but that their experience "has not made them in love with the practical results that have come from it." Regarding the proposed legislation, he said that only the passage of the eight-hour law, with a penalty for violations, would effect a settlement of the controversy without a strike, but that no influence could be brought to bear that would induce the organizations to accept what he called "compulsory arbitration." He bitterly criticized the Canadian act, saying it has "made of Canadian workingmen a nation of lawbreakers and has bred a contempt for the law that is a menace to good citizenship." When Senator Newlands pointed out that there was nothing in the proposed bill to require a man to work, Mr. Garretson said that a strike of one man would amount to nothing and that the brotherhoods would never accept until compelled to a law "to make the combination of men for the purpose of self-defense a criminal act until it has been investigated." He said that in Canada employers had used the period of investigation to prepare for a strike and had then refused to abide by the award, having already procured strikebreakers.

In giving an explanation of the demands of the men, Mr. Garretson said: "The charge that has been made by the other side that it was impossible to put in a true eight-hour day on a railway is correct. It cannot be done. The trainman cannot stop, because eight hours may find him in a semi-desert country, or find him 50 miles from his home; therefore, he is compelled to go on and work; but he demands a higher rate of speed."

Mr. Gompers spoke at length on the subject of the eight-hour day, saying the American Federation of Labor had endorsed the demands of the train employees, and he was especially vigorous in his opposition to "compulsory arbitration." He said such a law would make strikes criminal, but that it would not stop strikes "when strikes are necessary."

W. G. Lee outlined the negotiations with the President, saying that when no definite proposition was received from the railways after 10 days' consideration of the President's plan the 600 general chairmen had returned to their homes with sealed instructions for the calling of the strike unless they received a message saying "satisfactory settlement reached"; that the passage of the eight-hour law would be regarded as "just about what the President offered" and that no power on earth could stop the strike except a message saying that a satisfactory settlement had been reached on that basis. He said the brotherhoods had conceded a great deal in agreeing to postpone the demand for punitive overtime, because "those who are honestly complaining of their long hours" would rather have time and one-half after ten hours than an eight hour day. Asked by a member of the committee whether the bill would in any way limit the hours of labor, he said:

"Oh, it cannot. Without the time and one-half for overtime we will probably be up against exactly the same condition under the eight-hour or 12½ mile speed basis that we are today against under the 10-mile hour speed basis."

W. S. Carter put into the record a series of articles he had written regarding the demands of the employees and a list of roads that have an eight-hour basis in part of their service, saying "none of them has been wrecked by it." He said he had long been an advocate of arbitration, but that he had had a change of heart. "After years of experience under arbitration," he said, "I have reached the conclusion that a labor question is not arbitrable if the working men hope to secure justice in the results. I have discovered that anything that pertains to workingmen's wages or working conditions is purely a class question, a question on which there is an alinement hard and fast, and that whenever a man rises to that stage of industry where he has the ability to hire another man he loses all sympathy for the working people. Arbitrators are necessarily selected from the master class, that class which either takes its profits from the labor of others or else is employed by corporations in the capacity of offi-

cer or attorney. You may as well select Mr. Gompers as a neutral arbitrator as select people usually selected as arbitrators."

W. S. Stone discussed the working conditions in freight service, saying that while the engineers on the passenger trains that brought the witnesses to the hearing from Chicago only worked three or four hours a day, "100 freight men who had been on duty anywhere from 12 to 25 hours were struggling to clear the way for the limited." He said that the men engaged in freight service are "practically slaves."

R. S. Lovett, chairman of the Union Pacific, spoke on behalf of the railway executives, emphasizing the fact that the controversy involves not only the railways and their employees, but the public. He gave some figures showing the diversified ownership of railway securities and declared that the bankers have not attempted to dictate the position of the railway executives. He had received but one communication from any banker since he had engaged in the controversy and that was to advise him to accept the President's proposals as the easiest way out of the difficulty. Whatever expense is incurred by the increasing of wages, he said, will be ultimately paid by the public, and the $60,000,000 which the eight-hour day would add to wages would appropriate at once the power to pay 5 per cent on $1,200,000,000 with which to develop the railroads of the country. Moreover, this sum would not go to the men who work the longest hours and do the hardest work for the least money, but to the best paid men in the service. Such an important question the railroads felt should be decided by arbitration, after careful study by some impartial tribunal, and the roads have offered to submit it to arbitration under the Newlands act, to the Interstate Commerce Commission, or to any commission that the President of the United States might appoint. He said that if Congress proposed to forbid the employees to work more than eight hours they would be up in arms against it.

"A great many of us feel that we have no right to surrender," he said in conclusion. "This question is up to the government of the United States. If Congress declares that their demands shall be accepted; if, under this menace that now confronts the country, Congress sees proper to surrender without inquiry to these four men and put upon the commerce of the country $60,000,000 of additional cost, that is Congress' affair and not ours. We do not believe it should be done and we do not believe it is necessary to do it. I do not believe the people of the United States will ever stand for any system that permits four men, whether they be Wall Street men or any other men not chosen by popular vote, to have it within their power to paralyze the national life. I feel that this problem has passed beyond my hands. I feel that it is a national problem. We have done our utmost to solve it. Whatever Congress sees proper to do about it, of course, we must abide by it. If Congress wants us to take on this burden it must say so. My judgment is that it would be a great injustice."

Elisha Lee, chairman of the National Conference Committee of the Railways, explained some of the technical features pertaining to the demands and to the estimates of the increased cost, which, he said, had been calculated by applying the demands to the actual payrolls for October, 1915. He also described briefly studies that had been made of various methods of operation under the proposed schedules, which had resulted in the conclusion that it would be more economical to pay the overtime demanded than to increase the facilities sufficiently to enable a speed basis of 12½ miles an hour to be maintained. The committee had asked the roads in the movement to compile statements for the month in which they had had the largest number of cases of service in excess of 16 hours a day, which had showed that of 586,920 freight trains, .3 of 1 per cent had exceeded 16 hours on the road and 1.3 per cent were tied up to prevent violation of the law. In reply to statements made by the other side regarding the number of roads that have an eight-hour basis, he said that about 85 per cent of the service in the country is on a speed basis of 10 miles an hour.

J. M. Sheean, counsel for the conference committee, said that there is no railroad schedule in the United States that has the eight-hour day which the bill provides for, that on only one railroad, the New York, New Haven & Hartford, is there an eight-hour day in yard service, and that on that road the men in eight-hour yards receive eight-tenths of the pay of the ten-hour men. He said that the railroads had felt the problem too big a one to be settled privately and that Congress was now faced with the same problem which had confronted the railroads, as to whether it should add $60,000,000 to the transportation cost of the country without investigation. Asked by the chairman how much it would cost to extend the eight-hour day to all railway employees, he said that it had been roughly estimated at $250,000,000 a year.

A. P. Thom, counsel for the Railway Executives' Advisory Committee, said that if Congress proposed to legislate on the subject in the present emergency all of the recommendations of the President should be included, not merely parts of his program. "We do not demand the right to determine this question," he said, "we do not think that any other interested party ought to claim the right to determine the question. We think it ought to be determined by the enlightened consciences of impartial men. We were told that an eight-hour day was not an arbitrable question. We answered that these gentlemen would not accept an eight-hour day if it was tendered to them. Every eight-hour day which has passed under the review of the judgment of this country has had a humanitarian object and has not been regarded as a means simply of increasing wages for hours that should remain unchanged."

Representatives of some of the principal organizations of shippers urged Congress to avert a strike, but not at the expense of the shippers, saying there should be a full hearing before the cost of additional wage increases should be added to freight rates. Among those who testified were E. H. Goodwin, general secretary of the Chamber of Commerce of the United States; H. C. Barlow, traffic director of the Chicago Association of Commerce; W. E. Lamb, representing a number of western shippers; Luther M. Walter, attorney for the National Industrial Traffic League; Thomas Creigh, attorney for the Chicago Association of Commerce; R. S. French, general manager of the National League of Commission Merchants; James A. Emery, representing the National Association of Manufacturers; H. G. Wilson, chairman of the legislative committee of the National Industrial Traffic League; Frank Lyon, a traffic attorney, and James L. Cowles.

Mr. Goodwin, for the Chamber of Commerce of the United States, presented recommendations that Congress do two things and no more: First, provide immediately for a prompt, thorough and impartial investigation of all facts relevant to the controversy, and second, command the brotherhoods and the railroads to suspend all action in the nature of a strike or lock-out pending such an investigation. Mr. Barlow urged that both parties be required to "lay their rights on the table" pending an investigation, and also that consideration be given to the question of what freight rates should be affected by any increased expense. "How much will the state of Iowa pay?" he asked, "the state of Ohio, the state of Illinois; or shall we create and perform an undue discrimination in favor of those states and tax 70 per cent of the Interstate earnings of these companies, exempting the passenger traffic? Let the people of the country know who must foot these bills. Let us have our day in court as well as these honorable gentlemen and the railway carriers."

B. M. Robinson, president of the Short Line Railroad Association of the Southeast, said that about 110 of the 125 members of his association are independent lines that were not involved in the controversy, because their men had not presented demands, but that the bill as proposed would seri-

ously affect them. He said that most of the train and engine employees on these roads are men who have not had the experience necessary to qualify them for trunk line work and who are not worth and do not demand the standard rates of pay.

H. L. Clark, representing the American Electric Railway Association, asked that a distinction be made between steam and electric railroads in the proposed law.

While the hearing was in progress, President Wilson conferred with the brotherhood leaders at the White House and urged them to recall the strike order. It was stated, however, that they would give him no definite assurance.

Proceedings in Congress

On the same day Representative Adamson, chairman of the House Committee on Interstate and Foreign Commerce, introduced in the House a bill, H. R. 17,700, substantially in the form in which it was finally passed, and a special rule was adopted providing for a vote on Friday.

Following the hearing on Thursday, which lasted for nine hours, the Senate Committee on Interstate Commerce held an all-night session and on Friday morning reported a bill, S. 6981, including the provisions for an eight-hour basic day and for an investigation by a commission, but omitting the sections recommended by the President referring to freight rates, providing for the reorganization of the Interstate Commerce Commission, for a compulsory investigation in advance of a strike or lockout, and for giving the President power to take over railways for military purposes. As reported the bill included a section providing a penalty for "any person who shall wilfully delay, obstruct or hinder the operation of trains" and a section giving the Interstate Commerce Commission power "to fix the hours of labor and prescribe just and reasonable wages for all employees" of railroads in interstate commerce, the wages and hours provided for by the eight-hour section of the act to remain until changed by the decision of the Interstate Commerce Commission within a period of from 6 to 12 months. The commission was also given power from time to time to change the hours of labor and the rate of wages "either on its own initiative, on the petition of the employees, the managers of the railroads or of the public."

Under the special rule the Adamson bill was discussed in the House on Friday and was passed in the afternoon at 4:30, having been amended only in minor particulars. The effective date was changed from December 1 to January 1, and electric street and interurban railways, and independent roads less than 100 miles long, except switching and transfer roads, were exempted. The bill was passed by a vote of 239 to 56. Only two Democrats voted against it, but 70 Republicans voted for it. During the debate, in which many of the representatives protested that Congress was being coerced into passing the bill, the brotherhood leaders occupied a committee room just outside the Chamber and were in constant communication with the advocates of the bill.

The Senate took up consideration of the bill introduced by Senator Newlands, chairman of the Committee on Interstate Commerce, on Friday afternoon, but in the evening, after the bill passed by the House had been received, unanimous consent was obtained for the substitution of the House bill. Senator Underwood immediately proposed as an amendment the section giving the Interstate Commerce Commission power to fix wages and hours. Most of the evening session was taken up with debate on this amendment and a long speech by Senator Cummins criticizing the entire plan. Senator Newlands supported the Underwood amendment, criticizing Congress for not being willing to support the President's entire legislative program, and agreeing with Senator Underwood that the section giving the commission power to regulate wages was needed to afford some permanent means of settlement of wage disputes. He said that the section was favored by the committee and that he favored it "because it does something in the way of preserving the general balance of legislation which the President sought to insure."

Senator Cummins opposed the amendment on the ground that it would take away from the employees the right of collective bargaining, and also on the ground that it would not prevent the strike, saying that the brotherhoods would not accept it. He also opposed the bill as the "brassiest gold brick that was ever tendered the people of the United States." "In its title," he said, "it is not only misleading, but positively false. It does not establish an eight-hour day; it has no tendency to establish an eight-hour day. Instead of having a tendency to shorten the hours of labor its tendency is to lengthen the hours of labor." He said he was in favor of an eight-hour workday, but that the bill merely advances the wages of the trainmen for a short period, without investigation, and that there were serious doubts as to its constitutionality. He had proposed to the committee a temporary measure designed to meet the emergency by creating an investigating commission and suspending the power to strike pending the investigation, but no one had voted for this measure.

The debate in the Senate was continued nearly all day Saturday, under a unanimous consent agreement providing for a vote at 6 o'clock. The Republican senators at a caucus had agreed not to obstruct the measure, but a large number of them made speeches vigorously opposing it, saying that Congress was being placed in the position of being compelled to "stand and deliver" without adequate consideration, to avert a national calamity. Several of the Democrats spoke in favor of the bill, but most of them referred to it as merely a temporary measure, designed to meet the emergency, and referred to the possibility of reconsidering it when Congress meets again in December. Some senators were of the opinion that if Congress provided a means of settling the dispute, even without conceding the eight-hour day in advance, the brotherhoods would not defy public sentiment by making the strike order effective.

Views of Senators

The following quotations from statements by various senators indicate the attitude toward the bill:

Senator Vardaman: "I am opposed to this sort of legislation, but I think that if this measure is passed it will be acceptable to the employees of the railroads and no harm can possibly result to the railroads. It will bridge the chasm and possibly enable Congress to deal intelligently with this question, and save the country the disaster that would follow a strike. I do not care if you call it 'bread-pill therapeutics' or what you say about it."

Senator Borah: "The legislature of this great country sitting here is not legislating according to its own will and according to its own judgment, but by reason of and because of dictation outside of this chamber. We are even told here we cannot amend the bill. We are mere automatons; we are mere registrars of decrees formulated by others."

Senator Hardwick: "The correct way to handle this situation was to permanently refer all questions relating to wages and hours, the terms and conditions of railroad employment, to the Interstate Commerce Commission for regulation by that body. The Congress of the United States is almost literally held up. We are notified that we must require these railroads to make concessions literally under force, under duress, under compulsion, in order to keep these highly organized workmen from absolutely tying up the business and commerce and industry of the Republic."

Senator Sherman: "If we can not rise to a higher level, if we cannot seek to prevent the Chief Executive from bending to petty politics to serve ephemeral purposes on the eve of a presidential election, then we are unworthy of our great

trust. I believe in an eight-hour day. In its essential analysis this is not an eight-hour question."

Senator Underwood: "If you stop with this eight-hour bill, without section 6, you will have a piece of legislation that is merely the purchase price of peace."

Senator Brandegee: "If the government is purchasing its peace for $60,000,000 a year does not the Senator think it would be honester for the government to pay it out of its own treasury instead of reaching into the treasury of some other persons and having them pay it?"

Senator McCumber: "This bill in no way purports to be the establishment of a limitation upon the hours of labor of anybody anywhere."

Senator Husting: "We are facing a situation that is without parallel in the history of the country. The first thing to be attended to, in my judgment, is to stop that strike. The people are not so much concerned how you are going to stop it so that it be stopped. The other considerations can be attended to later."

Senator Sterling: "The question is as to whether the United States Congress is to be dragooned into enacting a law now before six o'clock. That is the grave question. It is more far-reaching in its importance than the other question, the one relating to the material loss that may be sustained by reason of the trainmen going on a strike. It is as though a highwayman said to us 'Stand and deliver.' I, for one, refuse to be stampeded."

Senator Weeks: "I am convinced that with public sentiment almost completely against this strike, as it would be, that even if it were ordered it would be of short duration and would result in the humiliation of those conducting it. If Congress accedes to this demand, it is, in effect, temporarily at least, an end of representative government and the substitution for it of government by coercion."

Senator McLean: "I am in favor of the eight-hour day where the character of the employment will permit it. It is admitted that the demand is not for regulation of the hours of service but for a raise of 25 per cent in the compensation."

Senator Owen: "I must support the bill because it appears to be the most convenient means by which we can avoid the strike on Monday. It does not meet the true legislative requirements. It is but a poor temporary expedient, but will permit the Congress of the United States to discuss and consider this matter in a broader aspect next winter."

Senator Brandegee: "There is not a line or a syllable of the bill that attempts to prevent anybody from working more than eight hours a day. We regulated the hours of service because that was necessary for the safety of interstate transportation. To what extent a court will go in saying that the regulation of wages is necessary for the safety of interstate transportation remains to be seen."

Senator Gallinger: "The fiat has gone forth and the probabilities are that no effort that we make here against this bill will be successful. It will pass because it has the endorsement and the active support of the President of the United States, who seems to have taken charge of the legislative department of the government."

Senator Kenyon: "I am opposed to this bill, not because I am opposed to an eight-hour day, for I favor that. I oppose it for two reasons. One is that, in my judgment, the bill is a humbug; that it will give these men nothing that they desire. When the period of nine months is up they will be just where they are now, with a strike upon their hands."

Senator Pomerene: "Congress will be in session in December and we will then have an opportunity to take up this question to investigate it, to consider it thoroughly."

Senator Underwood: "I have always voted for an eight-hour day. If it were practicable I would do it in this instance, but there is no eight-hour provision in this bill."

Senator Shafroth proposed an amendment to the Underwood amendment providing that "nothing herein contained shall be construed as compelling the employees to work at the wages prescribed." Senator Newlands proposed as an amendment the discarded section of the Senate bill making it a misdemeanor to obstruct the operation of trains. Senator Norris offered an amendment providing for eight hours as the standard of a day's work and a day's wage, but giving the Interstate Commerce Commission the power to fix the rate of pay for both officers and employees. Senator La Follette offered an amendment that nothing in the act shall operate to alter the effect of the 16-hour law. While the amendments were being discussed Senator Reed of Missouri announced that Chairman Adamson of the House committee had just told him that if the House bill were amended it would be utterly impossible to pass it; that the absence of a quorum would prevent the consideration of an amended bill in time to prevent a strike.

The amendments were then voted upon and defeated, and at 6 p.m. the vote was taken on the bill, which was passed, 43 to 28. Only one Republican, Senator La Follette, voted for it, and two Democrats, Senators Hardwick and Clarke, voted against it.

The leaders of the brotherhoods occupied a room just off the Senate gallery during the debate, and after the bill had been passed announced that the strike order would not be rescinded until the President had signed the bill. The President was at Long Branch, N. J., too far away to receive it before midnight, but after he had sent a message promising to sign it on Sunday morning the telegrams rescinding the strike order were released at 8:30 p.m. The President returned to Washington for a short time on Sunday morning and signed the bill, using four pens, which were presented to the brotherhood leaders.

Most of the railway officers who had been in Washington conferring with the President on the strike situation left the city on the day he made his recommendations to Congress, for the purpose of making preparations for a strike. One of the first steps taken was to declare partial embargoes in order to avoid congestion when it became necessary to operate with a restricted service. These were rescinded by many roads when it became apparent that Congress proposed to prevent the strike and by others after it had been declared off. In explanation of the embargoes a statement was issued on September 1 from the office of the General Managers' Association of Chicago, saying that the railways were not merely protecting their own interests but that in a larger measure they were protecting the interests of the public, and that if they were causing inconvenience and loss to the public they were causing greater proportionate inconvenience and loss to themselves.

An advertisement was also placed in the newspapers on August 31, explaining the proposition made by the railways for a peaceful settlement of the controversy on the day of their last conference with the President, which was rejected by the brotherhoods. This plan provided for keeping an account of the wages on the eight-hour and on the ten-hour bases, pending an investigation by a commission, the additional pay on the eight-hour basis to be payable as directed by the commission if it approved of the increase in wages. The advertisement was signed by the sub-committee of eight railway executives, with Hale Holden, president of the Chicago, Burlington & Quincy, as chairman, appointed by the railway executives in Washington. Several railroads also published advertisements explaining the position of the railroads in the controversy.

On many roads assurances were received from a large number of their employees that they would not join the strike. On the Union Pacific the engineers had not presented any demands and on several divisions the conductors had announced that they would take no part in the strike. On the Atchison, Topeka & Santa Fe a large percentage of the men declared themselves to be opposed to the strike. One thous-

and conductors on the Chicago, Milwaukee & St. Paul telegraphed Mr. Garretson saying that they would not walk out when ordered, and a delegation of conductors from the Chicago & North Western was on its way to Washington to protest against a strike when the decision to call it off was reached.

The wage controversy continued to be a subject of discussion in Congress on Monday. Senator Lewis made a long speech defending President Wilson's course in reply to a criticism made by Charles E. Hughes in a speech in St. Louis, and Senator Reed of Missouri offered a resolution directing the Interstate Commerce Commission "to investigate and, as nearly as possible ascertain what, if any, increase in the cost of the operation of trains will result from the compliance by the railways" with the eight-hour law, and to report its findings to Congress on the first day of the session in December. The resolution provides that if the commission cannot conclude its investigation by that time it shall report for the railways as to which it has been able to complete its investigation.

History of the Controversy

The wage controversy thus temporarily terminated has been in progress throughout this year. Early in January the executive committees of the four brotherhoods formulated their demands for an eight-hour basic day and time and one-half for overtime in freight and yard service, and early in March it was announced that the demands had been approved by a referendum vote of the membership of the organizations. The demands were formally presented to the railways individually on March 30, and on the same date the railways replied with their contingent proposals for a reopening of other schedule provisions not directly involved in the demands. On April 27 arrangements were made for the beginning of conferences in New York on June 1 between the brotherhood committee and the National Conference Committee of the Railways. These conferences lasted for two weeks, at the expiration of which the railways proposed that the controversy be submitted to the Interstate Commerce Commission or to arbitration under the Newlands law. This offer was refused by the brotherhood leaders and a strike vote was taken. On August 8 the conferences were resumed in New York and the brotherhoods announced the results of their strike vote. The conference committee then proposed mediation by the United States Board of Mediation and Conciliation. The brotherhoods declined to join in the request for the service of the mediators, but accepted them when offered by the members of the board. After five days of conferences with both sides the board announced that it had been unable to effect any agreement, and President Wilson summoned both committees to Washington to confer with him.

The President proposed that the railways concede the eight-hour day, leaving the other questions in controversy in abeyance pending the report of a special investigating commission. This plan the conference committee declined to accept, and President Wilson asked the railway executives to come to Washington. About 60 of the leading railway executives of the country spent nearly two weeks in Washington conferring with the President and endeavoring to have the controversy submitted to arbitration. After the brotherhoods had refused the counter-proposal made by the roads and while the negotiations were still pending the general chairmen composing the brotherhood committee left the city carrying sealed orders for a strike to begin on the morning of September 4.

Copper in 1916.—It is estimated that 20 leading copper companies operating in the United States, Canada and South America, produced approximately 895,000,000 lb. of copper in the first half of 1916. This is an increase of 299,000,000 lb., or 50 per cent, over the first half of the year 1915.—*Iron Age.*

SIMPLIFIED FREIGHT STATION ACCOUNTING

By Major Charles Hine

Freight station accounting is one of the most complex processes included in railway administration. It is believed that the application of banking conceptions and practices to station accounting as herein outlined will result in marked simplification and notable savings in station expenses.

There is a story of an old general yardmaster who spent Sunday afternoon with his clerk comparing for accuracy the originals and the carbons of letters and reports turned out on the newly installed typewriter. Perhaps railway men generally have likewise overlooked the possibilities of modern processes of duplicating and recording reports and documents. One purchases from his bank a draft on New York. Thereupon the issuing bank mails a duplicate of the draft to the bank on which drawn. The matching of these two identical components of the same unit is the best possible kind of auditing.

The accounting department of a railway as a clearing house for freight accounts needs to know two fundamental facts: first, how much should the agent remit; second, has he remitted correctly?

The first of these essentials will be met by requiring the forwarding agent to furnish each auditor concerned with a carbon copy of the waybill forwarded, another carbon being retained by the agent for the outbound station record. The auditor on receipt of such carbon will hold it against the receiving agent until the waybill itself is accepted by the auditor from the receiving agent after satisfactory evidence of corresponding remittance to the treasurer. By permitting the receiving agent to hold the waybill until collection is actually made, the necessity for a book account with each agent will be obviated. The auditor's office will contain rooms equipped like a postoffice with racks and compartments of appropriate size for each station's waybills. Floor space is usually cheaper than clerk hire.

The second requirement, that of assuring proper remittance, will be covered by pitching the entire transaction at the receiving station on the expense bill. Waybills and expense bills will be numbered in series and issues charged to agents after the manner of passenger tickets, switching tickets, and car seals. A spoiled waybill and expense bill will be sent to the auditor as is a spoiled ticket. The auditor will thus have a check from the time the blanks are printed. By adopting the manibill system, long in use on the Central of Georgia, and recently introduced on the Pennsylvania, the waybill, the expense bill, and the so-called cashier's stub, as well as notice to consignee and receipt for freight delivered, can all be made at once by the forwarding agent and all bear the same serial number. The copy of the expense bill now in use on most roads as a cashier's stub and as a station record will be made the station record for inbound business.

The agent, his cashiers and collectors, sell transportation in the form of expense bills as does the ticket agent in the form of passenger tickets. At convenient times the corresponding waybills and cashier's stubs will be segregated. At the close of the day's business the unsold expense bills represent uncollected. Normally the auditor should no more worry about the details of the uncollected than should a bank about notes due next month. Only one day can be lived at a time, and under a proper system each day can be made to take care of itself. Abnormal indications can be met by judicious use of traveling auditors. Expense bills receivable and notes maturing are assets which both the auditor and the bank must take into account.

On American railways the traffic department urges the agent to secure new business. If this happens to be secured from a large concern with an established place on the credit list the uncollected of the receiving agent may increase considerably in amount. Whereupon he may receive a snappy

letter from some clerk in the auditor's office complaining of the uncollected. This is not good teamwork.

The agent will close the day's business by adding the unsold expense bills to obtain the total of the uncollected. The station copy of sold expense bills will be added to balance the day's collections. The agent will then make in triplicate a cash slip showing balance on hand yesterday; collections today; remittance; balance on hand; and total of uncollected. One copy is sent to the treasurer with the remittance, one copy to the auditor with corresponding waybills, and the third is retained as the station cash record.

Where an adding machine is used a copy of the slip from the machine will accompany the waybills to assist the auditor in checking. If no machine is used, the auditor should do his own checking. The theory that money is saved by having the agent do work for the auditor breaks down in the face of the multifarious duties imposed upon the modern agent and the latter's force. Here, again, is shown a lack of teamwork. Station expenses, amounting to something like 4 per cent of gross operating revenue, are charged to the operating department. The auditor has no direct responsibility for operating expenses. His cost efficiency is judged by the payroll of the comparatively small clerical force directly under his control.

The agent having balanced his cash, remitted his money and cash slip to the treasurer, his collected waybills and cash slip to the auditor, will bind the day's cashier's stubs with corresponding receipts for freight delivered in convenient sized volumes for the inbound station record, sectionalizing by days and attaching slip from adding machine, if any, to facilitate future checking. This bound record with station copy of daily cash slip will cover the handling and delivery of freight as well as the collection and remittance of money. The outbound station record will consist of bound volumes of carbon copies of waybills forwarded.

These station records, both outbound and inbound, will consist of first hand, primary data free from errors in transcription and unclouded by the useless balances of perplexing and second-hand abstracts.

The forms rendered obsolete, and whose preparation is both expensive and annoying, will include:

Abstract of freight received.
Abstract of waybills received.
Abstract of waybills forwarded.
Items of uncollected.
Station cash book.
Daily account current.
Monthly account current.

All statistical reports made by agents should also become obsolete. The work should be done by machines in the auditor's office, preferably from carbon of waybill rendered by forwarding agent and while awaiting arrival of original waybill from receiving agent. Integrating machines have within the last ten years been generally introduced in railway accounting offices. American railways have been about 15 years behind the United States Government in the adoption of integrating machines.

The simplified system of freight station accounting will treat a correction as a waybill received. Instead of a special form of correction suitable special colors of waybills and expense waybills will indicate credits, debits, or prepaid. Each phase being treated as an independent transaction, the integrity of each day's cash balance can be preserved. Normally, a bank does not correct an error by altering the original check or draft. A new document, in the form of a check, draft or charge ticket, is drawn to balance.

Revenue from other sources than waybills will be similarly recorded on a special color of expense bill and reported by rendering to the auditor, without abstracting, the appropriate original or carbon copy of the primary document supporting the transaction.

It is believed that the science of organization and the art of administration rest upon principles as immutable as the laws of matter. Because of the delightful inconsistencies and amiable failings of human nature more difficulty is experienced in establishing sound precepts for men than for things. Let a correct principle be established for the solution of a major problem and all minor incidentals and collaterals will be found amenable to the same line of treatment. It is claimed that the system outlined, being sound in principle, is workable in practice. True progress is from the complex to the simple. The principle here established is that modern devices for producing primary data render secondary data obsolete. In modern accounting the abstract and the list have no proper place.

RELATIONS BETWEEN SUBORDINATE RAILROAD ASSOCIATIONS AND THE A. R. A.*

By Charles Burlingame

President, American Association of Railroad Superintendents.

It is readily apparent that the greatest good to the greatest number can be accomplished by the various subordinate railroad associations working together in the closest harmony, in the promulgation of recommendations to the parent body, the American Railway Association.

Stupendous as have been the achievements of the American Railway Association in the past, its work is as yet only in infancy. Representing, as that body does, the greatest single industry in our national life, the transportation of persons and property, it can be seen what tremendous responsibility is theirs in wisely administering the trust with which they are charged. The interests of the individual railroad must be conserved, and yet each company must give enough and take enough to strengthen the fabric of transportation as a whole. The art of scientific management must be carefully studied and brought to the highest state of efficiency possible to obtain. Standard rules and practices must be suggested, minutely tested, and, having proved worthy, be rigidly enforced. Lasting differences of opinion are only annoying and expensive. These differences must be ironed out by committees, careful of the interests of all alike, and the best practices for the common good adopted and maintained.

I have often pictured the railroad situation in a relationship very similar to the states of the Union, the American Railway Association, with its dignity, conservative yet unalterably progressive, representing the Senate, and the various subordinate organizations representing the House. The simile very aptly illustrates our relationship with the public which we serve and the interests which we represent. As the congressman is closely in touch with the wants and requirements of the constituency which he serves, so are the members of your association, and mine, actively in touch with the needs of the people we must serve, and upon whose good will and prosperity we must depend for the revenues to support the various companies by whom we are employed. As the congressman should be very careful to separate the worthy from the unworthy before drafting bills which may eventually be enacted into laws, lest they be rejected, so should we be very careful to separate the wise from the unwise before presenting recommendations to our superior officers.

At the present time, in my opinion, there are too many recommendations going to the American Railway Association, resulting in about five-sixths of them being discarded by that body. The joint recommendations of our associations should be sound rather than numerous, so the American Railway Association can discern that our associations are well prepared to originate proposals for its consummation. We should eliminate all doubtful issues, having in mind that good recommendations which stand and bear fruit, add laurels to the subordinate association originating and referring them. We

*From an address at the Twenty-ninth Annual Convention of The American Association of Freight Agents in Cincinnati, Ohio, June 20-23, 1916.

will not gain the plaudits of members of the American Railway Association by referring to that body ill-advised or superfluous legislation. While our associations are marked for higher duties in the future, recognition will come sooner and more surely if we do not send so many recommendations to them.

I have thought and have suggested to our executive committee, that the various subordinate organizations should be financed by the American Railway Association, over and above a nominal membership fee of, say, $1 per year. The members of your association and mine are devoting their time and energies to the interests of the railroads, and no form of recognition would be more apt to stimulate enthusiasm and increase our possibilities for usefulness than the promise of the American Railway Association to finance our association work. Many of those eligible for membership are deterred by the thought that since our organizations are not so financed that their purposes do not meet with the approval of the executive officers comprising the membership of the American Railway Association. This is, of course, not the case, but, as stated, recognition on the part of the American Railway Association, in the matter of finances would swell our membership to such proportions, and so increase the number of our workers, that the $1 per year dues would easily take care of routine expenses. I am well aware that some of the individual railroads are paying the expenses of the members of our association, and have been very liberal in granting leaves of absence to members engaged in association work. It is this liberal policy on the part of some of the carriers that has made possible the results which we have heretofore achieved, but our usefulness would be increased if this principle would be adopted by the American Railway Association as a standard practice.

In this connection, just a word in regard to committee appointments. It is important in getting officers and committeemen, while selecting them for high character and talent, that the sanction of their superior officers be obtained to the appointments, so that the men will be backed up with the knowledge that their superior officers desire them to attend committee meetings and conventions and give a portion of their time to the general science of railroading. A few of our higher officers are only lukewarm at the present time on these subordinate associations. Where you find a manager who is so constituted that he frowns on the work of these subordinate associations, then a superintendent or an agent appointed as a committeeman by that road is not going to attend your meetings regularly or make a very enthusiastic committeeman. For the present, at least, until the subordinate associations gain more recognition from the American Railway Association, it is very important that men be selected for committtee duty who volunteer for the work, and who know they can attend the meetings. If they do not know, then their membership on committees should be solicited through the general manager, in order to have his stamp of approval. An immense majority of the general managers approve of the work of subordinate associations, but there are some who do not, and who throw cold water on the aspirations of the officers of the subordinate bodies.

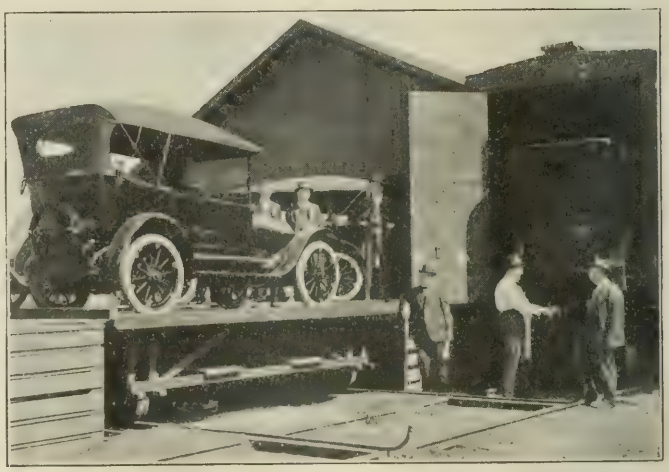
Furthermore, I recommend to the agents' association, as well as to the superintendents' association, that the officers and committeemen be kept in office for a longer period of time. With only one or two committee meetings a year, a man hardly gets in practice, he hardly strikes the rhythm of the work of the committee, in one year. With a four years' term similar to that of the President of the United States, and senators and congressmen, the officers and committeemen might be expected to produce more valuable results.

Another thought in connection with committee work. During my term as president of the superintendents' association I have noticed a good many subjects brought up in which the freight agents also had an interest. I believe that if suitable joint committees should be appointed all subjects requiring concerted action could be referred to these committees and much good result. It might be desirable to extend this plan still further and have the committees enlarged to include representatives from the Train Despatchers' Association. Joint committees seem to me to be very desirable. If approved of the details could be readily worked out. But if the agents' association does not approve of the joint committees allow me to suggest that your recommendations, involving action in operating matters, be referred to the American Association of Railroad Superintendents for its consideration, before being passed to the American Railway Association, a plan which is now followed by the divisions in local matters.

AN AUTOMOBILE UNLOADING PLATFORM

The unloading of automobiles from box cars has come to be a frequently repeated operation at all freight stations of any size and the character of the facilities provided for transferring the motor cars from the freight cars to the ground is largely responsible for the expense this operation involves. These facilities vary from a pair of skids set against the end of the car, down which the automobile is lowered, to a flat car coupled to the loaded freight car to which the automobile is transferred on its way to the platform, the latter usually being provided with an incline for wheeling the auto to the street. In some installations a stub track is provided abutting on a platform to which the automobile is transferred with the help of a steel plate, bridging the gap between the car and platform.

Another means for accomplishing this operation, and one which overcomes a number of the difficulties encountered with most of the earlier methods, has been introduced at Riverside, Cal., and other points on the Santa Fe. It consists of an application of the rolling milk platform idea, the additional feature in this case being a pair of movable rails which are placed on top of the track rails so that the platform may be moved out directly over the track on which the automobile car is standing.



Platform Rolled Back Into Recess Ready to Release the Automobile

When not in use the loading platform remains in a recess provided for it in the freight platform of which it forms a part at such times. When it is desired to unload a car the rolling platform is run out over the track in line with the end of the car to be unloaded, a plate apron forming the bridge over which the automobile passes from the freight car to the rolling platform. The platform is then rolled back into place and the automobile is transferred to the freight platform. The scheme was devised by B. J. Simmons, division engineer of the Santa Fe Coast Lines, San Bernardino, Cal., and J. B. Bauman, agent at Riverside.

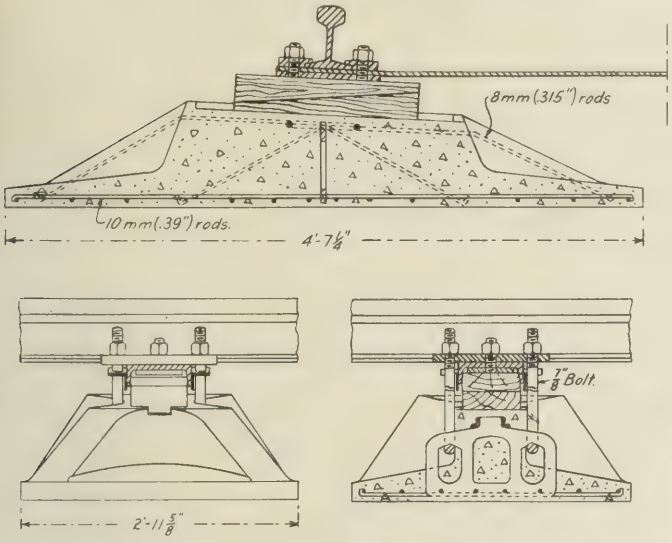
EXPERIMENTAL TRACK IN HOLLAND

By K. den Tex,

Utrecht, Netherlands.

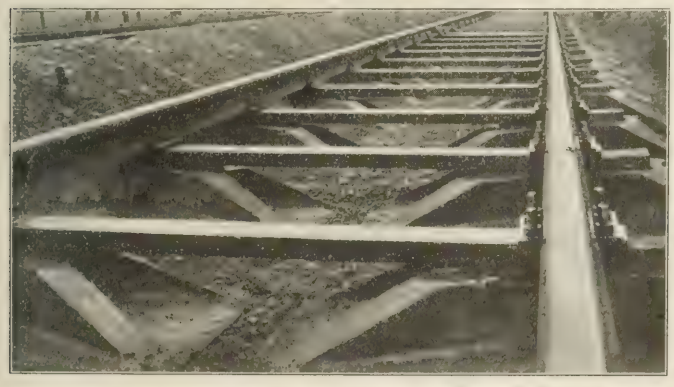
A great obstacle to the use of a reinforced concrete tie is its weight. Many of the designs which have been tried have been found too weak and sufficient strength has been secured only by adding material. But as the ties are already heavy, additional weight is objectionable. One way out of this difficulty is to cut the tie in two.

A tie fulfills a double function. It provides the necessary



Sections Through Concrete Pedestal

base to support the load on the roadbed, and it holds the rails to gage. As a support on the roadbed, reinforced concrete serves very well, but to limit the weight the lateral dimensions must be small. In fact, a round slab or foot placed underneath the junction of the rail and the tie would be the ideal solution. The other function, to hold the rails to gage, can be entrusted to a light tie of steel or wood, which materials, owing to their elasticity, are well adapted to that purpose. A trial track based on these principles has been installed on the Netherlands state railways. This is shown in the accompanying photographs, one of which shows the stretch of track with the ballast removed. The length of this experi-



The Experimental Track wtih Ballast Removed

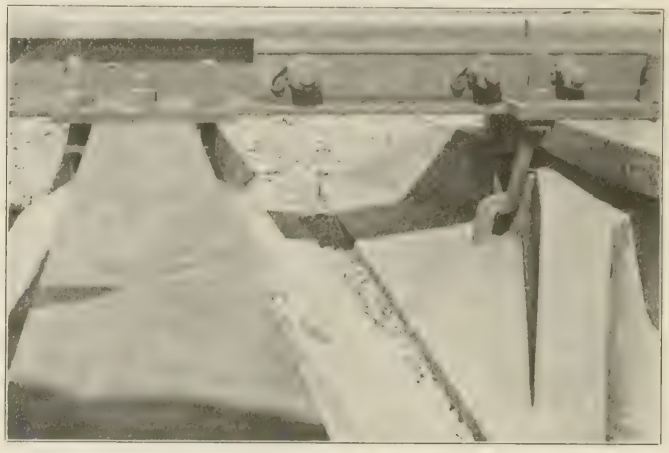
mental section of track is 120 ft. It contains 30 steel ties of channel section, laid flat, reposing on 60 concrete slabs, with the intermedium of an equal number of wooden wedges.

This track was built in December, 1914, in the main line from Utrecht to Amsterdam, which carries a traffic of 50 trains a day. The speed at this location is not fast, as the distance from Utrecht is only a mile, and all the trains stop at this station. After a service of 1½ years, the track is still practically as good as it was when new.

One of the most important observations of this experiment is that the wedges do not work loose. The entire combination of the rails, ties, wedges and reinforced concrete slabs is strongly bound together by V-shaped bolts, which are hooked into the reinforcement of the slabs. The wedges are of hard wood and have an inclination of 1 in 10.

The surface of the track is regulated by adjusting the wedges, the V-bolts being loosened in advance. The track has required very little maintenance work. The ties near the joints, which are laid opposite, have settled about ¾ in. more than the others. Although it was not yet necessary, the pair of slabs under one of these ties was lifted on a layer of gravel which was shoved under them. The tamping of the ballast under the concrete is dangerous for this material and has been avoided.

The concrete has been sufficiently protected against the shocks of the traffic by the wooden wedges and the tight attachments. It does not crumble, but on some of the slabs cracks may be seen across the bottoms of the center openings. The great feature of the track is its rigidity. Its weight including the ballast reposing on the slabs amounts to 1,500 lb. per yard against 600 lb. calculated for the standard track of the Netherlands state railways, consisting of wooden ties and flat cast iron chairs. The weight of one slab is 440 lb. The cost of the track, calculated from normal prices before the



Pedestal at a Rail Joint

war, is $6.15 per yard as compared with $5.70 for the standard track.

To keep the cost down to this reasonable amount the spacing of ties has been increased 4 ft. with a 2-ft. spacing of the joint ties. It is judged that rails weighing 92 lb. per yard are strong enough for this spacing if well supported. In fact, as the rail is subjected by the traffic to two systems of pressures, one from above and the other from the reaction of the supports below, there is no reason why the distance of the last-named supports should be so much closer together than the others, represented by the axles of the train.

By exact measurement the strain has been determined in the base of the rail between the supports and it has been found that, although the distance of the supports in the trial track was more than double that in the standard track, the strain was only about 50 per cent in excess.

It is not necessary to carry the concentration of support and attachment as far as it has been done with this trial track. The principal features of the trial are the employment of the wooden wedges and separate slabs under the rails and the depth of the bases of these slabs.

Durability and an easy, but thorough, maintenance of the track can be procured by this system. Ballast of inferior quality may prove sufficient. The laying of the track and the surfacing when the wedges have reached their limit of life is difficult, compared with the ordinary track on wooden ties, but the difference is not sufficient to be of importance.

General News Department

Leaders of the shop men's unions of 19 roads, west of Chicago, said to represent 35,000 men, are negotiating with the railroads for an 8-hour day and a 5 per cent increase an hour in wages. The conferences are taking place in cities throughout the west.

The Chicago, Milwaukee & St. Paul announces a wage increase of 2½ cents an hour for the 200 or more boilers makers and helpers employed between Mobridge, S. D., and the Pacific Coast. In future the average wage of the boiler makers on this system will be 49 cents, and that of the helpers 25 cents an hour. Nine hours will constitute a day's work as heretofore.

Representative Keating, of Colorado, on August 29 introduced in Congress a joint resolution directing the joint Congressional committee appointed to investigate the subject of railway regulation to investigate the proposed reorganization of the St. Louis & San Francisco and the application of the road to the Missouri Public Service Commission for authorization of an issue of stock and bonds to the amount of $850,000,000.

The United States Civil Service Commission announces examinations October 4 for the following positions in the division of valuation, Interstate Commerce Commission: Junior civil engineer, grade 1; junior civil engineer, grade 2; junior mechanical engineer, grades 1 and 2; junior structural engineer, grades 1 and 2. Salaries range from $720 to $1,080 for second grade positions, and $1,200 to $1,680 for first grade positions. Applicants must be between 21 and 36 years old.

The joint congressional committee recently appointed to investigate the subject of railway regulation has decided to hold hearings in Washington beginning November 20. It will be decided then whether hearings will be held in other cities. The investigation will also include the hours and wages of labor. The committee will invite to its hearings railway officers and employees, shippers, bankers, representatives of state and interstate commissions and commercial bodies. Frank Healy, secretary to Senator Newlands, has been elected secretary of the joint committee, and Willis Davis, secretary to Representative Adamson, assistant secretary of the committee.

Revenues and Expenses of Express Companies for April, 1916

The following statement, which is subject to revision, has been compiled by the Interstate Commerce Commission from the monthly reports of operating revenues and operating expenses of the principal express companies for April, 1916 (the express companies have three months in which to make report):

A—For the Month of April

Item	Adams Express Co.		American Express Co.		Canadian Express Co.		Globe Express Co.*		Great Northern Express Co.	
	1916	1915	1916	1915	1916	1915	1916	1915	1916	1915
Mileage of all lines covered (miles)	44,973.36	44,878.65	73,805.97	72,616.10	10,238.13	9,676.50	.....	2,839.78	9,582.80	9,557.73
Charges for transportation	$3,802,984	$2,980,181	$5,440,264	$4,093,788	$329,662	$262,250	‡ $31	$54,749	$272,229	$242,408
Express privileges—Dr.	1,846,115	1,378,349	2,707,049	2,045,950	163,410	123,579	...	27,289	165,341	147,072
Operations other than transp.	50,182	44,773	284,050	217,945	15,533	5,559	...	865	4,759	4,343
Total operating revenues	2,007,052	1,646,605	3,017,265	2,265,773	181,785	144,230	‡ 31	28,325	111,647	99,679
Operating expenses	1,791,969	1,448,925	2,560,133	1,966,906	154,840	121,914	100	27,702	86,273	87,093
Net operating revenue	215,082	197,679	457,131	298,867	36,944	22,315	† 131	622	25,374	12,585
Uncollectible revenue from transp.	473	419	670	449	2	11	...	...	26	33
Express taxes	20,653	16,300	48,073	31,646	4,200	4,000	...	1,600	3,194	3,122
Operating income	193,955	180,959	408,387	266,772	22,742	18,304	† 131	977	22,153	9,429

Item	Northern Express Co.		Southern Express Co.		Wells Fargo & Co.		Western Express Co.		Total for Companies Named.	
	1916	1915	1916	1915	1916	1915	1916	1915	1916	1915
Mileage of all lines covered (miles)	8,233.03	8,118.34	34,846.60	34,574.60	109,258.73	110,295.30	5,232.87	5,174.26	296,171.49	297,731.26
Charges for transportation	$237,121	$211,157	$1,484,736	$1,241,326	$3,994,157	$3,341,186	$119,204	$97,443	$15,680,332	$12,524,493
Express privileges—Dr.	129,169	116,097	770,455	657,257	2,057,606	1,709,748	58,335	46,410	7,897,484	6,251,766
Operations other than transp.	4,268	3,613	31,246	26,009	111,546	65,820	3,736	3,203	505,324	372,135
Total operating revenues	112,220	98,673	745,528	610,077	2,048,097	1,697,258	64,606	54,236	8,288,172	6,644,862
Operating expenses	88,805	87,318	571,985	513,353	1,712,537	1,458,866	55,202	48,678	7,021,849	5,760,761
Net operating revenue	23,415	11,355	173,542	96,724	335,559	238,392	9,403	5,558	1,266,323	884,101
Uncollectible revenue from transp.	65	18	198	84	1,897	1,063	6	13	3,340	2,094
Express taxes	5,000	5,000	15,437	14,132	32,231	31,561	1,216	905	130,008	108,270
Operating income	18,349	6,336	157,906	82,506	301,430	205,767	8,179	4,638	1,132,975	773,737

B—For the Ten Months Ending with April.

Item	Adams Express Co.		American Express Co.		Canadian Express Co.		Globe Express Co.*		Great Northern Express Co.	
	1916	1915	1916	1915	1916	1915	1916	1915	1916	1915
Charges for transportation	$34,557,964	$28,351,210	$46,771,419	$38,198,826	$3,172,105	$2,571,009	$1,361	$593,099	$2,786,495	$2,575,967
Express privileges—Dr.	17,001,056	14,207,366	23,444,639	19,178,252	1,633 361	1,290,313	447	297,358	1,699,448	1,571,493
Operations other than transp.	473,062	412,837	2,621,899	1,844,674	63,850	49,994	10	8,053	48,061	42,989
Total operating revenues	18,029,970	14,556,680	25,948,678	20,865,248	1,602,594	1,330,690	925	303,794	1,135,109	1,047,463
Operating expenses	16,113,757	15,095,392	22,707,470	20,500,459	1,363,472	1,283,755	6,014	290,748	877,843	886,344
Net operating revenue	1,916,212	† 538,711	3,241,207	364,788	239,121	46,935	† 5,089	13,046	257,265	161,119
Uncollectible revenue from transp.	5,743	4,870	7,929	2,201	455	88	...	...	201	88
Express taxes	186,342	168,789	442,270	329,061	42,000	40,000	4,200	10,600	37,438	38,002
Operating income	1,724,126	† 712,372	2,791,007	33,525	196,666	6,846	† 9,289	2,446	219,624	123,027

Item	Northern Express Co.		Southern Express Co.		Wells Fargo & Co.		Western Express Co.		Total for Companies Named.	
	1916	1915	1916	1915	1916	1915	1916	1915	1916	1915
Charges for transportation	$2,495,282	$2,261,871	$13,683,118	$11,691,037	$37,157,591	$31,490,638	$1,163,606	$953,923	$141,768,946	$118,687,585
Express privileges—Dr.	1,355,562	1,236,108	7,032,551	6,037,075	19,178,640	16,113,814	558,584	497,215	71,904,293	60,428,997
Operations other than transp.	38,908	32,875	289,695	252,854	941,667	592,273	36,461	30,811	4,516,618	3,267,363
Total operating revenues	1,178,629	1,058,638	6,940,263	5,906,816	18,920,618	15,969,097	641,482	487,520	74,398,271	61,525,951
Operating expenses	885,425	884,940	5,493,659	5,261,464	16,235,904	14,803,204	541,838	517,837	64,225,387	59,524,148
Net operating revenue	293,203	173,697	1,446,604	645,352	2,684,713	1,165,893	99,644	† 30,317	10,172,884	2,001,803
Uncollectible revenue from transp.	667	150	942	528	11,030	8,998	67	91	27,039	17,018
Express taxes	50,000	50,000	143,072	145,888	332,034	351,015	11,558	9,986	1,248,917	1,143,344
Operating income	242,536	123,547	1,302,589	498,935	2,341,648	805,879	88,017	† 40,395	8,896,928	841,441

* Discontinued operations on April 30, 1915. † Deficit or loss. ‡ Debit item.

REVENUES AND EXPENSES OF RAILWAYS

Month of June, 1916

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Ann Arbor	294	$184,691	$44,430	$241,854	$24,901	$63,401	$5,620	$85,265	$581	$15,884	$195,652	$46,201	$5,954	$40,225	—$8,189
Atlantic & St. Lawrence	167	223,172	20,047	259,443	36,601	40,252	4,549	78,547	.....	5,229	165,179	94,264	7,822	102,086	151,223
Atlantic City	170	80,950	169,234	261,573	17,007	24,956	8,392	111,477	92	1,528	163,451	98,122	8,474	89,641	54,872
Baltimore & Ohio	4,539	8,075,120	1,475,232	10,345,418	1,553,070	1,917,346	168,951	3,273,906	69,701	201,086	7,140,047	3,204,471	371,332	2,831,693	—77,153
Boston & Maine	2,298	2,856,508	1,274,810	4,692,208	528,761	589,296	52,014	1,801,997	23,063	109,740	3,104,871	1,587,337	171,733	1,412,980	365,785
Central of New Jersey	684	2,162,890	557,204	2,966,148	298,765	416,647	28,730	987,354	15,780	80,466	1,827,508	1,138,640	149,125	989,258	210,741
Central Vermont	411	235,145	83,199	364,973	37,306	14,957	9,487	165,608	4,940	7,477	239,776	125,197	16,032	109,153	—67,339
Chicago, Rock Island & Pacific	7,548	3,909,168	1,589,719	5,986,653	760,128	759,904	133,812	2,089,441	46,627	151,720	3,935,961	2,050,692	195,999	1,834,172	760,420
Colorado Southern	1,102	514,931	129,383	694,080	91,127	161,956	11,792	189,268	4,230	20,663	479,036	215,044	75,159	139,859	57,967
Detroit, Grand Haven & Milwaukee	191	169,309	61,013	290,395	52,391	40,051	5,428	142,614	1,023	4,761	246,269	44,126	6,087	38,019	—106,410
Fort Worth & Denver City	454	277,109	110,147	412,021	54,576	61,192	8,888	96,457	2,613	15,380	239,107	172,914	17,024	155,890	104,035
Grand Trunk Western	347	598,305	164,703	816,988	83,988	129,344	16,589	261,505	7,027	15,102	513,755	303,963	76,971	225,962	38,258
Hocking Valley	350	642,067	77,432	785,954	65,182	304,203	8,347	206,604	.....	15,940	600,277	185,677	61,352	124,297	—39,966
Louisville & Nashville	5,038	3,687,998	1,042,968	5,076,913	728,998	925,360	136,694	1,483,773	18,055	106,145	3,385,599	1,691,314	117,634	1,566,390	738,316
Missouri, Oklahoma & Gulf	334	89,986	22,476	118,095	23,041	23,392	4,357	53,380	529	7,417	112,116	5,979	8,291	—2,327	68,746
Missouri Pacific	3,931	1,930,901	468,104	2,624,505	433,026	638,928	75,294	905,384	8,715	69,432	2,126,806	497,699	160,223	335,801	195,382
New Orleans Great Northern	285	129,544	27,811	80,447	39,521	16,975	2,758	8,805	211	5,780	—4,993	85,440	4,196	80,906	29,798
Oahu Ry. & Land Company	114	96,416	20,475	125,035	16,125	1,101	2,243	25,855	.....	5,818	51,143	73,892	5,681	68,211	26,708
Port Reading	21	118,446	.....	144,326	242	10,640	38	48,711	.....	208	59,840	84,487	.....	84,487	17,235
Richmond, Fredericksburg & Potomac	88	194,335	83,009	313,369	19,134	33,303	4,103	88,805	2,257	8,138	155,741	157,629	10,100	147,441	36,364
St. Louis, Iron Mountain & Southern	3,555	2,013,135	506,348	2,724,031	505,634	723,490	73,341	780,866	10,468	81,060	2,161,777	562,254	287,854	273,390	—286,935
Washington Southern	36	65,621	47,259	148,608	14,185	19,293	1,500	47,360	1,004	3,690	87,032	61,576	4,352	57,223	16,064

Twelve Months of Fiscal Year 1916

Ann Arbor	294	$1,989,434	$538,688	$2,684,309	$241,835	$415,727	$58,871	$966,136	$5,562	$140,338	$1,828,469	$855,840	$159,764	$693,632	$172,628
Atlantic & St. Lawrence	167	1,666,995	266,109	2,080,394	270,010	310,328	49,227	900,641	.....	53,452	1,583,659	496,736	118,733	377,991	238,332
Atlantic City	170	904,305	1,447,140	2,477,111	372,322	246,432	41,523	1,210,506	1,145	17,592	1,889,518	587,593	118,474	468,887	247,194
Baltimore & Ohio	4,539	88,476,032	14,971,472	111,668,680	13,917,815	23,513,811	1,937,386	36,835,921	682,000	2,486,520	79,319,804	32,348,876	3,674,248	28,639,064	4,057,367
Boston & Maine	2,298	31,963,979	15,041,833	52,075,428	5,986,603	6,588,049	421,797	21,757,066	206,152	1,238,292	36,197,958	15,877,469	1,986,267	13,888,578	5,109,468
Central of New Jersey	684	25,115,598	6,167,063	33,462,929	2,775,739	5,451,510	359,641	11,665,217	164,232	717,309	21,129,895	12,333,033	1,826,514	10,505,758	2,148,632
Central Vermont	411	2,995,052	900,625	4,270,686	455,305	620,099	102,304	1,889,190	27,885	94,166	3,188,949	1,081,737	187,772	893,922	228,580
Chicago, Rock Island & Pacific	7,622	48,636,151	18,049,678	72,189,277	10,021,607	12,226,020	1,629,958	26,142,825	529,732	1,842,287	52,308,871	19,880,405	3,450,278	16,399,678	2,947,423
Colorado Southern	1,102	6,667,845	1,370,244	8,643,377	1,094,006	1,708,449	122,260	2,413,183	46,859	267,691	5,652,448	2,990,929	459,559	2,531,015	850,083
Detroit, Grand Haven & Milwaukee	191	2,209,310	586,452	3,242,210	362,099	421,079	65,199	1,502,980	8,302	52,548	2,410,208	832,002	47,557	783,444	419,703
Fort Worth & Denver City	454	4,017,529	1,504,131	5,822,480	690,217	940,092	79,307	1,652,681	31,332	187,928	3,581,557	2,240,924	201,637	2,039,287	712,708
Grand Trunk Western	347	6,642,235	1,610,550	8,818,662	846,359	1,361,035	187,698	3,094,614	65,916	162,148	5,717,700	3,100,962	439,641	2,660,339	1,871,151
Hocking Valley	350	5,996,618	861,174	7,411,526	728,178	1,814,110	99,747	2,137,472	.....	174,070	4,953,577	2,457,949	501,755	1,955,697	378,481
Louisville & Nashville	5,038	44,658,860	11,488,085	60,317,993	8,314,204	10,910,744	1,480,734	17,663,609	270,863	1,285,213	39,760,481	20,527,512	2,237,583	18,265,906	8,284,457
Missouri, Oklahoma & Gulf	334	1,107,060	249,060	1,416,301	376,518	289,844	52,702	616,449	1,769	90,650	1,423,901	7,599	80,455	88,726	88,386
Missouri Pacific	3,931	23,945,688	5,042,330	31,589,056	4,847,973	7,145,345	818,064	11,174,196	104,732	780,395	24,844,131	6,744,926	1,293,988	5,422,237	31,464
New Orleans Great Northern	285	1,358,331	320,388	1,768,916	166,159	255,251	31,705	470,197	2,160	75,078	1,000,551	768,365	42,058	725,625	212,634
Oahu Ry. & Land Company	114	949,924	251,398	1,292,148	124,944	92,208	9,920	291,032	.....	62,518	580,622	711,525	99,292	612,233	20,593
Port Reading	21	1,572,428	.....	1,804,075	88,999	146,355	461	759,444	.....	2,197	997,449	806,626	110,000	696,626	52,426
Richmond, Fredericksburg & Potomac	88	1,777,055	1,113,215	245,391	367,813	42,318	1,048,663	43,066	91,662	.....	1,838,912	1,486,806	106,838	1,379,574	412,560
St. Louis, Iron Mountain & Southern	3,555	24,564,708	5,795,983	32,783,246	5,740,705	6,810,831	777,890	9,312,571	108,465	758,018	23,439,885	9,343,360	1,558,492	7,754,523	91,657
St. Louis Southwestern	943	6,233,933	1,312,903	8,040,227	665,062	1,291,716	353,498	1,981,352	37,410	301,742	4,624,543	3,415,684	387,775	3,025,405	1,080,697
St. Louis Southwestern of Texas	810	2,949,251	894,171	4,184,222	728,045	977,188	168,177	1,780,570	13,043	218,932	3,782,242	401,980	211,301	189,849	451,815
San Antonio & Aransas Pass	724	2,645,102	946,814	3,862,745	775,192	635,071	81,418	1,768,034	.....	147,022	3,404,594	458,152	183,932	273,392	257,185
San Pedro, Los Angeles & Salt Lake	1,154	7,045,210	3,127,852	11,244,355	1,081,047	1,591,596	389,895	3,158,345	259,486	221,622	6,678,177	4,566,178	578,886	3,986,282	1,190,340
Seaboard	3,449	10,674,321	3,088,754	15,321,018	1,756,109	2,130,609	493,117	5,045,071	97,067	453,056	9,974,891	5,346,127	689,297	4,650,887	.....
Southern	7,027	47,020,482	16,615,857	69,997,675	8,175,411	11,183,701	1,904,129	22,751,698	404,168	2,038,702	46,041,116	23,956,559	2,916,427	21,004,005	7,603,951
Southern Pacific	6,950	73,019,893	32,250,730	115,942,991	12,568,902	16,484,202	2,186,675	35,857,174	2,039,479	2,785,065	71,678,820	44,264,171	5,068,111	39,176,237	8,403,641
Spokane, Portland & Seattle	555	3,016,467	1,470,058	4,973,037	599,370	456,903	98,690	1,161,357	43,911	166,436	2,522,055	2,450,983	656,980	1,792,766	557,279
Staten Island Rapid Transit Co	11	574,020	314,644	1,243,739	128,620	79,907	8,921	499,500	.....	29,119	746,067	497,672	62,500	435,165	50,742
Tennessee Central	294	1,145,349	379,443	1,619,238	308,100	229,780	69,171	590,124	.....	80,781	1,277,846	341,392	55,058	285,634	119,914
Terminal R. R. Ass'n of St. Louis	37	.....	4,696	3,123,588	374,410	184,055	10,831	994,347	.....	57,524	1,621,167	1,502,421	425,160	1,177,252	224,013
Texas & New Orleans	468	3,015,943	1,043,853	4,500,474	703,635	908,252	97,551	1,534,283	119,210	119,667	3,480,228	1,020,247	242,199	775,483	600,187
Texas & Pacific	1,944	13,383,497	4,283,170	19,156,856	2,019,740	3,042,806	464,617	7,536,036	156,451	619,584	13,815,976	5,340,881	920,438	4,410,636	1,184,984
Toledo & Ohio Central	436	4,477,702	594,423	5,403,920	707,494	1,178,222	84,806	1,919,514	20,837	120,013	4,030,885	1,373,034	289,058	1,083,349	232,879
Toledo, Peoria & Western	248	687,405	443,497	1,218,132	187,349	336,868	27,638	449,705	.....	45,027	1,046,587	171,545	74,000	97,545	130,769
Toledo, St. Louis & Western	451	4,928,512	387,949	5,643,365	656,200	823,580	195,810	1,849,729	.....	100,824	3,623,892	2,019,473	208,068	1,808,438	919,516
Ulster & Delaware	129	522,188	299,653	1,025,638	106,238	122,902	21,213	411,284	4,020	41,504	707,160	318,478	48,708	269,367	178,420
Union Pacific	3,622	45,283,181	10,842,011	62,286,701	8,022,842	7,525,381	1,311,423	14,729,196	981,372	1,473,100	33,935,738	28,360,963	2,502,331	25,846,692	6,813,054
Union R. R. of Baltimore	8	1,496,690	278,134	1,797,451	180,464	.....	.....	58,602	.....	25,531	264,597	1,532,854	65,099	1,467,755	199,865
Union R. R. of Pennsylvania	32	.....	.....	5,501,591	451,762	1,172,695	1,362	2,034,559	.....	53,072	3,713,025	1,788,566	88,607	1,699,959	1,279,565
Vandalia	917	8,639,539	2,438,342	12,486,643	1,832,009	2,402,313	286,652	4,419,370	124,074	306,156	9,370,575	3,116,069	449,587	2,665,024	773,474
Vicksburg, Shreveport & Pacific	171	999,119	463,207	1,634,180	257,419	306,477	42,781	505,253	25,137	62,869	1,192,275	434,905	105,176	329,244	283,455
Virginia & Southwestern	225	1,727,509	170,781	1,959,705	308,180	535,793	26,082	539,946	.....	51,963	1,461,964	497,742	85,428	412,242	32,473
Virginian	505	6,497,994	437,913	7,300,382	760,604	1,229,934	65,097	1,462,596	152,872	189,628	3,844,626	3,545,756	286,100	3,259,486	1,069,512
Wabash	2,519	25,452,963	6,416,077	34,704,887	3,831,588	5,378,450	1,016,614	12,564,617	189,379	789,275	23,749,880	10,955,007	1,027,943	9,920,396	4,989,390
Washington Southern	36	594,589	634,244	1,611,288	178,572	194,849	16,691	501,774	19,171	40,792	951,850	659,438	47,980	611,427	294,695
West Jersey & Seashore	358	2,548,209	4,352,253	7,503,959	1,256,790	1,097,616	143,179	2,928,364	32,095	187,195	5,645,940	1,858,719	467,053	1,390,948	480,684
Western Maryland	689	9,386,082	952,741	10,930,369	1,269,245	1,736,704	257,528	3,452,852	85,435	245,436	7,039,608	3,890,761	348,740	3,541,823	1,422,635
Western Pacific	941	5,249,369	1,700,422	7,466,004	1,100,739	737,358	259,238	2,308,936	165,111	216,520	4,787,892	2,678,112	349,174	2,327,406	1,396,101
Western Ry. of Alabama	133	754,513	408,832	1,308,758	212,822	260,484	71,630	350,201	21,475	55,240	970,494	338,264	65,471	266,470	133,096
Wheeling & Lake Erie	512	7,853,269	627,476	9,184,516	1,158,889	1,378,355	102,486	2,741,217	19,699	180,194	5,580,840	3,603,676	452,393	3,151,175	2,148,768

A Correction

In the article describing the gasoline switching locomotive for the Erie, which was published in the *Railway Age Gazette* of August 11, page 232, the data concerning the cylinders, drive and capacity of the gasoline tank were incorrectly stated. There are six cylinders of 7¾ in. diameter and 12 in. stroke. The engine is driven by means of Scotch yoke side rods; and the capacity of the gasoline tank is 40 gallons.

First Meeting of the Rock Island System Loss and Damage Committee

In an article which will appear in the next issue of the Rock Island Employees' Magazine, W. O. Bunger, general superintendent of freight claims of the Chicago, Rock Island & Pacific, gives an account of the first meeting of the system loss and damage committee, and summarizes the achievements of the organization during its first half year of existence.

The meeting was held at Kansas City, Mo., on August 7, 8 and 9, and was attended by 151 officers and employees. It was shown by a comparison of claim payments made during the fiscal years of 1915 and 1916 that noticeable reductions were made in the later period on practically all commodities listed and in all causes tabulated, except the one item of payments due to errors of employees, which showed a small increase unquestionably due to a more definite determination of causes than in previous years. Briefly stated, the 1916 payments showed, as compared with those of the previous year, a reduction of $265,000 in the amount charged out as concealed or unlocated loss or damage, which means that a larger proportion of payments were charged ao definite causes. Yet the definite causes show a reduction in payments under 1915 as follows: Robbery, 47 per cent; wrecks and fires, 18 per cent; defective equipment, 37 per cent; grain, 22 per cent; live stock, 34 per cent; all carloads, including switch cars, 34 per cent. The total amount charged to loss and damage from all causes showed a reduction from 1915 of $400,000, and, taking into consideration increased freight revenue, the saving approximated $500,000.

Instructive exhibits were shown at the meeting, including different designs of grain doors; especially constructed racks used successfully in bracing shipments of butter and eggs, and under contemplation for use in bracing other freight; heavy canvas curtains used with much success in partitioning off cars, making it possible to use one end of the car for shipments requiring refrigeration, and the other end for ordinary shipments or even for shipments requiring heater protection, with a large saving in icing cost; devices recommended for use in sealing and recoopering bad order packages; and a device known as an impact register used for locating points at which cars are roughly handled.

The system committee will convene again on January 8, 9 and 10, 1917, at Hot Springs, Ark.

Railway Signal Association

The secretary of the Railway Signal Association announces that there has been no change in the date of the association's convention and that the meeting will be held at the Grand Hotel, Mackinac Island, Mich., September 12-14, as originally planned. The secretary also advises persons from New York, Boston and vicinity to take train No. 17, leaving at 5:00 p.m. on September 10 from Grand Central Terminal, New York.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, New Orleans, La.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.

American Electric Railway Association.—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.

American Electric Railway Manufacturers' Association.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Railway Association.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Denver, Colo.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, New Orleans, La.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

Association of Manufacturers of Chilled Car Wheels.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

Bridge and Building Supply Men's Association.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

Maintenance of Way and Master Painters' Association of the United States and Canada.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

Master Car and Locomotive Painters' Association of the United States and Canada.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 12-14, 1916, "The Breakers," Atlantic City, N. J.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

Railway Fire Protection Association.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Annual meeting, October 3-5, 1916, New York.

Railway Real Estate Association.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 11-13, 1916, Chicago.

Railway Signal Association.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 12-14, 1916, Grand Hotel, Mackinac Island, Mich.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

Roadmasters' and Maintenance of Way Association.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Signal Appliance Association.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

Society of Railway Financial Officers.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Washington, D. C.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next meeting was to have been September 5-8, 1916, Hotel Sherman, Chicago, but was postponed on account of train employees' wage controversy.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The Panama Canal was opened to traffic September 5, after a blockade of about a week by landslide.

Nine railways operating in the province of Ontario, Canada, have promised the government to discontinue the sale of liquor on trains within that province.

Railroads operating in Nebraska have applied to the state railroad commission for permission to reduce the free time allowance on freight cars of 60,000 lb. capacity or more, from 60 to 48 hours. If the request is granted the intrastate allowance will become the same as the interstate allowance, which is 48 hours on cars of all capacities.

The Federal Express, running through once a week between Boston and Washington, over the Poughkeepsie bridge, is to be continued through the month of September; and southbound it will run twice a week, leaving Boston on Thursdays and Sundays, including Sunday, October 1. Northbound, the train will be run on September 8, 15, 22 and 29.

The American Steel & Wire Company, calling attention to the Interstate Commerce Commission's statement of August 10, concerning an impending car shortage, has asked its customers to co-operate with the carriers in order that delays and losses may, so far as possible, be avoided. "Inability to ship," says the circular, will, at this season, with the shortage of iron and steel material in every direction, "be very injurious to your interests. We hope, therefore, that you will take every possible means to unload cars very promptly."

Loan for Extension of Colombian Railway.—The Colombian Congress has authorized the government to contract one or more loans for a total sum not to exceed $400,000, to be used in the extension of the Tolima Railway to Ibague. The authorization as published in the Diario Oficial specifies that the loan will be guaranteed by a mortgage on the railway, including the part already constructed. The usual interest rates and the amortization will be covered by the proceeds of the railway, secured by 2 per cent of the proceeds of the Atlantic custom houses.

The Channel Tunnel.—Since Queen Victoria and Napoleon III agreed that a submarine connection between England and France would be a benefit to both countries, many tides have flown over the site of the proposed channel tunnel—and many changes have taken place in sub-aqueous tunnel construction, which no doubt will be fully considered by the present promoters of the scheme. Both the tunnel itself and the necessary drains from the center to each shore can now be constructed so comparatively cheaply and expeditiously that some of the principal objections to the project have been greatly weakened. It is a question, indeed, whether the small amount of water that should enter the tunnel cannot be got rid of by other means than by drains. It will probably be found advisable to keep at a greater depth below the bed of the channel than was originally designed; this will involve steeper gradients—but with electric traction and regenerative control this will not add to the difficulty of working the traffic. With present systems of signaling it will be possible to run many more trains than in the old steam tunnels; also it may be taken for granted that Sir John Hawkshaw's two straight inclines meeting in the center will be adopted instead of the crooked line, advocated, in order to avoid possible water-bearing strata; indeed, at the increased depth, it is very doubtful if these would be encountered—nor with present appliances and after experience elsewhere need they be considered as of much importance compared with the advantages of the straight run. The danger of invasion would surely be overcome by some device by which the authorities, by touching a button, might flood the center part of the tunnel up to its intrados. Provision will, of course, be made for telephone and telegraph wires, and it may be safely asserted that the time has now come for carrying out the queen and the emperor's long-deferred proposal.—*Railway Gazette, London.*

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Iron Ore Rate Cases

Opinion by Commissioner Harlan:

With certain exceptions it is found upon the whole record that (a) the present groups, both of the lake ports and points of destination, (b) the rate relationships of the several destination groups, and (c) the iron-ore rates themselves are unreasonable and discriminatory. Reasonable maximum rates are prescribed for the future. The carriers are further required to establish separate charges for storing ore on their docks and for certain other dock services performed by them, and for switching and other services on private industry tracks. Reasonable maximum rates are prescribed for the dock services, and a charge on the engine-hour basis suggested for the services on the private industry tracks.

This proceeding is a general investigation of the rates and practices of the rail carriers of iron ore from the lower Lake Erie ports to points in Ohio, Kentucky, West Virginia, and western Pennsylvania. The traffic amounts to about 25,000,000 long tons a year and yields to the rail carriers a revenue of about $20,000,000.

The ore originates at mines in Wisconsin, Minnesota, and the upper peninsula of Michigan. It reaches the lower Lake Erie ports by vessel and is there handled over the docks and forwarded to interior destinations by rail. Most of the docks are owned by the railroads; there are, however, a number of independent or privately owned ore docks. In some cases the railroads themselves operate their docks, but in most instances they employ stevedores or dock companies to do the work. About 79 per cent. of the ore is handled from the vessels directly to the cars for immediate shipment to destination. This is known as "direct" ore. The remaining 21 per cent. is placed in storage on the docks and is later forwarded to destination by rail. This is called "dock" ore.

Elaborate, powerful, and costly machinery is used in unloading the vessels, loading the cars, and in handling the ore to and from the storage yard. At the present time all the machinery and other facilities on the railroad docks are owned by the railroads, and a uniform charge of 10 cents per long ton is assessed by the rail carriers against the lake carriers for raising the ore from the hold to the "rail of the vessel." The charges for the rail line service, both for direct ore and dock ore, apply from the "rail of the vessel" to final destination. These charges in most cases are 8 cents, and in some cases 10 cents, higher per long ton on dock ore than on direct ore because of the storage and additional service required in handling the dock ore.

Many destination points take the same rate, and, generally speaking, the rate to a given point is applicable from more than one lake port. In other words, both the lake ports and the destination points are grouped. The destination groups are usually referred to as districts, as, for example, the Pittsburgh district, the Wheeling district, the Beaver district, etc. There is no official grouping as sometimes provided for in railroad tariffs.

In the table following the lowest rate on direct ore to the several groups and principal individual destination points is shown. There are varying rates in effect to certain of the groups. The rates are stated in cents per long ton:

Group No.	District	Lowest rate on direct ore	Lake ports from which rate is applicable
1	Cincinnati	90	Cleveland
2	Ashland-Ironton	90	Various
3	Hamilton-Wellston	67	Toledo
4	Zanesville-Coshocton	55	Various
5	Wheeling	88	Do.
6	Beaver	70	Do
7	Valleys	56	Do.
8	Pittsburgh	88	Do.
9	Johnstown-Scottdale	10[illegible]	Do.
10	Josephine-Vandergrift	93	Cleveland Ashtabula Erie
11	Du Bois-Punxsutawney	90	Buffalo
.	Josephine, Pa.	85	Do.
.	Columbus, Ohio	50	Various
.	New Straitsville, Ohio	52½	Toledo

The commission considered the following special questions: (a) discrimination as between general districts; (b) the burden of proof; (c) carriers' charges for unloading vessels; (d) operation of ore docks by stevedores or dock companies under contract with carriers; (e) cost of transporting iron ore and constructive rates based thereon.

Taking into consideration the generally shorter haul for iron ore, its value compared with the value of other commodities, and making due allowance for the special services accorded this commodity at the ore docks, while in transit, and at destination, the commission does not find, as contended by certain of the shippers, that it is paying more than a fair proportion of the gross revenue derived by the respondent carriers from the transportation of freight. This is particularly true if comparisons be limited to heavy loading bulk commodities generally transported in open cars. In saying this, however, it does not wish to be understood as indorsing or approving all the present rates, rules, and regulations governing shipments of iron ore.

There are several distinct operations that occur independently of each other as follows:

1. Unloading the ore from the vessel, or, technically speaking, raising the ore from the hold to the rail of the vessel.
2. Loading the ore into the car directly from the vessel when for immediate shipment to destination.
3. Placing the ore in the pit or trough if for storage.
4. Handling the storage ore from the pit or trough to the storage yard.
5. Holding the ore on storage in the storage yard.
6. Loading the ore into the car from the storage pile at the time of shipment to the final destination.
7. Hauling to destination by rail.
8. Placing the cars at the point of unloading on the private industry tracks at the furnace plants and returning them to the carriers' tracks after having been unloaded.

The carriers at present impose a separate charge for lifting the ore from the hold to the rail of the vessel. Of the other services enumerated above, the commission thinks that separate charges should be made as follows, the rates named being prescribed as reasonable maximum rates for the future:

	In cents per long ton
For handling the ore from the rail of the vessel, or point where it is received by carriers for transportation by rail, into the cars when for immediate shipment to interior destinations	6
For handling the ore from the rail of the vessel, or point where it is received by carriers for transportation by rail, to the storage yard	16
For handling storage ore from the storage piles into the cars for shipment to interior destinations	10
For storing ore on the docks, per month, from date of unloading from vessel	1

Storage charges should be collected monthly as they accrue, and other charges at the time the service is performed.

The commission finds further that the rates to certain points and groups are unreasonably high, while to some of the destinations and groups they appear to be intrinsically and relatively low. The record also shows many inconsistencies in the rate structure, particularly when considered from the standpoint of the distance from the lake ports, and these inconsistencies appear whether the short line, the mean average, or the weighted average distances be used as a basis for making comparisons. The rates appear to be illogical and inconsistent also, whether the territory under investigation be considered as a whole or whether the eastern district, the central district, and the western district be considered separately.

Maximum rates for the future are prescribed as follows, the rates named being applicable from the tracks of line-haul carrier at the lake port after the ore has been loaded into cars to the point of interchange with private industry tracks at destination:

Youngstown group, 50 to 74 miles, rate 50 cents.—Niles, Alliance, Hubbard, Canton, Girard, Youngstown, Brier Hill, Haselton, Massillon, Struthers and Lowellville-Bentley, Ohio; Shenango, Farrell, Greenville, Sharon, Titusville, Sharpsville, Wheatland and West Middesex, Pa.

Leetonia group, 75 to 99 miles, rate 55 cents.—Leetonia and New Philadelphia, Ohio; New Castle, Canal Dover, Franklin, Elwood City and Beaver Falls, Pa.

Midland group, 100 to 124 miles, rate 64 cents.—Steubenville and Mingo Junction, Ohio; Monaca, Aliquippa, Woodlawn, Butler, Midland, Ambridge, Coraopolis, Neville and McKees Rocks, Pa.

Pittsburgh-Wheeling group, 125 to 159 miles, rate 55 cents.—Martin's Ferry, Bridgeport and Bellaire, Ohio; Follansbee, Benwood and Wheeling, W. Va.; Pittsburgh, Allegheny, Hays, Homestead, Lucas, Etna-Sharpsburg, Carnegie, Avenue-Brackenridge, Rankin, Leechburg, Verona, Vandergrift, Bessemer, Munhall, South Duquesne, McKeesport, Kittanning, Clairton-Wylie, Avonmore, Irwin, Briquette and Mifflin Junction, Pa.

Monessen-Johnstown group, 160 to 199 miles, rate 88 cents per long ton.—Monessen, Donora, Latrobe, Josephine, Newell, Scottdale, Everson, Connellsville, Dunbar and Johnstown, Pa.

The commission does not at this time definitely fix the maximum charges for the service of placing cars upon private industry tracks at destination. Under the present practice, it appears that this service is performed in units of time rather than in units of tons and cars; therefore it is suggested that the locomotive hour will perhaps afford the most reliable basis for a charge, but this will be left for practical consideration by the carriers.

Commissioner McCord dissents. He is unable to agree with the findings in so far as they result in increased rates to Monessen and Donora, points now embraced in the Pittsburgh district but transferred by regrouping to the Monessen-Johnstown group. He does not approve the rates to the Pittsburgh-Wheeling and other groups. The effect in part of the regrouping is to increase the rates to Monessen on direct ore from 88 to 94 cents. "It seems that the commendable desire to work out more logical groups has, in the judgment of the majority, outweighed the evidence relating to the reasonableness of the rates themselves and other considerations properly bearing upon the issues before us." (41 I. C. C., 183.)

PERSONNEL OF COMMISSIONS

E. G. Rider of Sutton, West Virginia, has been appointed a member of the Public Service Commission of that state in place of W. M. O. Dawson, deceased.

Hon. Samuel W. Pennypacker, a member of the Pennsylvania Public Service Commission, and formerly, for six years—1903 to 1909—governor of the state, died at his home near Schwencksville, Pa., September 2, at the age of 73. He had been on the commission four years.

COURT NEWS

Service on Agents of Company

The Illinois Supreme Court holds that a ticket agent, not in the employ of a railroad, but employed as the agent of a connecting carrier, which employment includes the sale of tickets over the railroad's line, is not an agent of the railroad on whom service of summons may be made under the Illinois Practice Act.—Barnard v. Springfield & Northeastern (Ill.), 113 N. E., 89.

Bridge Repairers Engaged in Interstate Commerce

The Arkansas Supreme Court holds that a bridge repairer in the employ of a railroad engaged in interstate commerce fatally injured through the negligence of his fellow-servants while one of a crew engaged in removing old bridges and while removing the bolts from old caps lying clear of the rails, was "engaged in interstate commerce," since the repairing of the bridge would only be accomplished by removing the bridge timbers so far away that their presence would not materially injure the operation of trains or increase the danger of fire from passing trains.—Long v. Lusk (Ark.) 186 S. W., 601.

Sufficiency of Notice of Loss

The Kansas City Court of Appeals holds that under a shipping contract requiring the shipper to give written notice within four months for loss, damage, or delay, notice of damage to berries "on account of delay," could not mislead nor relieve the carrier of liability, where the damage was caused, not by delay, but by improper care in transit; the notice being for the purpose of giving the carrier opportunity to investigate the merits of the claim while the facts are fresh and information readily obtainable.—R. W. Gess Commission Co. v. Illinois Central (Mo.) 186 S. W., 1136.

Fencing Statute

The Wisconsin fencing statute renders liable a railroad which does not fence its roadbed for damages "occasioned by the want of a fence." A boy of 16 entered upon a railroad's unfenced right of way, boarded a moving freight train, and, in attempting to leave the train while in motion, after it had traveled for some miles, was killed. The Wisconsin Supreme Court holds that the road was not liable for the death. The boy's voluntary act of jumping off the moving train was wholly unrelated to the company's omission to fence, and the latter could not be considered as causing the death in any incidental or in-

direct manner.—Vaillant v. Chicago & North Western (Wis.), 158 N. W., 311.

"Interstate Shipment"

A manufacturer shipped by railroad to a point in the same state goods sold and to be delivered to another railroad company, billing them at the purchaser's request to a point on the latter's line in another state, to which they were transported by the purchasing railroad as its own goods. In an action to recover alleged overcharges the St. Louis Court of Appeals holds that the shipment, being continuous, was interstate, justifying the interstate rate rather than the intrastate rate on the haul to said junction point.—Werner Sawmill Co. v. Kansas City Southern (Mo.), 186 S. W., 1118.

Crossing Accident—Contributory Negligence

In an action for the death of the driver of a covered wagon, struck by a train at a crossing in Philadelphia, it conclusively appeared that if the deceased looked before driving upon the crossing, he must have seen the approaching train in ample time to avoid the accident, there being a space of 25 feet, affording a clear view down the tracks for a block. The Pennsylvania Supreme Court held that a verdict should have been directed for the railroad, notwithstanding the testimony of a witness who was riding with the deceased, that they stopped and looked when about 7 or 8 feet from the track and saw no train approaching.—Bernstein v. Pennsylvania (Pa.), 97 Atl., 933.

Evidence of Setting Fires

In an action against a railroad for setting fire to a barn, the Michigan Supreme Court held that verdict for the plaintiff was contrary to the great weight of the evidence where it was shown that the barn was located at a comparatively great distance from the track; there had been frequent showers the day prior to the fire; no other fires had been set in the vicinity, and the locomotive in question had never before been charged with setting fire. The evidence of the good state of repair of the locomotive on the morning of the fire was convincing. Judgment for the plaintiff was therefore reversed.—Malloy v. Grand Trunk (Mich.), 158 N. W., 854.

Fires—Burden of Proof of Negligence

Action was brought to recover damages for the destruction of a lot of lumber by fire. The lumber was placed on the defendant's right of way for shipment. Fire was communicated to it from a camp or commissary car used by the railroad's section hands, stationed on a side track near the lumber. The origin of the fire in the car, whether accident, negligence or intentional act, was not shown. The Alabama Supreme Court holds that where fire is communicated from a railroad right of way, in consequence of a burning building, or of a burning car standing on the track, the same rule applies as in the case of any other owner of property; that, where such owner sets a fire on his own premises for a lawful purpose and in a proper and careful manner, and without negligence, or the fire accidentally starts without his fault, he is not liable for damages caused by its being communicated to the property or premises of another unless he is thereafter guilty of negligence in failing to control or extinguish the fire before it spreads; and the burden of proof of such negligence is on the party alleging it.—Poe v. Southern (Ala.), 71 So., 997.

Liability for Outrage by Public Officer

A colored man 66 years old and his wife went as passengers from Newton to Walton, Kansas, arriving late in the afternoon. They failed to find the man they went to see, and desired to remain in the station until the train back to Newton, due in about an hour and a half, should come. The town marshal came in, looked at them, asked the ticket agent where they were going, and ordered them out, telling them they could not get a train till late the next morning and "they could make it back to Newton before that time." When they expressed a desire to get a ticket and remain in the station, he told them they could not stay there, and he would lock them up if they went up town, and with some force ejected them from the station; the station agent being within sight and hearing and making no remonstrance, but taking no part in the expulsion. Being thus compelled to walk back to Newton on a dark and inclement evening, they received injuries for which they sued the railroad, on the theory that it was the agent's duty to protect them from the actions of the officer. Remarking that a considerable research had failed to discover any case exactly similar and but few bearing any analogy to the case under consideration, the Kansas Supreme Court, assuming, without deciding, that the plaintiffs were entitled to the right of passengers waiting to take a train, held that the railroad was not rendered liable for the mere noninterference with the officer by the agent.—Fenwell v. A. T. & S. F. (Kan.), 158 Pac., 14.

Duties Towards Passengers Alighting

The Oklahoma Supreme Court holds that generally the contract of a carrier is that it will carry the passenger safely and in a proper carriage, and afford him safe and convenient means for entering cars and alighting therefrom; but it does not contract to render him personal service or attention beyond that. The recognized exceptions to the general rule are passengers who by reason of illness, great age, or other infirmity, are unable to help themselves. Action was brought by a woman for injuries received in falling from the step of a car while attempting to alight. Her husband had advised the conductor and the porter of the train at starting that his wife, who had been pregnant for about four months, and was accompanied by several small children, and carried a grip and a lunch basket, would have to change cars, and would need some assistance. It appeared that the conductor assisted the children to alight, and that he was there, ready to assist her. The jury gave a verdict for the plaintiff, but the Oklahoma Supreme Court held that, considering the evidence most favorable for the plaintiff, there was none which reasonably tended to support such a verdict, and reversed the judgment. The cause of the fall was uncertain. The plaintiff was strong enough to perform the duties of a field hand the day before the accident, and there was no evidence of any particular sickness on that day. It could not be said that the railroad was charged with knowledge that after a ride of less than 25 miles she was so weakened that she came within the exception of sick or infirm persons to whom the carrier owed a duty, and that she could not carry a basket containing one day's lunch and a grip whose weight she did not testify to.—St. Louis & S. F. v. Dobyns (Okla.), 157 Pac., 735.

Stipulation as to Claim for Loss Cannot be Waived in Interstate Shipments

In an action for the loss of household goods, the Kansas City Court of Appeals holds that where a shipment is interstate, the stipulation of the bill of lading that claims for loss or damage shall be made within four months, is valid. No notice of loss was given, and suit was not brought until nearly three years after the shipment. A railroad, by accepting and receiving a shipper's claim after the time stipulated in the bill of lading and by declining to pay on other grounds than want of notice, cannot waive the requirement of notice within the stipulated time. That would violate the Federal Interstate Commerce act, forbidding discrimination. A railroad cannot voluntarily say to one shipper, I will enforce the burdensome terms of our contract requiring notice in a specified time, and to another, I will release you from the same provisions in the same character of contract. The court remarked in passing that the order in Bills of Lading, 29 Interst. Com. R., 417, and the opinion therein, disclosed that the carriers and the commission construed the statute as prohibiting waivers of the contractual provisions as to notice. Several cases were cited to the court from the United States Supreme Court and the State Courts of Appeals on the subject of waiver; but these were not decided on the Interstate Commerce statute. That statute and the decisions thereon by the Supreme Court of the United States have superseded state laws and the decisions of the different states.—Banaka v. Missouri Pac. (Mo.), 186 S. W., 7.

In another case before the same court it was held that under such a stipulation notice is required even in case of a willful misdelivery by the final connecting carrier.—Kemper Mill Co. v. Missouri Pac. (Mo.), 186 S. W., 8.

Railway Officers

Executive, Financial, Legal and Accounting

C. W. Pidcock, Jr., has been appointed assistant treasurer and purchasing agent of the Georgia Northern.

G. R. Martin, controller of the Great Northern, at St. Paul, Minn., has been elected a vice-president, effective September 1.

Nathaniel Montgomery Rice, the announcement of whose election to the office of third vice-president of the reorganized St. Louis & San Francisco was recently made, was born December 28, 1863, at Rome City, Ind. He received his early education in the public schools at that place, and in May, 1887, entered railway service as a brakeman on the Gulf, Colorado & Santa Fe. He served in various capacities in the transportation and store departments of this same company, and on April 1, 1901, he was made assistant general storekeeper of the Atchison, Topeka & Sante Fe Coast Lines, which connection he held until April 1, 1903, when he became general storekeeper in full charge of material, fuel and stationery, serving the entire system. In November, 1913, he was appointed chief purchasing agent of the St. Louis & San Francisco, with headquarters at St. Louis, Mo., which latter office he retained up to the time his present appointment became effective.



N. M. Rice

Charles W. Hillard, whose election as fourth vice-president of the St. Louis-San Francisco, has already been announced, was born on June 9, 1855, in Northampton, England. He began railway work in 1876 as assistant secretary of the Chicago, St. Paul & Minneapolis, remaining in that position until the road was absorbed by the Chicago & North Western in December, 1882. In 1885 he became secretary and treasurer of the Chicago & Indiana Coal Railway, which was consolidated in 1887 with the Chicago & Eastern Illinois, when he became vice-president and treasurer of the combined company. In October, 1902, control of the Chicago & Eastern Illinois was secured by the St. Louis & San Francisco, and Mr. Hillard was made controller of the 'Frisco, in addition to his other duties, and on February 9, 1906, was elected also fourth vice-president of the Chicago, Rock Island & Pacific. In December, 1907, he was elected vice-president of the 'Frisco, resigning the duties of controller at that time, and in October, 1908, was elected also vice-president of the Evansville & Terre Haute. In December, 1909, when the Rock Island-'Frisco properties were separated, Mr. Hillard resigned as vice-president of the Chicago, Rock Island & Pacific, remaining as vice-president of the St. Louis & San Francisco, the Chicago & Eastern Illinois and the Evansville & Terre Haute. Since May, 1913, until his present appointment became effective, he served under the receivership of the 'Frisco as agent in the treasury department with headquarters at New York.



C. W. Hillard

E. L. Brown, formerly vice-president and general manager of the Denver & Rio Grande, has been elected president of the Minneapolis & St. Louis, succeeding Newman Erb, who has resigned. C. W. Huntington has been re-elected vice-president, but not general manager.

Arthur Colburn Griffith, whose appointment as auditor and treasurer of the Pittsburgh & Shawmut, with headquarters at Kittanning, Pa., has already been announced in these columns, was born on December 4, 1866, at Batavia, Ill. He was educated at Chicago University and at Oberlin (Ohio) College, and began railway work in August, 1891, in the accounting department of the Gulf, Colorado & Santa Fe. Mr. Griffith left the service of the G. C. & S. F. in 1902, and for a short time in 1903 served in the accounting department of the Delaware, Lackawanna & Western. In August of the same year he went to the Pittsburgh & Shawmut in the freight accounting department, and on February 1, 1905, was appointed chief clerk, which position he held until his recent appointment as auditor and treasurer of the same road, as above noted.

Edward Dailey Levy, whose election as second vice-president and general manager of the newly reorganized St. Louis & San Francisco was recently announced, was born October 16, 1879, at Paris, Tex., and received his early education in the public schools of that city and at Dallas, Tex. In February, 1898, he entered the service of the Santa Fe Refrigerator Dispatch at Chicago, Ill., since which time he has been consecutively to May 1, 1904, stenographer in the office of assistant superintendent of motive power and equipment, Michigan Central at Detroit, Mich.; stenographer in the office of general superintendent, Chicago, Milwaukee & St. Paul, at Chicago, Ill.; stenographer in the office of the industrial commissioner, Atchison, Topeka & Santa Fe; secretary to division superintendent same road; stenographer in the office of master mechanic, Atchison, Topeka & Santa Fe Coast Lines at Needles, Cal.; stenographer in the office of master mechanic, Ft. Worth & Denver City, at Ft. Worth, Tex.; stenographer in the office of vice-president and general manager, Mexican Central Railway, City of Mexico; stenographer in the office of division superintendent, and trainmaster's clerk, Kansas City Southern at Texarkana; secretary to general superintendent; stenographer and file clerk in general superintendent's office, Gulf, Colorado & Santa Fe at Galveston, Tex.; secretary to general manager and transportation clerk in general manager's office; senior clerk in general manager's office; May 1, 1904, to August 15, 1906, chief clerk to general superintendent same road; August 15, 1906, to June 1, 1907, assistant superintendent car service, St. Louis & San Francisco, at Springfield, Mo.; June 1, 1907, to May 1, 1911, superintendent of transportation; May 1, 1911, to March 1, 1914, assistant general manager of the same road, with headquarters at Springfield, Mo. From March 1, 1914, until his present appointment became effective he was general manager, with headquarters at St. Louis, Mo.



E. D. Levy

Operating

J. J. Rounds, trainmaster of the Delaware & Hudson at Carbondale, Pa., has been appointed superintendent of telegraph, with office at Albany, N. Y.

F. C. Fox, general manager of the western lines of the Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Tex., has been appointed general manager, eastern lines, succeeding C. W. Kouns, deceased.

Joseph Henry Nuelle, whose appointment as general superintendent of the New York, Ontario & Western, with headquarters at Middletown, N. Y., has been announced, was born on April 9, 1881, at Chicago, Ill. Mr. Nuelle was educated at Phillips Exeter Academy and at Princeton University, and began railway work in June, 1906, with the Pennsylvania Lines at Chicago, Ill. In 1907 he went to the New York, Ontario & Western as assistant engineer, and in September, 1911, was appointed principal assistant engineer. From January, 1912, to July, 1913, he was engineer of maintenance of way, and then was promoted to chief engineer; in June, 1915, he was appointed also assistant general superintendent, and now becomes general superintendent of the same road, as above noted.

Traffic

A. Revis Witherspoon has been appointed general agent of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at Winnipeg, Can., succeeding Wilfred S. R. Cameron, resigned.

J. E. Tilford has been appointed assistant general freight agent of the Atlanta, Birmingham & Atlantic with headquarters at Atlanta, Ga. C. I. Allen, commercial agent at Jacksonville, Fla., has been appointed general agent with office at Jacksonville, and the position of commercial agent has been abolished.

P. F. Finnegan, general freight and passenger agent of the Baltimore & Ohio Chicago Terminal Railroad, has been appointed general western freight agent of the Baltimore & Ohio, with headquarters at Chicago, succeeding C. H. Harkins, appointed assistant to western freight traffic manager. George A Upton, northwestern freight agent of the Baltimore & Ohio at Minneapolis, Minn., has been transferred to Chicago as commercial freight agent, succeeding H. S. Garvey, resigned. D. E. Sullivan, commercial freight agent at Milwaukee, succeeds Mr. Upton as northwestern freight agent, with headquarters at Minneapolis, and George D. Richards has been appointed commercial freight agent, succeeding Mr. Sullivan.

Frank H. Moser, whose appointment as coal freight agent of the Lehigh Valley, with headquarters at New York, has already been announced in these columns, was born at Mauch Chunk, Pa. He entered the service of the Lehigh Valley in 1909 and served as chief clerk to W. T. Grier, who at that time was coal freight agent. On October 14, 1914, when Mr. Grier was appointed general traffic manager, Mr. Moser was temporarily placed in charge of coal freight matters and remained in that position until his recent appointment as coal freight agent of the same road, with headquarters at New York, as above noted. Prior to his railroad service, Mr. Moser had been connected with the coal mining industry, serving in various capacities.



F. H. Moser

M. H. Jacobs, whose appointment as general freight agent of the Western Maryland, with headquarters at Baltimore, Md., has already been announced in these columns, was born on August 12, 1877, at Waynesboro, Pa. He was educated in the public schools, and began railway work on October 1, 1893, with the Western Maryland as messenger boy at York, Pa. In December, 1900, he was transferred to the commercial freight agent's office at Baltimore, Md. He later served consecutively as soliciting freight agent, and traveling freight agent until August 1, 1912, when he was appointed general agent at Pittsburgh, Pa. In November of the following year he became assistant general freight agent at Pittsburgh, which position he held until his recent appointment as general freight agent of the same road, as above noted.

Donald Wilson, whose appointment as general freight agent of the Long Island Railroad, with headquarters at New York, has already been announced in these columns, was born at Harrisburg, Pa., on May 11, 1875, and was educated in the public schools of his native town. He entered the service of the Pennsylvania Railroad on August 1, 1888, as a clerk in the freight department in the Kensington district, Philadelphia, Pa. Five years later he was transferred to the division freight agent's office at Washington, D. C., where he remained for five years. He was then for two years connected with the general freight agent's office at Philadelphia, Pa. On March 18, 1901, Mr. Wilson entered the service of the Long Island Railroad as chief freight clerk. Later, in the same year, he was made chief clerk in the freight department and on January 1, 1905, was appointed superintendent of express. Two years later he was appointed special agent of the traffic department and now becomes general freight agent of the same road, with headquarters at New York, as above noted.



D. Wilson

Engineering and Rolling Stock

L. S. Werthmuller has been made acting signal supervisor of the St. Louis Terminal division of the Union Pacific, succeeding L. R. Mann, promoted.

W. L. Whittington has been appointed acting signal supervisor of the eastern division of the Missouri Pacific, with headquarters at Jefferson City, Mo., succeeding F. E. Baugh, transferred.

L. R. Mann has been appointed general signal inspector of the Missouri Pacific, with headquarters at St. Louis, F. E. Baugh being appointed assistant general signal inspector, with office at the same place.

C. O. Ryborg and E. C. Lisle, signal instructors of the Pennsylvania Lines West, have been temporarily assigned to special work, and signal foremen H. F. Einsick and A. B. Eyster have been appointed acting signal inspectors.

OBITUARY

Charles W. Kouns, general manager of the Atchison, Topeka & Santa Fe, eastern lines, died at his home at Topeka, Kan., on September 3. Mr. Kouns was a member of the Conference Committee of the Railways that handled the recent wage controversy.

Joseph Richardson, chairman of the Southeastern Passenger Association, died at his home in Atlanta, Ga., September 3, at the age of 52. He was born at Auburn, N. Y., and at the age of 17 entered the service of the Pullman Company, at Philadelphia, as clerk. He remained with that company for about eleven years, rising to the position of superintendent at Jacksonville, Fla. In July, 1892, he was appointed general passenger agent of the Jacksonville, St. Augustine & Indian River, and with that road and its successor, the Florida East Coast, he remained four years. On July 1, 1896, he went to Atlanta to take the position which he held at the time of his death. Since 1897 his title has been chairman of the Southeastern Passenger Association.

Equipment and Supplies

LOCOMOTIVES

The New York Central is reported as contemplating the purchase of 230 locomotives.

The Pennsylvania Equipment Company, Philadelphia, Pa., is in the market for 25 to 30 second-hand Pacific type or similar locomotives.

FREIGHT CARS

The New York, Chicago & St. Louis is in the market for 500 40-ton steel frame automobile cars.

The Freedom Oil Works Company, Freedom, Pa., has ordered 10 40-ton tank cars from the American Car & Foundry Company.

The Pennsylvania Equipment Company, Philadelphia, Pa., is in the market for 2,000 to 3,000 second-hand flat cars of 20, 25 or 30 tons capacity.

Russian Government.—It is reported that the Russian Government has placed an order with the Bettendorf Company for 4,000 40-ton steel gondola cars.

The Lehigh Valley, reported in the *Railway Age Gazette* of August 18 as being in the market for 25 60-foot baggage cars, has ordered these cars from the Pullman Company.

PASSENGER CARS

The Long Island is inquiring for 60 coaches and 10 baggage cars.

The New York Central has issued inquiries for 10 70-ft. coaches and one 73-ft. 6-in. dining car.

The Delaware & Hudson, reported in the *Railway Age Gazette* of June 30 as being in the market for 3 baggage cars, has ordered 3 baggage and mail cars from the Pullman Company.

The New York, New Haven & Hartford also authorized the Osgood-Bradley Car Company to proceed with the construction of 40 baggage cars in addition to the 60 coaches mentioned in last week's issue. The New Haven has also ordered one private car from the Pullman Company.

IRON AND STEEL

The Baltimore & Ohio has ordered 250 tons of bridge steel from the American Bridge Company.

The Piedmont & Northern has ordered 500 tons of bridge steel from the Virginia Bridge & Iron Company.

The Chicago, Milwaukee & St. Paul has ordered 226 tons of steel from the American Bridge Company for a bridge over Bay street, Tacoma, Wash.

Philadelphia & Reading.—Henry A. Hitner's Sons Company, Philadelphia, Pa., were the successful bidders in connection with the sale of the Philadelphia & Reading bridges over the Susquehanna river at Milton, Pa., about 2,000 ft. long, and at Sunbury, Pa., about 3,600 ft. in length. The company will commence to dismantle the superstructures at once.

SIGNALING

The Chicago, Burlington & Quincy is installing 312 one-arm and 83 two-arm Federal type-4 automatic block signals on 172 miles of line.

The Atlanta & West Point will install automatic block signals on its line between East Point, Ga., and Newman, a distance of 39 miles.

The Missouri, Kansas & Texas will install a mechanical interlocking plant at Oswego, Kans. The contract has been let to the Union Switch & Signal Company.

The Chicago & Eastern Illinois has plans under advisement for the construction of automatic block signals between Ft. Branch, Ind., and Ingle, Ind., a distance of 10 miles, single track.

The Cleveland, Cincinnati, Chicago & St. Louis has authorized the installation of three interlocking plants; a 36-lever electro-mechanical plant, a 56-lever electro-mechanical plant and a 56-lever electric plant.

The Union Switch & Signal Company has been awarded a contract by the Alabama Great Southern to furnish the material required for the installation of an electro-mechanical interlocking plant at the crossing of this line with the Mobile & Ohio at Tuscaloosa, Ala.

The Nashville, Chattanooga & St. Louis has asked for bids on an interlocking plant at Stevenson, Ala., where the Southern joins the tracks of this company. An electric interlocking plant has been authorized at Wauhatchie, Tenn., at the junction with the Alabama Great Southern and the Southern.

The Chicago & North Western began work early in September on the installation of automatic block signals in connection with double tracking through Cedar Rapids, Ia., to Beverly, a distance of 55 miles. The new bridge over the Chicago river at Deering, Ill., was recently completed, and a new interlocking plant is being built to replace the old.

The Atlantic Coast Line is pushing rapidly the installation of new automatic block signals between Ashley Junction, S. C., and Charleston, S. C., a distance of 7 miles. There will be five interlockings through which automatic control is carried. Authority has been granted for the installation of a six-lever mechanical interlocking at the Rowland Lumber Company's crossing at Bowden, N. C.; a 20-lever mechanical interlocking at a crossing at Waycross, Ga., and a six-lever electro-mechanical interlocking with smash-boards, at Ogeechee River, Ga.

New Work on the New Haven

The New York, New Haven & Hartford is to install a G. R. S. electro-mechanical interlocking machine at Greenwich, Conn., comprising 32 electrical lever spaces, of which 21 have working levers, and 16 mechanical lever spaces, of which 10 have working levers. The installation will be done by the railroad's own forces.

Extensive changes have been authorized in the track layout at New Haven, Conn., which will include the reconstruction of two large interlocking plants, one a mechanical and the other electrical.

The signal department of this road is developing a signal system for the New York Connecting Railroad, the connecting line between this road and the Pennsylvania system, crossing Hell Gate bridge, New York City.

Extension of Light Signals on the Pennsylvania

Continual progress is being made by the Pennsylvania in the installation of position-light signals between Philadelphia and Chestnut Hill, on the Philadelphia division, 12 miles, mostly four-track, incident to the electrification of the Chestnut Hill branch. It is not expected, however, that the work will be completed this year. Other position-light signal installations authorized or under way include five miles of two-track line between Shanley's Cut and Manhattan Transfer on the New York division; 4½ miles of six-track between South Elizabeth, N. J., and Rahway, N. J.; six miles of two-track from Camden, N. J., to Haddonfield, N. J., on the West Jersey & Seashore; seven miles of two-track between Selinsgrove Junction, Pa., and Sunbury, Pa., on the Sunbury division, and from Sunbury through three interlockings to Northumberland, Pa., on the Williamsport division. Position-light distant block and distant switch signals will also be installed at a number of points on various divisions. A large amount of miscellaneous interlocking work is also being carried out.

MISCELLANEOUS

The Atchison, Topeka & Santa Fe has awarded a contract to the Roberts & Schaefer Company, Chicago, for building a 400-ton, four-track, automatic electric coaling plant, using the duplex shallow pit loader, at the new terminal at Las Vegas, N. M. Contract price, $22,000.

Supply Trade News

The Greenfield Tap & Die Corporation, Greenfield, Mass., has discontinued its store in Detroit, Mich.

W. E. Sharp, whose election to the presidency of the Grip Nut Company, Chicago, Ill., has been announced, succeeds Edward R. Hibbard, retiring from business. Mr. Sharp began his railway career as an apprentice in the car department of the Erie in April, 1889. In October, 1892, he was promoted to general foreman of the car and locomotive department of the same road, with headquarters at Chicago. He left this position in 1898 to accept service with the Armour Car Lines as assistant superintendent, and in April, 1901, he became superintendent of this line. In 1911 he resigned this position to enter the railway supply business, becoming vice-president of the Grip Nut Company, which office he continued to fill until his election to the presidency.



W. E. Sharp

R. W. Cameron & Co., New York, who maintain a staff of engineers in Australia and New Zealand in connection with their export business, have found it necessary to recall R. W. Nichols of their Australian staff to New York in order to cope with the increasing business in railway supplies, machine tools, steel products, etc., and will have the advantage of the services of an engineer who thoroughly understands conditions in Australasia as well as the United States and Canada.

Burton W. Mudge, president of Mudge & Co., Chicago, dealers in railway specialties, has also been elected president of the Safety First Manufacturing Company, Chicago, which will represent in Western territory the Franklin Manufacturing Company, Franklin, Pa., manufacturers of asbestos and magnesia products together with additional specialties. Mr. Mudge was formerly connected with the operating departments of the Atchison, Topeka & Santa Fe, the Chicago & North Western, the Fort Worth & Denver and the Chicago, Rock Island & Pacific, from which latter road he resigned as assistant to the general manager in 1908 to engage in the railway supply business. In September, 1908, he started the firm of Burton W. Mudge & Brother, representing the Commonwealth Steel Company, of St. Louis, Mo. Later the company name was changed to Burton W. Mudge & Co., and finally to Mudge & Co. The specialties to be handled by the Safety First Manufacturing Company under the direction of Mr. Mudge include a parcel rack for passenger cars, a caboose stove, angle cock brackets for freight cars and a combustion chamber for oil burning shop furnaces.



B. W. Mudge

J. E. Saunders, formerly electrical engineer of the Union Switch & Signal Company, has been promoted to assistant chief engineer. D. R. Bell succeeds Mr. Saunders as electrical engineer and W. P. Neubert, who has been acting assistant to the chief engineer, has been made mechanical engineer.

Henry B. Denker, one of the founders of the St. Charles Car Company, now a part of the American Car & Foundry Company, died at St. Charles, Mo., on August 30, aged 77 years. Mr. Denker was a native of Germany and came to this country when 19 years of age. He served in the Union army as captain during the Civil War, and then assisted in establishing the car plant which afterward was merged with the larger concern. After the merger he was made district manager.

Howard H. Hibbard, whose election to the vice-presidency of the Grip Nut Company, Chicago, has already been announced in these columns, succeeds W. E. Sharp, who has recently been elected president of the company. Mr. Hibbard is the son of Edward R. Hibbard, who is retiring from the presidency to make his home in California. Immediately on leaving school Howard H. Hibbard began his work in the company's plant at South Whitley, Ind., where he has made a careful study of the details of engineering and manufacturing of the devices handled by the company.



H. H. Hibbard

H. E. Brashares, formerly assistant signal engineer of the Great Northern Railway, has been appointed signal engineer of the Chicago Railway Signal & Supply Company, Chicago, Ill.

Dwight E. Robinson, formerly eastern railway representative of the Acme White Lead & Color Works, Detroit, has been elected vice-president and treasurer of Thornton N. Motley & Co., Inc., manufacturers' agents, Grand Central Terminal, New York.

Pollak Steel Company

The Pollak Steel Company, manufacturers of car and locomotive axles, with plants located at Cincinnati, Ohio, announces that it has taken over the Willard Sons & Bell Company of South Chicago, Ill., and will make axles there as well as in Cincinnati. The capacity of the plant at Cincinnati recently has been doubled and extensive improvements have been made in it in the way of additional buildings and new machinery. About 1,500 men are now employed at this plant and about 500 men at the South Chicago plant. The combined forging and axle output of the two plants is estimated at 30,000 tons per month.

Rodney D. Day, formerly general manager of sales for the William Tod Company, Youngstown, Ohio, has been appointed assistant to the vice-president of the company, with headquarters at Cincinnati. Mr. Day will be in full charge of all operations of both plants.

Frank Dunbar, formerly western sales manager of Brown & Co., of Pittsburgh, Pa, and for many years connected with the mechanical department of the Missouri Pacific, has been appointed district manager, with headquarters at South Chicago.

TRADE PUBLICATIONS

Spraco System for Cooling Condensing Water. This is the title of a 16-page booklet recently issued by the Spray Engineering Company, Boston, Mass. In the "Spraco" system the hot water is cooled by spraying it into the air so that when it falls into the basin or pond, its temperature is sufficiently reduced to permit of it being used over again. The booklet describes the system in detail, showing its advantages and the economies derived from its use and a number of views are given of Spraco

systems in operation. The same company has also issued two leaflets relating respectively to the "Vaughan Flow Meter" and "Cooling Water for Ice Plants."

Locomotive Tanks.—The Locomotive Tank Company, New York, has issued a folder descriptive of the Acme-Flanged sectional locomotive tank. The distinguishing feature of the tank is that the top and bottom are formed from plates with edges turned toward the water space, thus eliminating all rivet holes through top and bottom.

Train Lighting Batteries.—Bulletin 118, recently issued by the Edison Storage Battery Company, Orange, N. J., bears the title, Train Lighting Batteries, Edison. The booklet defines the various points of superiority of the Edison alkaline storage battery, touching upon its advantages under the heads of weight, maintenance and operation, life, temperature, efficiency and care. Several pages in the bulletin are devoted to a description of its manufacture.

Passenger Car Trimmings. Catalogue No. 200 recently issued by the Dayton Manufacturing Company, Dayton, Ohio, is 9 in. by 12 in. in size and contains 1,600 pages of illustrations of passenger car trimmings of all kinds. The book is a complete catalogue of passenger car hardware, lighting fixtures, water and dry closets, washstands and saloon fittings, vestibule and platform trimmings, brake handles, sash fixtures, basket racks, headlights, etc.

Pulverized Coal Equipment.—This is the title of catalogue No. 71 recently issued by the Lehigh Car, Wheel & Axle Works, Fullerton, Pa. The booklet is 8 by 10½ in. in size, and contains 28 pages. It gives descriptions and illustrations of the following units used for the production of pulverized coal: The Fuller-Lehigh pulverizer mill, Lehigh coal crushing rolls; indirect fired rotary dryers; pulverized coal feeders, and Fuller quality sprockets.

Welding and Cutting.—The Searchlight Company, Chicago, is now distributing catalogue No. 12 on Searchlight welding and cutting equipment. The booklet, to quote from its title page, is "A book of specific information on the welding and cutting of metals by the oxy-acetylene process, together with a catalogue of the equipment necessary for such work." There are many illustrations showing the Searchlight equipment and the work for which it is adapted.

Mortar.—The Hydrated Lime Bureau of the National Lime Manufacturers' Association, Pittsburgh, Pa., has issued a 32-page booklet describing a series of tests conducted by J. S. Macgregor, professor of civil engineering, Columbia University, on the effect of adding hydrated lime to cement mortar used in brick work. This booklet contains a large amount of interesting information regarding these tests, showing that the use of hydrated lime results in a greater strength at a less expense for materials.

Ingersoll-Rand Company.—This company has recently issued three new bulletins as follows: Form 9,024 deals with steam condensing plants of the Beyer barometric type. The Beyer condenser is of the barometric counter-current type, in which the air and vapor leaving the condenser move counter to or in an opposite direction to the incoming water. As a result, the air contained in the water is removed before the mixture of water and steam takes place, and the air and vapor leave at a comparatively low temperature. The catalogue describes the fundamental principles of steam condensing plants in minute detail, and compares the Beyer barometric condenser with low level jet condensers and surface condensers. Auxiliary apparatus, such as vacuum pumps and centrifugal water pumps is also illustrated and described in detail. Form 4,122 describes the IR Model Leyner drill sharpener. This bulletin explains and illustrates the sharpener in detail, and shows the various styles of bits. Machine sharpeners, it is asserted, not only make uniform bits, but make them at less expense and with greater satisfaction than can be done by hand. Form 3,033 describes the Imperial "XPV" duplex steam driven compressors, produced to meet a demand for a steam driven air compressor designed and constructed to operate satisfactorily under "high pressures" and "superheat," as well as under "ordinary steam" conditions. The catalogue shows the various sizes and capacities, and explains in detail the operation of the Imperial piston valve.

Railway Construction

Alexandria & Western.—According to press reports an extension is to be built west to Leesville, La. The company now operates a line from Alexandria, La., west to Gardner, about 15 miles. (April 7, p. 817.)

Charleston Interurban.—This company will probably build an extension next year to Montgomery, W. Va., about ten miles. No arrangements have yet been made for the construction of this line.

Florida Roads (Electric).—It is understood that preliminary work will be started this year on a proposed electric line from St. Augustine, Fla., north to Jacksonville, about 40 miles. T. R. Osmond, St. Augustine, may be addressed.

Mitchell & Northwestern.—Application has been made in South Dakota by residents of Mitchell, for permission to build a railway from Mitchell, S. D., northwest via Crow Lake and Gann valley to Highmore, through the counties of Davison, Aurora, Jerauld, Buffalo, Hand and Hyde about 100 miles.

Morehead & North Fork.—Work on an extension of this road has been resumed, it is said, from Redwine, Ky., southeast to Lenox, about 5 miles, and it is expected that the line will be completed about December 1. The company now operates a 25-mile line from Morehead, Ky., southeast to Redwine.

Nashville & Eastern Electric.—DeKalb county, Tenn., has voted to issue $150,000 of bonds, it is said, in aid of the construction of this proposed line. The projected route is from Lebanon, Tenn., southeast to Smithville, about 35 miles. C. Edwards, Smithville, is interested.

New York Subways.—The New York Public Service Commission, First district, will receive bids on September 18 for the installation of tracks for a portion of the new Culver line in the borough of Brooklyn. This work is on the section from a point between Eighth and Ninth avenues near Thirty-eighth street to a point at or near Avenue X and Gravesend avenue.

Ogden, Logan & Idaho.—This company is expected to complete and have ready for operation by September 15 the new cut-off being constructed between Hot Springs, Utah and Brigham, Utah, a distance of 12.6 miles. The cut-off is considered quite an improvement, both as regards time and expense. The grading was done by the Utah Construction Company. Only one small bridge was required over the entire district.

Pennsylvania Railroad.—This company has let a contract for carrying out improvements at Phillipsburg, Pa. The first part of the work consists of building a main track next to the river from Lehigh Junction to Lopatcong creek, 1.46 miles; this work includes building a bridge over Lopatcong creek and the necessary grading for the main track.

Petersburg & Appomattox (Electric).—Work is now under way building an extension from Hopewell, Va., to City Point, about 2.5 miles. The Vaughan Construction Company, Roanoke, Va., has the contract for the work. The company now operates a 10-mile electric line from Petersburg to Hopewell. (March 17, p. 527.)

Philadelphia & Reading.—This company has given contracts to the John A. Kelly Company, Philadelphia, Pa., for grading and masonry work, and to the Phoenix Bridge Co., Phoenixville, Pa., for the bridge work in connection with laying additional parallel tracks on the New York division between Hopewell, Pa., and Trenton Junction. The work calls for 32,000 cu. yd. of excavation a mile; the maximum grade will be 0.3 per cent, and the maximum curvature 2 deg. There will be three arch culverts consisting of from 6 ft. to 24 ft. spans and eight bridges varying in length from 18 ft. to 60 ft. spans. The work calls for the use of 75 tons of steel and constructing 6,700 cu. yd. of concrete.

Southern Pacific.—Surveys are being made for a new line to run from Milton, Cal., to Copperopolis, a distance of 18 miles. It has not yet been decided when construction work will be commenced.

VAN BUREN RAILROAD.—Incorporated in Tennessee, with $300,000 capital, to build from Doyle, Tenn., on the Nashville, Chattanooga & St. Louis south to Onward, and thence to Gillentine in Van Buren county, about 10 miles. The incorporators include J. J. Lynch, M. M. Allison, Chattanooga, Tenn.; E. N. Haston and C. B. Cuthbert.

VIRGINIA ROADS.—The question of building a line connecting Goshen, Va., with Monterey to develop timber lands, is said to be under consideration. K. T. Crawley, Richmond, Va., may be addressed.

RAILWAY STRUCTURES

BOSTON, MASS.—The New York, New Haven & Hartford will build eleven new steel girder highway bridges of single 57-ft. spans with concrete masonry abutments. The improvements will cost about $829,000. Bids have not yet been asked for the work.

EAST DEERFIELD, MASS.—The Boston & Maine has given a contract to the H. Wales Lines Company, Meriden, Conn., to build a locomotive shop at East Deerfield. It will be of brick and steel construction 40 ft. high, 170 ft. wide, and 200 ft. long. The improvements will cost about $80,000.

LEWISTON, MAINE.—A contract is reported let by the Maine Central to F. W. Cunningham & Son, Portland, to build a new station at Lewiston.

MYSTIC, CONN.—The New York, New Haven & Hartford will build a steel bridge 32 ft. wide and 180 ft. long over the Mystic river.

NEW ORLEANS, LA.—A constitutional amendment, authorizing the construction of a bridge or tunnels to connect the east and west banks of the Mississippi river at or near New Orleans, will be submitted to the voters of Louisiana on November 7, and is expected to be carried. The Public Belt Railroad Commission of New Orleans will be charged with the construction of a structure across the Mississippi river, and would like to hear from engineering firms who want to submit applications for contracts in connection with the work.

POCATELLO, IDAHO.—The Oregon Short Line is greatly enlarging several of its enginehouses along the line. Besides the 18-stall annex at this point, construction work is progressing rapidly on additions to other enginehouses as follows: 5 stalls at Salt Lake City, Utah; 5 stalls at Montpelier, Idaho; 5 stalls at Glenn's Ferry, Idaho, and 4 stalls at Dubois, Idaho. New facilities at Nampa, Idaho, including a 6-stall enginehouse and machine shop annex, also are nearing completion. The track lying on the new extension of the Marshfield branch from Marshfield, Idaho, to Idahome, Idaho, a distance of 19 miles, previously mentioned in the *Railway Age Gazette* under date of July 14, 1916, is expected to be pushed from now until the road is ready for business.

RUTHERFORD, N. J.—Regarding the report that the Erie Railroad will eliminate the grade crossing at Park avenue, an officer writes that no definite decision has yet been reached, regarding the carrying out of this work.

ST. JOHN, N. B.—Bids are wanted until September 18 by J. W. Pugsley, secretary Department of Railways and Canals, Ottawa, Ont., for constructing the foundations of a grain elevator, working house and track shed at St. John. The elevator is to have a storage capacity of 500,000 bushels.

TRENTON, N. J.—The Pennsylvania Railroad has given a contract to the John A. Kelley Company, Philadelphia, Pa., for the elimination of the grade crossings at Whitehead's road and East Clinton avenue east of Trenton station, on the main line, New York division. The present grade crossing at Whitehead's road is across 6 tracks. The new overhead bridge at Whitehead's road is to be of steel with concrete abutments and piers. It provides space for 7 tracks. The new bridge over East Clinton avenue will be of half-through girders resting on concrete abutments with columns on the curb line. This bridge provides space for 7 tracks. (April 28, p. 975.)

TUSCALOOSA, ALA.—A warehouse will be built by the Tuscaloosa Railway & Utilities Co., at Tuscaloosa.

Railway Financial News

BOSTON & MAINE.—See Connecticut River Railroad and Vermont Valley Railroad.

CONNECTICUT RIVER RAILROAD.—Judge Morton in the United States District Court at Boston on August 31 appointed James H. Hustis temporary receiver. As noted in last week's issue, Mr. Hustis was appointed on August 29 temporary receiver of the Boston & Maine, which leases the Connecticut River Railroad.

KANAWHA & WEST VIRGINIA.—See Kanawha & Michigan.

KANAWHA & MICHIGAN.—This company has purchased all or nearly all of the $1,359,600 stock of the Kanawha & West Virginia, outstanding, and has assumed $1,000,000 5 per cent first mortgage bonds, due July 1, 1955. The Kanawha & Michigan is one of the New York Central lines. The Kanawha & West Virginia runs from Charleston, W. Va., to Blakely up Elk river, 33 miles; it is to be extended into the coal fields.

MINNEAPOLIS & ST. LOUIS.—E. L. Brown, formerly vice-president and general manager of the Denver & Rio Grande, was on August 31 elected president of the Minneapolis & St. Louis, to succeed Newman Erb, who has resigned. A complete new board of directors was also elected as follows: Charles Hayden, of Hayden, Stone & Co., chairman; Edward L. Brown; E. V. R. Thayer, president of the Merchants National Bank of Boston; John A. Spoor, president, Chicago Junction Stock Yards; J. S. Bache, Frank P. Frazier, F. H. Davis of the Edwin Hawley estate; Colonel Slocum, of the Russel Sage estate; H. E. Huntington, S. B. Novembre and Thomas Gibson. C. W. Huntington was re-elected vice-president, but not general manager.

The following directors resigned: Newman Erb, W. J. Wollman, A. C. Doan, Ward E. Pearson, T. P. Shonts and Frank Trumbull.

VERMONT VALLEY RAILROAD.—James H. Hustis, temporary receiver of the Boston & Maine and the Connecticut River Railroad, was on August 31 also appointed receiver of the Vermont Valley Railroad. This company is a subsidiary of the Connecticut River Railroad, who is also in receivership, as noted elsewhere in this column.

WESTERN PACIFIC RAILROAD CORPORATION.—This company has been organized with the election of the following directors: C. Ledyard Blair, of Blair & Co.; F. H. Ecker, treasurer Metropolitan Life Insurance Company; Alvin W. Krech, president Equitable Trust Company; A. M. Hunt, San Francisco; R. W. Martin, of Wm. A. Read & Co.; Starr J. Murphy, of the Rockefeller Foundation; William Salomon, of Wm. Salomon & Co., and R. B. Young, of E. H. Rollins & Sons. The Western Pacific Railroad Corporation is the holding company controlling the Western Pacific Railroad Company, the operating company.

FRENCH RAILWAY PROSPERITY.—French industrial and economic activity is reviving, although some of the richest districts of France are still in the hands of the enemy, and although France has already spent in two years of war nearly $10,000,000,000. Railway receipts show the greatest resumption of prosperity, the total for the Western, the Paris, Lyons & Mediterranean, Orléans, and the Midi Railways reaching $144,000,000 for the first six months of the present year, as against $123,400,000 for the first half of 1915. This total actually shows an excess of $13,600,000 over peace time; that is, for the first six months of 1914. A great portion of the Northern Railway system and some part of the Eastern Railway system are still in the hands of the enemy, and both systems are almost entirely in the zone of the armies. Nevertheless, the Northern receipts reached $23,800,000 for the first half of 1916, as against $14,800,000 for the corresponding period of 1915; and the Eastern receipts for the same period were $22,800,000 for 1916, and $15,200,000 for 1915.

ANNUAL REPORT

CANADIAN PACIFIC RAILWAY COMPANY THIRTY-FIFTH ANNUAL REPORT

DIRECTORS OF THE CANADIAN PACIFIC RAILWAY COMPANY.
YEAR ENDED JUNE 30TH, 1916.

To the Shareholders.

The accounts of the Company for the year ended June 30th, 1916, show the following results:

Gross Earnings		$129,481,885.74
Working Expenses		80,255,965.28
Net Earnings		$49,225,920.46
Deduct Fixed Charges		10,306,196.06
Surplus		$38,919,724.40
Contribution to Pension Fund		125,000.00
		$38,794,724.40
Deduct Net Earnings of Pacific Coast Steamships, Commercial Telegraph, and News Department, transferred to Special Income Account		1,923,288.96
		$36,871,435.44
From this there has been charged a half yearly dividend on Preference Stock of 2 per cent., paid April 1st, 1916	$1,613,638.42	
And three quarterly dividends on Ordinary Stock of 1¾ per cent. each, paid December 31st, 1915, April 1st, 1916, and June 30th, 1916	13,650,000.00	
		15,263,638.42
		$21,607,797.02
From this there has been declared a second half yearly dividend on Preference Stock, payable October 1st, 1916	$1,613,638.42	
And a fourth quarterly dividend on Ordinary Stock 1¾ per cent., payable October 1st, 1916	4,550,000.00	
		6,163,638.42
Leaving net surplus for the year		$15,444,158.60

In addition to the above dividends on Ordinary Stock, three per cent. was paid from Special Income.

THE FOLLOWING ARE THE DETAILS OF SPECIAL INCOME FOR YEAR ENDED JUNE 30TH, 1916.

Balance at June 30th, 1915	$8,216,144.15	
Less Dividend paid October 1st, 1915	1,950,000.00	
		$6,266,144.15
Interest on Proceeds Land Sales		151,170.51
Interest on Deposits and Loans		976,326.08
Interest from Minneapolis, St. Paul & S. S. Marie Ry. Bonds		159,720.00
Interest from Mineral Range Ry. Bonds		50,160.00
Interest from Toronto, Hamilton & Buffalo Ry. Bonds		10,237.78
Interest from Montreal & Atlantic Ry. Bonds and other Securities		108,136.03
Interest from Berlin, Waterloo, Wellesley & Lake Huron Ry. Bonds		17,040.00
Interest from St. John Bridge & Railway Extension Co. Bonds		6,250.00
Interest from Esquimalt & Nanaimo Ry. Bonds		193,280.00
Interest from Dominion Atlantic Ry. Extension Debenture Stock		56,940.00
Interest from Dominion Atlantic Ry. 2nd Debenture Stock		36,986.67
Interest from Hull Electric Railway		60,000.00
Dividend on St. John Bridge & Railway Extension Co. Stock		70,000.00
Dividends on Minneapolis, St. Paul & S. S. Marie Ry. Common Stock		890,645.00
Dividends on Minneapolis, St. Paul & S. S. Marie Ry. Preferred Stock		445,326.00
Dividends on West Kootenay Power & Light Co. Common Stock		27,500.00
Dividends on West Kootenay Power & Light Co. Preferred Stock		3,850.00
Dividends on Consolidated Mining & Smelting Co. Stock		307,437.50
Dividend on Berlin, Waterloo, Wellesley & Lake Huron Ry. Stock		12,500.00
Earnings from Ocean Steamships and Hotels		3,583,292.28
Revenue from Company's Interest in Coal Mine Properties		557,842.72
Extraneous Mail Earnings		216,305.07
Net Earnings on Pacific Coast Steamships, Commercial Telegraph, News Department		1,923,288.96
Received for Space Rented in Office Buildings		76,720.34
		$16,207,099.09
Less:—Payments to Shareholders in dividends: December 31st, 1915, April 1st, 1916, and June 30th, 1916		5,850,000.00
		$10,357,099.09
From this a dividend has been declared payable October 1st, 1916		1,950,000.00

2. The working expenses for the year amounted to 61.98 per cent. of the gross earnings, and the net earnings to 38.02 per cent. as compared with 66.04 and 33.96 per cent., respectively, in 1915.

3. There were no sales during the year of four per cent. Consolidated Debenture Stock, four per cent. Preference Stock or other Capital Securities.

4. The sales of agricultural land during the year were 390,715 acres for $6,126,108.00, being an average of $15.68 per acre. Included in this area were 8,046 acres of irrigated land which brought $54.67 per acre, so that the average price of the balance was $14.86 per acre.

5. You will be asked to give your approval to an Agreement between the New York Central, Michigan Central, and Canada Southern Railway Companies and your Company, and the Toronto, Hamilton & Buffalo Railway Company, which, in addition to providing for the interchange of traffic passing over the latter Company's lines, provides for the issuance by the Toronto, Hamilton & Buffalo Railway Company of First Mortgage Consolidated Bonds not exceeding in amount $10,000,000., bearing interest at a rate not in excess of 5% per annum, to be issued only with the consent of the other Companies, parties to the Agreement, and to be unconditionally guaranteed as to principal and interest by these Companies jointly and severally.

6. In consequence of the extraordinary conditions created by the present War your Directors considered it advisable to postpone the effective date of the Agreement entered into between your Company and the Allan Line Steamship Company and the Canadian Pacific Ocean Services Limited, authorized by Resolution passed at the last Annual Meeting, for the acquisition by the last named Company of the Capital Stock of the Allan Line now held by your Company and of the vessels of your Company named in the Resolution. Your Directors have, however, thought it desirable to enter into an Agreement with the Canadian Pacific Ocean Services Limited under which the vessels of both fleets are operated by that Company as Managers and Agents. In view of possible changes in the conditions pertaining to ocean traffic, your Directors consider that it may be advisable, in your Company's interests, that in giving effect to the proposals previously approved a somewhat different plan should be adopted, and a Resolution will be submitted granting authority to your Directors to carry out the transaction with the Ocean Services or some other Company created for that purpose, of which Company your Company will have full ownership and control in such manner and on such terms as seem to them proper.

7. The revenue from your steamships given in the statement of Special Income is exclusive of an amount transferred to the Reserve Account to cover the cost of replacing ships sold or destroyed, and of a sum sufficient to meet any tax on excess profits that may be ultimately payable.

8. The relations between the Consolidated Mining & Smelting Company and the West Kootenay Power & Light Company were such as to make it desirable, in the interest of both properties, that they should be under one control, and in order that this might be accomplished, your Company joined with the other shareholders in the West Kootenay Power & Light Company in exchanging its holding of Common Stock in that Company for shares in the Consolidated Mining & Smelting Company, on a basis of $75 of the stock of the Consolidated Company for each $100 face value Common Stock of the West Kootenay Company.

9. Your Directors appropriated for Expenditure on Capital Account in the calendar year the amount of $3,749,474. Of this, $1,955,000. was required for the Connaught Tunnel in the Selkirk Mountains, and the balance for miscellaneous works of improvement over the whole system.

10. The profits resulting from the manufacture in your Company's shops of munitions of war undertaken at the request of Government, have not been taken into the operating revenue, but have been applied as a set-off against contributions to Patriotic and Relief Funds, and other expenditures by your Company directly due to the war and not properly chargeable to working expenses.

11. The important falling off in the revenue per ton mile for the carriage of freight traffic from .76 cents in 1915 to .64 cents this year, was largely due to the abnormal increase in the tonnage of grain handled at the very low rates that apply to that commodity, although the reduction in many tariff rates in Western Canada had considerable influence.

12. There being some doubt as to the right of the Company to issue its Preference and Debenture Stocks in dollar currency as well as sterling, the requisite authority to do so was secured by Act of Parliament at the last Session.

13. In November last the Trustees under the Mortgage securing £7,191,500 First Mortgage Bonds executed a discharge of mortgage and reconveyance of the property to the Company, and the documents have been deposited with the Honourable the Secretary of State at Ottawa.

14. Mr. E. W. Beatty, K.C., Vice-President and General Counsel, was elected a Director of the Company to fill the vacancy caused by the resignation of Mr. David McNicoll.

15. The under-mentioned Directors will retire from office at the approaching Annual Meeting. They are eligible for re-election,—

Mr. WILMOT D. MATTHEWS,
Mr. AUGUSTUS M. NANTON,
Mr. GEORGE BURY.

For the Directors,
SHAUGHNESSY,
President.

MONTREAL, August 14th, 1916.

GENERAL BALANCE SHEET, JUNE 30TH, 1916. CANADIAN PACIFIC RAILWAY COMPANY

ASSETS

Property Investment:		
Railway	$352,971,897.76	
Rolling Stock Equipment	153,605,367.56	
Ocean, Lake and River Steamers	24,211,713.33	
		$530,788,978.65
Acquired Securities (Cost):		
Schedule "A"		111,793,714.53
Advances on Lines and Steamships Under Construction		42,852,519.99
Advances and Investments		9,639,472.07
Deferred Payments on Lands and Townsites Sales, No. 2		12,006,140.61
*Special Investment Fund:		
Deferred Payments on Lands and Townsites	39,044,383.42	
Government Securities	10,088,734.86	
Deposited with Trustee	7,135,650.56	
		56,268,768.84
Working Assets:		
Material and Supplies on Hand	$11,814,583.84	
Agents' and Conductors' Balances	1,819,709.40	
Net Traffic Balances	512,056.88	
Miscellaneous Accounts Receivable	8,737,605.83	
Temporarily Invested in War Loans	5,272,690.63	
Cash in Hand	41,581,680.69	
		69,738,327.27
Other Assets:		
Schedule "B"		127,129,135.93
		$960,217,057.89

*Security for issue of Note Certificates, $52,000,000.

LIABILITIES

Capital Stock:		
Ordinary Stock	$ [illegible]	
Four Per Cent. Preference Stock	[illegible]	
		$340,681,921.12
Four Per Cent. Consolidated Debenture Stock		176,284,882.10
Mortgage Bonds:		
Algoma Branch 1st Mortgage [illegible] per cent.		3,650,000.00
Note Certificates 6 Per Cent.		52,000,000.00
Premium on Ordinary Capital Stock Sold		15,000,000.00
Current:		
Audited Vouchers	[illegible]	
Pay Rolls	4,789,748.92	
Miscellaneous Accounts Payable	[illegible]	
		15,511,225.47
Accrued:		
Rentals of Leased Lines and Coupons on Mortgage Bonds		531,658.91
Equipment Obligations		11,680,000.00
Reserves and Appropriations:		
Equipment Replacement	[illegible]	
Steamship Replacement	[illegible]	
Reserve Fund for Contingencies and for Contingent War Taxes	[illegible]	
Marine Insurance Fund	[illegible]	
		24,801,796.36
Net Proceeds Lands and Townsites		68,255,803.19
Surplus Revenue from Operation		100,604,596.60
Surplus in other Assets		121,215,174.14
		$960,217,057.89

[illegible] OGDEN,
Vice-President.

Auditors' Certificate.

We have examined the Books and Records of the Canadian Pacific Railway Co. for the fiscal year ending June 30th, 1916, and having compared the annexed Balance Sheet and Income Account therewith, we certify that, in our opinion, the Balance Sheet is properly drawn up so as to show the true financial position of the Company at that date, and that the relative Income Account for the year is correct.

PRICE, WATERHOUSE & CO.,
Montreal, August 10th, 1916. Chartered Accountants (England).

FIXED CHARGES FOR YEAR ENDED JUNE 30TH, 1916.

£ 200,000	St. Lawrence & Ottawa Ry. 4% First Mortgage Bonds	$ 38,933.34
$2,544,000	Man. S. West. Colzn. Ry. 1st Mortgage 5% Bonds due June 1st, 1934	127,200.00
£4,007,381 15 5	Ontario & Quebec Ry. Debenture Stock 5%	975,129.56
$2,000,000	Ontario & Quebec Ry. Ordinary Stock 6%	120,000.00
£1,330,000	Atlantic & North West. Ry. 1st Mortgage Bonds, due January 1st, 1937	323,633.34
£ 750,000	Algoma Branch 5% 1st Mortgage Bonds due July 1st, 1937	182,500.00
$ 500,000	New Brunswick Southern Ry. 1st Mortgage Bonds, 3%	15,000.00
$ 500,000	Lindsay, Bobcaygeon & Pontypool Ry. 1st Mortgage Bonds, 4%	20,000.00
	Rental, Toronto, Grey & Bruce Ry	140,000.00
	Rental, Calgary & Edmonton Ry	218,357.60
	Rental, Farnham to Brigham Jct	1,400.00
	Rental, Mattawamkeag to Vanceboro	23,800.00
	Rental, New Brunswick Ry. System	372,829.74
	Rental, Terminals at Toronto	25,968.71
	Rental, Terminals at Hamilton	38,877.61
	Rental, Hamilton Jct. to Toronto	43,487.40
	Rental, St. Stephen and Milltown Ry	2,050.00
	Rental, Joliette & Brandon Ry	5,000.00
	Rental, Lachine Canal Branch	939.96
	Interest on Montreal & Western Ry	12,501.84
	Interest on Equipment Obligations	567,191.66
		$3,254,800.76
£36,222,921	4% CONSOLIDATED DEBENTURE STOCK	7,051,395.30
		$10,306,196.06

STATEMENT OF EARNINGS FOR THE YEAR ENDED JUNE 30TH, 1916.

From Passengers	$ 24,690,652.19
" Freight	89,654,405.19
" Mails	1,384,567.43
" Sleeping Cars, Express, Telegraph and Miscellaneous	13,752,260.93
Total	$129,481,885.74

STATEMENT OF WORKING EXPENSES FOR THE YEAR ENDED JUNE 30TH, 1916.

Transportation Expenses	$38,915,381.50
Maintenance of Way and Structures	14,671,791.20
Maintenance of Equipment	16,695,955.87
Traffic Expenses	2,798,699.40
Parlor and Sleeping Car Expenses	990,410.87
Expenses of Lake and River Steamers	829,811.73
General Expenses	4,014,753.69
Commercial Telegraph	1,339,161.02
Total	$80,255,965.28

STATEMENT OF SURPLUS INCOME ACCOUNT, JUNE 30TH, 1916.

Balance at June 30th, 1915		$83,019,483.06
Net Earnings of Railway	$36,871,435.44	
Special Income	9,940,954.94	
		46,812,390.38
		$129,831,873.44
Less: Dividends on Preference Stock paid October 1st, 1915, and April 1st, 1916	3,227,276.84	
Dividends on Ordinary Stock paid October 1st, 1915, December 31st, 1915, April 1st, 1916, and June 30th, 1916	26,000,000.00	
		29,227,276.84
		$100,604,596.60

DESCRIPTION OF FREIGHT FORWARDED.

	Year Ended 30th June		
	1914	1915	1916
Flour ..... Barrels	8,892,250	8,538,600	10,499,260
Grain ..... Bushels	184,954,241	126,909,828	276,788,209
Live Stock ..... Head	2,481,360	2,833,726	2,190,389
Lumber ..... Feet	2,953,125,699	2,180,735,600	2,696,804,934
Firewood ..... Cords	287,910	254,428	298,426
Manufactured Articles.. Tons	8,148,012	6,024,590	7,960,723
All other articles..... Tons	9,159,112	7,423,163	8,228,156

FREIGHT TRAFFIC.

	Year Ended 30th June		
	1914	1915	1916
Number of Tons Carried	27,801,217	21,490,596	29,276,872
Number of Tons Carried One Mile	10,821,748,859	7,940,151,342	14,057,685,773
Earnings per Ton per Mile	0.75 cents	0.76 cents	0.64 cents

PASSENGER TRAFFIC.

	Year Ended 30th June		
	1914	1915	1916
Number of passengers carried	15,638,312	13,202,603	13,833,978
Number of passengers carried one mile	1,587,368,110	1,164,488,630	1,255,561,198
Earnings per passenger per mile	2.05 cents	2.06 cents	1.97 cents

TRAIN TRAFFIC STATISTICS FOR TWELVE MONTHS ENDED JUNE 30TH, 1916 AND 1915.

EARNINGS OF LAKE AND RIVER STEAMERS NOT INCLUDED IN THIS STATEMENT.

	Year ended June 30th, 1916.	Year ended June 30th, 1915.	Increase or *Decrease.* Amount or number.	Per Cent.
TRAIN MILEAGE.				
Passenger trains	18,159,545	17,977,033	182,512	1.02
Freight "	25,355,997	16,896,368	8,459,629	50.07
Mixed "	3,098,825	1,939,478	159,347	8.22
Total trains	45,614,367	36,812,879	8,801,488	23.91
CAR MILEAGE.				
PASSENGER.				
Coaches and P. D. and S. cars	88,080,027	87,283,067	796,960	.91
Combination cars	2,835,311	2,829,455	5,856	.21
Baggage, Mail and Express cars	39,335,804	40,691,990	*1,356,186*	*3.33*
Total Passenger cars	130,251,142	130,804,512	*553,370*	*.42*
FREIGHT.				
Loaded	603,705,406	404,249,594	199,455,812	49.34
Empty	280,241,711	144,408,527	135,833,184	94.06
Caboose	27,558,813	18,476,337	9,082,476	49.16
Total Freight cars	911,505,930	567,134,458	344,371,472	60.72
Passenger cars per Traffic Train Mile	6.43	6.57	*.14*	*2.13*
Freight " " " " "	33.20	30.11	3.09	10.26
PASSENGER TRAFFIC.				
Passengers carried (earning revenue)	13,727,219	13,086,064	641,155	4.90
" " " " one mile	1,247,118,119	1,155,371,348	91,746,771	7.94
Passengers carried (earning revenue) one mile per mile of road	96.546	93.413	3.133	3.35
Average journey per passenger....miles	90.85	88.29	2.56	2.90
Average amount received per passenger....$	1.78	1.81	*.03*	*1.66*
" " " per passenger mile....cts.	1.96	2.05	*.09*	*4.39*
Average number of passengers per train mile	61.56	58.01	3.55	6.12
" " " " car "	13.72	12.82	.90	7.02
Revenue from passengers per passenger car mile....cts.	26.84	26.32	.52	1.98
Total passenger train earnings per train mile....$	1.55	1.53	.02	1.31
" " " " " mile of road....$	2,425.15	2,468.87	*43.72*	*1.77*
FREIGHT TRAFFIC.				
Tons of revenue freight carried one mile	13,822,509,920	7,734,433,065	6,088,067,855	78.71
" non-rev. " " "	1,300,624,817	985,500,816	315,124,001	31.98
Total tons (all classes) freight carried one mile	15,123,125,737	8,719,933,881	6,403,191,856	73.43
Tons of revenue freight carried one mile per mile of road	1,070,068	625,338	444,730	71.12
Tons of non-rev. freight carried one mile per mile of road	100,688	79,679	21,009	26.37
Total tons (all classes) freight carried one mile per mile of road	1,170,756	705,017	465,739	66.06
Average amount received per ton per mile of revenue freight....cts.	0.641	0.773	*0.132*	*17.08*
Average No. of tons of revenue freight per train mile	503.46	410.62	92.84	22.61
" " " non-rev. " " "	47.37	52.32	*4.95*	*9.46*
" " " (all classes) " " "	550.83	462.94	87.89	18.99
" " " revenue freight per loaded car mile	22.90	19.13	3.77	19.71
Average No. of tons of non-rev. freight per loaded car mile	2.15	2.44	*.29*	*11.89*
Average No. of tons of (all classes) freight per loaded car mile	25.05	21.57	3.48	16.13
Freight train earnings per loaded car mile....cts.	14.68	14.79	*.11*	*.74*
" " " " train mile....$	3.23	3.17	.06	1.89
" " " " mile of road....$	6 860.21	4,832.53	2,027.68	41.96

Railway Age Gazette

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OPENING OF OUR WASHINGTON OFFICE

THE city of Washington has become within recent years a source of a large amount of important news relating to railway matters. As the Simmons-Boardman Publishing Company now publishes one weekly paper, the *Railway Age Gazette*, and four monthly papers, the Railway Mechanical Engineer, the Railway Maintenance Engineer, the Railway Signal Engineer and the Railway Electrical Engineer, it has become financially feasible for us to establish in Washington an editorial office to cover all developments in the national capital which interest and concern the readers of these publications. Therefore, we have opened a new office in rooms 64 and 65 Home Life building, Washington, D. C.

We regard this as one of the most important developments that have taken place in trade journalism in recent years The course of events at Washington has been rapidly growing in interest and importance to all classes of American industries, but this company is, we believe, the first one devoting itself exclusively to the publishing of trade or technical papers which has opened an editorial office at the national capital and placed a member of its own staff in charge of it.

The Washington editor of the *Railway Age Gazette* and other Simmons-Boardman publications is Harold F. Lane. Mr. Lane has had a long and valuable experience in railway newspaper work, and has a wide acquaintanceship among railway officers. He entered this line of activity naturally, since he is a son of Francis W. Lane, formerly editor of the Railway Age. Immediately after his graduation from Dartmouth College he became connected with the editorial staff of the Railway Age and the Electric Railway Review, then published by the Wilson Company, Chicago. After the consolidation of the Railroad Gazette and the Railway Age into the *Railway Age Gazette* he became railroad editor of the Chicago Tribune, a position he held for four years. In January, 1912, he joined the editorial staff of the *Railway Age Gazette* in Chicago, where he was located until his recent transfer to Washington. Throughout his connection with this paper he has specialized on such subjects as traffic, the labor situation and government regulation, and he is, therefore, especially equipped by virtue of his training and broad knowledge of railway economic matters to present and discuss the developments at Washington affecting railroads.

His long connection with railway journalism has also given him a working knowledge of the more technical departments of the railway business, and he will therefore be almost as much at home in covering developments in such technical departments of the Interstate Commerce Commission as its locomotive inspection bureau has in dealing with the commission's regulation of rates.

The Simmons-Boardman Publishing Company hopes and expects that by establishing this editorial office in Washington and placing one of its most experienced and competent men in charge, it will be able to render the readers of all its publications a greatly improved service.

The Trainmaster's Responsibility

The letter from an ex-trainmaster printed in another column is a present-day picture. It is drawn in pretty bold lines, but a level-headed superintendent, to whom we have shown it, says it is true to life. The wrong things shown in it are not new, but they need to be more carefully looked at than they usually are. He says some of the absurd allowances made to the trainmen tempt a superintendent—or a trainmaster—to tear his

hair; but he does not do so; he girds up his loins to work harder than ever for his ideal—good and economical service. And whether the new law stands, and all plans have to be adjusted to one standard—that of hours—or the courts come to the rescue with a rule of reason, permitting trainmasters to put a premium on real efficiency, the underlying duty is the same. The master must keep his equilibrium and aim straight ahead, even if half his men go crazy. One chief despatcher, a month ago, gave notice that if the brotherhoods should win their battle, he wanted to be transferred to another job; the lazy, the overbearing and the tricky were already worrying him all he could bear. But, he, the trainmaster who knows the difficulties of the problem, is the very one on whom the superintendent ought to be able to depend for a leader in a fresh campaign. Individual efficiency of individual trainmen remains the goal and no amount of dust must be allowed to obscure it. Meantime, the railway managements of the United States have an imperative duty to perform, and that is to recognize the loyalty and the efficient work of the officers in the subordinate ranks, such as trainmasters, roadmasters, road foremen of engines, etc., in some more substantial manner than by mere words. In many cases locomotive engineers and conductors already are receiving higher wages than trainmasters, roadmasters, road foremen of engines, and even in some cases than superintendents, and if the engineers and conductors get the raise in wages recently decreed by law the situation will be made still worse. If those in control of the management of the railways continue to let such a condition exist they will be guilty of base ingratitude and of great folly. The policy which has given rise to this condition penalizes loyalty and puts a premium on disloyalty; it tends to break down esprit de corps and to destroy efficiency, and it ought to be changed, and changed now.

Train Shed Supports Between Tracks

An interesting development in the design of the new passenger station of the Lehigh Valley at Buffalo, N. Y., described in another column in this issue, is the placing of the supports for the Bush train shed between the tracks rather than in the center of the platforms as has been the more common practice up to this time. This offers an interesting contrast with a train shed of the same type which is now being built at the new Lackawanna station a few blocks distant, where the supports are placed in the platforms. While the design adopted by the Lehigh Valley involved a considerable change in the structural details of this type of train shed the removal of the center obstructions from the platforms is of obvious advantage. This is particularly true where it is necessary to truck baggage and express on the same platforms used by passengers going to and from trains, for the platforms must be of sufficient width to provide ample clearance for trucks on each side of the posts, which clearance must be increased under the increasingly common practice of using motor trucks hauling several baggage or express trucks in a train. It is, of course, necessary to increase the distance between the tracks to permit the placing of the supporting posts for the train shed. However, clearance standards out on the line can be encroached upon at such a location because of the absence of any necessity for an employee to be upon the side of a car passing into the station. Thus the track centers were established at 14 ft. 8 in. in the Lehigh Valley station as compared with 13 ft. in the adjacent station of the Lackawanna, while the platforms were reduced from 20 ft. with the center platforms to 14 ft. 2½ in. at the former station. This decrease in the width of the platforms effected a net saving of approximately 4 ft. for each group of tracks, an important consideration in most terminals with their high land values.

The Quebec Bridge Disaster

A second disaster, in what has been one of the most tragic chapters in the history of bridge engineering, took place on the morning of September 11, when the suspended span of the Quebec bridge dropped into 200 feet of water while it was being raised into what was to be its final position between the two gigantic cantilever arms that reach out from each side of the river. Nine years previous, on August 27, 1907, the world was shocked at the news of the failure of the first attempt to erect one of the world's greatest bridges at the same site. The confidence of the public in the engineering profession was seriously shaken, and not entirely without justice, for subsequent investigation proved that the real cause for this first disaster arose from a disregard or indifference in some quarters for what were then considered certain theoretical refinements of detail that were designed to insure a unity of action in the built up members. This lesson has been thoroughly learned, although dearly bought and nearly a decade of courageous, thoughtful and painstaking effort have been expended in a renewed attempt to complete the bridge. Then, with the goal actually in sight and with the scheme of erection that involved a most spectacular and unprecedented feat, the builders of the new structure were doomed to bitter disappointment because of a second failure. Compared to the collapse of 1907 this later mishap is inconsiderable, both as to the loss of life which it entailed and as to the financial loss, and it is doubtful whether the completion of the bridge will be delayed more than a year.

RELATION OF THE STORES DEPARTMENT TO THE MECHANICAL DEPARTMENT

IN a paper on the "Determination of Efficiency in the Supply Department," which was presented by H. C. Pearce, general purchasing agent of the Seaboard Air Line, at the April meeting of the Richmond Railroad Club, and abstracted in the August 4 issue of the *Railway Age Gazette*, page 200, the author takes the mechanical department to task for keeping too much material on hand with which to meet its needs. He refers to the staff meetings of the local mechanical officers at which lists of material delaying their work are made, as "nothing but a fence for excuses."

There is much in this statement, and Mr. Pearce deserves commendation for calling attention to the situation. But there is something to be said on the other side of the question. Mr. Pearce adds: "The policy of encouraging officers and employees to make complaints regarding shortage of material is wrong, and has probably done as much as any other one thing to encourage unnecessary investment in material." And further on he states: "Instead of men holding meetings to report and complain of shortage of material their efforts would be better directed toward ways and means of getting along with what they have."

It is the duty of the mechanical department to keep the cars and locomotives in service and to make repairs with the least possible delay, in order that the railroads may properly and expeditiously handle the one thing they have to sell—transportation. If the mechanical department is handicapped by the lack of proper material delays will be occasioned, and at times of car shortage and a rush of business these delays may be expensive. During periods of heavy traffic the earning power of a locomotive will be between $100 and $200 per day and sometimes more. It would be a serious mistake therefore to hold this equipment out of service for too long a time. The stores department should see that the mechanical department is supplied with its needs in order that quick repairs can be made.

The whole matter presents a need for co-operation. Both the stores department and the mechanical department should

remember that they are working for a common purpose. Each is dependent upon the other for its success. The mechanical department should co-operate with the stores department to keep the amount of material carried in stock down to the lowest possible minimum, and the stores department should, as its first duty, see that the mechanical department is supplied with the proper kind and amount of material. A "showing" by the stores department can be made at the expense of the mechanical department, and a "showing" by the mechanical department can be made at the expense of the stores department, and in either case at a direct loss to the railroad as a whole. It is only by getting together, each assisting the other, that the most economical results can be obtained. "Rawhiding" of one department by the other will not lead to the proper co-operation.

THE EIGHT-HOUR DAY IN OTHER INDUSTRIES

PRESIDENT WILSON, in his recent address to Congress asking for legislation to avert the strike, said that "the preponderant evidence of recent economic experience spoke for the eight-hour day. . . . The whole presumption of modern experience would, it seemed to me," he said, "be in its favor, whether there was arbitration or not."

Whatever economic justification there may be for an eight-hour work day in some kinds of work is no argument for its introduction in railway train service, where, as everyone knows, it is impossible to divide the work into fixed periods of time. Train employees must remain with their trains from one terminal to another; they cannot be released wherever they may happen to be at the expiration of a certain number of hours, and different kinds of trains naturally require different lengths of time to complete their runs. A local train with many stops to make for loading or unloading freight may take 10 or 11 hours to make a run that a passenger train will make in three hours and a through freight train in seven hours.

But, as a matter of fact, every one also knows that the eight-hour workday has by no means been generally adopted in other industries, even under conditions where it would be physically possible to do so. A bulletin recently issued by the United States Bureau of Labor Statistics gives the hours of labor per day fixed by the union scales in 11 trades and in 47 cities located in 32 states, a total of 5,548 scales or contracts. This shows that eight hours is the prescribed day in only 2,992 or 53.7 per cent of the whole number of cases reported. In 2,016 cases the prescribed working day is nine hours or over and in 814 cases it is ten hours or over. This would seem to demonstrate that the eight-hour workingday does not have the sanction of general acceptance even in the trade union scales.

The 11 trades mentioned are: bakery trade; brewery and bottling house workmen; building trades; chauffeurs, teamsters and drivers; freight handlers; granite and stone trades; metal trades; mill work; printing and publishing, book and job, and printing and publishing, newspaper; and soft drink establishments.

Other published reports of the same bureau show the hours of labor in eight different industries, covering the work of 317,005 employees, for 1913 and 1914. A compilation of these reports shows that of the total only 8,259, or 2.6 per cent, worked only 48 hours or less per week; while 36,426, or 11.5 per cent, worked over the 48 hours and less than 54 hours; 114,442, or 36.1 per cent, worked 54 hours; 91,222, or 28.8 per cent, worked over 54 hours and less than 60 hours; 46,340, or 14.6 per cent, worked 60 hours, and 20,316, or 6.4 per cent, worked over 60 hours.

The eight industries included in these reports are cotton manufacturing, wool manufacturing, silk manufacturing, men's clothing, boot and shoe industries, hosiery and underwear, iron and steel industries, and building and repairing steam railroad cars. These data are not for union labor alone, nor for non-union labor, but apply to the industries as a whole, including both union and non-union labor.

The available state reports on the hours of labor also indicate that the eight-hour day is by no means an established feature of industry. The following gives the results of an examination of the reports of all states that publish information on this subject:

Kansas, 1914.—46,662 men employees represented. 21.8 per cent worked 8 hours or less per day. The prevailing hours were over 9 up to and including 10 hours per day.

Kentucky, 1913.—9,869 adult male employees represented. 15.3 per cent of these employees worked 8 hours per day. The prevailing hours were from 9 to 10 hours per day.

Louisiana, 1914.—25,793 men employees represented. One per cent of these worked 8 hours per day. The prevailing hours per day were 9 and 10, mostly 10.

Michigan, 1914.—285,424 adult male employees represented. The hours for Michigan are reported as averages in each county, so that the exact number working 8 hours per day, or less, is not disclosed. The averages reported indicate the prevailing hours to be from 9 to 10 per day.

Minnesota, 1913-1914.—79,208 adult male employees represented. 16.79 per cent of these employees worked 8 hours or less per day. The prevailing hours were from 9 to 10 per day.

Montana, 1914.—13,029 male employees represented. 54.6 per cent of these worked 8 hours or less per day. The remaining employees were employed in about equal numbers 9 and 10 hours per day.

New Jersey, 1913.—242,339 adult male employees represented. 3.6 per cent of these were in industries that averaged 9 hours and over 8 hours per day. These doubtless include some who worked 8 hours or less, but their number is not separately shown. The great majority of employees worked over 9 hours or over 10 hours per day.

North Carolina, 1914.—68,299 adult male employees represented. .6 of one per cent of these employees worked 8 hours per day. The great majority worked over 9 hours and as much as 10 hours per day.

Ohio, 1914.—12,779 establishments represented. The data for Ohio show the hours by establishments, but do not report the number of employees working any specified number of hours. 19.9 per cent of the establishments worked 48 hours per week or less. The great majority of them worked over 54 hours per week and up to 60 hours per week.

Oregon, 1914.—17,568 adult male employees represented. 15.1 per cent of these employees worked 8 hours or less per day. Some additional, but unknown number, worked 8 hours, but are included among those reported as working from 8 to 9 hours, or from 8 to 10 hours. The data indicate that the prevailing hours per day are from 9 to 10.

Tennessee, 1913.—8,669 adult male employees represented. 1.6 per cent of these employees worked 48 hours per week or less. The great majority work over 54 hours per week and up to 60 hours per week.

Texas, 1914.—55,147 male employees represented. 25.7 per cent of these employees worked 8 hours or less. The prevailing hours were from 9 to 10 per day.

Virginia, 1914.—The data for Virginia are reported by establishments and indicate the prevailing hours per day, and other hours per day when they are also worked. The data as reported show that the prevailing hours for all industries as a whole were from 9 to 10 per day.

Washington, 1913.—32,149 men employees represented. 3.8 per cent of these employees worked 8 hours or less per day. The great majority worked over 9 hours and up to 10 hours per day.

In an article on the "Growth of Labor Organizations," published in the Quarterly Journal of Economics for August, Prof. George E. Barnett of Johns Hopkins University estimates the trade union membership in 1914 to have been about 6.28 per cent of all "gainfully employed" persons in the United States. The statistics available, therefore, would seem to indicate that the eight-hour day is a "presumption" of the unions rather than of economic experience. In any event, in view of such facts, it seems peculiarly strange that any one should contend that the question of establishing either an eight-hour workday or an eight-hour payday in train service is not an arbitrable one.

NEW BOOKS

Air Brake Association Proceedings. Compiled and edited by F. M. Nellis, secretary of the association. 262 pages, 41 illustrations, 6 in. by 9 in. Bound in morocco. Published by the association, F. M. Nellis, secretary, 165 Broadway, New York City.

This is the official report of the twenty-third annual convention of the Air Brake Association, which was held in Atlanta, Ga., May 2 to 5, 1916. It contains papers on the Slack Action in Long Passenger Trains, Best Methods of Educating Air Brake Apprentices, Care of Modern Passenger Brake Equipment, Proper Piping of Locomotives and Cars, Excess Pressure, Hand Brakes for Heavy Passenger Cars, Need of Efficient Cleaning and Repairing of Freight Brakes, Recommended Practices, and Accumulation of Moisture and Its Elimination from Trains in Yard Testing Plants.

Letters to the Editor

EFFECT OF AN INCREASED DEMURRAGE RATE

CHICAGO, Ill.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I note in the September 8 issue of the *Railway Age Gazette* (page 394) you commented upon the performance of the California Demurrage Bureau in the release of freight cars under the $3 rate. The following statement will compare the performance of California under the $3 rate with the rest of the country under the $1 and $2 rates provided by the National Demurrage Code during the months of February, March, April and May, 1916:

	Under National Code			California
	$1 February and March	$1 and $2 April and May	Total for four months	rate $3 for four months
Cars handled	4,219,926	4,494,520	8,714,446	491,866
Cars released in 24 hrs. free time	2,626,986	2,900,337	5,527,323	388,803
Percentage	62.3	64.5	63.4	79
Cars held over free time	670,113	739,004	1,409,117	8,545
Percentage	15.9	16.4	16.2	1.74
Cars held more than 3 days over free time	182,679	186,380	369,059	858
Percentage	4.3	4.1	4.2	0.17
Demurrage accrued	$1,422,039	$1,963,838	$3,385,877	$49,128

If the $3 rate with no "average agreement" had been in effect and produced the same results in territory under the National Code, the number of cars held over the free time during this period would have been 151,631 instead of 1,409,117, a decrease of 1,257,486 (89.24 per cent), and the demurrage charges would have amounted to $871,878 instead of $3,385,877—a decrease of $2,513,999 (74.22 per cent).

I call particular attention to the percentage of cars released in the first day of free time and the percentage held over the free time, together with the percentage of cars held to exceed five entire days from time of placement.

This is the basis of our feeling that the demurrage rate should be increased to prevent the continued use of equipment as storehouses.

GEORGE HODGES,
Chairman A. R. A. Committee on Relations Between Railroads.

TRAIN DESPATCHER CRITICIZES FALSE ECONOMY

REDSTACK, Ark.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The railroad on which I am employed is a comparatively short one, but it has a long and ambitious name; not the "New York, Mexico City & Yokohama," but about as bad as that. However, it is very up-to-date; it has a loudly advertised policy of "Safety First." Above the despatchers' table is a rather ornately designed placard bearing the advertising symbol of the company, and a safety-first motto. On the train sheet—thoughtfully placed in a space that could otherwise be used by the despatcher to much better advantage—is the same design in miniature. On the blotters which we use is printed a wordy dissertation upon the necessity of employees being safe above all other things.

Bearing this firmly in mind I safely ring the operators at Guatemala, Peking and Vladivostok to safely issue a safe train order; and it is one which conditions demand shall be longer than usual.

"Wait a minute," says Guatemala, "until I step out and see if my signal light is burning. This cross between rainwater and Scott's Emulsion that they furnish for signal oil won't burn longer than ten minutes at a time."

"I'm ready," says Peking, "but you will have to send awfully slow, so I can bear down hard enough to get through these darned old worn-out carbons."

"Why don't you get some new carbons?" I inquire.

"Can't; on account of the war, I guess. We order three dozen every month, and get half a dozen. They're good for about three days."

"Can I put it on a '31' instead of a '19'?" inquires Vladivostok. "We're almost out of 19 blanks and I shall have to stop 262 to deliver it anyway. We haven't any hoops here and I nearly got killed trying to hand one up last night. Going to stop 'em after this. Safety first, you know."

"Why don't you get some hoops?"

"Can't. We've been ordering four every month for a year, and have written letters about them, too; but never got any except one that was sent to us Christmas. That, however, got broken Decoration day."

"Full up!" breaks in Guatemala, when I am within three words of the end of the order. "Could get the rest of it down but would have to run it into the print. These blanks aren't big enough to write the company's full name on with a stylus plain enough to be read."

"Make another, I'll send it over," I announce, comforting myself with thoughts of "Safety First" while trains wait for orders.

When I have finished this interesting process I reread a chapter or two of "Safety First" literature and wonder if the policy of the company isn't really "Safety First, but Saving Firster." Perhaps it is the result more of training and instinct than of a definite policy on the part of the parties concerned, but it is certainly noticeable on many railroads, that where economy and safety-first clash, economy (so-called) more often triumphs. The store and stationery departments of a railroad offer a wide field for either economy or extravagance, and the wise administration of these two departments is of vital interest to every company; but a wise administration is not one that substitutes arbitrary stinginess for intelligent judgment of requirements. It does not make a good showing in decreased disbursements, while the service on the line suffers for it.

I have never yet seen a despatcher's office where the supply of blotters, pen-points, ink, etc., was large enough to last from one requisition day to another, and I have often observed that other offices felt the pinch of the same circumstances. However, it is generally possible to beg enough advertising blotters from insurance agents and buy enough pen-points, and water the ink until it has the writing qualities of weak tea, and get through the crisis O. K., in that respect. But when it comes to economizing on train order carbons and other material vitally connected with the handling of train orders—"Safety First!" Instead of being so desperately careful that too much of such material is not furnished, some one should make it a point to see that a sufficient supply for average needs *is* furnished.

Mr. General Manager, please do see to it that ambitious stationers do not arbitrarily curtail such requisitions; let them cut down only after a thorough investigation shows that they are justified in so doing. An operator who turns out illegible copies of train orders through the use of worn-out carbons should not be retained in the service. There is nothing more hazardous than such an order. An adequate supply of train-order hoops should be maintained at every station. Any one who differs with me on this subject is respectfully requested to try to hand up an order with his bare hands to a train going 45 miles an hour.

Of course there is always a risk that these articles may be diverted to other uses than the ones they are intended for, and cause a big waste. The train-order carbons might be used for wrapping fresh butter, and the hoops are adapted to lassoing jackrabbits. But if there is anything in "Safety First" it demands that this risk be taken in preference to the other risks of a butting collision or of an operator being

struck halfway between the mail-catcher and the warehouse by a Pacific type while in the performance of his duties.

In this connection I wonder if there is any reason, other than that they may be a cent a million cheaper than a larger blank, why the railroad companies so religiously adhere to the use of such small train order blanks. These forms evidently were devised in ancient times when a white mule furnished ample motive power for all the trains that were run. I suppose a contract was signed that they would be used for the next ninety-nine years. Very few railroads have a train order blank long enough to contain an order of average length without cramping, despite the fact that the orders must be copied in manifold. If there is anything that should be firmly and clearly written, it is a train order.

HOMER PIGEON.

"THE HIGH COST OF EXPEDIENCY"

PEORIA, Ill., September 1.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Anderson Pace, in an address before the American Society of Railroad Superintendents at Memphis last month on "Building a Line to the Public," reported in your issue of August 25, says: "We are far from finding our way through the woods, but we believe that there is one tool which could do more than all the rest. That tool is the organized employee. Get him on the side of the railroads; let him be our missionary, and the conversion of the public is over."

That sounds well. The half million or more members of the railroad brotherhoods could do a great deal to remove barriers and cement friendly relations between railroads and public; but what do we learn from the conditions in the railroad world at the present time? With the officers of the four brotherhoods setting a date four days hence for a general strike, to tie up the commerce of the country, to expect these men to "build a line to the public" is just as sensible as to talk of building a line to the planet Mars. A brief review of the conditions that have led to this climax will open anyone's eyes.

The brotherhoods were, in a measure, the natural outgrowth of lack of consideration by railroad managements of the past. Because of lack of foresight on the part of railway officers the wages of the organized crafts were brought up not only to a fair standard, but they were carried above that level. Year after year arbitrary allowances were granted with excessive liberality while the more loyal and unorganized forces, the monthly salaried men such as clerks, station agents and their forces, were neglected and left to work Sundays and into the night and without overtime, in order to keep up with their work.

Annual passes were granted to members of brotherhoods and their families, at the same time such courtesies being refused to many of the unorganized men, and even to chief clerks in the superintendents' offices.

The disrespect for local authority, and consequent disloyalty, has been bred by the reinstating of men discharged for good and sufficient cause, on request of brotherhoods. In short, the managements of many roads are guilty of a culpable lack of effort to conserve their resources in loyalty. This has been done in the name of expediency; getting by today at the expense of tomorrow.

Who has the credit of getting all these concessions for the organized forces, as the rank and file see it? Their officers! Would they have been treated thus fairly had it not been for the organizations? In answer to this they point you to the unorganized men—clerks, section foremen, train despatchers, agents, roadmasters, master mechanics—working for 30 to 40 per cent less wages. Roadmasters receive about half the salary of a locomotive engineer. Master mechanics and train masters 20 to 30 per cent less. Chief clerks and accountants often less than a brakeman or a fireman. What is the lesson the masses in the brotherhoods get from this anomalous situation? They can see that the railroads are unfair and do not appreciate good service and loyalty when they have it. Therefore do not do anything that you can shirk; or, in any line, any more than you have to. Penalize the company every time you get a chance. Simply keep in to clear, and seniority will take care of you.

The officers of the brotherhoods explain to the men and "produce the goods" in contined increases of wages, arbitrary allowances, reinstatement of men discharged for good cause, and reversal of rulings by trainmasters and superintendents. This is the result in some cases of a very obvious cause, namely, promoting to official positions men from the ranks of the brotherhoods, who are unfit for supervising positions. These men keep the brotherhoods mobilized to build a line to the railroad's treasury.

Every one of the many arbitrary allowances which have been granted gradually and insidiously are illogical and even vicious in character. They are subversive of discipline. On those roads which are the worst tied up with these arbitrary allowances, discipline is all but gone, so far as relates to a large percentage of the men. Right here is where hazard in operation comes into the reckoning.

Conceive, if you can, how any man sincerely interested in his company and his discipline ever justified himself in tying the hands of the operating officers by agreeing to the following arbitrary allowances, now in force on some of the roads:

"Terminal time."—This means that when for any reason a train doesn't leave a terminal within one hour of the time set for departure the crew is paid one hour arbitrarily in addition to a full day, which includes the same hour; and on the other end of the run another arbitrary hour is added if held out of yard 30 minutes or more.

Running for coal or water.—In the event of any engine running low on either coal or water, making it necessary to leave the train and take the engine light to a water tank or a coal chute and then return for its train, even though they may be only a quarter of a mile from chute or tank, a minimum of ten miles or one hour is paid, in addition to regular time and mileage. The same concession applies to a train that doubles a hill, and even to the crew of an engine or train that helps a train ahead over a hill; and in some cases it is now being applied in case of train parting.

Automatic release.—A crew in freight service is automatically released, completes trip or day on arriving at any established terminal or division point, with no exceptions, no matter what the emergency or how much the company is losing by reason of the emergency. For instance, a washout makes it necessary to detour traffic, and in so doing the trains are moved to a terminal or division point on an adjoining division over a cut-off or a short route; and no matter how short the distance, be it only 10 miles, the crew is paid a full day or 100 miles for each move. It may make a round trip, taking a train to the terminal on the other division and return with only engine and caboose, doing it all inside of two or three hours. Two full days must be allowed, one for each single trip. If a second round trip is made these men are paid for four full days. This is actual practice on some roads.

Crews in work train service and formerly paid by the hour and protected by the minimum day, are now paid mileage to and from point of work and, in addition thereto, actual hours while in work service. This often means pay for a day and a half or two days for one day's service. Work train crews stationed at outlying points, gravel pits, etc., are paid an arbitrary hundred miles or full day for bringing their engines to a terminal after completing ten hours in work service, in addition to the full day in work service, no matter how short the distance, or how short the time.

Crews in work service, used in an emergency to move a train of revenue freight, no matter how short the distance or

few the hours, are allowed a full day for each class of service.

Crews in through freight service are allowed arbitrary time for what is termed miscellaneous work. For instance, a crew is instructed to stop at a certain point and allow section men to unload a car of ballast that may be in the train—possibly in a dump car requiring only 5 or 10 minutes to throw the latch and let the ballast run out (and this is done by the section men)—an additional or arbitrary hour is allowed.

Crews in this service are allowed arbitrary time for placing cars of coal on the coal chute (because of accident to switch engine or other emergencies) when perhaps the job doesn't take 10 minutes. And in all this so-called miscellaneous service the hour or hours as the case may be are allowed in addition to a full day's pay, even though the trip is completed in less than ten hours, as is very often the case. Train crews in through freight service are allowed local freight pay when as much as two hours' switching is done between terminals. Local freight pay is allowed for the entire trip, even though it is a fast freight run with a light train, making 150 miles in ten hours or less. Thus they get a day and a half at the local freight rate. And they get it even though they did not actually consume two hours doing the work, since there can be no check on the time unless a trainmaster or other officer in authority rides the train. Can you imagine how any officer who was sincerely interested in his road—or his discipline, or even the men themselves—in his right mind, ever bound his company by such an agreement as this? It is in effect an invitation to kill time and misrepresent facts, to secure increased pay. This is a very recent concession.

Another recent concession is that engines shall not be doubleheaded except going to and from the shops for repairs. In transferring an engine from one point to another we can not doublehead, even though the train on which the engine might doublehead is not given increased tonnage; the hazard in operation must be increased to the extent of running this additional train, in order to give a conductor a job. The above are only some of the more vicious arbitrary allowances which I recall. There are still others, and numerous other ways by which the organizations appropriate the company's money by means of these vicious codicils to the working agreement which have been put through, one at a time, as the grievers have found an easy manager—one of the smooth, diplomatic kind who often boast how nicely and easily they get along with the men.

To avoid reversals and criticism by this type of officer many superintendents have evidently taken the same line of "easy resistance," and thus, on many roads, the officers have greatly assisted the brotherhoods in bringing about the situation which we see today. It is wholly natural that the gates of promotion are closed to the division officer who can not get along smoothly with the brotherhood men—that is, the local brotherhood officers.

It is this puerile type of officer who panders to the brotherhoods and neglects to fight for the unprotected 75 to 80 per cent, that is largely responsible for the fear evidenced by some of the executives as well as the public, as to the great power of the brotherhoods.

They were bluffing again this time. The older ones were from the start against making the bluff and many would not have gone out. They know that there is no great secret in running a locomotive and still less in the other four positions, and that men could and would have been quickly recruited and trained from other ranks.

It is to be hoped that the presidents of our railroads have got their eyes open a little bit through their recent experience. Perhaps they will do a little organizing themselves, and put a stop to the bargain festivals between popularity-seeking or sympathetic officers and the leaders of the brotherhoods. The actions of some of the officers at times would indicate that they were trying to get in line for a soft political berth sometime, somewhere. I wish it were possible to trace back and identify the road or officer that first granted some of the most vicious of the arbitraries, and thus place the responsibility where it belongs.

The executives must not only federate, they ought to see to it that no more of these unbusinesslike allowances are granted. Unless a majority of the roads will agree to an allowance it should be held questionable. The president should stop swapping between the officers and the brotherhoods. Anyone can see that not one of these arbitrary allowances could have been forced on its merits. No good business man would have allowed the brotherhoods to slip them over.

To build the line to the public don't count on the modern union man; he is too busy building a line to Congress. Your best builders are the neglected 80 per cent—the station agent, for instance, who is on duty all of the time and whose force as well as salary has often been reduced by the officers popular with the brotherhoods. The chief clerks and other clerks, the chief despatcher, the trainmaster, the master mechanic, the roundhouse foreman, the roadmasters, the section foreman, and many others—those who have been told year in and year out that the situation is such that "the management can not consider increases in force or salary at this time"—give this class a little relief from the heavy grind. Give them increased help where needed, and a little more encouragement and appreciation. They will rebuild the line to the public which has been torn down by the organized forces. More than that, they will run the trains when the walkout comes.

A man can not be thoroughly loyal unless he sees substantial evidence of appreciation; mere words are not sufficient. "The world cares little for what a man utters that is not distilled in the alembic of his life." Verily; the law of compensation never rests; the present climax is one of the back strokes. About 20 years ago a large percent of our population endeavored to remedy deficiencies in our monetary system by putting a dollar mark on 50 or 60 cents' worth of silver; but experience has shown that under the law of supply and demand the scheme won't work. Our railroads, for some years, by measures of "expediency" have tried to stamp 50 to 75 per cent of efficiency of labor rendered by the organized man with a 100 per cent fiat; and then have always been disappointed. But even yet they are endeavoring to apply the same principle conversely with respect to some of the unorganized forces, i. e., stamping a dollar's worth of efficiency with a 70 or 80 cent stamp. They are continually losing on this proposition, but cannot or will not see it. Verily the cost of expediency comes high.

AN EX TRAINMASTER.

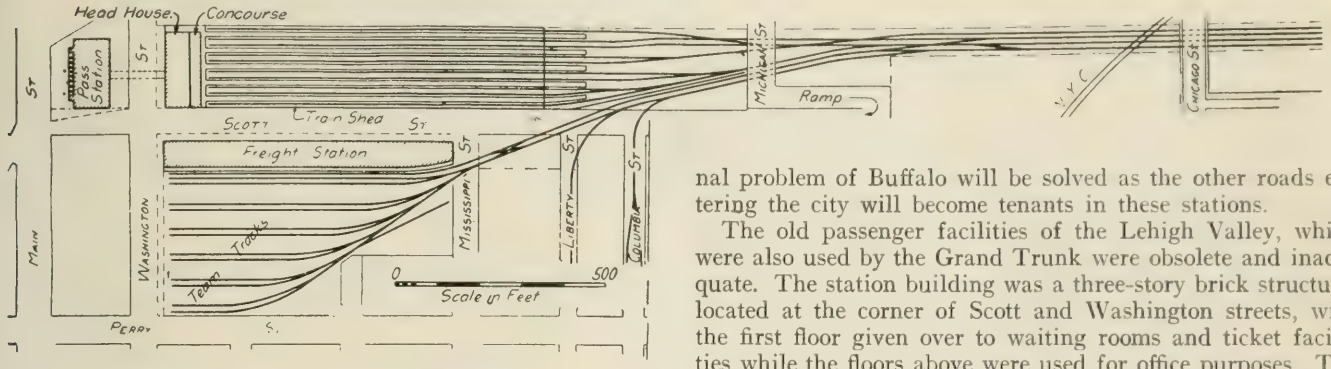
THE ENGLISH RAILWAY LABOR SITUATION.—In October last the railway companies increased the war bonus paid their men from 3s. (72 cents) to 5s. ($1.20) per week and that paid to boys from 1s. 6d. to 2s. 6d. The men are now asking for 10s., and J. H. Thomas, the assistant secretary of the National Union of Railwaymen, justifies the men's undertaking, made in October, not to ask for more money, being broken, because the promise was made under protest and after the companies' representatives had stated that, as common-sense men, they would be prepared to realize changed circumstances if the war went on indefinitely. Mr. Thomas showed how the increased earnings of dockers and munition workers had rendered the position of railwaymen doubly hard. In the vicious circle which had been created wherever wages increased, the shopkeepers and everybody else immediately set out to increase prices. The railwaymen also had to pay higher prices, but they could not go to the dockyards or the munition works, because the companies would refuse them leaving certificates.

New Lehigh Valley Terminal at Buffalo

Complete Passenger Facilities With Original Features Now Being Completed. L. C. L. Freight House Built

THE Lehigh Valley terminal improvements at Buffalo which involve an outlay of approximately $5,000,000 for the properties and buildings are nearing completion. The project includes a new passenger station, a new freight house and yard and a new four-track main line approach to the terminal district. The freight layout was placed in service last December, and the passenger station, while not completed in all details, was opened for traffic on August 29.

The construction of this terminal is a result of negotiations



Track Layout at the New Terminal

that have been carried on between the city of Buffalo and the railroads for several years with the purpose of replacing the old stations which have long been unsatisfactory and inadequate. Buffalo is a terminal for all of the twelve roads entering the city except the New York Central and the Erie. Four old and inadequate stations owned by the New York Central, the Erie, the Lehigh Valley and the Lackawanna have served these roads. The first three are located within a radius of two



Interior of the Freight Station

blocks, while the Lackawanna is removed a considerable distance from the others. Because of these conditions a large number of passengers transfer from one terminal to another in addition to a large number who are required to wait for connecting trains, both of which make necessary commodious waiting room facilities in the various stations.

A union station scheme was originally presented, but was finally rejected as impractical. The problem of the improvement of the separate terminals was next considered and, in order that the possibilities might be fully investigated, a terminal commission was created by an act of the New York state legislature to carry on the negotiations with the railroads. As a result, in addition to the Lehigh Valley, the Lackawanna is completing a new passenger terminal and plans for a new New York Central station are under consideration. When these three stations are completed the terminal problem of Buffalo will be solved as the other roads entering the city will become tenants in these stations.

The old passenger facilities of the Lehigh Valley, which were also used by the Grand Trunk were obsolete and inadequate. The station building was a three-story brick structure, located at the corner of Scott and Washington streets, with the first floor given over to waiting rooms and ticket facilities while the floors above were used for office purposes. The main entrance was from Washington street with the exit to the train shed in the rear, which was served by six-stub-end tracks. A double track main line approached the station at street grade, crossing Louisiana, Chicago and Michigan streets, and had a lengthwise occupancy of 900 ft. in Scott street. In the new layout this line has been abandoned from a point approximately one mile east of the terminal and Scott street has been restored to use as a public thoroughfare. The old line is replaced by a four-track line located entirely on property purchased for this purpose with all intersecting



Concrete Piles Cast on the Ground

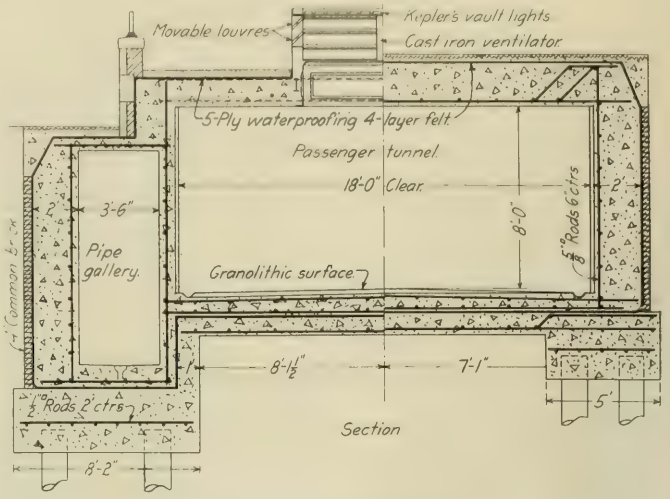
streets carried over the tracks on viaducts. The construction of the new line was complicated by its proximity to the New York Central which adjoins the new location on the north. The intersecting streets had previously been carried over the New York Central tracks on viaducts and to utilize the new location it was necessary to continue these structures over the new line and provide new approaches. A further complication

was caused by the streets that parallel the tracks, it being necessary to provide access to the viaducts from the streets and also from the New York Central freight house. The situation was met by constructing inclines connecting the two levels. This portion of the layout was completed before work was started on the terminal buildings.

The new passenger layout includes the new station located between Main, Washington, Quay and Scott streets and the headhouse and train shed located on the site of the old station at the corner of Washington and Scott streets. The separation of the station building from the headhouse was made necessary by the refusal of the city to close Washington street. Because of this somewhat unusual condition it was necessary to construct a reinforced concrete tunnel under Washington street to connect the waiting room of the station with the concourse in the headhouse.

The Passenger Station

The station building is a four-story structure of gray Indiana lime stone with a granite base and terra cotta trimmings. It has a frontage of 164 ft. on Main street, which is the principal thoroughfare of the city, and extends back 102 ft. along Scott street. It is set back 50 ft. from Main street to provide space for approaches. The principal entrance is from Main street and is accentuated by a colonnade of eight columns backed by three great arches. This entrance opens directly into the waiting room, 82 ft. by 102 ft. in area and extending the full height of the structure. Directly in front of the entrance and on the opposite side of the waiting room is a ramp leading down to the tunnel under Washington street, which connects the waiting room and the headhouse. The restaurant and the invalids' room are located on the Quay street side of the waiting room and on opposite sides of a lobby leading from the Quay street carriage entrance to the waiting room. A hall way off this lobby leads to the elevator and stairs to the floors above. The ticket office is located to the left of the ramp on the Washington street side



Cross-Section of the Subway Connecting the Passenger Station and the Concourse

of the waiting room and the parcel room and news stand are at the right of the ramp. The telephone and telegraph facilities, smoking room, woman's room and the toilets are on the Scott street side. The floors and wainscoting in the waiting room are of marble. A flat plaster finish is used on the walls, and the ceiling is finished with ornamental hung plaster. Light is admitted by three large arched windows on the Main



Main Street Elevation of the Passenger Station

street side and smaller windows on the other sides. The artificial lighting is both direct and indirect. The direct light is furnished by two suspended chandeliers and seat lights, and the indirect by wall lights.

Record and storage rooms are provided in the basement.



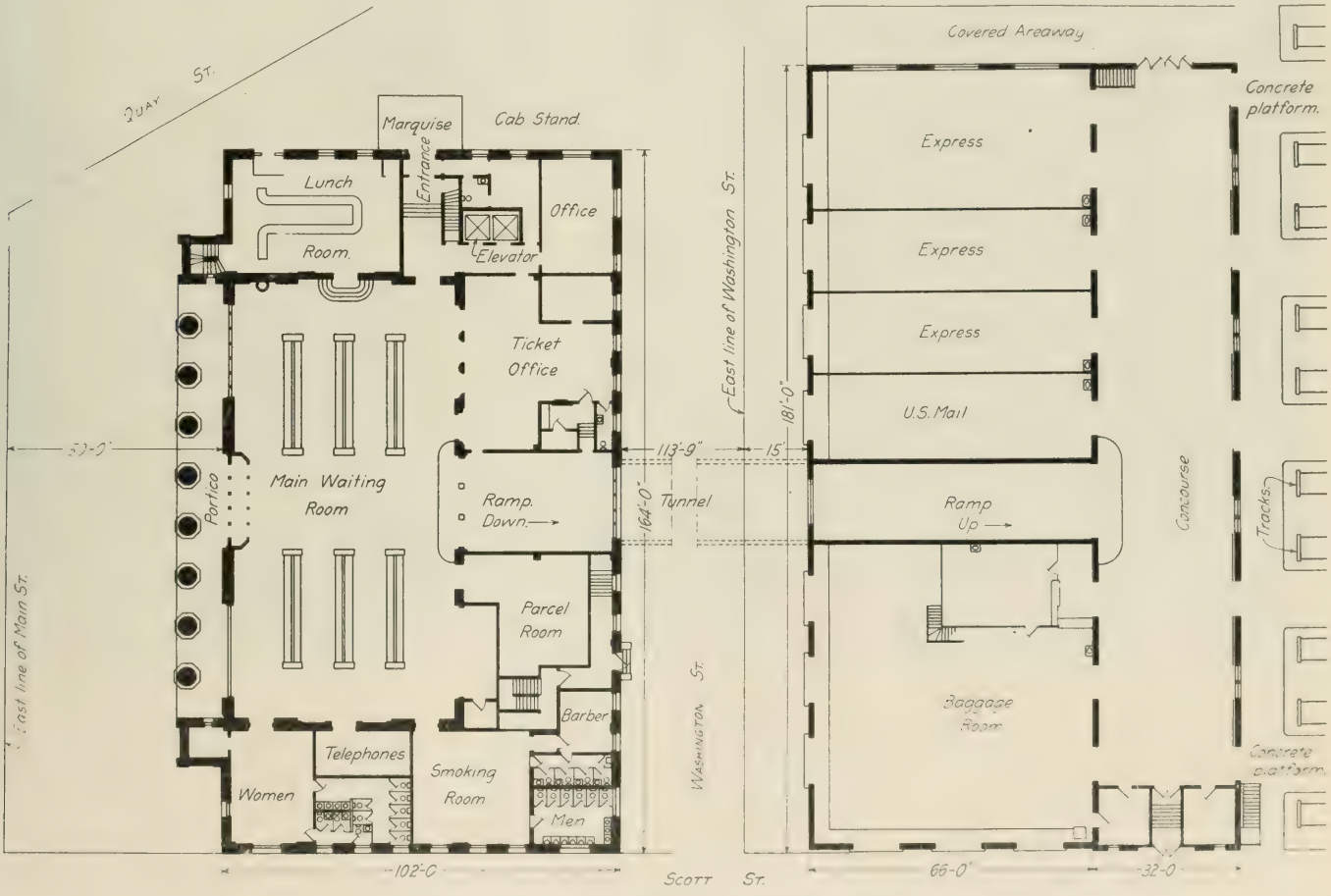
Waiting Room Entrance to the Subway

The mechanical and electrical equipment is also located in the basement, as is the heating plant which will furnish heat for the entire passenger layout, including passenger cars when parked in the train shed. The second and third floors are utilized for office purposes.

The construction of the station building was complicated by the presence of the Hamburg canal sewer, 28 ft. in width, which passes under the building on a slight skew, with the flow line above the elevation of the basement floor. The sewer was protected during construction by two lines of Lackawanna sheet piling. The basement floor is carried over the sewer by a reinforced concrete slab with ramps between the two levels. The foundation walls for the station are carried over the sewer on plate girders 8 ft. 2 in. in height and 42 ft. long. These girders are supported on reinforced concrete piles as is the entire foundation wall of the station. These piles were cast on the ground and were driven to rock, 35 ft. below street grade by means of a jet and steam hammer. A total of 560 piles was used in the passenger station foundations.

On the Quay and Washington street sides of the station is a paved area way for parking public conveyances with a drive to the Quay street entrance which is covered by a broad marquis serving as a porte cochere. A second drive serves the main entrance with a platform between it and the street for passengers waiting for street cars. This platform is elevated above the drive and protected from it by a concrete railing.

The reinforced concrete tunnel under Washington street provides a passage way for passengers between the waiting room and trains. This tunnel has a clear width of 18 ft. and 8 ft. clear head room. A pipe gallery 3½ ft. in width adjoins the tunnel and is separated from it by a 10 in. concrete wall. The entire structure is supported on wooden piles driven to rock and is waterproofed by four layers of felt and one ply of reinforced felt, backed by a 4 in. wall of common brick with joints laid with asphalt. Cast iron ventilators and Keppler vault lights are provided. The approaches to the tunnel are on 10.5 per cent grades at each end. The entrance to the ramp at the waiting room end con-



Floor Plan of the Station and Concourse

sists of a flat arch supported on marble pillars. Five doors open from the ramp into the tunnel. These doors will remain open except when strong drafts are created and when it is necessary to control the crowds.

The headhouse is a two-story, steel encased structure harmonizing with the station building in architectural design. It has a frontage of 181 ft. on Washington street and extends 66 ft. along Scott street. The first floor is devoted to express, mail and baggage. The express rooms with 4,600 sq. ft. of floor space are located in the west end of the building; a baggage room with 4,300 sq. ft. of floor area occupies the Scott street end and the United States mail room is placed in the central portion of the building and adjoins the ramp from the tunnel. On the street sides of the baggage room an elevated platform 12 ft. in width and 3 ft. above the floor level is built. Scales are provided in this platform and in the baggage room proper. To reach the trains with baggage, trucks are run from the baggage room through the concourse to the proper platform. The headhouse is set back 20 ft. from the street lines to allow space for a paved areaway leading to the express, mail and baggage rooms.

The waiting room and toilet facilities for immigrants occupy the Scott street end of the second floor of the headhouse. The remainder of this floor is devoted to lounging and locker rooms for the use of the employees of the railroads, the Pullman Company, the express company and mail clerks. Four toilet rooms are also provided for the use of employees.

Immediately adjoining the headhouse is the concourse 35 ft. by 181 ft. in area and open to the roof. It provides waiting room facilities for passengers not desiring to enter the main station. On the Scott street side are the offices for the baggage master and station master. Exits from the concourse are provided to Washington and Scott streets.

The train shed is 195 ft. wide and 842 ft. in length and providing for 10 tracks adjoins the concourse. The shed is the Bush type of concrete and steel with the supports placed between tracks. The tracks are stub-end and have a combined clear width of 9,750 ft. They are arranged in pairs 14 ft. 8 in. center to center and are separated by concrete platforms 14 ft. 2½ in. in width, with their top surfaces 6 in. above the rail, with a 2-in. crown in the center. Keppler skylights requiring more than 50,000 sq. ft. of glass are used in the train sheds. The movement of trains in and out of the sheds will be controlled by an all-electric interlocking plant not yet constructed. The arrangement of the train shed with supports placed between tracks and leaving the platforms space unobstructed is a feature of this work. This plan has not been generally used in station design and has a very great advantage over the usual type in the saving of space.



Interior of the Main Waiting Room

The freight layout is located between Scott, Washington, Mississippi and Perry streets, directly across Scott street from the headhouse and train sheds of the passenger terminal. It includes the freight house and tracks, a team yard and a track equipped with a 40-ton electric crane for handling heavy materials. This crane operates through a longitudinal distance of 148 ft. and can serve four cars at a time. The yard tracks are all stub-end. The entrance to

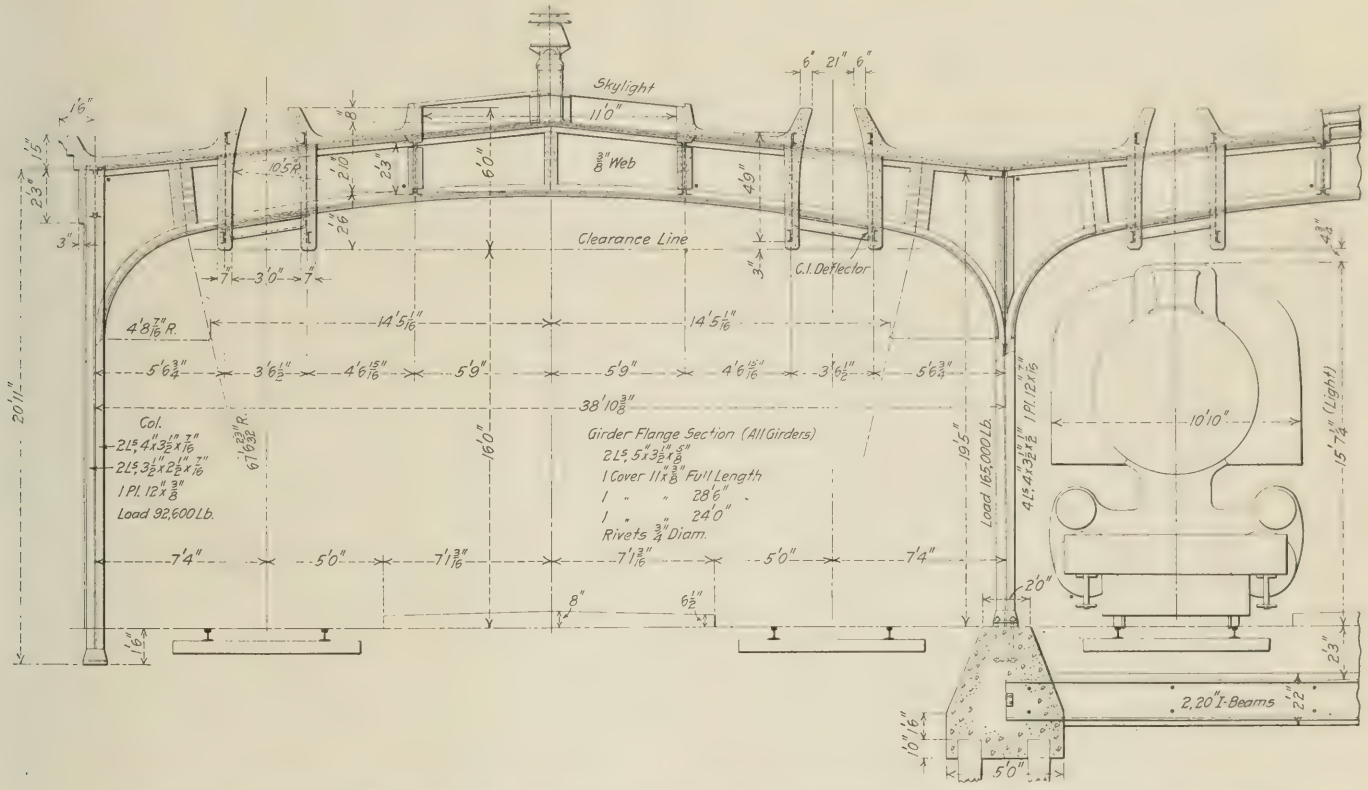
the yards is double tracked and will be controlled by an all-electric interlocking plant. At the corner of Scott and Perry streets a track is equipped with a concrete ramp for unloading end-opening cars.

In acquiring the site for the freight layout a large area of valuable improved property was purchased by the railroad. To utilize the site it was necessary to close Burrell place and Beaver alley and in the agreement with the terminal commission the necessary consent was secured.

The freight house is set back 15 ft. from the east line of Washington street and 18 ft. from the south line of Scott street. The Washington street end is a two-story, steel-encased structure with a granite base and terra cotta trimming, with a 60-ft. frontage on Washington street and extending back 111 ft. along Scott street. The entrance is from Washington street and opens into a lobby with offices for the cashier and clerk on either side. In the rear of the lobby is a 5 ft. passage way leading to the freight room and Light is admitted to the freight room by continuous wire glass windows over the doors. Artificial light is provided by 3-200 watt lights in each section.

The areaway between Scott street and the house is paved with Belgian blocks. On the track side a concrete platform 10 ft. in width extends the full length of the building with ramps at both ends. Canopies are provided over the driveway and the platforms. The foundation piers that support the house are carried on concrete piles cast on the ground and driven to rock by means of a jet and a steam hammer. These piles are designed for a load of 25 tons.

The house is served by three tracks having a combined clear length of 1,800 ft. Both inbound and outbound freight are handled through the house, the two east sections being used for inbound freight and the third section which adjoins the office for outbound. Two and four wheel hand trucks are used. Nine Kron scales of 3,500-lb. capacity are provided in the freight rooms. Electric light conduits are provided un-



Cross Section of the Train Shed Showing the Supports Between the Tracks and Unobstructed Platforms

separating a storage room from the perishable freight room, each of which has an area of 26 ft. by 54 ft. The perishable freight room is heated in cold weather, but has no refrigerating plant for summer use.

The second floor is occupied by the agent and clerks. The general office has an area of 58 ft. by 69 ft. with a record room in the rear with an area of 20 ft. by 58 ft. Toilet facilities are provided on both floors of the office building. The floors in the lobby and toilets are tile while maple flooring is used in the offices.

Connected directly with the office building is the freight house proper, 60 ft. in width by 577 ft. in length. This house is a steel, brick and concrete structure and is divided into three sections by firewalls, equipped with Kinnear automatic steel rolling doors on one side of the wall and Ajax sliding doors on the other. The side doors are also Kinnear steel rolling doors equipped with chain hoists and steel canopies. The roof trusses span the entire width of the building, leaving the floor area clear of obstructions. Johns-Manville mastic floor on a concrete base is used in the freight house.

der the platform slab with sockets in the track side for portable lights for use inside cars.

Refrigerator cars are iced at the house by an arrangement with a local ice company. The cars to be iced are placed on the track next to the platform and the ice wagons are driven up the ramp, the cars iced and the wagons then pass along the platform and down the ramp at the other end.

A concrete fence with iron gates encloses the entire freight layout. A concrete house is provided for the yard man and gate tender on the Washington street side.

This project has been carried out under the direction of E. B. Ashby, chief engineer. Kenneth M. Murchison of New York was architect for the station building and J. Henry Miller of Baltimore was the contractor for both the passenger station and the freight house.

AN ENGLISH RAILWAY'S CONTRIBUTION.—Of the 3,406 men who have joined the colors from the London, Brighton and South Coast, 162 have been killed, 304 wounded, and 30 made prisoners.

CONGRESS AND THE "EIGHT-HOUR" LAW

WASHINGTON, D. C., September 12, 1916.

Even amidst the rush and confusion incident to the adjournment of Congress on Friday of last week, the so-called "eight-hour" law, hurriedly passed by Congress to avert a strike of the train employees, continued to be a source of lively discussion at the Capitol until the last day of the session. The prompt seizure of the issue for campaign purposes by Charles E. Hughes, the Republican candidate for President, and the decision of the Newlands joint congressional subcommittee to include the wages and hours of labor in its investigation of railway regulation, seem to insure that the subject will continue to be an exceedingly live one during the period before the law becomes effective on January 1.

The fact that the law might prove to be one of the principal issues in the campaign was apparently manifest to many members of Congress as soon as the bill reached them, and many of them began preparing for such a contingency at once by scrambling to get into the Congressional Record their views on the subject for future use. During the limited time available for the passage of the measure before the strike order should become effective there were not enough hours in the day for all members of Congress to make oral speeches, but a large proportion of those who did not have something to say at the time have taken advantage of the opportunity accorded them since then under a general "leave to print" privilege, to "extend" their remarks on the pages of the Record to such an extent that while Congress adjourned on September 8 it is proposed to continue the publication of the Record till September 20 to include the written speeches. Scores of newspaper editorials and other articles on the subject have been incorporated in the Record for the same purpose, and the proceedings at the hearing before the Senate Committee on Interstate Commerce on August 31 are to be printed as a Senate document and will undoubtedly be made useful for campaign purposes.

Mr. Hughes began his attack on what he called Congress' surrender to organized labor, in his speech at St. Louis on Labor Day, and continued it in his speeches during the week, referring to it as "legislation under oppression," "a surrender of the principle of arbitration," and "but another step from the abdication of government itself." "We have recently had, at the proposal of the executive," he said, "an act passed by Congress, confessedly in ignorance of the facts, confessedly in ignorance of what justice demands. It is not an eight-hour-a-day law. It is a wage law and nobody knows whether it was just or not." Several of the Democratic members of Congress immediately felt called upon to defend the course of the administration and of themselves by insisting that they had performed a great service to the country by averting a strike, and that whatever defects there may be in the law as passed were due to the necessity of acting quickly and may be corrected at the next session. Their view of the necessity in the case must be construed in the light of what congressmen about to seek re-election had in mind as to the attitude of organized labor if they should attempt to pass a law designed solely to prevent the strike by the simple expedient of making a strike illegal.

The opinions expressed in Washington as to the probable effect of the administration's participation in the wage controversy, and especially of its partisanship toward the side of the trainmen, seem to depend mainly on the political faith of the speaker. Democrats insist that the fact that a strike was averted may be used as valuable political capital, as a sort of companion to the fact that Wilson "kept us out of war," and are evidently placing a great deal of dependence on the efficacy of the "eight-hour day" slogan. Republicans, on the other hand, feel that they have the same chance to criticize the methods by which the strike was averted, as the methods by which open hostilities with Mexico have been avoided, and avowed advocates of a real eight-hour day keep hammering away at the fact that the new law does not provide an eight-hour day.

One indication of what effect the "eight-hour" law issue may have on the political prospects of the administration was promptly furnished in the results of the Maine election on Monday, in which the Republicans won a sweeping victory. Whether or not the reputation of the state as an election weathervane is to be sustained, the fact that national issues played such a prominent part in the campaign and that the labor question was made a paramount issue when Mr. Hughes made so many of his speeches attacking the Adamson law during his tour of the state will, undoubtedly, give an unusual significance to the result. Maine is a state in which the population is not of a kind to appreciate giving a special preference either in wages or hours to a single class of labor, but would be inclined to consider the effect of a large increase in railroad expenses on the freight and passenger rates paid by the public. It is admitted that the value of the new law as a political asset will depend on the comparative effect of whatever it may be worth to organized labor as giving prestige to the eight-hour movement and its reception by the employers of labor and the shippers of freight.

Senator Martine of New Jersey has already discovered what is to his mind "a complete connection between the railroads—particularly the Pennsylvania Railroad—and the Republican party," in an extract from a statement on the subject of railroad regulation, by Charles E. Hughes, printed on the menu cards used in the Pennsylvania dining cars. In an impassioned speech in the Senate on September 8 he characterized this as a "most infamous abuse," "a miserable farce and contemptible humbug," a "burning wrong and outrage" and "clearly a case of a contribution to the Republican campaign fund." He wanted to "make such a system of insidious advertising a crime against the laws of the land," and was not perceptibly appeased when Senator Penrose remarked that, according to his information, President Rea of the Pennsylvania is a Democrat and voted for Wilson. The Senator made no prediction as to how Mr. Rea would vote this year.

Representative Adamson, chairman of the House Committee on Interstate Commerce, and the father of the bill in the House, has published a speech in the Record defending it as providing for a real eight-hour day. He says the law fixes an eight-hour day just as the hours of service law provides for a 16-hour day and a 9-hour day and that "the only reference to wages is in the language used to hold *in statu quo* until the workings of the eight-hour law could be observed and all other features of the service adjusted to the eight-hour law"; that "when we have time to agree we will enact whatever else is necessary," and "equitably adjust all the relations between the roads and the men." "We will establish conditions under which wages will be adjusted according to what is right and proper." He added. "On the other hand the railroads will be taken care of. If the men are being paid too much or too little their wages will have to be increased or diminshed. If when these proposed adjustments are made, either by legislation or by agreement of the parties, it is found that the railroad rates are too low to be remunerative they will be increased under existing law. If they are too high they will be reduced in the same way."

President Wilson has also given an explanation of his attitude, indicating that the question has by no means been settled, in a statement regarding the work of Congress. He said:

"It is to be regretted that the session could not have continued long enough to complete the program recently projected with regard to the accommodation of labor disputes between the railways and the employees, but it was not feasible in the circumstances to continue the session any longer, and therefore only the most immediately pressing parts of the program could be completed.

"The rest, it is agreed, has merely been postponed until it can be more maturely deliberated and perfected. I have every reason to believe that it is the purpose of the leaders of the two houses, immediately upon the reassembling of Congress, to undertake this additional legislation. It is evident that the country should be relieved of the anxiety which must have been created by recent events with regard to the future accommodation of such disputes."

The rest of the President's program, it will be recalled, included a provision for a compulsory investigation before a strike could be called, as well as provision for an increase in rates if the additional expense of a wage increase should render it necessary. In view of this fact, and the many statements being made by members of Congress that the law as passed was merely a make-shift—intended to bridge the chasm created by the imminence of election day—which may be entirely reconsidered at the next session, there is some occasion for wonder why the brotherhood leaders were so willing to accept it, unless they were anxious to be relieved of the necessity of carrying out their strike threat. It will be remembered that Warren S. Stone, of the Brotherhood of Locomotive Engineers, recently said that carrying around a strike order in his pocket was something like carrying dynamite. Possibly he and the other brotherhood leaders were entirely willing to exchange the dynamite even for a "gold brick."

Senator Simmons, chairman of the Senate Committee on Finance has also issued a statement in defense of the course pursued. "We did what was necessary to be done," he said "The strike was averted. The country was saved from the frightful consequences which everyone foresaw would inevitably follow should there have been a failure in this behalf. Of course, no one responsible for that legislation thought or intended that it should be the end of legislation upon this subject. It was only the beginning. It was all that was absolutely necessary at the time to accomplish the purpose in view. I am confident that at the next session this subject will be taken up and we will have comprehensive legislation which will make a recurrence of the menace which we have just escaped impossible; which will deal with this subject in all of its phases, and which will establish a permanent and just rule for all the factors of our interstate commerce."

As the hearings before the Newlands committee are to begin on November 20 it is likely that the railroads will have an opportunity to present convincing evidence of the need for a comprehensive program of legislation for the regulation of wage disputes at that time. Meanwhile the counsel for the railroads will make a careful study of the course of action that they should adopt with reference to the new law. In reply to the statement by President Ripley of the Atchison, Topeka & Santa Fe, that that road would not comply with the law until forced to by the courts, Chairman Newlands of the Senate Committee on Interstate Commerce said that the government would proceed to enforce the law on petition of any employee.

Senator Lewis of Illinois, a member of the Senate Committee on Interstate Commerce, had expected to introduce in the Senate at the closing session a bill providing for the creation of a new executive department of transportation, to which would be referred such controversies between railroads and their employees. On account of the pressure of other matters at the closing session the bill will now be deferred until Congress resumes its sessions in December. The bill will provide for a new member of the cabinet, with the title of Secretary of Transportation, to have supervision over matters affecting railroads, water lines and interstate electric lines, with the exception of rate questions, which would be left to the Interstate Commerce Commission. The idea is to give the new department jurisdiction over railroad operations, including those relating to equipment, and questions between the companies and the employees, and also the administration of the Panama Canal, superseding the Isthmian Canal Commission, and of the government railway in Alaska, now in the hands of the Department of the Interior. It is proposed that the secretary of transportation shall be an experienced transportation man and that he shall have two assistants, also experienced, one in operation and the other in traffic.

THE FEDERAL BILL OF LADING LAW

The bill of lading act, passed by the present Congress—the Pomerene bill, which has been under discussion, off and on, for more than four years*—became a law August 29. It consists of 45 sections and goes into effect January 1, 1917.

It embodies a carefully prepared codification of all existing federal law on this subject and puts in statute form numerous common-law principles; it makes a new rule concerning the carriers' duty to count or weigh goods loaded by shippers; and, reversing the rule at present and heretofore enforced by the federal courts, makes the carrier fully responsible for the acts of agents in signing bills of lading. These last-named provisions are embraced in sections 20, 21, 22, which are as follows:

"SEC. 20. That when goods are loaded by a carrier such carrier shall count the packages of goods, if package freight, and ascertain the kind and quantity if bulk freight, and such carrier shall not, in such cases, insert in the bill of lading or in any notice, receipt, contract, rule, regulation, or tariff, 'Shipper's weight, load, and count,' or other words of like purport, indicating that the goods were loaded by the shipper and the description of them made by him or in case of bulk freight and freight not concealed by packages the description made by him. If so inserted, contrary to the provisions of this section, said words shall be treated as null and void and as if not inserted therein.

"SEC. 21. That when package freight or bulk freight is loaded by a shipper and the goods are described in a bill of lading merely by a statement of marks or labels upon them or upon packages containing them, or by a statement that the goods are said to be goods of a certain kind or quantity, or in a certain condition, or it is stated in the bill of lading that packages are said to contain goods of a certain kind or quantity or in a certain condition, or that the contents or condition of the contents of packages are unknown, or words of like purport are contained in the bill of lading, such statements, if true, shall not make liable the carrier issuing the bill of lading, although the goods are not of the kind or quantity or in the condition which the marks or labels upon them indicate, or of the kind or quantity or in the condition they were said to be by the consignor. The carrier may also by inserting in the bill of lading the words 'Shipper's weight, load, and count,' or other words of like purport indicate that the goods were loaded by the shipper and the description of them made by him; and if such statement be true, the carrier shall not be liable for damages caused by the improper loading or by the non-receipt or by the misdescription of the goods described in the bill of lading: *Provided, however,* Where the shipper of bulk freight installs and maintains adequate facilities for weighing such freight, and the same are available to the carrier, then the carrier, upon written request of such shipper and when given a reasonable opportunity so to do, shall ascertain the kind and quantity of bulk freight within a reasonable time after such written request, and the carriers shall not in such cases insert in the bill of lading the words 'Shipper's weight,' or other words of like purport, and if so inserted contrary to the provisions of this section, said words shall be treated as null and void and as if not inserted therein.

"SEC. 22. That if a bill of lading has been issued by a

*See *Railway Age Gazette*, March 17, 1916, page 481; [illegible], page 845; May 5, page 988.

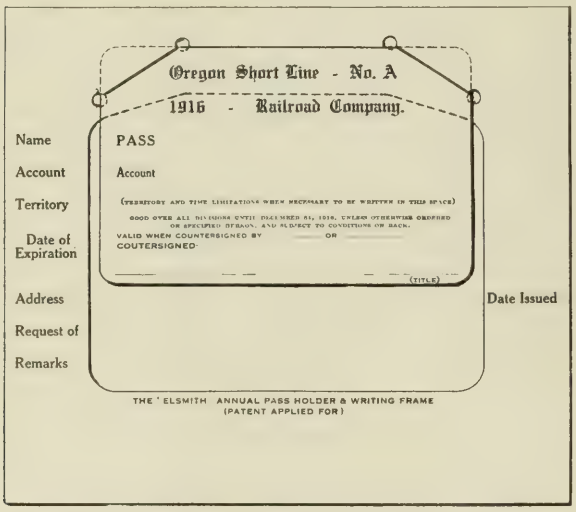
carrier or on his behalf by an agent or employee the scope of whose actual or apparent authority includes the receiving of goods and issuing bills of lading therefor for transportation in commerce among the several states and with foreign nations, the carrier shall be liable to (a) the owner of goods covered by a straight bill subject to existing right of stoppage in transitu or (b) the holder of an order bill, who has given value in good faith, relying upon the description therein of the goods, for damages caused by the non-receipt by the carrier of all or part of the goods or their failure to correspond with the description thereof in the bill at the time of its issue."

SEC. 41 provides a penalty of a fine of not exceeding $5,000 or imprisonment for five years or both, for forgery or counterfeiting any bill of lading or for any one who issues, negotiates or transfers for value a bill which contains a false statement as to the receipt of goods.

THE ELSMITH PASS HOLDER AND WRITING FRAME

Ernest L. Smith, chief clerk to the general manager of the Oregon Short Line, Salt Lake City, Utah, has devised a frame, made of heavy paper, to be used in filling out annual passes on the typewriter, which enables him to make the pass and all necessary records at one writing, two, three, or four carbon sheets being used, as may be necessary; and the patent office has allowed his claim for a patent on the invention.

The frame, made of heavy linen paper, is illustrated in outline in the accompanying engraving, its size being reduced one-half in width and height. The pass card is fastened in place by the insertion of its two upper corners in slits cut in the holder. The corners beneath the holder



Elsmith Annual Pass Holder and Writing Frame

are shown by dotted lines, and in the same way the engraving shows the part of the holder that is beneath the pass card. The blanks beneath are made to register in a simple manner by matching their edges with the edges of the holder.

The words printed at the left of the holder "Name; Account; Territory; Date of expiration;" etc., correspond with the same or similar words on the blanks beneath, the blanks being so printed as to call for the desired information in exactly the same position on each blank.

On the Oregon Short Line the records include a form which is substantially a duplicate of the pass; an "advice" to be sent with passes which have been issued without request, an acknowledgment of receipt of the pass, and classification form.

When a pass has been written, it can be taken out of the frame and then additional information, if such is desired, can be written on the top sheet remaining in the typewriter.

A competent clerk can write 400 passes and records in a day. Experience with the device has proved its practicability, efficiency and economy.

TO INVESTIGATE TRANSPORTATION FACILITIES FOR MILITARY PURPOSES

The army appropriation bill, recently passed by Congress and approved by the President, contains special provision for a study of the transportation question in its relation to military purposes. The act provides for the creation of a Council of National Defense "for the co-ordination of industries and resources for the national security and welfare," to consist of the secretaries of war, navy, interior, agriculture, commerce and labor, who are to nominate for appointment by the President, an advisory commission of not more than seven persons, "each of whom shall have special knowledge of some industry, public utility, or the development of some natural resource, or be otherwise specially qualified, in the opinion of the council, for the performance of the duties hereinafter provided." They are to serve without compensation, but shall be allowed expenses.

According to the terms of the act it shall be the duty of the Council of National Defense "to supervise and direct investigations and make recommendations to the President and the heads of executive departments as to the location of railroads with reference to the frontier of the United States so as to render possible expeditious concentration of troops and supplies to points of defense; the co-ordination of military, industrial and commercial purposes in the location of extensive highways and branch lines of railroad; the utilization of waterways; the mobilization of military and naval resources for defense; the increase of domestic production of articles and materials essential to the support of armies and of the people during the interruption of foreign commerce; the development of seagoing transportation; data as to amounts, location, method and means of production, and availability of military supplies; the giving of information to producers and manufacturers as to the class of supplies needed by the military and other services of the government, the requirements relating thereto, and the creation of relations which will render possible in time of need the immediate concentration and utilization of the resources of the nation."

The Council of National Defense "shall adopt rules and regulations for the conduct of its work, which rules and regulations shall be subject to the approval of the President, and shall provide for the work of the advisory commission to the end that the special knowledge of such commission may be developed by suitable investigation, research and inquiry and made available in conference and report for the use of the council; and the council may organize subordinate bodies for its assistance in special investigations, either by the employment of experts or by the creation of committees of specially qualified persons to serve without compensation, but to direct the investigations of experts so employed."

The sum of $200,000, or so much thereof as may be necessary, is appropriated to be immediately available for experimental work and investigations undertaken by the council, by the advisory commission, or subordinate bodies, for the employment of a director, expert and clerical expenses and supplies, and for the necessary expenses of members of the advisory commission or subordinate bodies.

TIMBER PRESERVATION.—To preserve timber from decay it is treated with an antiseptic, such as creosote or zinc chloride. Creosote is the oldest known preservative and one of the best. Creosote oil is insoluble in water, and has a boiling point of over 4,100 deg. F.—*Power.*

Caboose for Nashville, Chattanooga & St. Louis

Built with Steel Frame Construction for Use on Trains Where Mallet Locomotives Are Employed as Pushers

THE Nashville, Chattanooga & St. Louis on its Chattanooga division passes over the Cumberland mountains. Pusher service is required to get the tonnage trains over this grade. With the installation of the Mikado locomotives on this division the tonnage of the trains has been materially increased and Mallet locomotives having 99,000 lb. tractive effort have been installed to push these trains over the mountain. This has made necessary the construction of 30 cabooses of sufficient strength to be used ahead of the Mallets. They were designed and built at the company's shop at Nashville, and have substantial steel underframes and steel frame superstructures and are of the single sheathed type. They are of the following general dimensions:

Length over striking castings	37 ft. 8½ in.
Length inside	31 ft. 6½ in.
Length between end sills	36 ft. 11½ in.

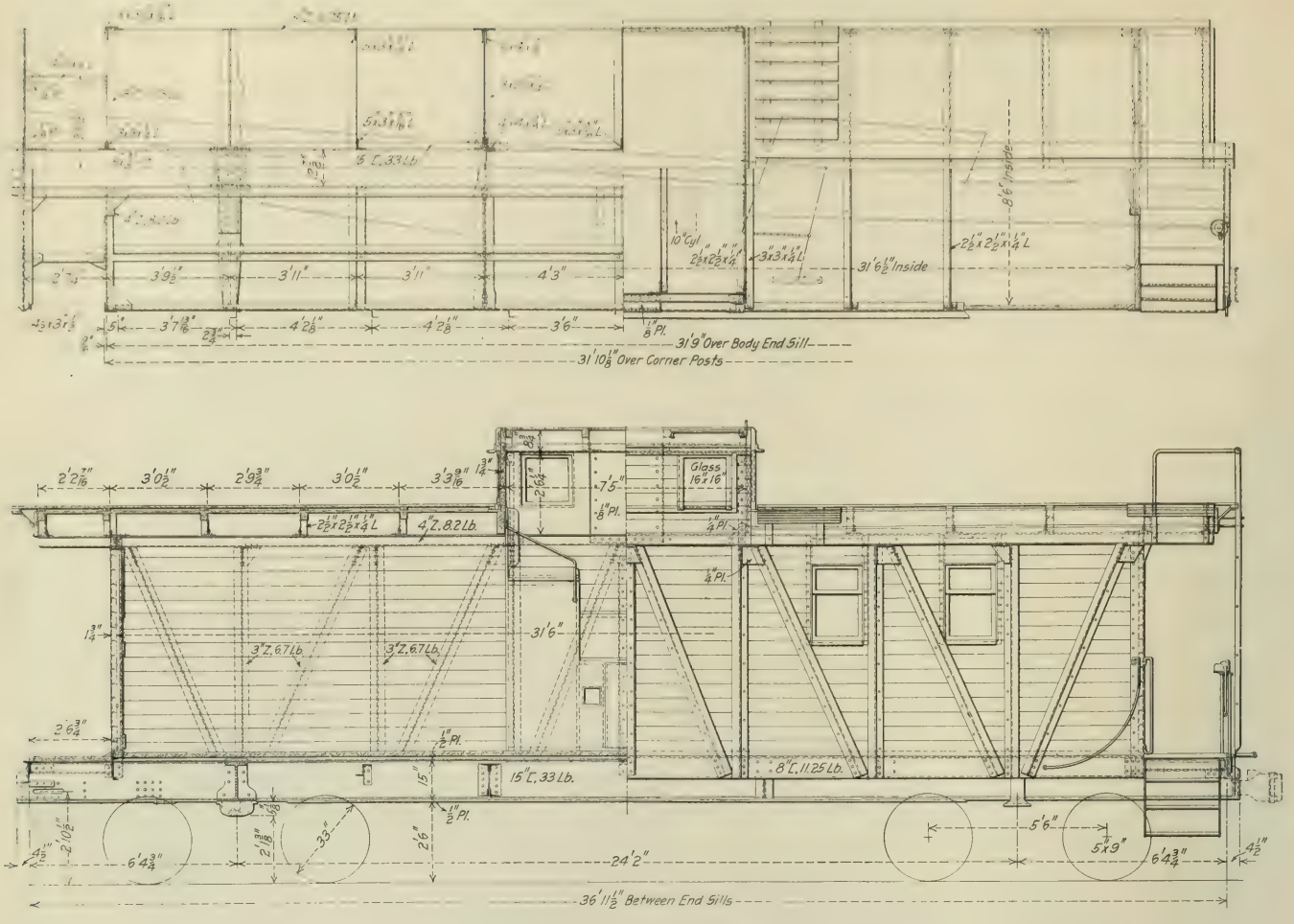


Steel Frame Single Sheathed Caboose for the N. C. & St. L.

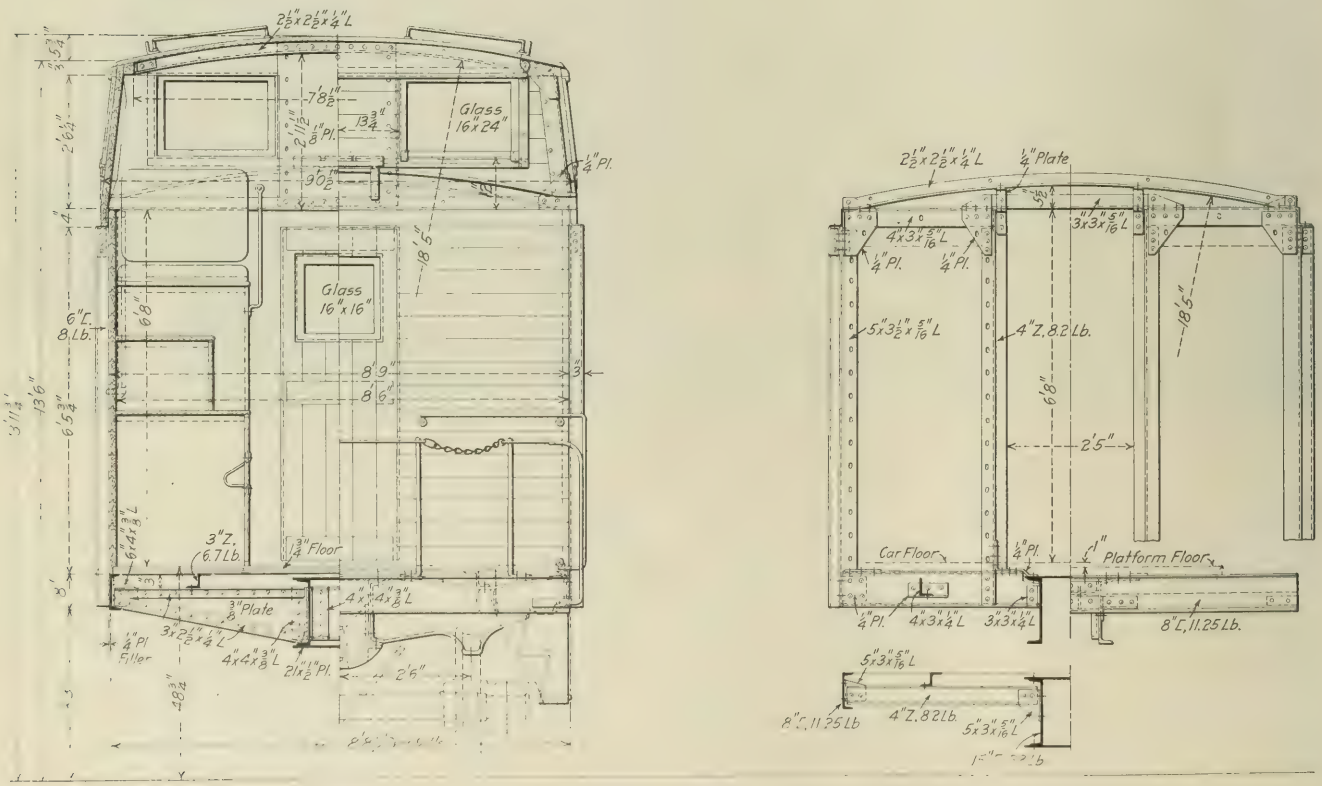
Width inside	8 ft. 6 in.
Height from floor to top of rail	4 ft. 6¾ in.
Height from rail to top of running board	11ft. 8¼ in.
Center to center of trucks	24 ft. 2 in.
Truck wheel base	5 ft. 6 in.
Width of platform	2 ft. 6 in.

The underframe is made of structural shapes, the center sill consisting of two 15-in., 33-lb., steel channels extending the full length of the car and under the striking castings. They are spaced 12⅞ in. from back to back, the flanges being turned outward, and are covered for their full length by a top cover plate 21 in. wide by ½ in. thick, which extends over the body bolsters. The bottom cover plate is of the same material and extends between the bolsters. The center sills are connected at each crossbearer by a 12-in. channel spacer connected to each center sill by one 4-in. by 4-in. by ⅜-in. angle. The two crossbearers are made up of ⅜-in. web plates bound at the top and bottom on each side by 3-in. by 2½-in. by ¼-in. angles. They are connected to the center sill by two 4-in. by 4-in. by ⅜-in. angles and to the side sill by two 6-in. by 4-in. angles. The side sills are 8-in., 11.25-lb., channels extending the full length of the car between the end sills, being connected to them by the 5-in. by 3½-in. by 5/16-in. corner post angles. The end sills are made of the same material and extend the full width of the car. They are connected to the center sill by 5/16-in. gusset plates and the striking castings. The body bolsters consist of steel castings which extend between the center and side sills. They are the same as those used on the road's 80,000 lb. capacity box cars. A cover strap riveted to the top of the bolster passes over the center sill securely tying together the body bolsters on each side of the center sill. The connection between the center sills at the body bolster is made by a cast steel truck center casting. There are three floor beams per car which consist of 4-in., 8.2-lb., Z-bars fastened to the center and side sills by an angle bar. The floor stringers consist of two 3-in., 6.7-lb., Z-bars extending between the end posts and fastened to the end sill.

The framing of the car is similar to that used in the 80,000 lb. capacity box cars. The side posts and braces consist of 3-in., 6.7-lb., Z-bars which are riveted to the side

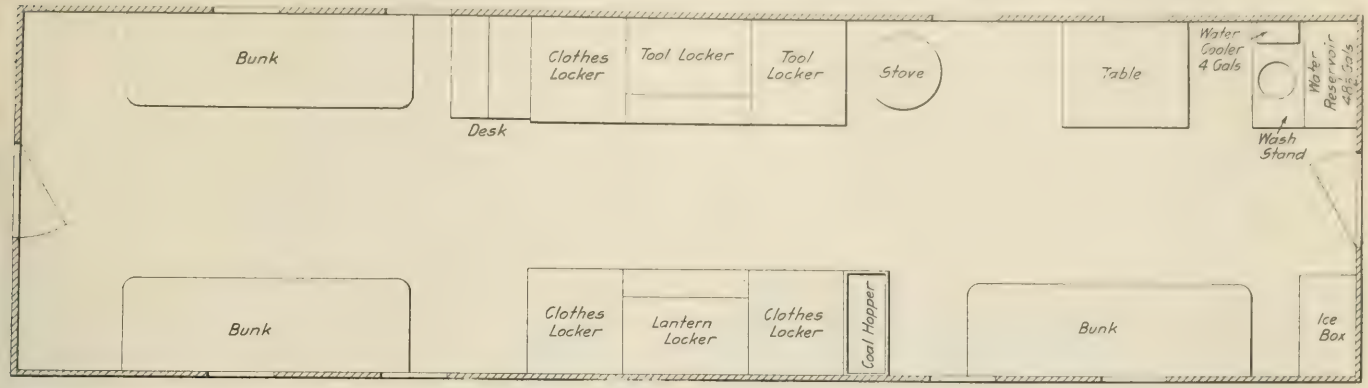


Plan and Elevation of N. C. & St. L. Caboose Cars



End Elevation and Sections of Steel Frame Caboose Cars

sills and are connected to the side plates by ¼-in. steel gusset plates. The end posts consist of 4-in., 8.2-lb., Z-bars which are riveted to the end sills and are connected to the end plates by angle bars as shown in the drawing. The corner posts are 5-in. by 3½-in. by 5/16-in. steel angles. The side plates consist of 4-in., 8.2-lb., Z-bars and the end plates are 4-in. by 3-in. by 5/16-in. angles. Both the side plates and end plates are riveted directly to the corner post angles. The carlines are made of 2½-in. by 2½-in. by ¼-in. angles filled with 2½-in. by 2½-in. filler blocks to which is nailed the roofing. The lining is 1½-in. tongued and grooved yellow pine having a 5½-in. face on all except the top board, which is 8¾ in. The roof lining is 13/16-in. yellow pine. It is covered with Follansbee slow process tin. The flooring is ship-lapped yellow pine 1¾ in. thick with a 7¼-in. face. The flooring is secured to the steel stringers by ½-in. carriage bolts. The cupola framing is built up of steel plates and angles. The operating arrangement for the conductor's valve is such that it may be operated from the outside on both ends of the cupola and from either of the interior cupola seats. This arrangement has recently been made standard on this road.



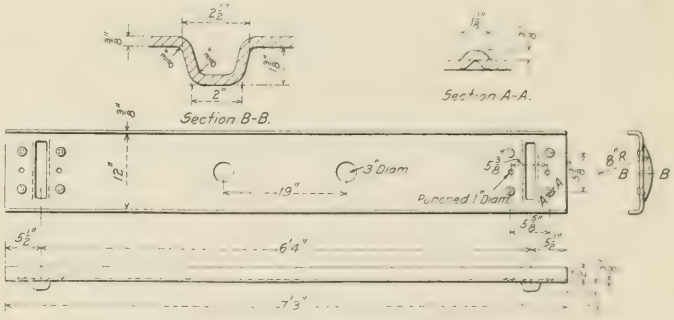
Floor Plan of N. C. & St. L. Caboose Cars



Interior of the N. C. & St. L. Steel Frame Caboose Cars

The trucks have a wheel base of 5 ft. 6 in., 5-in. by 9-in. journals and 33-in. wheels. The truck side frame is of the Scullin type with the Sullivan flexible spring plank. This spring plank, which is shown in one of the drawings, is the invention of J. J. Sullivan, superintendent of machinery of the N. C. & St. L., and was designed for the purpose of making an equalized truck, distributing the weight equally on all journals regardless of the track conditions. It will be noticed that near the ends lugs are formed 1⅜ in. deep, 2 in. wide and with a radius of 8 in. These rest in corresponding grooves in the lower member of the truck frame. With this construction the truck is less liable to derail under rough track conditions than the rigid truck where the weight shifts diagonally on the journals. The truck springs are of the triple elliptic type.

The cars are equipped with the Miner friction draft gear, Westinghouse schedule K.C. 1012 air brakes, Sharon cast steel couplers with 5-in. by 7-in. shank, and the National Malleable Castings Company's journal boxes. The Master Car Builders' standards have been used extensively throughout the entire car.



Sullivan Spring Plank for Car Trucks

Russian Steel Imports in 1915.—Russian imports of certain steel products over the European, Russo-Finnish and Black Sea frontiers are given as follows in metric tons:

	1913	1914	1915
Wrought iron and steel	38,690	28,830	27,080
Tin plates and sheets	7,370	4,910	920
Wire and manufactures	8,710	7,490	48,660
Total	54,770	41,230	76,660

The large increase for 1915 over 1914 is due mostly to imports of barb wire.—*Iron Age.*

The High Polish of Russian Shells.—One reason suggested for the high polish of Russian shells was, that when the shells were silver or nickel plated, the plating acted as a resister against rust. And one of our rather sarcastic friends thought that so finished the shells looked better as souvenirs on the top of a grand piano in a drawing room. The subject may now be settled and further discussion cease. We have it from a high Russian authority that this fine finish and polish are to prevent pulling off some lint from the cotton gloves worn by the soldiers who load the guns. A rough surface on the shells would pull off some of this lint, which would fill up the clearance between the shell and the gun bore and impair the accuracy of the firing piece.—*American Machinist.*

COLLAPSE OF THE QUEBEC BRIDGE

Another unfortunate chapter was added to the history of the Quebec bridge now being built over the St. Lawrence river, when on the afternoon of September 11 the suspended span, which is 640 ft. long and 80 ft. wide, weighing approximately 5,000 tons, collapsed while it was being raised from scows to its final level, 150 ft. above the water. Of the 90 men working on the structure 11 are reported killed or drowned and many others injured.

This span was erected about three miles down stream from the site of the bridge, on staging placed under each panel point. When the erection was completed the intermediate supports were removed and the bridge swung on the end bents. Six scows were floated in and sunk under panel points, L 1, L 2, L 3, L 15, L 16 and L 17. At low tide the



The Completed Suspended Span As Erected Three Miles Below the Site of the Bridge. The Staging Is Still in Place

scows were drained, and as the tide rose the span was lifted from the end supports and the load transferred to the scows. Tugs then towed the span to its proper position, and on arrival at the bridge site the span was anchored to the end of hanging trusses and coupled up to the hanger slabs provided at the four corners of the cantilever arms and made ready to be raised to its final position by hydraulic jacks. A full account of the erection methods appeared in the *Railway Age Gazette* of May 26, 1916.

The span had been raised about 15 ft. when the collapse occurred, and, up to the time that this article was written, no official statement had been made as to the probable cause of the accident. P. S. Johnson, president of the St. Lawrence & Dominion Bridge Company, is quoted as saying: "We are at a total loss to account for it thus far. The lifting apparatus is still in place and is practically uninjured. It is hard to say whether the bridge slipped off its end bearings or whether the trusses of the span failed. I do not think I can express myself further than this."

W. D. Updergraff, representative of the Watson-Stillman Company, Aldene, N. J., who installed the hydraulic jacks and who was engineer in charge of installation on the bridge, said: "The jacks are still in their positions and are practically intact. There was no weight on them when the span moved off, they being just getting ready to take hold again to lift the span to the fourth notch. It is hard to say just what caused the accident. I may say, however, that nothing has been spared by the company to guard against possible mishap, yet this regrettable affair occurred."

History of the Bridge

The project thus interrupted was first given serious consideration in 1887 when the Quebec Bridge Company was chartered to build a highway and railroad bridge over the St. Lawrence about seven miles above Quebec. The company was granted subsidies by the Dominion government, the Province of Quebec and the City of Quebec. Competitive plans were asked for in 1897 and plans for a cantilever bridge were approved by the committee. During 1902-03 the truss approach spans at each end of the bridge were erected. In 1905 construction was started on the main structure, only to terminate in the disaster of 1907, an account of which appeared in the *Railway Age Gazette* of September 6, 1907.

After 1907 the Dominion government took up the construction of the bridge and a board of engineers was appointed. It is comprised of C. M. Monsarrat, chairman and chief engineer; Ralph Modjeski and C. S. Schneider. The construction of the new bridge has been carried on under the direction of this board.



The Completed Anchor and Cantilever Spans Showing the Hanging Trusses to Which the Suspended Span Was Anchored When the Collapse Occurred

COMPARATIVE SUMMARY OF FREIGHT CARS IN SERVICE

The tables on the two pages immediately following show the number of freight cars in service on all of the important railroads of the country in 1914 and 1915 and in 1900 and 1915. It will be noted that narrow-gage cars are excluded, as well as non-revenue cars, but that cars used to carry company freight are included. The railways are grouped under the heads of New England roads, trunk line roads, Southern classification roads, Central classification roads and Western classification roads.

The tables show the number of cars in service, the number of cars per mile of road, average length of haul, freight cars per thousand freight car miles and per thousand ton miles, the average rate per ton per mile, and the freight cars in service per thousand dollars of freight earnings.

The table does not show the capacity of cars and, of course, railroads which show a decrease in the number of cars may have cars with a larger total capacity despite the smaller number.

COMPARATIVE SUMMARY OF FREIGHT CARS IN SERVICE ON RAILROADS OF THE UNITED STATES—1914 AND 1915

Note.—Narrow-gage cars excluded.
Non-revenue cars excluded.
Company freight included.

	Miles		Freight equipment				Per cent of change	Freight cars per mile of road		Average length of haul		Freight cars: Per 1,000 frt. car miles		Freight cars: Per 1,000 rev. ton miles		Rate per ton mile (Dollars)		Frt. cars per $1,000 frt. earnings	
	1914	1915	1914	1915	Increase	Decrease		1914	1915	1914	1915	1914	1915	1914	1915	1914	1915	1914	1915
NEW ENGLAND ROADS—																			
Boston & Maine R. R. Co.	2,302	2,302	23,964	23,410	.....	554	2.31	10.4	10.2	106.46	106.55	.107	.111	.0091	.0096	.01057	.01119	0.86	0.86
Bangor & Aroostook R. R. Co.	625	625	5,193	5,299	106	.....	2.04	8.3	8.5	126.93	124.52	.246	.245	.0215	.0223	.01225	.01232	1.76	1.80
Central Vermont R. R. Co.	536	536	3,065	3,001	.....	64	2.09	5.7	5.6	79.09	80.14	.103	.110	.0090	.0102	.00920	.00960	1.01	1.06
Maine Central R. R. Co.	1,209	1,220	9,640	9,363	.....	277	2.87	7.9	7.6	96.40	93.96	.158	.166	.0136	.0143	.01050	.01097	1.29	1.21
N. Y., N. H. & H. R. R. Co.	2,003	2,005	35,713	34,308	.....	1,405	3.93	17.8	17.1	87.40	91.65	.173	.169	.0147	.0157	.01415	.01434	1.09	1.10
Total	6,675	6,688	77,575	75,381	.....	2,194	2.83	11.6	11.3	99.25	99.36	.157	.145	.0136	.0130	.01133	.01168	1.20	1.05
TRUNK LINE ROADS—																			
Baltimore & Ohio R. R. Co.	4,478	4,535	86,974	85,040	.....	1,934	2.22	19.4	18.7	194.48	201.49	.106	.110	.0062	.0065	.00544	.00546	1.15	1.20
Buffalo, Rochester & Pittsburgh R. R. Co.	586	586	17,438	17,402	.....	36	0.21	29.8	29.6	161.00	153.80	.189	.214	.0088	.0103	.00462	.00477	1.90	2.17
Central R. R. Co. of New Jersey	678	681	23,790	23,721	.....	69	0.29	35.1	34.8	72.80	71.51	.169	.174	.0100	.0105	.00910	.00948	1.14	1.11
Chesapeake & Ohio Ry. Co.	2,349	2,369	43,555	45,291	1,736	.....	3.99	18.5	19.1	255.00	271.00	.117	.106	.0061	.0055	.00409	.00384	1.51	1.45
Delaware & Hudson Company	904	909	18,850	18,760	.....	90	0.48	20.9	20.6	137.48	135.31	.111	.111	.0064	.0065	.00690	.00684	1.00	0.95
Delaware, Lackawanna & West'n R. R. Co.	985	981	28,249	27,593	.....	656	2.32	28.6	28.1	176.76	189.61	.108	.094	.0074	.0065	.00743	.00764	0.99	0.85
Erie Railroad Co.	2,257	2,257	52,811	51,791	.....	1,020	1.93	23.4	22.9	202.45	214.25	.105	.089	.0070	.0060	.00596	.00590	1.20	1.02
Lehigh Valley R. R. Co.	1,440	1,442	45,583	44,974	.....	609	1.34	31.7	31.7	163.44	165.64	.140	.135	.0084	.0084	.00657	.00661	1.36	1.28
New York Central Railroad Co.	5,609	5,609	134,814	129,603	.....	5,211	3.87	24.0	23.1	182.63	196.40	.113	.095	.0089	.0073	.00595	.00592	1.50	1.24
New York, Ontario & Western Ry. Co.	568	568	6,351	6,041	.....	310	4.88	11.2	10.6	145.30	145.73	.108	.116	.0072	.0070	.00784	.00782	0.92	0.90
Pennsylvania Railroad Company	4,512	4,541	146,429	150,293	3,864	.....	2.64	32.4	33.1	163.38	159.98	.118	.114	.0062	.0065	.00589	.00610	1.13	1.08
Philadelphia & Reading Ry. Co.	1,120	1,120	40,730	39,014	.....	1,716	4.21	36.4	34.8	95.12	100.65	.130	.128	.0076	.0080	.00705	.00787	1.07	1.03
Western Maryland R. R. Co.	661	659	9,116	8,816	.....	300	3.29	13.9	13.4	113.07	114.55	.135	.120	.0073	.0063	.00554	.00524	1.32	1.20
Total	26,147	26,257	654,690	648,339	.....	6,351	0.82	25.0	24.7	158.68	163.07	.127	.111	.0075	.0069	.00634	.00642	1.25	1.15
SOUTHERN CLASSIFICATION—																			
Atlantic Coast Line Ry. Co.	4,661	4,698	29,539	28,619	.....	920	3.11	6.3	6.1	155.59	166.73	.125	.132	.0145	.0163	.01217	.01203	1.19	1.35
Central of Georgia R. R. Co.	1,924	1,924	10,104	9,907	.....	197	1.95	5.2	5.3	150.40	154.99	.128	.142	.0094	.0130	.01083	.01034	1.10	1.26
Florida East Coast Ry. Co.	696	745	1,819	1,682	.....	137	7.53	2.6	2.3	164.16	184.69	.068	.066	.0121	.0102	.01735	.01672	0.70	0.61
Louisville & Nashville R. R. Co.	4,937	5,037	46,480	46,710	230	.....	0.49	9.4	9.3	171.09	185.51	.114	.128	.0084	.0090	.00778	.00719	1.08	1.26
Mobile & Ohio R. R. Co.	1,122	1,122	10,776	11,422	646	.....	5.99	9.6	10.2	224.80	230.03	.085	.098	.0060	.0078	.00670	.00627	1.00	1.25
Nashville, Chat. & St. Louis R. R. Co.	1,231	1,231	10,189	9,975	.....	214	2.10	8.3	8.1	151.00	154.78	.127	.131	.0122	.0136	.01054	.01019	1.16	1.33
Norfolk & Western Ry. Co.	2,036	2,042	47,483	46,973	.....	510	1.07	23.3	23.0	269.28	272.18	.098	.100	.0052	.0052	.00420	.00416	1.23	1.28
Norfolk Southern R. R. Co.	843	860	3,329	3,277	.....	52	1.56	3.9	3.8	85.63	87.32	.198	.215	.0185	.0190	.01518	.01514	1.22	1.31
Seaboard Air Line Ry. Co.	3,084	3,106	17,629	17,919	290	.....	1.65	5.7	5.8	151.28	158.08	.115	.109	.0098	.0133	.01099	.01069	1.02	1.25
Southern Railway Co.	7,033	7,031	47,161	47,130	.....	31	0.07	6.7	6.7	154.61	162.41	.110	.118	.0084	.0112	.00995	.00962	1.05	1.16
Virginia Railway Company	503	504	7,196	7,929	733	.....	10.19	12.3	15.7	354.77	361.43	.104	.133	.0042	.0053	.00342	.00343	1.24	1.56
Total	28,070	28,300	231,705	231,543	.....	162	0.07	8.2	8.2	184.78	192.56	.116	.117	.0099	.0092	.00991	.00962	1.09	1.26
CENTRAL CLASSIFICATION																			
Chicago, Ind. & Louisville R. R. Co.	618	621	6,703	6,741	38	.....	0.57	10.8	10.8	135.74	128.80	.147	.159	.0096	.0120	.00730	.00765	1.45	1.57
Cincinnati, Hamilton & Dayton Ry. Co.	1,015	1,003	9,449	8,592	.....	857	9.07	9.3	8.6	123.16	125.30	.117	.102	.0063	.0058	.00502	.00494	1.27	1.19
C. C. C. & St. Louis R. R. Co.	2,381	2,385	31,254	30,989	.....	265	0.85	13.1	13.0	162.80	165.00	.100	.094	.0071	.0065	.00531	.00557	1.33	1.17
Grand Rapids & Indiana R. R. Co.	575	575	3,056	2,900	.....	156	5.10	5.3	5.1	93.82	93.44	.093	.093	.0062	.0064	.00707	.00738	0.97	0.87
Lake Erie & Western R. R. Co.	906	900	2,681	4,669	1,988	.....	74.52	2.9	5.2	121.27	125.06	.059	.080	.0037	.0061	.00656	.00682	0.59	0.89
Michigan Central R. R. Co.	1,800	1,803	25,032	24,114	.....	918	3.67	13.9	13.4	149.00	147.00	.091	.089	.0078	.0076	.00675	.00733	1.21	1.04
New York, Chicago & St. Louis R. R. Co.	523	523	11,435	11,341	.....	94	0.82	21.9	21.7	206.00	202.00	.073	.066	.0061	.0054	.00514	.00513	1.23	1.06
Pennsylvania Company	1,757	1,758	58,925	60,274	1,349	.....	2.29	33.5	34.3	78.76	73.46	.153	.153	.0084	.0090	.00586	.00618	1.50	1.53
P. C. C. & St. L. Ry. Co.	1,472	1,489	29,920	29,453	.....	467	1.56	20.3	19.8	115.13	119.99	.099	.095	.0067	.0064	.00629	.00624	1.14	1.03
Pere Marquette R. R. Co.	2,322	2,314	15,868	15,916	48	.....	0.30	6.8	6.9	166.42	173.11	.117	.107	.0082	.0076	.00611	.00614	1.44	1.27
Vandalia R. R. Co.	910	917	8,120	8,330	210	.....	2.59	8.9	9.1	111.90	115.14	.098	.100	.0065	.0065	.00617	.00610	1.10	1.07
Total	14,279	14,288	202,443	203,319	876	.....	0.43	13.3	14.23	133.09	133.48	.104	.103	.0070	.0072	.00614	.00632	1.20	1.15
WESTERN CLASSIFICATION—																			
Atchison, Topeka & Santa Fe Ry. Co.	10,961	11,136	65,230	63,297	.....	1,933	2.96	5.9	5.7	292.25	316.68	.097	.085	.0073	.0077	.01007	.00974	0.89	0.79
Chicago & Alton R. R. Co.	1,033	1,952	13,803	13,604	.....	199	1.44	12.4	12.1	172.63	182.52	.123	.117	.0087	.0095	.00606	.00641	1.56	1.48
Chicago & Eastern Illinois R. R. Co.	1,283	1,282	26,004	25,078	.....	926	3.56	20.3	19.6	150.43	145.10	.200	.212	.0111	.0128	.00510	.00530	2.30	2.44
Chicago & North Western R. R. Co.	8,071	8,108	65,093	67,401	2,308	.....	3.55	8.1	8.3	143.85	153.87	.193	.126	.0104	.0108	.00870	.00840	1.21	1.30
Chicago, Burlington & Quincy R. R. Co.	9,264	9,366	65,157	65,514	357	.....	0.55	7.0	7.0	265.91	268.51	.098	.099	.0075	.0077	.00729	.00733	1.04	1.05
Chicago Great Western Ry. Co.	1,496	1,428	10,643	10,978	335	.....	3.15	7.1	7.7	217.65	216.75	.100	.105	.0072	.0080	.00729	.00700	1.07	1.14
Chicago, Milwaukee & St. Paul Ry. Co.	9,681	10,053	63,361	61,958	.....	1,403	2.21	6.5	6.2	244.79	248.37	.092	.089	.0066	.0076	.00808	.00781	0.97	0.97
Chicago, Rock Island & Pacific Ry. Co.	8,295	8,330	45,674	44,247	.....	1,427	3.12	5.6	5.3	219.50	222.77	.101	.094	.0075	.0081	.00860	.00870	1.03	0.93
Chicago, St. P., Minn. & Omaha R. R. Co.	1,748	1,753	11,911	11,388	.....	523	4.39	6.8	6.5	152.85	151.93	.177	.114	.0092	.0085	.00880	.00860	1.04	0.99
Colorado & Southern R. R. Co.	1,866	1,828	10,594	12,079	1,485	.....	14.02	5.7	6.6	143.05	152.48	.152	.158	.0122	.0123	.01033	.01013	1.17	1.21
Denver & Rio Grande R. R. Co.	2,583	2,571	17,936	16,431	.....	1,505	8.40	6.9	6.4	126.78	130.77	.176	.170	.0169	.0122	.01201	.01186	1.05	1.03
Duluth S. S. & Atlantic R. R. Co.	627	626	3,196	3,055	.....	141	4.41	5.1	4.9	80.93	77.55	.173	.183	.0123	.0147	.00804	.00872	1.53	1.69
Great Northern Railway Co.	7,528	7,822	55,394	55,779	385	.....	0.70	7.4	7.1	224.59	246.18	.126	.147	.0069	.0097	.00790	.00817	1.01	1.18
Illinois Central R. R. Co.	4,769	4,770	59,437	63,863	4,436	.....	7.46	12.5	13.4	240.83	240.25	.104	.116	.0065	.0085	.00563	.00548	1.35	1.55
Kansas City Southern Ry. Co.	827	836	5,567	5,148	.....	419	7.53	6.7	6.2	238.77	249.38	.077	.071	.0049	.0046	.00784	.00692	0.67	0.67
Minneapolis & St. Louis R. R. Co.	1,646	1,646	7,259	7,162	.....	97	1.34	4.4	4.4	155.01	166.29	.110	.099	.0074	.0075	.00840	.00795	1.01	0.94
Minn., St Paul & S. Ste. Marie R. R. Co.	4,102	4,103	24,946	24,801	.....	145	0.58	6.1	6.0	203.04	192.07	.124	.125	.0090	.0097	.00735	.00772	1.22	1.25
Missouri Pacific Ry. Co.	7,295	7,286	43,349	42,802	.....	547	1.26	5.9	5.9	225.78	232.77	.100	.097	.0068	.0075	.00799	.00769	0.99	0.98
Missouri, Kansas & Texas Ry. Co.	3,825	3,865	25,515	24,776	.....	739	2.90	6.6	6.4	202.88	223.36	.129	.115	.0138	.0109	.01090	.00990	1.26	1.11
Northern Pacific Ry. Co.	6,325	6,461	48,974	48,160	.....	814	1.66	7.7	7.5	275.60	293.00	.128	.133	.0087	.0093	.00854	.00849	0.99	1.10
St. Louis & San Francisco R. R. Co.	5,259	5,252	31,384	30,068	.....	1,316	42.11	5.9	5.7	146.79	158.33	.125	.127	.0088	.0097	.01000	.00950	1.03	1.02
St. Louis Southwestern Ry. Co.	1,735	1,753	11,657	13,704	2,047	.....	17.56	6.7	7.8	237.45	234.96	.149	.193	.0141	.0183	.01120	.01060	1.25	1.74
San Antonio & Aransas Pass R. R. Co.	724	723	2,673	2,602	.....	71	2.66	3.7	3.6	135.36	124.89	.123	.140	.0130	.0167	.01613	.01611	0.88	1.04
Southern Pacific Company	10,422	10,554	51,392	48,368	.....	3,024	5.88	4.9	4.6	218.65	208.35	.087	.092	.0062	.0073	.01114	.01099	0.66	0.66
Texas & Pacific R. R. Co.	1,885	1,901	11,016	11,101	85	.....	0.77	5.8	5.8	183.00	184.78	.090	.092	.0073	.0082	.00969	.00923	0.87	0.89
Union Pacific R. R. Co.	7,597	7,784	34,772	37,998	3,226	.....	9.28	4.6	4.9	359.58	357.43	.072	.078	.0044	.0063	.00975	.00968	0.56	0.64
Wabash R. R. Co.	2,515	2,519	22,450	21,845	.....	605	2.69	8.8	8.7	207.96	219.93	.082	.079	.0062	.0068	.00608	.00632	1.11	1.07
Total	123,262	124,898	834,387	833,207	.....	1,180	0.14	6.7	6.7	202.83	207.36	.122	.121	.0087	.0097	.00885	.00869	1.10	1.14
TOTAL, ALL ROADS	198,433	200,341	2,000,800	1,991,789	.....	9,011	0.45	10.08	9.94	172.03	176.16	.122	.122	.0087	.0094	.00828	.00824	1.15	1.17

COMPARATIVE SUMMARY OF FREIGHT CARS IN SERVICE ON RAILROADS OF THE UNITED STATES—1900 AND 1915

Note.—Narrow-gage cars excluded.
Non-revenue cars excluded.
Company freight included.

	Miles		Freight equipment				Per cent of change	Freight cars per mile of road		Average length of haul		Freight cars: Per 1,000 frt. car miles		Freight cars: Per 1,000 rev. ton miles		Rate per ton mile (Dollars)		Frt. cars per $1,000 frt. earnings	
	1900	1915	1900	1915	Increase	Decrease		1900	1915	1900	1915	1900	1915	1900	1915	1900	1915	1900	1915
NEW ENGLAND ROADS—																			
Boston & Maine R. R. Co.	1,787	2,302	12,230	23,410	11,180	.....	91.41	6.8	10.2	66.99	106.55	.126	.113	.0146	.0096	.01440	.01119	1.02	1.04
Bangor & Aroostook R. R. Co.	354	625	3,091	5,299	2,208	.....	71.43	8.7	8.5	88.62	124.52	....	.245	.0539	.0223	.01420	.01232	1.76	1.76
Central Vermont R. R. Co.	513	556	2,006	3,00[illegible]	905	.....	45.60	3.9	5.6	94.97	80.44	.065	.120	.0079	.0102	.00880	.00960	0.98	1.02
Maine Central R. R. Co.	846	1,220	3,586	9,36[illegible]	5,777	.....	161.10	4.4	7.6	87.11	93.96	.163	.166	.0123	.0143	.01130	.01097	1.62	1.51
N. Y., N. H. & H. R. R. Co.	2,003	2,005	13,116	34,20[illegible]	21,102	.....	160.87	6.5	17.[illegible]	84.36	91.65	.076	.169	.0097	.0157	.01451	.01484	0.67	0.90
Total	5,478	6,688	34,0[illegible]	75,38[illegible]	41,352	.....	121.52	6.5	11.3	83.61	99.36	.107	.145	.0197	.0130	.01264	.01168	1.49	1.45
TRUNK LINE ROADS—																			
Baltimore & Ohio R. R. Co.	3,179	4,535	61,708	85,040	23,332	.....	37.81	19.3	18.7	1[illegible].88	201.[illegible]	.118	.110	.0068	.0054	.00412	.00346	1.50	1.40
Buffalo, Rochester & Pittsburgh R. R. Co.	472	586	8,858	17,[illegible]20	8,544	.....	96.46	18.7	29.6	1[illegible].00	153.80	.139	.114	.0097	.0108	.01479	.00477	1.99	1.17
Central R. R. Co. of New Jersey	639	681	15,00[illegible]	[illegible],72[illegible]	8,719	.....	58.12	23.4	34.8	[illegible].[illegible]	71.[illegible]	.153	.[illegible]71	.0118	.0101	.00871	.00848	1.34	1.01
Chesapeake & Ohio Ry. Co.	1,476	2,369	17,270	[illegible],[illegible]00	28,028	.....	162.25	24.6	19.[illegible]	.[illegible]082	231.00	.[illegible]06	.[illegible]06	.0058	.0056	.[illegible]43	.00383	3.71	1.25
Delaware & Hudson Company	665	900	13,630	[illegible],760	5,130	.....	43.98	19.6	23.6	[illegible].[illegible]6	135.[illegible]	.147	.[illegible]1[illegible]	.0113	.[illegible]067	.00889	.00684	1.54	0.93
Delaware, Lackawanna & Western R. R. Co.	947	981	27,[illegible]	27,[illegible]3	306	.....	1.12	28.8	28.	1[illegible].[illegible]	188.[illegible]	.[illegible]	.[illegible]08	.0144	.0065	.[illegible]08	.00764	1.79	0.85
Erie Railroad Co.	2,164	2,257	45,23[illegible]	51,79[illegible]	5,[illegible]66	.....	12.04	21.9	22.9	1[illegible].[illegible]	214.[illegible]	.10[illegible]	.089	.0089	.0060	.00559	.00590	.60	1.02
Lehigh Valley R. R. Co.	1,382	1,442	34,954	44,974	10,020	.....	28.67	25.3	31.7	188.[illegible]	165.[illegible]	.135	.135	.0106	.00[illegible]	.0054	.00661	1.97	1.38
New York Central Railroad Co.	4,318	5,609	79,157	129,603	50,[illegible]46	.....	63.73	18.3	23.[illegible]	170.50	196.46	.067	.095	.0071	.007[illegible]	.00431	.00593	....	1.24
New York, Ontario & Western Ry. Co.	400	568	5,899	6,04[illegible]	142	.....	2.41	12.3	10.6	142.38	145.7[illegible]	.[illegible]1	.116	.0[illegible]91	.0070	.00876	.0078	1.49	0.90
Pennsylvania Railroad Company.	3,716	4,341	80,385	150,[illegible]0	69,[illegible]03	.....	86.97	21.6	34.[illegible]	109.54	159.[illegible]	.091	.114	.0067	.0065	.00540	.00560	1.25	1.08
Philadelphia & Reading Ry. Co.	1,000	1,120	31,824	39,0[illegible]	7,190	.....	22.59	31.8	34.8	89.[illegible]	100.65	.[illegible]1	.[illegible]18	.0114	.0080	.[illegible]	.0078	1.56	1.03
Western Maryland R. R. Co.	279	659	601	8,8[illegible]6	8,125	.....	1175.83	2.5	[illegible]	[illegible]	114.55	....	.120	.2038	.0063	.[illegible]724	.00525	1.53	1.20
Total	20,657	26,257	422,290	648,5[illegible]0	226,049	.....	56.53	20.4	24.7	[illegible].[illegible]	165.[illegible]	.121	.111	.0093	.0059	.00625	.00642	1.56	1.15
SOUTHERN CLASSIFICATION—																			
Atlantic Coast Line Ry. Co.	1,759	4,698	5,378	[illegible]3,619	23,[illegible]41	.....	432.15	3.6	6.3	1[illegible].90	166.[illegible]	....	.13[illegible]	.0145	.010[illegible]	.[illegible]08	.01203	1.02	1.35
Central of Georgia R. R. Co.	1,196	1,924	5,641	9,907	4,[illegible]66	.....	96.[illegible]3	4.2	5.[illegible]	1[illegible].86	13.[illegible]	....	.[illegible]	.0[illegible]83	.0[illegible]3[illegible]	.[illegible]08[illegible]	.01034	1.26	1.26
Florida East Coast Ry. Co.	.....	745	.....	1,682	1,682	.....	100.00	....	2.[illegible]	.....	18.[illegible]7	.....	.[illegible]6[illegible]	.....	.0[illegible]62	.....	.01672	.....	0.61
Louisville & Nashville R. R. Co.	3,007	5,037	22,402	46,710	24,[illegible]08	.....	99.60	7.5	9.3	163.[illegible]0	158.[illegible]9	.[illegible]06	.[illegible]2[illegible]	.0090	.[illegible]0[illegible]	.00758	.00760	1.[illegible]	1.26
Mobile & Ohio R. R. Co.	876	1,122	5,389	11,422	6,[illegible]33	.....	111.95	6.2	10.[illegible]	[illegible].[illegible]8	2[illegible].[illegible]4	....	.[illegible]8	.0076	.0078	.[illegible]0[illegible]	.00647	1.33	1.25
Nashville, Chat. & St. Louis R. R. Co.	1,189	1,231	5,328	9,[illegible]25	4,[illegible]97	.....	87.22	4.4	8.[illegible]	[illegible].00	[illegible]5.[illegible]0	.[illegible]63	.[illegible]31	.0076	.0136	.[illegible]08[illegible]	.01019	1.10	1.33
Norfolk & Western Ry. Co.	1,551	2,042	18,656	46,92[illegible]	28,[illegible]67	.....	151.[illegible]8	12.0	[illegible].0	[illegible]3.41	[illegible].	....	.100	.0068	.0052	.[illegible]0430	.00415	1.58	1.28
Norfolk Southern R. R. Co.	147	860	[illegible]49	3,277	[illegible],[illegible]68	.....	705.[illegible]	2.8	[illegible].8	[illegible].42	[illegible].	....	.[illegible]15	.0161	.0190	.[illegible]4770	.01514	0.91	1.31
Seaboard Air Line Ry. Co.	(1901) 2,604	3,706	[illegible],[illegible]35	[illegible]7,019	9,[illegible]84	.....	1[illegible].[illegible]	3.[illegible]	5.8	[illegible]33.[illegible]	[illegible]50.[illegible]	....	.109	.0136	.0133	.[illegible]1[illegible]8	.01069	1.[illegible]	1.25
Southern Railway Co.	6,306	7,[illegible]31	26,814	47,130	20,316	.....	75.[illegible]6	4.[illegible]	6.7	[illegible]0.[illegible]	[illegible]6[illegible].[illegible]	.[illegible]	.118	.0116	.0112	.00[illegible]6	.00961	1.27	1.16
Virginia Railway Company	.....	504	.....	7,[illegible]20	7,920	.....	[illegible]0.[illegible]	.....	[illegible].7	.....	[illegible]61.[illegible]	....	.133	.....	.0053	.....	.00343	....	1.56
Total	18,635	28,300	98,752	[illegible]7,[illegible]7[illegible]	132,791	.....	134.[illegible]	5.3	8.[illegible]	[illegible]7.00	[illegible]0[illegible].[illegible]	.[illegible]07	.[illegible]17	.0119	.0092	.[illegible]0[illegible]	.00962	1.19	1.26
CENTRAL CLASSIFICATION—																			
Chicago, Ind. & Louisville R. R. Co.	546	621	5,440	6,7[illegible]	1,[illegible]	.....	23.[illegible]2	9.9	[illegible].8	1[illegible].00	1[illegible].8[illegible]	.[illegible]35	.[illegible]9	.0[illegible]43	.0130	.00[illegible]7	.00765	1.86	1.57
Cincinnati, Hamilton & Dayton Ry. Co.	632	1,003	7,838	8,5[illegible]	7,[illegible]	.....	9.[illegible]2	12.[illegible]	[illegible].0	[illegible]8.90	[illegible].	....	.[illegible]9[illegible]	.[illegible]0[illegible]2	.0068	.[illegible]0[illegible]0	.00494	.90	1.19
C. C. C. & St. Louis R. R. Co.	1,891	2,385	15,484	30,[illegible].0	14,[illegible]0[illegible]	.....	100.[illegible]7	8.2	13.0	[illegible]0.80	[illegible].	....	.[illegible]99	.[illegible]0[illegible]3	.0065	.[illegible]0[illegible]3	.00557	1.42	1.17
Grand Rapids & Indiana R. R. Co.	58[illegible]	575	3,[illegible]5	[illegible],[illegible]30	.....	115	3.[illegible]2	5.[illegible]	5.[illegible]	[illegible].[illegible]3	[illegible].	....	.[illegible]00	.[illegible]156	.[illegible]364	.[illegible]0[illegible]8	.00738	.88	0.87
Lake Erie & Western R. R. Co.	725	900	5,549	4,66[illegible]	.....	880	15.86	7.6	[illegible].[illegible]	[illegible].[illegible]	[illegible].	....	.[illegible]61	.[illegible]1[illegible]	.00[illegible]	.[illegible]0[illegible]4	.[illegible]0[illegible]3	.89	0.80
Michigan Central R. R. Co.	1,635	1,803	14,219	[illegible]4,[illegible]14	9,[illegible]95	.....	[illegible].59	8.6	13.[illegible]	[illegible]2.[illegible]	[illegible].	....	.[illegible]0[illegible]	.[illegible]0[illegible]	.0076	.[illegible]0[illegible]	.00756	1.19	1.44
New York, Chicago & St. Louis R. R. Co.	513	523	6,743	[illegible]1,[illegible]3[illegible]	4,[illegible]92	.....	[illegible].39	13.[illegible]	[illegible]1.[illegible]	[illegible]7.00	[illegible].	....	.[illegible]3[illegible]	.[illegible]055	.065[illegible]	.[illegible]0[illegible]4	.0051	.16	1.65
Pennsylvania Company	1,396	1,758	43,963	[illegible]0,[illegible]7[illegible]	16,36[illegible]	.....	[illegible].09	31.5	38.[illegible]	[illegible].95	[illegible].	....	.[illegible]45	.0135	.[illegible]0[illegible]0	.[illegible]0[illegible]0	.00668	2.30	1.53
P. C. C. & St. L. Ry. Co.	1,407	1,489	12,8[illegible]	[illegible]9,[illegible]	16,560	.....	128.60	9.1	19.[illegible]	[illegible]1.[illegible]	[illegible].	....	.[illegible]0[illegible]	.[illegible]032	.[illegible]0[illegible]4	.[illegible]0[illegible]6	.00622	0.84	1.03
Pere Marquette R. R. Co.	1,821	2,514	7,944	[illegible]0,[illegible]6	7,972	.....	100.35	4.3	6.9	[illegible].[illegible]3	[illegible].	....	.107	.[illegible]0[illegible]	.[illegible]0[illegible]	.[illegible]0[illegible]	.00614	1.55	1.27
Vandalia R. R. Co.	727	917	5,922	8,[illegible]0	2,[illegible]08	.....	40.66	8.1	9.1	[illegible].76	[illegible].	....	.100	.0119	.[illegible]0[illegible]	.007[illegible]	.00610	1.56	1.07
Total	11,895	14,288	120,005	[illegible]0,[illegible]19	74,314	.....	57.01	10.8	[illegible].	[illegible]0.14	[illegible].	....	.103	.0[illegible]0[illegible]	.[illegible]0[illegible]	.[illegible]0[illegible]7	.00632	1.61	1.05
WESTERN CLASSIFICATION—																			
Atchison, Topeka & Santa Fe Ry. Co.	7,426	11,136	27,486	63,297	35,[illegible]11	.....	130.29	3.7	5.7	3[illegible].19	3[illegible].[illegible]	.[illegible]	.[illegible]85	.0079	.0077	.[illegible]0076	.[illegible]0974	0.81	0.79
Chicago & Alton R. R. Co.	855	1,052	9,386	13,604	4,218	.....	44.91	10.9	[illegible].1	[illegible].[illegible]	18[illegible].[illegible]	.[illegible]35	.[illegible]17	.0148	.0095	.[illegible]0[illegible]	.00641	.87	1.48
Chicago & Eastern Illinois R. R. Co.	711	1,292	8,206	25,078	16,872	.....	205.[illegible]	11.5	[illegible].6	144.70	1[illegible].[illegible]	.[illegible]	.212	.00[illegible]	.[illegible]28	.[illegible]	.00580	.99	2.44
Chicago & North Western Ry. Co.	5,210	8,108	40,846	67,401	26,555	.....	65.[illegible]	7.8	8.3	151.30	15[illegible].[illegible]	.08	.[illegible]96	.0100	.[illegible]08	.008[illegible]	.[illegible]	.28	1.30
Chicago, Burlington & Quincy R. R. Co.	7,346	9,366	42,287	65,514	23,227	.....	[illegible].93	5.6	7.0	[illegible].82	208.[illegible]	.[illegible]09	.0111	.0077	.[illegible]0[illegible]	.[illegible]0[illegible]	.00733	.29	1.05
Chicago Great Western Ry. Co.	920	1,428	5,[illegible]82	10,978	5,196	.....	89.87	6.2	7.7	301.[illegible]	2[illegible].[illegible]	.[illegible]0[illegible]	.10	.008[illegible]	.[illegible]0[illegible]	.[illegible]0[illegible]	.[illegible]0[illegible]	1.13	1.14
Chicago, Milwaukee & St. Paul Ry. Co.	8,423	10,033	35,740	61,958	26,218	.....	73.36	5.6	6.2	[illegible]8.07	240.37	.[illegible]02	.[illegible]06	.[illegible]0[illegible]	.[illegible]0[illegible]	.[illegible]	.00781	1.14	0.97
Chicago, Rock Island & Pacific Ry. Co.	3,647	8,330	17,150	44,247	27,097	.....	158.00	4.7	5.3	218.[illegible]	222.77	.[illegible]0[illegible]	.094	.[illegible]0[illegible]	.[illegible]081	.[illegible]0[illegible]	.[illegible]0[illegible]	1.03	0.93
Chicago, St. P. Minn. & Omaha R. R. Co.	1,557	1,753	10,253	11,388	1,135	.....	11.07	6.6	6.5	160.55	151.93	.[illegible]11	.[illegible]135	.0085	.[illegible]08	.[illegible]0[illegible]	.00860	1.39	0.99
Colorado & Southern R. R. Co.	762	1,828	2,979	12,079	9,100	.....	305.47	3.9	6.6	101.00	152.48	.[illegible]0[illegible]	.[illegible]3[illegible]	.[illegible]0[illegible]5	.[illegible]0[illegible]3	.[illegible]0[illegible]	.01013	0.93	1.21
Denver & Rio Grande R. R. Co.	1,674	2,571	8,350	16,[illegible]3[illegible]	8,[illegible]7[illegible]	.....	96.57	4.9	6.1	.....	130.77	.[illegible]1[illegible]	.170	.....	.0122	.....	.01186	.09	1.03
Duluth S. S. & Atlantic R. R. Co.	585	626	2,697	3,0[illegible]	353	.....	13.27	4.6	[illegible].[illegible]	[illegible]9.07	77.55	....	.183	.0200	.0147	.[illegible]1[illegible]3	.0087	.70	1.69
Great Northern Railway Co.	5,818	7,822	21,[illegible]4	[illegible]5,[illegible]79	34,295	.....	159.63	3.9	7.[illegible]	[illegible]9.00	246.18	.[illegible]01	.147	.0085	.0097	.00899	.00817	0.93	1.18
Illinois Central R. R. Co.	3,996	4,770	32,439	63,86[illegible]	31,424	.....	96.87	8.1	[illegible].2	[illegible]1.[illegible]3	240.25	.[illegible]0[illegible]	.116	.[illegible]09[illegible]	.0085	.[illegible]0[illegible]1	.00548	.45	1.55
† Iowa Central R. R. Co.	510	....	2,238	.....	....	2,238	100.00	[illegible].8	....	[illegible].30	.....	.[illegible]09	....	.[illegible]08[illegible]	.....	.[illegible]0[illegible]96	.....	1.21	....
Kansas City Southern R. R. Co.	833	836	5,118	5,148	[illegible]0	.....	0.59	6.1	6.[illegible]	[illegible]0.41	249.38	.[illegible]8	.[illegible]71	.[illegible]0[illegible]	.0046	.00613	.00692	.49	0.67
† Minneapolis & St. Louis R. R. Co.	5[illegible]	1,646	3,066	7,[illegible]6	[illegible]096	.....	133.59	5.1	[illegible].4	[illegible]8.79	166.20	.[illegible]6	.[illegible]09[illegible]	.0155	.0075	.01212	.00795	.45	0.94
Minn., St. Paul & S. Ste. Marie R. R. Co.	[illegible]55	4,105	6,631	24,[illegible]1	18,170	.....	274.02	5.3	6.0	[illegible]4.65	192.07	.129	.125	.0109	.0097	.[illegible]0658	.00773	.67	1.25
Missouri Pacific Ry. Co.	4,938	7,286	25,186	42,[illegible]2	17,616	.....	69.94	5.1	5.9	[illegible].24	232.77	.102	.097	.0095	.0075	.00834	.00769	.15	0.98
Missouri, Kansas & Texas Ry. Co.	2,218	3,865	9,666	24,7[illegible]	15,107	.....	156.24	4.4	6.4	[illegible].93	223.36	.073	.115	.0082	.0109	.00840	.00990	0.98	1.11
Northern Pacific Ry. Co.	5,096	6,461	23,108	48,1[illegible]3	25,022	.....	108.14	4.6	7.5	300.60	293.00	.105	.133	.0104	.0093	.00987	.00849	1.04	1.16
St. Louis & San Francisco R. R. Co.	[illegible],639	5,252	5,974	30,0[illegible]8	24,094	.....	403.31	3.6	5.7	182.05	158.33	.093	.127	.0114	.0097	.01058	.00850	1.08	1.02
St. Louis Southwestern Ry. Co.	1,258	1,753	5,386	13,704	8,318	.....	154.44	4.3	7.8	196.28	234.96	.127	.193	.0130	.0183	.01116	.01060	1.17	1.74
San Antonio & Aransas Pass R. R. Co.	687	723	1,553	2,602	1,049	.....	[illegible].55	2.3	[illegible].6	162.28	124.89	.113	.140	.0142	.0167	.01861	.01611	0.55	1.04
Southern Pacific Company.	7,576	10,554	29,413	48,368	18,955	.....	64.44	3.9	4.6	307.31	208.35	.096	.092	.6062	.0073	.00957	.01099	0.73	0.66
Texas & Pacific R. R. Co.	1,570	1,901	6,263	11,101	4,838	.....	77.25	3.9	5.8	231.77	184.78	.079	.092	.0093	.0082	.01030	.00923	.91	0.89
Union Pacific R. R. Co.	5,428	7,784	21,826	37,998	16,172	.....	74.10	4.0	4.9	305.68	357.43	.080	.078	.0082	.006[illegible]	.01046	.00968	.78	0.64
Wabash R. R. Co.	2,340	2,519	13,087	21,817	8,758	.....	66.92	5.6	8.7	216.70	219.93	.071	.079	.0068	.0068	.00558	.00632	.[illegible]	.07
Total	82,624	124,808	423,642	833,26[illegible]	409,565	.....	96.68	5.0	6.7	211.25	207.36	.[illegible]04	.121	.0106	.0097	.00926	.00869	1.21	1.14
TOTAL, ALL ROADS.	139,289	200,341	1,107,699	[illegible].99[illegible]7[illegible]	884,090	.....	79.81	7.95	9.[illegible]5	168.89	176.16	.111	.122	.0112	.0094	.00857	.00824	1.36	1.17

† 1915 operations of Iowa Central R. R. Co. included in Minneapolis & St. Louis R. R. Co. * Before consolidation with other companies.

Measures for the Improvement of L. C. L. Service*

Several Discussions of Methods Used for Reducing the Cost and Increasing the Efficiency of This Work

THE papers printed below, received in the contest on The Handling of L. C. L. Freight, discuss essential features in the successful solution of this increasingly important railway problem.

PAYING ATTENTION TO THE DETAILS

By C. A. Pennington

Assistant Superintendent, Cheasapeake & Ohio, Huntington, W. Va.

The selection and organization of labor together with systematic co-operation between the freight house and office forces offer the widest field for advancement in the handling of business. At Louisville we have tried white forces, joint white and black gangs and straight negro labor. The latter has been found the most successful under a variety of conditions. In charge of a competent foreman who thoroughly understands his nature, the negro is a satisfactory and a satisfied worker. We work them principally under the tonnage system, but pay a few extra gangs of less experienced men on an hourly rate. Conditions make this necessary and this also offers an incentive to the new men to become proficient in their work in order to secure promotion.

One highly important thing that has an influence on net revenue as well as on the condition of the freight house is the handling of the O S and D work. Platform and office men should be alive to the necessity of keeping the O S and D freight properly sorted out, tagged and listed. It requires constant energetic effort to control this situation and the man in the local office whose activity sometimes causes him to be branded as a pest is the fellow who shows results. A good yardmaster does not sleep well with a bunch of "no bills" in his yard and the agent should feel the same way about his "overs." Meetings of O S and D men of all lines in a terminal to discuss overs and shorts and the work in general are of considerable value.

A check should be kept to locate the sources of errors and of bad loading. There are many ways of doing this, all of which are more or less effective. It is well to keep a careful record of errors against individual clerks when a comparison will show up the unsatisfactory men. So far as laborers are concerned, we prefer to hold the gang responsible as a unit, just as we pay the gang rather than the individual. All of these units are thoroughly impressed with this responsibility and the better men help eliminate any inefficient labor.

The correct handling of shipping tickets on the platform and proper loading constitute just one step in the right direction. Trouble lurks in the wake of the bill clerks and the work of these men must be closely watched and a check made to locate errors. The initial of the bill clerk should go on each way bill and all errors should be tabulated so as to show the party at fault and also to ascertain the nature of the errors. An undue number of mistakes along one line will often disclose the reason for the trouble and enable the remedy to be applied. Billing machines have eliminated to some extent the chance for error in reading way bills, but machines will not correct senseless abbreviations and incorrect descriptions or the ordinary errors of arithmetic. It is economical to make a check of the outgoing billing. Agents should push a campaign of education among shippers to have them furnish legible billing with full information to obviate the chance of incorrect interpretation.

Robbery and petty thieving drain the treasury. The more or less unimportant shortages under original seals should be recorded with a view to locating the possible source of trouble. Several "possibles" make a "probable" and a few of the latter constitute a reasonable certainty. Packages should be watched on receipt at the warehouse. It is no great trick for a driver to remove a small parcel without detection in the rush of business. This can be traced back with careful study. It is not a bad idea to open cases of whiskey or similar freight occasionally, especially if there is any slight evidence of tampering with the boxes. Records should be kept of the position in the train of cars showing shortage, the nature of shortage, the location of the crew, etc. This may locate and prevent some trouble "within the family."

There are many little things around a freight house that can be so handled as to reduce the general expense. Money can be saved on warehouse trucks if they are given attention. These are sometimes allowed to go to pieces for want of minor repairs. A missing bolt today may mean a new truck next week. In many cases no skill is necessary to remedy the trouble. Incidentally, we plainly brand our trucks. Some drivers have deplorably bad memories especially when commercial and railroad trucks are so similar, but fortunately, second hand dealers prefer not to handle branded trucks. Old lumber can often be salvaged to advantage. Cleats on car doors are very discouraging to the ordinary thief, especially the water tank and steep grade variety. Some expense is attached to cleating cars, but here is where the usual man of odd jobs can save some money by preparing scrap lumber for cleats during his spare time.

Employees should be taught to deal courteously with the public and they should also be encouraged to watch all the little odds and ends—to save a dollar here and there. It is often the small things taken together that make for failure or success of economical operation.

THE MAN ELEMENT

By A. E. Aumiller

Chief Clerk to Agent, Pennsylvania Railroad, Harrisburg Transfer, Pa.

In a study of methods of handling l. c. l. freight, we must start at the gates of the shipper, or rather in his shipping room. A spring that is contaminated may cause trouble all along the course of the particular waterway of which it is a part and a bad condition at the shipper's plant may leave a trail of trouble for the railroad and a dissatisfied consignee. To remove difficulties of this nature, allow the agent at the shipping point one day each month to have his patrons visit his station in order that he may explain current rulings. It is probable that the points can be driven home a little stronger at the station. Show the shipper who invariably delivers goods late in the day, what it means to prepare the necessary forms and load his freight, and it is probable that he will expedite the future handling of his invoices and the movement of his freight to the freight house. Take the shipper into the cars being loaded and show him the difficulty in stowing a piece of freight with insufficient crating in a car that must or should carry an average of 7 or 8 tons

*The two prize-winning papers received in this contest were published in the issue of November 26, 1915, page 1005. Five papers on the subject of "Starting Right in Handling L. C. L. Freight Traffic" were published in the issue of January 7, page 5; four papers on the subject, "Reducing the Cost of Handling L. C. L. Freight" were published in the issue of February 25, page 359, and four papers on the subject, "The Reduction of Over, Short and Damage Claims" were published in the issue of June 23, page 1542.

of freight. Touch every phase of the interest between your patrons and yourself and don't forget to go to your patron's place of business and take an active interest in helping him out wherever possible.

The most efficient force possible to secure at a station should be employed at the receiving door as a great many claims, or the channels for them, have been instituted because of neglect and oversight in checking freight from the city to the warehouse or platform. When there is a question regarding the condition of a shipment at the receiving platform, it should be settled at once by the agent or his duly authorized representative to the entire satisfaction of the shipper and the railroad, as many such cases are passed over with resulting complication during transit and a claim eventually.

Too much care cannot be exercised in the choice of men to stow or load freight into cars for as a usual thing they have the last handling of the package. They should be to a considerable extent conversant with routing and loading as represented at that station, and where an arbitrary set-up is arranged daily it should be the duty of each stower to examine marks on his freight as this can be done in the average station without the expense of additional help. Secure good men to check and receive freight and to stow it in the cars, even if it does cost more, and an improvement in handling freight will have been accomplished.

If a new man is employed see that he understands his work or has some knowledge of it before you pass him out of your hands into the crowd. He may have the "metal" in him, but you may never profit by it because he did not get started right. A little coaching and careful handling, no matter what caliber of man you are obliged to employ, will make a decided improvement. Athletes call for good "coaching work," and they need it; so does a railroad business.

No case of erroneous handling should be overlooked. Much neglect and poor work is due to the fact that cases are not followed with a view to placing the responsibility definitely.

An effort should be made to examine all inbound loaded cars to ascertain the extent of the damage owing to improper loading. In no case should one neglect to make a report of such improper loading through the proper channel. It can be determined by a man of limited experience whether the bad condition was due to improper loading or to rough handling by the crew. At the end of the year a summary of errors for the year, chargeable to each of the stations, should be made and submitted to the division superintendent or through such a channel that it will effectively reach the agent at fault. We should be able to join in this without feeling that we are knocking our fellow employees, for it will save dollars and cents and the more we can save the more we get.

If you pay special attention to any one feature, let that be to astray freight, for herein lies the monster that saps the life out of the l. c. l. credit column. If you are over a shipment for Washington, D. C., get it there with the least possible delay. A check of freight houses should be made daily and not a pound of freight should be allowed to remain on the floor without an account therefor. It gets into the freight house so easy, and sometimes is there for so long a time that the consignee has lost hope and ordered a consignment to take its place and the railroad pays the bill more often than it avoids it.

There are many phases of this subject, but, after all, it is the careful supervision, the selection of a bit of the best from this and that and indefatigable exertion and attention to detail, a careful leading of our men and the institution among our men and associates of a special interest in the affairs of the company by humane efforts and interest and by the remuneration that grasps or holds the attention of the majority—the bonus system—that brings results.

COSTS OF FREIGHT HOUSE OPERATION

By Henry A. Goetz, Chicago, Ill.

The economical handling of freight upon any single platform depends upon a number of factors, the principal ones being the length of the platform, the possibility of using machinery, and the system of pay under which the men work.

In the combined in and outbound house, the labor and trucking expense is lowest, because inbound business can be unloaded from the car to the platform in the morning and the same car can be reloaded outbound in the afternoon. In many cases, we find outbound merchandise in one end of the car before all of the inbound freight has been removed. This condition permits a trucker to carry a load to the car and take a load from it, never making a trip without a load. For this reason, a combined house is the most economical in the labor cost of operation. But such houses are usually found only in the smaller cities or on roads doing a limited business. The increased business of a large city requires a division into distinctively inbound houses and outbound houses.

An inbound house handling 100 tons or more daily should never be less than 60 ft. wide. A total floor space of 150 sq. ft. for each ton handled daily should be allowed. This will give ample room for storage upon the floor until called for. In a house of a size up to 200 tons and 500 ft. in length, the two-wheel truck is the most economical, because the trucking distances are short, and the trucking, checking and delivery cost should not exceed $0.15 per ton. Many houses of this size are operating at $0.10 per ton.

When, however, the tonnage handled begins to exceed 300 tons, requiring 45,000 sq. ft. of platform, and which if 60 ft. wide, would be 750 ft. long, the hand trucking cost will run up to from $0.35 to $0.40 per ton. At this stage we can begin to see economy in machinery.

An outbound house should be 30 ft. wide and should allow for 40 sq. ft. of platform for each ton handled daily. Thus, a house handling 600 tons would require 24,000 sq. ft., and if 30 ft. wide, would need to be 800 ft. long. This will spot 120 cars, of six strings, with 20 in each string, allowing five tons to each car. By using the two and four-wheel trucks as now practiced, the manual labor cost per ton runs from $0.30 to $0.40 per ton. There seems a great disparity in this, for some foremen show an average of 6 tons per day per man, while others show 13 tons.

Two houses in Chicago, with platforms over 1,000 ft. long and a labor cost of over $0.40 per ton, have been trying out the motor truck. In the beginning, the attempt was made to place the load upon the power truck, but in this attempt it was soon found that no appreciable saving was effected. Not until a number of trailers were hooked together into trains and transported by a tractor, was the problem of economical handling solved. The most economical procedure in an outbound house is to load the four-wheeled trailers at the receiving doors and push them out to a fixed runway. A tractor hitches on to four to six trailers in one train, dropping off some trucks along the route and taking on others. The trailers dropped off are pushed into the proper car for unloading by the stevedore and his helper and then returned to the teamster's receiving side of the platform.

Small shipments, destined to many points along the road, are placed on one trailer, and pushed by hand (if distances are short), each shipment being taken off in turn and left at the car door until the stower finds time and place for it in its proper car. It is estimated that fully 90 per cent of the trailer trucks carry full loads for some specific car. This procedure carries out the drop-truck system in an ideal manner. It will pay big dividends to provide an ample number of trucks (say about 125 trucks for 600 tons handled, or one truck to each five tons of business). A surplus of

trailer trucks permits unloading from a dray direct to the trailer, thus saving one handling.

In one house, where an ample supply of trucks is provided, the teamsters themselves have placed their entire load upon trailers, assorting the shipments at the same time, by using a truck for each shipment. At first thought, this would seem to have been a favor to the road, but the facts are that, by assorting the load upon the trailer trucks, the teamsters were able to see if their loads checked up, and at the same time, it expedited the count and acceptance of the shipment by the receiving clerk. Another saving in time to both the teamsters and the road can be effected by placing a sign on the outside, near the receiving door, designating the stations to which the cars stationed opposite the door are destined.

By giving extra and prompt attention to the teamsters who back up to the doors most convenient to the spotted cars to which the bulk of their load is destined, one can direct, control and relieve the congestion now caused by promiscuous deliveries at any door, regardless of the destination. At a Louisville, Kentucky, outbound station 1,800 ft. long and 60 ft. wide, at which the above plan of directing the teamsters is carried out, the laborers are paid 13½ cents per ton and earn $2 to $2.25 per day.

IMPROVING LOCAL WAY FREIGHT SERVICE

By H. M. Gain

Trainmaster, Grand Trunk, Belleville, Ont.

The organization necessary to handle l. c. l. traffic properly and promptly is necessarily large as compared with that necessary to handle car load traffic. The ratio of expense is likewise high, aside from the liability of loss, damage and pilferage. From an operating point of view the main objects to attain are: promptness of delivery, regularity of service, good order delivery and economy in handling.

A review of what has been accomplished on this territory may not only prove of interest, but may be found workable elsewhere. The time was when complaints regarding delays in handling and damage to consignments reached a critical stage and special means were taken to effect improvement in this branch of the service. Investigation showed many causes for delay and damage, including a lack of geographical knowledge on the part of shed and trainmen in loading cars, resulting in re-handling freight at intermediate transfer points; lack of standardization in daily loading; indifference of trainmen whose only ambition seemed to be to load freight in any convenient car, thereby necessitating transfer at terminals; careless handling and trucking; careless stowing and rough handling of equipment.

The indifference of trainmen was no doubt brought about by conditions existing at the time. It was a daily event for trainmen to handle many "pedler" cars in their trains which they ought not to have handled. Such cars would contain one or two consignments for delivery on their territory, the bulk of the contents being for more distant districts. This frequently necessitated rehandling an entire car to get out the shipments required not only subjecting freight to extra handling and damage, but placing improper work on way freight crews, expensive delays to trains and serious delay to freight for more distant districts. The trainmen in return had little or no regard for the loading of freight at local stations and upon arrival at the end of the run way cars had to be sent to the transfer shed, frequently being delayed at the terminal by the accumulation of other transfer cars awaiting readjustment and consolidation. It was found determined that a considerable lack of knowledge and in some cases indifference existed at transfer sheds, freight not being handled with regard to time or district loading.

To overcome these difficulties a thorough study was made of every station on the territory as well as at the principal stations off the territory to learn to what extent l. c. l. freight was being loaded and the destination of shipments. A loading and movement schedule was worked out to meet requirements on the territory, every agent and way-freight conductor being supplied with a copy, which was posted in a conspicuous location in the freight sheds and cabooses.

The object of making up this schedule was to give the best possible despatch to the business, to eliminate as far as practicable the movement of this traffic on way freight trains for points off the originating district, the loading by both shed and way freight crews in district order, the avoidance of transfer sheds en route for the reconsolidation of freight and for the guidance of employees. In the elimination of transfer points deliveries to adjacent and distant districts were advanced 24 hours.

This system insures way freight trains leaving their terminals handling assigned way cars containing only freight destined for delivery on their territories, while upon arrival at their destinations assigned way cars are delivered at the terminals loaded in district order and ready to move out of those terminals to adjacent or distant districts, without adjustment or delay. This means light loaded cars in some cases, but the service is maintained and made dependable.

Since the inauguration of this system there has been effected a reduction of 583 transfer cars monthly at two transfer stations, in turn saving car miles and permitting a reduction in force in these sheds, notwithstanding an approximate increase of 25 per cent in the amount of l. c. l. business handled.

At first difficulty was experienced in getting employees to regard this loading and movement schedule as a strict essential daily feature of their work and it was therefore necessary to devise means to keep check on the service. To keep a check on shed loading, conductors are supplied with forms on which they report to the trainmaster all improper loading. In every case the offending station is dealt with. Likewise, in order to keep a check on improper loading by way freight crews, transfer sheds are supplied with forms on which a daily report is made to the trainmaster, showing all cars handled at the shed, the hour and date of placement, the point of origin and destination of contents and the hour and date removed from the shed. In every case improper loading on the part of train crews is made the subject of a personal interview. Conductors are also provided with a form on which they make a report to the superintendent of all shorts, overs and damages occurring on each trip and in addition the agents make immediate reports in like manner, aside from the usual short and over reports. This enables quick action to be taken in the location of shipments. In addition, all stations are visited periodically by the trainmaster to locate short, over and astray freight, as well as to check the receipt, delivery and general handling of shed freight.

SOME PRACTICAL IDEAS ON THE HANDLING OF L. C. L. TRAFFIC

By C. I. Heckman

Lake Freight Agent, Lehigh Valley, New York, N. Y.

Time must be the first consideration in the successful handling of l. c. l. freight. Once this has been determined between stations on a given railroad, and to points on foreign roads as well, the second consideration presents itself. This is the preparation of a schedule of cars sufficient to handle this business every day and deliver it at destination or to a transfer platform for rehandling and consolidation, strictly within the time allotted. Once these two important features have been accomplished other details that go to make efficiency in freight handling present themselves.

One of the most important features is the proper packing and marking of freight, that it may safely withstand ordinary handling and transportation shocks, and by its marks, reach the customer for whom it is intended. The best method

to follow in this respect is to place at each freight station and transfer platform a requisite force of practical men to check the condition of the packages, and the manner and the method of marking, and to assist the receiving clerks in reconciling it with the shipping bills as to description. Dealing direct with the shipper, when business not in accord with the provisions of the official classification is offered, with a display of the requisite discretion, surely means a better understanding on the part of the shipper, and it will serve to minimize, if not entirely eliminate, trouble from this source.

For checking outbound business received from wagons, in fact for checking all freight where time and the method of wheeling permit, the single ballot system undoubtedly is a meritorious one, while for checking inbound l. c. l. freight the blind tally system is recommended.

The inbound house should be sectionized for the location of the freight according to consignee, as it comes from the car, the best practice being to first assign necessary space for the large carting concerns, and then for the big receiving houses, the balance being assigned to the miscellaneous trade, beginning with section "A," and locating the freight according to the initial of the consignee. In the outbound house, if it can be done, the designation of certain doors for the reception of business for given points is recommended.

While the sectionizing of the inbound house in the manner described brings about long trucking, with the improved methods available this trucking distance can be minimized. Also there is the advantage of overcoming a second handling of a good share of the freight by permitting it to remain on trucks, facilitating prompt delivery and more than offsetting the additional distance. In the outbound house the movement of the freight on to trucks and thence quickly into cars saves here a second handling, and the combined operations will reflect creditably by a material reduction in labor force.

LOADING L. C. L. FREIGHT

By H. F. Kaho

District Agent, Missouri Pacific, Kansas City, Mo.

Less than carload freight yields a high percentage of revenue compared with its tonnage, but a large percentage of that revenue is paid for the handling, loss, and damage to this class of freight. Any plan for handling should provide for economical, safe and prompt service. Local freight trains are important, as it has become the custom for merchants to carry small stocks, replenishing them daily from distributing points. Many shippers are therefore more interested in the local freight service than any other. Less-than-carload freight can be distributed within a radius of 200 to 250 miles 24 hr. after it is loaded.

Loading schedules should be made for the entire system, providing for cars to be loaded regularly at all stations where the tonnage permits, showing what cars are to be loaded, the freight to be loaded in each car, where to open and set out cars, and by what train or trains cars are to be handled.

In trying to effect economy in loading cars the aim should be to load to avoid all transfers possible; to secure the maximum car loading; to load the proper class of cars; to load foreign cars in the direction of home and to connections to save per diem and to handle transfer and inbound cars promptly.

The following minimum carloads are in use by some railroads: 3,000 lb. for cars moving in the direction of light traffic on a local district, 4,000 lb. for cars moving in the direction of light traffic within 200 miles, when the car can be released following day, and 7,000 lb. to all points except when loaded from larger stations to transfer platforms or from one transfer platform to another.

Trucking is the largest item in handling l. c. l. freight. Any great reduction in cost must be made in the cost of trucking. Sufficient trucks should be provided that it will not be necessary to unload freight on the floor, thus saving one handling and utilizing the labor of the transfer men. Four or six-wheel trucks will be found economical, as a greater amount of freight can be loaded on each truck and it can be handled by one man on the ordinary floor.

About 75 per cent of the shipments offered can be loaded on one four or six-wheel truck; this greatly reduces the liability of splitting shipments in different cars. A number of shipments for the same destination or for different destinations may be loaded on one truck if care is taken to see that they are unloaded in the proper car. Experienced men should be assigned to handling trucks containing mixed destinations.

The bonus system is used by several roads. Freight is divided into classes, based on kind, weight, bulk, etc. Bonus payments for the quantity of work handled apply to check clerks, callers and truckers, a standard being made of the number of pounds per hour to be handled by each class of labor. Following is the standard used by one road:

	Class One	Class Two	Class Three	Class Four	Class Five
Checker	12,000 lb.	4,600	8,300	14,700	9,000
Caller	12,000 lb.	4,600	8,300	14,700	9,000
Trucker	3,000 lb.	1,150	8,300	3,700	2,300

Bonus is earned when more than 66.7 per cent of the above amounts are handled per hour, beginning with .01 per cent of the monthly earnings for 66.8 per cent and increasing to 20 per cent for 100 per cent of the above.

Bonus for stowing is based on the quality of work, and is determined by the number of hours worked per month and the errors made. A deduction is made for each error in checking, trucking, calling and stowing which in any way has or might have resulted in any unnecessary cost to the company. No deductions are made from regular wages on account of errors. This system has decreased the cost per ton and increased efficiency.

Efficiency should not be sacrificed to economy, as freight properly loaded is a long way on its road to destination and delivery, and freight promptly and properly handled means pleased patrons, fewer claims and increased revenue.

A MINISTER'S VIEW OF THE RECENT WAGE CONTROVERSY*

By Rev. Charles K. Carpenter

Pastor First Methodist Episcopal Church, Oak Park, Ill.

Text—I Thessalonians, 4:11. "Work with your own hands."

This day has come to be recognized as one of the nation's great days. It is finding a place upon many church calendars, and I stand today with thousands of ministers to speak concerning the "Dignity and Divinity of Labor."

If we compare our national holidays to a group of children, we celebrate today the birthday of the youngest of them. As a nation we have a right to be proud of our family. Here is the oldest child we name Prosperity, and whose birthday we celebrate as Thanksgiving Day. This first child was born when the family was poor and destitute, but God favored it with bountiful crops, and out of gratitude for Divine favor then and material blessings since then, we observe this child's birthday year by year.

And there is the next oldest child, named Independence, whose birthday we celebrate on the Fourth of July. This child was begotten in great travail. War clouds hung over the land, blood stained the fields, but a child was born, destined to come to sturdiest manhood, and out of gratitude to God for Providential deliverance, we annually observe this birthday.

And then there is the child Unity, likewise begotten in great travail. For there was quarreling in the family, state had risen against state, and it was uncertain that the nation would continue to exist. Divorce was threatened. And then

*From a "Labor Day" sermon preached on September 3.

there came settlement of difficulties; Unity was born, and out of gratitude to God, year by year, on Memorial Day we observe this birthday.

And now there is another child in the home called Labor, whose birthday we observe in this service. It is late born. Indeed, there has been no need in our family for this anniversary until these recent years. Labor needed no voluntary recognition, its demands were too insistent. "Sailing the seas" is poetry to us, but to those who really sailed it meant the reefing and unfurling of sails by day or night, in winter's blizzard or summer's gale, with Death the ghastly specter sitting always upon the masts. "Leveling the forests" or "breaking the sod" is music to us, but to those who actually did these tasks, it was almost back-breaking, heart-breaking work. If the older persons in this congregation this morning had been playing upon this very spot when they were children they would have seen the passing wagons making journeys of a hundred miles or more, coming to the Chicago market with wheat or livestock or returning with lumber and provisions. Those of us who are but middle-aged can well remember the cradling of the grain and the binding of the sheaves by hand. Then everybody worked, worked all the time, all day and a good share of the night, we can say with little exaggeration. But those times have passed. We have come to ease and comfort and luxury. Inventions and improvements and the fruits of past sacrifices have lifted many of the burdens, have lightened the toil very materially. It is well that emphasis shall be given to this factor of labor so important in God's program for humanity.

Continuing our figure of speech a moment longer we observe that this babe, lusty and powerful, has a severe attack of colic and needs serious attention.

Our country is in an ugly situation. Not only is it panic-stricken, but is being stampeded into doing things that are worse than panic and privation. Boats on the lakes and trains are crowded with people hurrying home from their vacations. That is not so serious, but it indicates the fear that prevails. There are tens of thousands of our soldier boys on the frontier, and if the strike comes they will be starving. There are scores of thousands of babies in our great cities who cannot live on condensed milk as we older ones can; they will die for want of proper food. In a few days the coal and flour and fruit and meat in the cities will be exhausted and the people suffering.

It is an ugly situation, with attending features uglier than the strike itself. I must give heed to these or make my journey alone. My goal is eulogy of those who are toilers. I would speak in praise of the engineer and fireman who make my travel safe; of the gardener who provides me with vegetables; of the wash woman who keeps the clothing clean and neat; of the street sweeper who prepares the path before me. But if I should speak those words without giving heed to the present crisis, you would not give me your attention. This crisis is gripping all our minds. The country is afraid, insulted, ugly-tempered.

If these words of mine are to have weight with you, you must be persuaded that there is no bias or partisanship in them. I have not a word to say as to the merits of the contention. I would not dare to express an opinion without days of thought and masses of evidence. But there are matters involved in this situation more important than the strike or the rights of either of the contending parties. They do not rest upon the contention, they are broader, more fundamental. I am willing to grant, for the sake of argument, that every contention of either party is right. That does not lessen one iota the blunders that have been committed. I am willing to grant the righteousness of the eight-hour law and the demand for higher wages and still insist that the method of procedure has been dangerous and demoralizing to our commonwealth and to the spirit of democracy. Two phases of the situation are particularly dangerous and worthy of our most careful thinking.

The first is that Congress has been compelled to do a thing that it does not know whether it should have done or not. Perhaps what it did was right; the method was absolutely wrong. It is as if a burglar comes to your house, points a pistol at your head and compels you to give him food and money. If he is starving he has a right to food. If his children are sick he has a right to have the services of a physician and nurse and may need the money to obtain their services, but you will not justify the method or believe that such procedure does not imperil the rights of property and life. So Congress has been held up. The President has pointed a pistol at its head and has said that it must pass such a measure within the next few hours. Party organization, appointments to office, political preferment bring great pressure to bear. But our republic is based upon the co-ordination and independence of three departments—the executive, legislative and judicial. And in proportion as the executive trespasses upon another department, no matter how worthy the motive, to that extent our government becomes a monarchy.

The railroad brotherhoods pointed a pistol at the head of Congress and said, "You will pass this bill within the next few hours or the strike will be called, no matter about the results." And no matter how worthy their demands, this is mob law. Again, the dread of business panic added its pressure. Commercial stagnation, privation, hunger, starvation are potent things. I will not mention the selfish item—the desire for re-election. But Congress, held up in this fashion, has displayed the spirit of cowardice that spells the doom of democracy. Democracy is still on trial. It is genuine only as all men are masters and all men are servants. If one man or small group of men or large group of men can hold despotic reign over the nation, we have forfeited our birthright.

The spirit of genuine democracy caused our fathers to exclaim, "not one cent for tribute"; caused Patrick Henry to exclaim, though the stress was greater than now, "Give me liberty or give me death."

These sons who now hold seats in Congress are unworthy of such ancestry. It is their business to investigate, to hear arguments, to debate and deliberate, and without the influence of threat or cajolery, pass such measures as in their judgment the welfare of the country demands. Congress is the servant of no faction, but of the entire nation. It may be that the present measure should be a law. It ought to come in decent, respectable fashion and not by such undemocratic procedure. Such procedure strikes at the vitals of our democracy. The second serious phase of the present situation is the surrender of the principle of arbitration.

As I see it, the President has taken a most unfortunate position in permitting himself to become a partisan and in yielding this principle, fundamental in such a government as ours. I do not bring this word of criticism with gladness. Most of you know my admiration for the President. I have rejoiced at many of the things he has accomplished and I have not hesitated to commend him at certain points where some of you have differed from me strongly. I do not envy the man his position. The burden seems more than man can bear; the pressure must be almost superhuman. He is entitled to our prayers, our sympathy, our loyal support. He is our President, our servant; we are his people. Indeed, this is not meant to be a personal criticism, but a consideration of a very dangerous precedent.

Did I say the President blundered? He should not have permitted himself to become a partisan, though he was perfectly assured that one party or the other was right. That should have been the judgment of a board of arbitration. The executive should have been just as much the guardian of the interests of the railroad presidents as the brotherhood presidents. He should have said to both parties: "The country must not have a strike. This matter must be settled. With both sides properly represented and protected, the differences must be adjusted." Such a position would have given him the endorsement, possibly of neither contending

faction, but of the great mass of our citizenship. The course he followed has lost him the support of many whose sympathies are with the larger group of men, but who see the peril in such course of action.

You say that is compulsory arbitration? Certainly. Here is a method the principle of which is absolutely fair to both parties. You say he cannot compel arbitration? I insist that he can. There may be technicalities that can be cited. There are moral obligations that are resting upon the executive greater than any technicalities. Our soldiers are upon the frontier. If the President had said to both parties, "The train service must continue to care for our soldiers," the citizenship of this country would have held up both his hands. If he had said likewise concerning the food problem, he would have had the same generous support.

You say this is infringing upon personal rights? I reply it is simply considering the larger right, the primal right.

Our trouble has been through the years, and is in this matter that we have ignored the large group involved, the large right, that of the entire nation. The other year, one of the employers said, "The public be damned." Today, by act if not by word, the brotherhoods have said the same thing. It is high time for the public to let it be understood that it is the principal party to be considered. Whatever the railroads are, and whatever privileges the employees enjoy, depend ultimately upon the entire public. The public has been long-suffering enough. Why, suppose a family of ten children; father and mother at one end of the table, the children seated about it. Two of the children at the farther end get to quarreling. They refuse in their anger to pass the food and all the children go hungry. Their ugly talk is disturbing to all. Finally they come to blows and throw chairs at one another, and the other children are struck during the fighting. I suspect laxity of family discipline has not gone so far, but that the father would take the contending parties by the collars and proceed to the woodshed. But why follow the sad scene further? We will close the door. So the nation must insist in these family quarrels that the differences shall be settled by the small groups without compelling the entire household to receive the hurt.

Our national democracy must maintain its self-respect, its authority. It will exist only as it is what it professes, "A government of the people, for the people, by the people." But that means, of ALL the people, by ALL the people, and for ALL the people, and not a minor group.

NEW CENTRAL RAILWAY STATION IN LEIPSIC

The new central station in Leipsic, which the German railway authorities finally completed on December 1, 1915, is the largest and one of the most convenient and luxurious railway terminals in Europe. Its construction was planned approximately 30 years ago and work on it has been going on since 1901. Its cost has been $32,130,000, the Kingdom of Saxony having paid $14,280,000 towards this amount, the Kingdom of Prussia $12,614,000, the city of Leipsic $4,046,000, and the Imperial Postal Department $1,190,000.

The city of Leipsic is in the western part of the Kingdom of Saxony, but a short distance from the boundary of Prussia. The station serves as a junction for the passenger traffic of Magdeburg, Thuringia and Dresden, and the larger part of the traffic between Prussia and Saxony passes through it.

The main building of the terminal has a front 984 ft. long and there are two wings, each 295 ft. wide, the entire structure covering an area of 168,000 sq. ft. The train shed covering the station's 26 tracks is covered by a high roof of steel and glass built in the form of 6 arches, the total length of the shed being 785 ft. and its area 710,424 sq. ft. The exterior of the building is trimmed with a yellow-colored sandstone from the quarries of Schona on the Elbe.

It has been asserted that the Leipsic station is the largest in the world. It is undoubtedly the largest in Europe, but it is doubtful if it is as large as the Grand Central or the Pennsylvania stations in New York. The station, although perhaps the busiest station in Germany, is not as busy as some of those elsewhere in Europe, notably the Gare St. Lazare in Paris, the busiest in the world, and the Liverpool Street station in London, both of which handle twice as much traffic as the busiest American station, the South Station in Boston.



The Central Station in Leipsic

RAILWAY CONCESSIONS IN CHILE.—The Chilean Government has granted a concession to The Potrerillos Railway Co. (Ltd.) to construct and exploit a branch railway from the Chañaral line to the stream of El Barquito, and official approval has been given to the transfer from William Braden to the Potrerillos Railway of a concession to construct and operate a branch line from the State Railway near Pueblo Hundido to the mining district of Potrerillos in the Department of Chañaral. This company has also received a concession of water rights in the river La Ola in the same Department, according to a recent number of the Diario Oficial.

RECENT BALDWIN LOCOMOTIVES FOR EXPORT

Among the locomotives recently built for export by the Baldwin Locomotive Works, are two for the Jamaica Government Railway and 10 for the Canton-Hankow Railway of China (Hupei-Hunan Section), which are of more than ordinary interest because of the conditions under which they will operate and the details of their construction.

The Jamaica Government locomotives are of the Mountain (4-8-2) type, and are designed for freight service on grades of 3⅓ per cent, combined with uncompensated curves having a minimum radius of 288 ft. In many of their leading dimensions, these locomotives are similar to a number of Baldwin Mikado type engines previously constructed for this road by the same builders. The tractive effort exerted by both types is 33,000 lb. The track gage is standard.



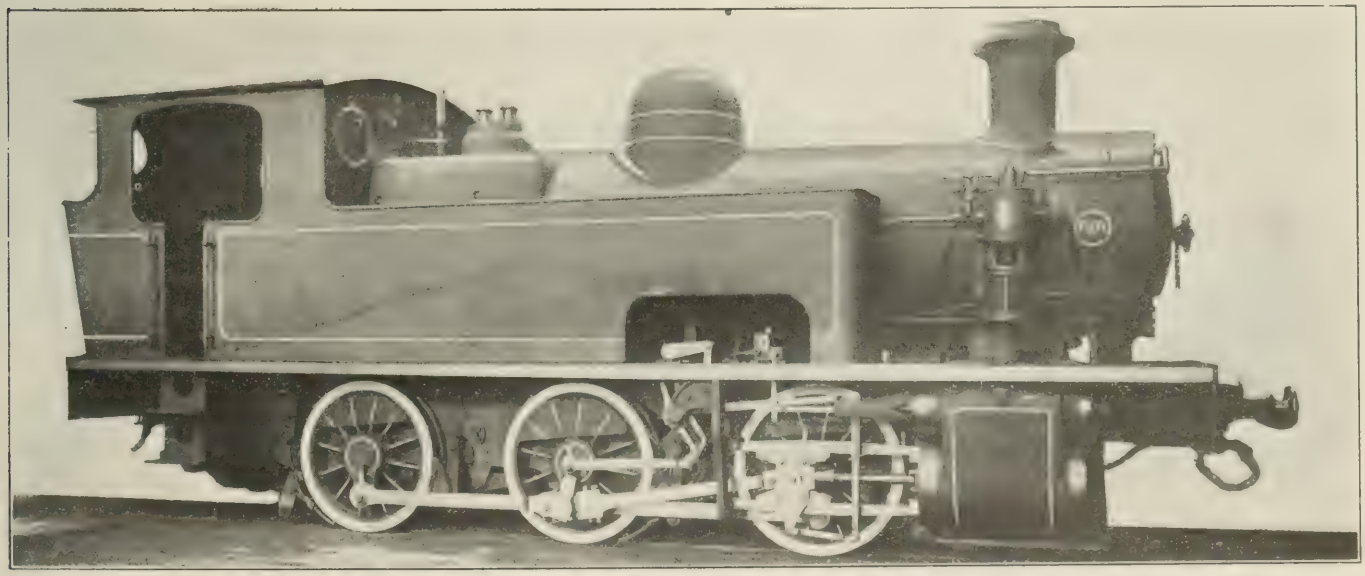
Mountain Type Locomotive for the Jamaica Government Railways

In order to enable the new locomotives to easily traverse the sharp curves on the line, the first and third pairs of driving wheels have plain tires, and the bolster of the front truck is allowed a lateral swing of 4 in. on each side of the center line. The rear truck is of the Rushton type, with inside journals. A lateral play of ¾ in. between rails and flanges is allowed on all wheels having flanged tires.

The boiler has a straight top with a wide firebox, and is equipped with a Schmidt superheater and a fire-brick arch supported on angle irons. The boiler shell and inside firebox are constructed of steel plate throughout. The valve gear is of the Walschaert type and is controlled by a hand reverse lever. Piston valves, 11 in. in diameter, control the steam distribution. The frames are of the bar type, and the general design is in accordance with American practice. Westinghouse automatic brakes are applied, and the equipment includes two 9½ in. pumps.

The Chinese locomotives are divided into three classes. Four of the engines are of the Ten-wheel type for passenger service, four are of the Consolidation type for heavy freight service, and the remaining two are tank engines of the 0-6-0 type, for switching service. These are all standard gage locomotives, built with interchangeable details where practicable. The materials conform to specifications issued by the American Society for Testing Materials. The drawings were prepared by the builders, but the designs are strongly suggestive of foreign practice.

The passenger locomotives exert a tractive effort of 23,600 lb., based on a mean effective pressure equal to 85 per cent of the boiler pressure. The boiler is of the Belpaire type, with a steel firebox, rocking grate and Schmidt superheater.



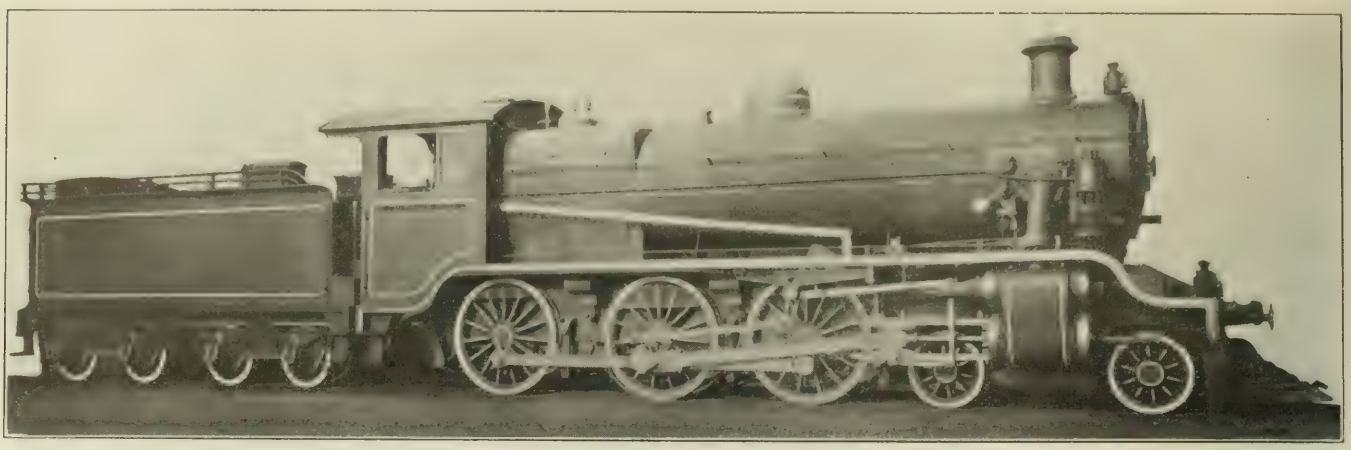
Six-Wheel Tank Engine for Switching Service, Canton-Hankow Railway

The frames consist of steel plates, 1¼ in. thick. Each frame is made in one piece, and a substantial system of cross bracing is applied to insure lateral stiffness. This bracing includes a long steel plate, placed in a horizontal position between the first and second pairs of driving wheels. The driving springs are underhung, those of the second and third pairs of driving wheels being connected by equalizing beams. The engine truck has a swing bolster and plate frames.

The truck springs are not equalized, as the frames are suspended directly from them.

The cylinders are cast separately from the saddle. Piston valves 11 in. in diameter control the steam distribution, and the valve gear is of the Walschaert type with screw reverse mechanism. The equipment includes Westinghouse air brakes, one Weir's feed-water pump and heater, and one Metcalf's vertical restarting hot water injector. The driving journals and cylinders are lubricated by mechanical oil pumps. The design is so arranged that the Lockyer balanced throttle valve, manufactured in Great Britain, can be installed.

Tractive effort	33,500 lb.	23,600 lb.	19,600 lb.
Weight in working order	159,600 lb.	159,700 lb.	100,500 lb.
Weight on drivers	143,400 lb.	113,900 lb.	100,500 lb.
Weight on leading truck	16,200 lb.	45,800 lb.	.....
Weight of engine and tender in working order	261,000 lb.	261,000 lb.	.....
Wheel base, driving	16 ft.	14 ft. 9 in.	12 ft.
Wheel base, total engine	24 ft. 3 in.	28 ft.	12 ft.
Wheel base, engine and tender	52 ft. 4¼ in.	55 ft. 7¼ in.	12 ft.
Cylinders			
Kind	Simple	Simple	Simple
Diameter and stroke	22 in. by 26 in.	21 in. by 26 in.	17 in. by 24 in.
Valves			
Kind	Piston	Piston	Piston
Diameter	11 in.	11 in.	8 in.

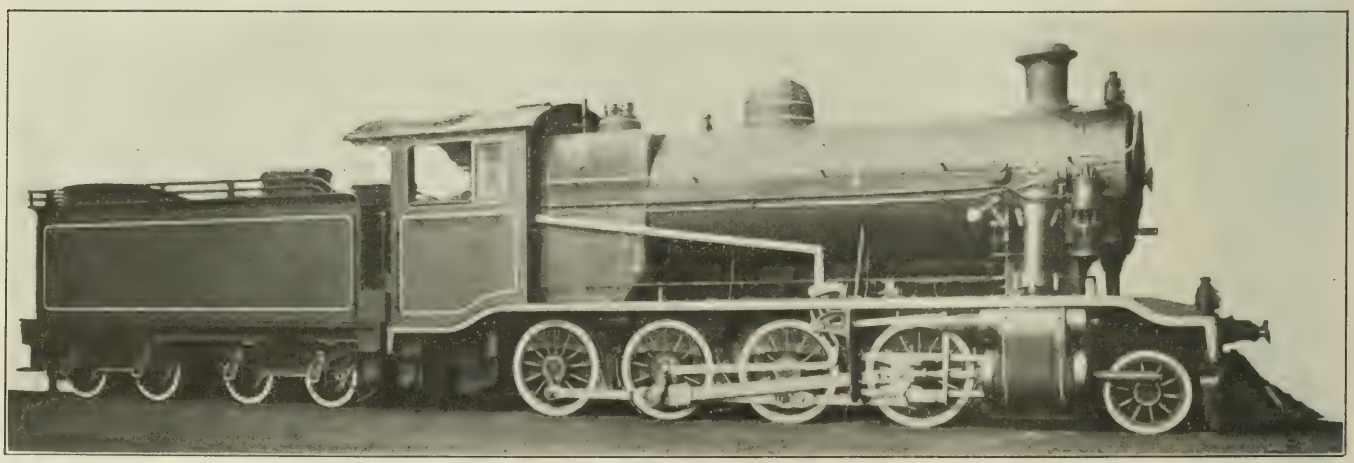


Ten-Wheel Locomotive for the Canton-Hankow Railway

However, as these throttles could not be secured in time, Baldwin throttles were temporarily fitted and the Lockyer valves will be installed subsequent to the arrival of the engines in China.

In general construction and equipment the Consolidation engines are similar to the Ten-wheelers. In order to obtain sufficient grate area, the firebox in the Consolidation type is placed above the rear pair of drivers, while in the Ten-

Wheels			
Driving, diameter over tires	51 in.	66 in.	48 in.
Boiler			
Style	Belpaire	Belpaire	Belpaire
Working pressure	160 lb.	160 lb.	160 lb.
Tubes, number and outside diameter	161—2 in.	137—2 in.	182—2 in.
Flues, number and outside diameter	24—5⅜ in.	22—5⅜ in.	.....
Tubes and flues, length	14 ft. 4 in.	15 ft. 7½ in.	10 ft. 6 in.
Heating surface, tubes and flues, sq. ft.	1,682	1,596	993



Canton-Hankow Railway Consolidation Type Locomotive

wheel type it is between the frames. The Consolidations exert a tractive effort of 33,500 lb.

The switchers exert a tractive effort of 19,600 lb. The water supply is carried in side tanks, and the fuel in a coal box placed back of the cab. In general construction, these locomotives are similar to the road engines.

The leading dimensions of the locomotives for the Canton-Hankow Railway are given in the following tables:

General Data			
Type	2-8-0	4-6-0	0-6-0
Gage	4 ft. 8½ in.	4 ft. 8½ in.	4 ft. 8½ in.
Service	Freight	Passenger	Switch
Fuel	Bit. coal	Bit. coal	Bit. coal
Heating surface, firebox, sq. ft.	157	185	103
Heating surface, total, sq. ft.	1,839	1,781	1,096
Superheater heating surface, sq. ft.	420	404	.....
Grate area, sq. ft.	39.7	31.8	19.5

ALLOWABLE STRENGTH OF WELDED JOINTS.—According to the A. S. M. E. Boiler Code, "the ultimate tensile strength of a longitudinal joint which has been properly welded by the forging process shall be taken as 28,500 lb. per sq. in., with steel plates having a range in tensile strength of 47,000 to 55,000 lb. per sq. in."—*Power.*

"WANTED—A SQUARE DEAL"

By Maurice H. Lundy

The railroads are entitled to a square deal in connection with the added burden of parcel post. At the time this is written, there are few indications in the political handling of this question of that common honesty that the government demands of the railroads and big business in general. In 1914 the post office department estimated that during the year 1915 600,000,000 parcel post packages would be handled, yielding a revenue to the post office of $60,000,000. The correct figures for the year 1915 would show about 1,000,000,000 parcel post packages handled with a corresponding increase of revenue to the post office department.

Before the establishment of the parcel post the railroads in this country received for transporting the mails at least one-fifth of the post office revenue. Assuming that their service is no greater in handling the parcel post than in handling other mail, this increased revenue of $60,000,000 to the post office department should in all fairness mean increased payments of at least $12,000,000 to the carriers.

This article will endeavor to demonstrate that the good showing of the post office department at the present time is made by methods that would be called reprehensible and dishonest if practiced by a private individual or corporation.

The railroads have been forced to carry the added matter brought into the post office through the parcel post, and have received no adequate compensation for the extra work. It is easy enough to make money when everything is coming in and nothing going out.

In every department of the federal service, and especially in the post office department, costs are never estimated as they would be by a private individual or corporation that desired to avoid bankruptcy. The post office department has been able to show a surplus in the last year, but it does this by neglecting to take into account the millions of dollars that have been spent for post office buildings and other equipment. It is easy to prove that the post office department is losing money every day in its operation of the parcel post service, and that the losses would be disastrous to any private corporation if the railroads were getting what honestly belongs to them for services rendered.

The post office department expects a gross revenue of about $60,000,000 from parcel post for the current year. It is able to give this service by paying the carriers less than they should receive and by making up any deficits in operation out of funds in the treasury which Congress will have to appropriate for the purpose.

There is no new system of honesty, and the oldest and latest definitions of the word and its application alike require that the government compensate fully and reasonably the railway companies and star-route carriers for the admirable and beneficial service they are rendering the country in this transportation of parcel post mail matter.

In the western part of the United States, from the eastern slopes of the Rocky Mountains to the Pacific ocean, from Canada to the Mexican boundary, is a territory approximately 1,500 miles long by 1,000 miles wide; this is not quite half, but more than one-third of the United States. It is traversed by three great ranges of mountains for its entire length. Railroads are few, and a considerable population must depend upon the star-route mail carriers, who have been confronted with the onerous and unjust exactions of the post office department in the delivery of parcel post. In July, 1914, contracts on star-routes for the ensuing four years were let on the basis of a flat bid for the first and second class mail. Letters, papers and similar mail are first and second class. Though the requirements vary on different routes, I will cite requirements on one route—Boise, Idaho, to Idaho City. This is a fair average of conditions on all star-routes at the present writing. The carrier has quite an accurate knowledge of the quantity of first and second class mail to be carried, and bids on that basis accordingly are required to transport up to 600 lb. of parcel post matter. The contractor can also bid on that intelligently.

If parcel post matter weighs over 600 lb. he is allowed double the regular time to transport it, and is allowed extra compensation therefor. The service is daily. Since July, 1914, there have been but few complaints of the inadequacy of compensation made by star-route carriers. The safest guides to the future are the happenings and events of the past, having in mind the large discretionary powers that would be conferred on the post master general by the passage of the Moon bill now before Congress. Let us glance back to 1913 and 1914 up until July 1 and observe the benevolent application of the discretionary powers at the service of the post office department. The mail contracts in force at that time were let for the most part in 1910 and ran until the middle of 1914. They called for the delivery of ordinary mail and between 1910 and 1914 the parcel post load was added to the backs and trucks of carriers without additional compensation. Was it honest to use a contract made before the parcel post bill was passed, or when the maximum to be sent by parcel post was 11 lb., to raise that limit to 50 lb., especially in the mountain region where bulk and weight count more in transportation than in the open and level country? Was it honest to compel mail carriers to carry additional loads without additional compensation?

To illustrate the injustice done star-route carriers I will give the experiences of several that came under my observation. In 1910 the contractor on the route from Stites, Idaho, to Elk City, agreed to carry the mails daily for $5,400 per year. The route from Stites to Elk City is through a mountainous country. The distance is 51 miles, and in making this trip the carriers on this route were compelled to cross two mountain ranges, and in winter and spring the roads at times were almost impassable. Stites lies at an altitude of 1,200 ft., the road runs up hill for 26 miles to an altitude of 6,900 ft., then drops to 4,000 ft. in the next nine miles, then makes a nine mile climb to a 6,500 ft. elevation, and finally drops to Elk City, which is 3,950 ft. above sea level. When the parcel post became effective with a four-pound maximum, the post office department allowed the contractor $270 additional per annum for such parcels as he might be required to handle.

In August, 1913, when the maximum weight of parcels was raised to 20 lb. he was granted a further allowance of $2,494, making his compensation $8,164 per annum. Later the maximum weight of parcels was advanced to 50 lb., and the carrier was delivering groceries, meats and other supplies in bulk packages often weighing as much as 50 lb. each. In order to handle this mail he was compelled to put on extra teams and drivers, and he received no extra allowance under the 50 lb. maximum. The actual cost of handling the mails on this particular route was $55 per day, which does not make any allowance for profit to the carrier. The department paid the contractor $22.40 a day for his service, hence he lost $32.60 each day that he operated under his old contract. His contract was signed up until June 30, 1914, and the department refused to allow him to withdraw, but compelled him to continue his service notwithstanding he was losing more than he was paid by the department.

Private contracts of this nature could not be enforced, and it was not right for the government to drive men into bankruptcy by enforcing old contracts made before the existence of parcel post in this country. In a letter to the junior Senator from Idaho the contractor said: "I have everything I own mortgaged to the limit, and my credit is exhausted; I have been able to tide over a while, but I will

have to have a larger allowance, or I will not be able to carry out my contract." Because of the Senator's protest the post master general sent his fourth assistant to investigate the Stites-Elk City route, and other routes in the Rocky mountains, to ascertain whether or not the government should increase the allowance.

The contractors on the route from New Meadows to Grangeville, Idaho, 1910 to 1914, distance 92 miles, notified the post office department that unless they were given immediate relief in way of compensation commensurate with their labors and expense in carrying the mail and parcel post over their route, they would throw up the contract. The expense of this firm after the inauguration of the parcel post, and the increase to 50 lb., ran up to $40 per day. On account of the increased parcel post, it was compelled to reject passenger and express business; therefore its daily receipts were practically confined to the $16.04 which it received from the government.

Another illustration as to how the parcel post was bankrupting the star-route carriers is furnished in the case of the contractor carrying mail from Mountain Home to Rocky Bar and Atlanta, Idaho, a distance of about 64 miles, from 1910 to 1914. The contractor had a four-year contract and his bondsmen appealed to secure a readjustment of this contract by the post office department, but, if I am rightly informed, the department declined to grant any relief, thus forcing him into bankruptcy. When he took this contract he owned an outfit, including horses, stage coaches, harness, etc., worth $7,000. Because of the burden imposed upon him by the parcel post he lost his outfit, and, furthermore, was obliged to sink $1,500 in addition which he secured as a loan from his bondsmen. The route covered was in a mountainous country where roads were bad and it was impossible to maintain a regular schedule. For failure to maintain schedule the contractor was subject to further penalty. The contractor explained that he would have been able to handle the mails under his contract but for the parcel post, but that after the department raised the weight limit on parcel post matter to 50 lb., people living along the route ordered most of their supplies, such as flour, meat, hardware, etc., by parcel post from Boise. The local merchants could not compete with Boise prices and this increase in the mails compelled the contractor to employ extra men and horses to handle the mails. The post office department refused to grant him extra allowance for the additional service rendered. One might say that he should have looked out for the additional weight under the new parcel post. True enough, but he did not expect it to be raised to 50 lb. and that flour, hams and bacon, and, in fact, everything but heavy farm machinery, would be going through the mail. The disastrous experiences of the carriers on the three routes I have mentioned were not rare or isolated cases of the government's injustice. Practically every carrier on the star-routes of the west endeavoring to fulfil their "pound of flesh" contracts, was facing financial disaster. People living east of the Rocky Mountains do not realize the nature or the variety of commodities that go by parcel post in the far west, nor the roundabout routes necessary to reach many post offices by rail and stage. They know nothing of the risks involved, nor the lives lost annually on the treacherous mountain trails. The original purpose of the parcel post was to bring the producer and consumer together to lower the cost of living—a very worthy purpose. Mail order houses in Chicago send catalogues by freight in car lots to certain points in the west and these are distributed by parcel post from those centers. An Idaho milling firm sent 4,600 lb. of flour by parcel post and this had to go by stage 70 miles after leaving the railroad. Another firm sent 1,700 lb. of bacon along with 4,800 lb. of assorted groceries. Such shipments were unthought of at the time the parcel post law was enacted.

The people of the United States expect the parcel post to be made the most efficient possible. They know its advantages and appreciate them fully, they know this efficiency is maintained by the work of the railway companies and star-route carriers that carry the mail, and they favor a just compensation for this service to the public. Nothing should be left to the discretion of any official. The carriers of Uncle Sam's mail desire the question of their compensation kept out of politics, and ask for nothing but what they are entitled to—a square deal.

BAGGAGE LIABILITY LAW MODIFIED

The Cummins amendment to the Interstate Commerce law, approved August 9, is No. 183. It repeals a large part of the Cummins amendment of March, 1915 (*Railway Age Gazette,* March 12, 1915), and reads in substance as follows:

"Provided, however, That the provisions hereof respecting liability for full actual loss, damage, or injury, notwithstanding any limitation of liability or recovery or representation or agreement or release as to value, and declaring any such limitation to be unlawful and void, shall not apply, first, to baggage carried on passenger trains or boats, or trains or boats carrying passengers; second, to property, except ordinary live stock, received for transportation concerning which the carrier shall have been or shall hereafter be expressly authorized or required by order of the Interstate Commerce Commission to establish and maintain rates dependent upon the value declared in writing by the shipper or agreed upon in writing as the released value of the property, in which case such declaration or agreement shall have no other effect than to limit liability and recovery to an amount not exceeding the value so declared or released, and shall not, so far as relates to values, be held to be a violation of section ten of this Act to regulate commerce, as amended; and any tariff schedule which may be filed with the commission pursuant to such order shall contain specific reference thereto and may establish rates varying with the value so declared or agreed upon; and the commission is hereby empowered to make such order in cases where rates dependent upon and varying with declared or agreed values would, in its opinion, be just and reasonable under the circumstances and conditions surrounding the transportation. The term 'ordinary live stock' shall include all cattle, swine, sheep, goats, horses, and mules, except such as are chiefly valuable for breeding, racing, show purposes, or other special uses."

Railway Extension in Chile.—Permission to construct a branch line from the Antofagasta-Bolivia railway, uniting the station Salinas with the nitrate deposits, Los Penitentes and Carabana, has been granted to Emilio A. Carrasco. The government has also granted to Alfredo Aldunate and Felix von J. Marteville permission to construct and exploit an electric railway between La Union, Rio Bueno, and Filuco, and a branch line from Rio Bueno to Lago Rauco.

The English Channel Tunnel.—An advocate of the English Channel tunnel recently gave some figures as to the cost and possible earning capacity of the tunnel. The estimated cost of construction is $80,000,000. It is calculated that of the 2,000,000 passengers who crossed the channel in both directions during the year, at least 65 per cent, or say 1,300,000, would use the tunnel, and if each were charged 10s. ($2.40) this would amount to an income of $3,120,000 a year. To this it was hoped to add $325,000 for baggage, $200,000 for postal services and $4,000,000 for freight traffic, the total estimated revenue being, therefore, $7,645,000. Running expenses were put down at $2,000,000 per annum, which would leave $5,645,000 as the annual net earnings on the $80,000,000, or over 7 per cent.

General News Department

The Interstate Commerce Commission has issued a revised set of regulations governing the issuance and recording of passes, effective on January 1, 1917.

The Denver & Rio Grande has been found guilty of violation of federal laws in regard to safety appliances, and fines aggregating $1,600 have been imposed on the company.

Fire at the Lehigh Valley terminal at Perth Amboy, N. J., destroyed more than 500 feet of an 825-foot pier and 16 cars loaded with ties and clay. The loss is estimated at $100,000.

Because of the scarcity of men and the impossibility of getting its freight checked in and out, the Canadian Pacific is advertising for 30 women freight checkers to work in its freight house at Toronto.

The Committee of Railroad Stockholders, formed recently to unite railroad investors for mutual protection, has received responses of approval from 2,500 railroad stockholders, including many savings banks, which are large holders.

According to press despatches, 25 Mexican soldiers and 11 passengers were killed when a constitutionalist train was wrecked by bandits claiming allegiance to Carrero Torres. The wreck occurred between San Luis and Tampico, below Carderas.

The British government, it is reported, has decided that hereafter all mails will be carried over Canadian railways exclusively, and existing contracts with American roads will not be renewed. Much Canadian mail is now transported over American lines.

The westbound Golden State Limited train of the El Paso & Southwestern was held up by six masked men 40 miles east of Douglas, Ariz. The robbers uncoupled the baggage car, and after a half hour's futile attempt to blow open the safe escaped on horses. No passengers were molested.

When the new general revenue law, passed by Congress in the last hours of the session, became effective on September 9, it repealed the stamp tax features of the emergency revenue law which had been in effect since December, 1914, and stamps will no longer be required on parlor and sleeping car tickets and bills of lading.

Contracts have been placed by the Baltimore & Ohio for a tugboat, a steam lighter and three covered lighters for use in the New York harbor, to cost about $150,000. In addition to this marine equipment the company has six other lighters and a carfloat under construction, delivery of which is expected at an early date.

Returns from 150 large steam roads operating 192,527 miles, that have reported to the Interstate Commerce Commission for July, show revenues per mile of $1,379, as compared with $1,179 for July, 1915, expenses per mile of $894 as compared with $785, and net revenue per mile of $485 as compared with $394 for July last year.

The railroads of the United States used 128,200,000 net tons of coal in 1915. This amounts to about 24 per cent of the total output. The bituminous mines furnished 122,000,000 tons, which is 28 per cent of their production, and the Pennsylvania hard coal regions supplied 6,200,000 tons, approximately 7 per cent of the total production.

The Grand Trunk has granted an increase in wages of from five to eight per cent to the conductors, baggagemen, brakemen and yardmen in the company's employ. The new schedule agreed upon affects all branches of the operating department except the firemen and engineers. These increases, which date from September 1, will mean an addition to the railway's payroll of about $500,000 per year.

At the recent Quebec Provincial Exhibition, the Canadian railways played a prominent part. The Canadian Pacific was awarded a gold medal by the exhibition commissioners for its display of toys suitable for home manufacture. It was also awarded a special diploma for the excellence of its agriculture exhibit. The Canadian Northern and the Grand Trunk had exhibits of sections which they serve.

The Interstate Commerce Commission has issued a summary of the monthly reports for Class 1 roads for the fiscal year ending June 30, 1916, subject to revision, showing that railway operating revenues amounted to $3,396,808,000; operating expenses amounted to $2,220,004,000; net revenue to $1,176,804,000; operating income to $1,029,243,000; operating revenues per mile, $14,818, against $12,678 last year; expenses, $9,684 against $8,915; operating income, $4,490, against $3,169.

The Interstate Commerce Commission has issued an order postponing from October 1 to January 1, 1917, the effective date of its order of June 6 requiring the equipment of locomotives with high power headlights. Rules 29 and 31 of the order, referring to locomotives in road and yard service, are made applicable to all new steam locomotives put in service subsequently to January 1, and to all steam locomotives given general overhauling subsequent to January 1, and all steam locomotives subject to the rules are required to be equipped in conformity with the rules not later than January 1, 1920.

The Salt Lake & Los Angeles (formerly the San Pedro, Los Angeles & Salt Lake) has issued a circular cautioning its employees of all degrees to follow out its new policy of quiet. "We want to make the Salt Lake Route known as the Road of Quiet," runs the statement. "Nothing adds so much to a journey as a good night's rest; nothing detracts more from the pleasure of traveling than a night's repose interrupted by noise. To be awakened by loud talking, the banging of a truck-handle on the station platform, the cracking of ice into the water coolers, the blasting of a whistle or the calling of signals on an adjoining track is indeed disquieting. Let 'mum' be the word has been passed along over the entire Salt Lake Route."

The Northern Pacific has awarded shorter hours and increases in pay to its telegraphers, thus averting a threatened strike. An average increase of four dollars a month was granted to all men on the system, and operators at the large terminals such as St. Paul, Minn.; Minneapolis; Fargo, N. D.; Helena, Mont.; Spokane, Wash., and Tacoma are given increases from five dollars to seven and one-half dollars. Increases for overtime work for operators on the line outside of the larger terminals range from 30 to 35 cents an hour, and for operators in the larger terminals, 45 to 50 cents an hour. Operators on one-man tricks, who have been working 11 hours, will now work only nine hours. Five hundred telegraphers are affected.

British Railway Strike Threatened

The railway situation arising out of the demands of the men for an increase in wages of ten shillings a week has become increasingly serious. At a meeting of 3,000 railway workers at Cardiff a resolution was adopted providing that unless the demand for an increase was conceded by September 16 all railway work would be stopped in South Wales at midnight the 17th. The resolution also stated the advance in wages should date from July 1, and that the government should give a definite guarantee that in the future it would control the supply of food and regulate prices. The labor leaders are working hard to obtain an agreement without calling a strike, which would be regarded as taking an unfair advantage of the nation in a time of adversity. The argument of the men is that it is as much the business of the government to see that railway workers are as properly fed and clothed as the soldiers in the field, since the railway workers are doing equally important work for victory, and that under existing conditions and the high prices of commodities this is impossible.

Pensions on the Great Northern

Directors of the Great Northern Railway have set aside the sum of $1,000,000 to endow a pension plan for veteran employees. The new plan will go into effect on September 16, the anniversary of the birth of the late James J. Hill. The appropriation will be invested in bonds, interest on which will be used for pensions, but if the fund thus created proves inefficient, the deficit will be paid out of earnings and included in operating expense. Employees are to be retired at the age of 70, but may voluntarily quit at 65 and receive pensions. The system will take in those employees who have been continuously in service for 20 years or more. For each year of service an allowance of one per cent of the average monthly pay received for the 10 years preceding retirement will be paid, but in no case will the payment be less than $20 a month nor more than $75. The plan was worked out by James J. Hill and W. J. McMillan, president of the Veterans' Association.

"Think It Over"

This is the heading of a circular which has been distributed by the Central Committee of Safety, of the Oregon-Washington Railroad & Navigation Company, and which reads:

"It was necessary to sacrifice 585 lives in the Iroquois Theatre fire before the public demanded that theatres be amply protected from loss of life by fire.

"It was necessary to sacrifice 1,517 lives in the sinking of the Titanic before the public demanded that passenger steamships be provided with adequate lifeboat protection.

"Yet the combined loss of lives in these two accidents does not equal one half of the total number of people killed yearly while trespassing on railway tracks in this country. The number of men, women and children killed during the year ending June 30, 1915, was *five thousand eighty-four.*

"How many more must be sacrificed before the public will put a stop to this annual slaughter by demanding an anti-trespassing law?"

New York Street Railway Strike

On August 6 the Public Service Commission settled the New York City traction difficulties by securing the acceptance of an agreement, which definitely provided that all disputes that may arise between the company and the employees in the future on which they cannot mutually agree shall be submitted to arbitration. This agreement did not cover the subway and elevated lines, and members of the Amalgamated Association had a conference with the officers of the Interborough Rapid Transit Company on August 30. According to the report of the investigation made by the Public Service Commission: "It was definitely agreed to by both that the principle of freedom to organize, the principle of freedom from intimidation or coercion, and the principle of arbitration should govern. Although this agreement was not reduced to writing and signed by the parties, it was approved by President Shonts, and was relied upon by both sides in their subsequent negotiations."

Prior to this meeting, however, and after the agreement of August 6, the Interborough officers advised their men to form an organization of their own. Apparently 10,000 of the 11,000 employees voted to carry out this policy, and enter into certain agreements with the Interborough. The officials of the Amalgamated Association insisted that the following clause should be added to the agreements:

> Fifth—Nothing in this agreement is to be held to preclude any employee from joining any organization or any union, and will not preclude him from participating in any movement toward the betterment of his working conditions or the increase of his wages; and in the event that he sees fit to join such an organization with such objects in mind, it will not be considered a breach of this agreement.

This caused the trouble, which finally culminated in the calling of the strike affecting the subway, elevated and surface lines on Wednesday evening, September 6. The Public Service Commission, after hearings and investigation, made the following recommendations on September 12:

> (1) That the question whether the distribution of the individual contracts constituted a violation of the agreements be referred to arbitration in the manner provided in the agreement.
>
> (2) That the charge that the company sought to secure acceptance of the individual contracts by fraud, misrepresentation, coercion, or intimidation be referred in the same way.
>
> (3) That the parties proceed with the conferences where they left off, and that, in order that friction may be avoided, they agree upon some impartial person to preside, or if they cannot agree, that they permit the Mayor and the Chairman of the commission to name such impartial person, to have no authority to decide, but merely to preserve the parties from further misunderstandings and disagreements, and, further, that such conferences be held in public.
>
> (4) That the strike should be declared off immediately.

The Interborough Rapid Transit Company advised the commission on September 13 as follows:

> (1) It cannot arbitrate its right to enter into agreements with 10,306 of its employees out of a total of 11,800, when the employees who have signed are content with those agreements and are endeavoring to carry them out in good faith.
>
> (2) It cannot arbitrate its own good faith in becoming a party to those agreements, when they are definite as to pay and terms, signed by the employees upon the recommendation of their own duly appointed agents, and today are fully accepted by the great mass of our loyal employees.

The New York company advised the commission as follows: "It cannot arbitrate the causeless desertion of its service by its striking employees when their differences with the company were in process of orderly adjustment under the terms of the agreement of August 6, underwritten by the mayor and the chairman of this commission."

The Amalgamated Association officers have agreed to arbitrate.

The present situation therefore is a deadlock. The strike has caused much inconvenience, and there have been several accidents and some violence. Both the subway and elevated lines are giving fairly good service, the subway on Wednesday transporting 400,000 more persons in 12 hours than ever before under normal conditions. Service on the surface lines is being gradually improved.

Western Railway Club

The first monthly meeting of the Western Railway Club for the 1916-17 season will be held at the Sherman Hotel, Chicago, Monday evening, September 18. A paper will be presented by W. L. Park, vice-president of the Illinois Central, on the subject of "Preparedness from the Railway Point of View." Mr. Park will discuss the need of preparation of the transportation systems, in case of war, from various angles, including the need of special equipment for transporting the various defense armament, the use to which the standard equipment can be placed and track and terminal facilities. He also will discuss the working out of defense plans as they may arise under the present conditions. Change in the time of meeting should be noted as being on the third Monday instead of the third Tuesday of the month. The Sherman Hotel will be the headquarters during the year, ample space having been provided for the meetings. The usual get-together-dinner will be held from 6 to 7:15 o'clock, and will continue to be a regular function of the monthly meetings.

Railway Fire Protection Association

This association will hold its third annual meeting at the Hotel Astor, New York City, October 3, 4 and 5, 1916.

The morning session, beginning at 10 a. m., October 3, will be devoted to a consideration of the business of the association and will also include an address by the president and an address by E. R. Hardy, assistant manager of the New York Fire Insurance Exchange, on Some Common Difficulties in Prevention Work.

The afternoon session, beginning at 2 p. m., will include the consideration of committee reports on Fire Prevention and Protection in Grain Elevators, and Locomotive Spark and Ash Pan Hazard. At its conclusion an inspection trip will be made to the Delaware, Lackawanna & Western terminals.

The program for Wednesday morning, October 4, will include an individual paper on Automatic Fire Protection, by C. N. Rambo, of the Norfolk & Western, and a committee report on Fire Prevention and Protection in Terminal Classification and Storage Yards. A round table discussion will be held during the luncheon hour.

At the Wednesday afternoon session, committee reports will be presented on Oil-Burning Appliances and Electrical Hazards, and Robert Scott, of the Atlantic Coast Line, will present a paper on Shop Property.

The Thursday morning session will include reports on Fire Prevention and Protection of Wharves and Piers, the association handbook, and a report of the president on statistics. At

2 o'clock in the afternoon an inspection trip will be made through the Grand Central terminal, after which the association will consider unfinished business and the election of officers and members of the executive committee.

The secretary of the association is C. B. Edwards, Seaboard Air Line, Norfolk, Va.

Bridge and Building Convention

The twenty-sixth annual convention of the American Railway Bridge & Building Association will be held at the Gruenwald Hotel, New Orleans, October 17 to 20. From present indications the attendance will exceed that at any previous convention. It is expected that a special train will be provided over the Illinois Central, leaving Chicago on Sunday morning, October 15, stopping at Vicksburg National Park en route, and reaching New Orleans about six o'clock Monday evening. The convention will be in session on Tuesday, Wednesday and Thursday. Friday will be devoted to a trip by special train to the sawmill of the Great Southern Lumber Company, Bogalusa, La. The Bridge and Building Supply Men's Association will give a dinner on Wednesday evening, while the annual association dinner will be held on Thursday evening.

All indications point to an unusually large exhibit by the Bridge and Building Supply Men's Association. Already applications have been received from more firms than were represented at any previous convention. Arrangements have been made for ample exhibit space for all firms desiring representation, and applications should be made promptly to P. C. Jacobs, secretary, care of H. W. Johns-Manville Company, Chicago.

The following firms have already made reservations for space:

American Hoist & Derrick Co., St. Paul, Minn.
Asphalt Ready Roofing Co., New York.
American Valve & Meter Co., Cincinnati, Ohio.
Barrett Mfg. Co., New York.
Bird & Son, East Walpole, Mass.
Phillip Carey Co., Cincinnati, Ohio.
Chicago Bridge & Iron Works, Chicago.
Chicago Pneumatic Tool Co., Chicago.
Jos. Dixon Crucible Co., Jersey City.
Detroit Graphite Co., Detroit, Mich.
Paul Dickinson, Inc., Chicago.
Fairbanks, Morse & Co., Chicago.
Heath & Milligan Mfg. Co., Chicago.
H. W. Johns-Manville Co., New York.
The Lehon Co., Chicago.
C. F. Massey Co., Chicago.
National Roofing Co., Tonawanda, N. Y.
Geo. P. Nichols & Bro., Chicago.
O & C Co., New York, N. Y.
Simmons-Boardman Publishing Co., New York.
T. W. Snow Construction Co., Chicago.
Standard Asphalt & Rubber Co., Chicago.
The Texas Co., Houston, Tex.
Toch Bros., New York, N. Y.
U. S. Wind Engine & Pump Co., Batavia, Ill.

Engineers' Society of Western Pennsylvania

The regular monthly meeting of the Engineers' Society of Western Pennsylvania will be held in the Oliver building, Pittsburgh, Pa., on Tuesday, September 19, 1916. At this meeting a paper on the "Hell Gate Bridge," by J. Lowenstein, engineer, American Bridge Company, New York, will be read.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, New Orleans, La.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.

American Electric Railway Association.—E. B. Burritt, 8 W. 40th St., New York Annual convention, October 9-13, Atlantic City, N. J.

American Electric Railway Manufacturers' Association.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Railway Association.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Denver, Colo.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, New Orleans, La.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

Association of Manufacturers of Chilled Car Wheels.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

Association of Transportation and Car Accounting Officers.—G. F. Conrad, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

Bridge and Building Supply Men's Association. P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers. Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago. Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club. H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Poutet Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago. A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

Maintenance of Way and Master Painters' Association of the United States and Canada. F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

Railway Fire Protection Association.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Annual meeting, October 3-5, 1916, New York.

Railway Real Estate Association.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 11-13, 1916, Chicago.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

Roadmasters' and Maintenance of Way Association.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, Hotel McAlpin, New York.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Society of Railway Financial Officers.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Washington, D. C.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.

Southern & Southwestern Railway Club. A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago. W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York. C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Utah Society of Engineers. Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

President Wilson has signed the shipping bill. This authorizes government organization of a corporation or corporations with capitalization of not more than $50,000,000 to buy or lease ships, and put them in trade if they cannot be leased for operation to private capital.

The Illinois State Public Utilities' Commission has called a conference of railroads and shippers for September 20 to determine ways and means of alleviating the impending car shortage. Representatives of the Illinois State Grain Dealers' Association, the Illinois State Farmers' Association and the railroads operating in Illinois will convene.

The Boston & Albany is making extensive arrangements for handling the crowds expected to attend the National Dairy Show to be held at Springfield, Mass., October 12-21. The Southern Railway is planning to run a special train to this exposition carrying dairy farmers and others interested in the building up of the dairy interests in the South.

According to the Seattle Times, a $22,000,000 fleet is to be built in Pacific Coast ports for A. U. Andersen & Co., of Copenhagen, Denmark. It will be placed under the American flag and operated in the lumber and general cargo trade from the Northwest. Seattle and Portland have been chosen as headquarters for the fleet. Fourteen vessels have already been contracted for in Pacific Coast yards.

Hearing of the three-cent passenger rate case has been resumed before the Kansas Public Utilities' Commission. Railroads in the state are asking permission to charge three cents a mile on intrastate passenger business. The present rate is two cents. Since the application of the roads was filed with the Utilities' Commission the Interstate Commerce Commission has allowed a rate of 2.4 cents in northern Kansas, and 2.6 cents in southern Kansas on interstate traffic.

Headquarters of the 10 recently appointed farm products agents, who are to work in the field in connection with the Southern Railway's plan of helping farmers find markets for their products are as follows: Frank Shorter, Danville, Va.; George Reese, Greensboro, N. C.; W. J. Sheely, Columbia, S. C.; T. U. Culver, Atlanta, Ga.; R. O. McCord, Macon, Ga.; T. E. Draper, Anniston, Ala.; L. D. Fuller, Huntsville, Ala.; B. M. Anderson, Knoxville, Tenn. They report to chief farm products Agent Roland Turner at Atlanta, Ga.

Car Surpluses and Shortages

The American Railway Association Committee on Relations Between Railroads has issued Statistical Statement No. 20, giving a summary of freight car surpluses and shortages for September 1, 1916, with comparisons.

TOTAL SURPLUSES

September 1, 1916	43,541
August 1, 1916	49,753
September 1, 1915	191,309

The surplus for August 1, 1916, includes figures reported since the issue of Statistical Statement No. 19.

The total surplus shows a general decrease since the report for August 1.

TOTAL SHORTAGES

September 1, 1916	57,822
August 1, 1916	39,991
September 1, 1915	6,300

The shortage for August 1, 1916, includes figures reported since the issue of Statistical Statement No. 19.

The increase in the car shortage is general in all classes of equipment throughout the country, with the exception of New England.

The figures by classes of cars follow:

Classes	Surplus	Shortage
Box	19,907	34,529
Flat	2,609	2,481
Coal and gondola	7,079	17,900
Miscellaneous	13,946	2,912
Total	43,541	57,822

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission has suspended from September 12 to January 10 a proposed increase in rates on wall board from Chicago, Milwaukee and other points to Ohio river crossings and Bristol, Tenn.-Va.

The commission has further suspended from September 12 to March 12 tariffs increasing refrigeration charges on fruits and vegetables from points in Oregon and Idaho to various interstate destinations. The tariffs had previously been suspended from May 15 to September 12.

The commission has suspended from September 9 to January 8 the cancellation, in a supplement to E. B. Boyd's tariff I. C. C. No. A 638, of the rule providing that where a portion of a shipment has been lost or damaged by a carrier, and a duplicate of such part is forwarded to replace the loss or damage, the freight charges on the duplicate part shall be cancelled.

The commission has suspended from September 17 to March 17 a proposed increase in rates on molasses in carloads from New Orleans, La., to Texarkana, Ark.-Tex., and other points in the same general territory which had previously been suspended from May 20 to September 17.

The commission has further suspended from September 17 to March 17 a proposed increase in the proportional rate on coal originating at mines in Kentucky from Chicago to Red Wing, Minn., and other points in Minnesota, which had previously been suspended from May 20.

The commission has postponed from October 16 to November 16 the effective date of its order in the Business Men's League of St. Louis case, involving passenger fares from Illinois points to St. Louis and to East St. Louis.

The commission on September 1 issued an order allowing carriers in Hawaii to reduce rates and fares on 10 days' notice without special permission. Full statutory notice must be given, however, of any advances unless the commission has allowed a shorter period.

Lumber from Wisconsin Points

Connor Lumber & Land Company v. Akron, Canton & Youngstown et al. Opinion by Commissioner Hall:

Rates on lumber in carloads from Wisconsin points along the shore of Green Bay to central freight association territory and other destinations are found to be dominated by central freight association lines through their car ferry routes across Lake Michigan.

The commission therefore holds that the lower rates from Green Bay, Oconto, Peshtigo and Marinette, Wis., than from Laona, Wis., a point at least 60 miles inland by rail, are not shown to be prejudicial to complainant or Laona. It is further found that Laona, as to shipments of lumber in carloads to the territory of destination, is included in the Wausau group, and that Wausau rates, as applied from Laona, are neither unjust nor unreasonable. (40 I. C. C., 111.)

Rates to Points on the Globe Division of the Arizona Eastern

Graham & Gila County Traffic Association v. Arizona Eastern et al. Opinion by Commissioner McChord:

The complaints attack as unreasonable the rates on certain commodities including canned goods, potatoes, fruit, sugar, etc., from points in California to points on the Globe division of the Arizona Eastern in Arizona, and also the class and commodity rates from certain eastern group territories to the same destinations. After the complaints were filed the carriers published reduced rates from the east which resulted in reductions to the destination points here involved. The commission holds that the rates from California, and those from the east as now in effect, are not unreasonable. The portion of the Southern Pacific's

fourth section application by which authority is sought to continue rates on high explosives from points in California to El Paso, Tex., which are lower than rates to intermediate points, is granted. (40 I. C. C., 573.)

Iron and Steel to Colorado Points

Vulcan Iron Works Company v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner Harlan:

The commission adheres to its finding in The Iron and Steel Cases, 36 I. C. C., 86, 98, that a rate of 60 cents per 100 lb. on certain iron and steel articles from St. Louis and points taking the same rate to Denver, will be a reasonable maximum through rate for the future; but on the further evidence it is also found that the maintenance of that rate contemporaneously with lower rates on wrought iron and certain other pipe from and to the same points would give to the eastern manufacturers of such pipe an advantage to the prejudice of the Denver manufacturers of riveted and welded pipe. The carriers are required so to readjust their rates as to avoid such prejudice. (41 I. C. C., 76.)

STATE COMMISSIONS

The Public Service Commission of Pennsylvania has approved the merger of all railroads under the control of the Pennsylvania Railroad Company centering in Washington, D. C.

The Alabama Public Service Commission has reduced the switching charges on all business from connecting carriers inbound and outbound to industries on the Belt Railroad of Birmingham from $5 to $3 per car.

The Railroad Commission of Georgia has passed an order ending the sale of "penny scrip" October 1. The order specifies that the Louisville & Nashville; the Nashville, Chattanooga & St. Louis, and the Georgia, Florida & Alabama, shall adopt and sell the "Z" mileage, which is on a basis of 2 cents a mile.

Chairman Allison Mayfield and Commissioner Earle B. Mayfield, of the Texas Railroad Commission, were served with papers in the injunction suit brought by the railroads of Texas to restrain the commission from enforcing its freight rate increase cancellation order, a temporary injunction having been granted by Federal Judge Pardee. A hearing is to be held before him September 28 at Atlanta, Ga.

COURT NEWS

Expense of Eliminating Grade Crossings

The New Jersey Supreme Court holds that the provision of the Fielder Act, by which 10 per cent. of the expense of eliminating a grade crossing of a steam railroad used by a street railway may be ordered to be paid by the company operating the street railway, is within the legitimate sphere of legislation under the police power of the state.—Public Service Ry. Co. v. Board of Public Utility Commissioners (N. J.), 98 Atl., 28.

Illinois Public Utilities Commission Cannot Construe Contract Rights

The Illinois Supreme Court holds that the State Public Utilities Commission has no jurisdiction over suits arising out of contract between railroads and shippers, such jurisdiction by the Constitution being vested in the Circuit Court. The construction and validity of a contract between a railroad and a shipper for the construction and use of a track is a judicial question, the determination of which by a court of competent jurisdiction cannot be affected by any action of the commission.—People v. Peoria & Pekin Union (Ill.), 113 N. E., 68.

Crossing Accident—Jury Question

In an action for personal injuries by being struck by an engine it appeared that the plaintiff, on a dark and foggy morning, approached a crossing with his horse and wagon, and stopped, looked, and listened for an approaching train. After due observation he neither heard nor saw one. There were gates and a gateman at the crossing. The gates were up. The railroad met the situation thus presented by proof that the approaching engine bell was rung, and the approach of the engine was discernible from various points at the crossing. The Court of Errors and Appeals of New Jersey held that the issue thus presented was properly submitted to the jury.—Schnackenberg v. Lackawana (N. J.), 98 Atl., 266.

Upset Price in Foreclosure Sale

In a proceeding to foreclose the mortgage securing the first mortgage bonds on the Western Pacific to the amount of $50,000,000, the only question was what should be the upset price. One of the parties contended for a price of $40,000,000, the other for a price not in excess of $15,000,000. The Federal District Court, Northern District of California, fixed the upset price at $18,000,000, basing it on the present earning capacity of the road, the value of the unproductive properties, and the bonding power of the properties after the proposed sale.—Equitable Trust Co. v. Western Pacific, 233 Fed., 335.

Regulation of Interstate Demurrage Charges

The Supreme Court of the State of Washington holds that courts are without power to determine the reasonableness of demurrage tariffs duly fixed, published, and filed, such power being in the Interstate Commerce Commission, except in review of the orders establishing the rates. The constitutional question whether a duly fixed, published and filed demurrage tariff imposed on the shipper's own cars while on its own tracks is taking property without just compensation and without due process of law is not independent of the act to regulate commerce, and therefore is to be determined by the commission; and the courts have no jurisdiction to pass on the validity of the demurrage rule prior to an affirmative order of the commission thereon.—Northern Pacific v. Carstens Packing Co. (Wash.), 158 Pac., 721.

Animals Scared by Blowing Off Steam

The Oklahoma Supreme Court holds that the mere unnecessary blowing off of steam from an engine does not constitute in itself lack of ordinary care, but the surrounding circumstances may be such as to require the submission to the jury of the question of lack of ordinary care under the particular facts. The fact that a mule was grazing in a field adjoining the right of way and that steam was blown from the engine, and that such act was likely to frighten the mule did not authorize a recovery against the railroad of damages resulting from such act, unless the men operating the engine saw the mule at or about the time of the act. There is ordinarily no duty on a railroad company to keep a lookout for such animals in the fields adjoining the right of way. Judgment for the plaintiff was reversed.—Rock Island v. Hine (Okla.), 158 Pac., 597.

Shippers Cannot Counterclaim for Damages to Freight In Actions for Interstate Freight Charges

The Federal District Court, S. D. Iowa, holds that under the Elkins act and its amendments a shipper cannot, on being sued by an interstate railroad company for freight charges, counterclaim for damages to goods. To permit counterclaims in such actions would open the door to a renewal of the method of making rebates by allowing fictitious claims for damages to freight. The railroad is required to institute suits for unpaid freight charges, and to perform this duty it must commence action in the district where the shipper resides. Railroads are often compelled to maintain actions in districts, and even in states, far removed from the district in which suits could be maintained against them. Very often the suits are for small amounts, and if the shipper can, by counterclaim, acquire jurisdiction of the carrier for damages to freight, he can force the carrier to spend much more in prosecuting its action for freight charges than the freight charges amount to.—Illinois Central v. W. I. Hoopes & Sons, 233 Fed., 135.

Repairs on Cattle Cars in Transit

If a railroad, on the arrival of a shipment of live stock at a connecting point, makes necessary repairs on cars containing part of the shipment as soon as possible and delivers the whole shipment to the connecting road as quickly as a person of ordinary prudence, similarly situated, would do under the same circumstances, the Texas Court of Civil Appeals holds that it is not liable for a delay in transportation, though the cattle were injured by heating on account of the stoppage. Testimony that

it is the custom of all railroads operating in Ft. Worth not to have employees present in their yards at night ready to make heavy repairs as soon as the necessity therefor was discovered, but depended on calling them whenever their services were needed, should have been admitted. Proof that others, in the same line of business, are in the custom of following the same course, is admissible as tending to show that the method adopted is not negligent, unless the conduct of a business in a certain manner is negligent per se.—Ft. Worth & Denver City v. Gatewood (Tex.), 185 S. W., 932.

Joint Rates

The Chicago & North Western owns a majority of the stock of the Chicago, St. Paul, Minneapolis and Omaha. Its stockholders own nearly all of the remainder. So far as concerned the ultimate power of direction and control, the officers of the two companies are substantially the same. The two roads connect, and are operated as a continuous line. Their location is such that they are not competing lines. Each maintains a separate organization and its legal individuality. As respects shipments made over the two there is a single control ultimately exercised by their common officers. The Minnesota Supreme Court holds that for the purpose of establishing freight rates the two constituted one road, and that the intrastate continuous mileage rates fixed by the Railroad and Warehouse Commission pursuant to the distance tariff law applied, and the commission is without authority to fix a joint rate.—State v. Chicago & North Western (Minn.), 158 N. W., 627.

Cost of Interlocking Plant at Crossing

Under the Illinois statute providing that a railroad seeking to cross another shall bear the entire cost of safety appliances, the Supreme Court of the State holds that the public utilities commission has no authority to permit an electric railroad to cross other roads at a place where interlocking devices are maintained without paying the entire expense of the necessary enlargement of the interlocking plant. An order of the commission, proportioning the expense of constructing a new interlocking plant at a crossing on the basis of the number of interlocking units used by each road and dividing the maintenance expense equally between the roads, was held proper as to those railroads which had already secured crossings, but not as to an electric road, which had not secured a crossing, and which, upon crossing, should be required to pay the increased cost of construction and maintenance of such plant, or one-fourth of the total.—State Public Utilities Commission v. Illinois Central (Ill.), 113 N. E., 162.

Terminal Charges

The owner of a building under construction and the builder had a contract as to furnishing steel for the building, and the builder arranged with the railroad which carried it to store it until used by the owner. The owner became bankrupt and the steel stored was sold by the receiver. The railroad made claim for storage and unloading charges. The Delaware Court of Chancery held that these charges were part of the transportation charges, which the carrier must charge and collect from the owner or consignee, until there is actual delivery, in accordance with its tariff schedules filed. The mere fact that the railroad had accepted less than the full amount due and given its receipt in full did not estop it to collect the sum fixed by the tariffs. The only effect of its doing so was to deprive it of its lien on the property; but it could collect any sum due for storage charges. To avoid liability, the owner was bound to show that by its contract with the builder the latter was ultimately liable for the charges. In the absence of such evidence, the inference arose that the owner was ultimately liable.—*In re* Arlington Hotel Co. (Del.), 98 Atl., 186.

Excessive Damages for Ejection Reduced

In an action for damages for wrongful ejection it appeared that the plaintiff bought a special round trip ticket properly consisting of the auditor's slip, the going coupon, and the returning coupon. The agent by mistake removed or did not attach the going coupon to the ticket. The conductor declined to receive it for the going trip. He tried to communicate with the selling agent and get the ticket corrected, and, failing to do so, informed the plaintiff that unless the ticket could be corrected she would have to leave the train. He put her off without violence or discourtesy. The Springfield (Missouri) Court of Appeals held that the company was liable for the ejection. The plaintiff left the train when it was about night, was cold and rainy, carrying a baby, and, with her husband, walked to a hotel, where they remained all night, continuing their journey next morning. It was held that the plaintiff could not recover any sum for the loss of time or for hotel expenses or for tickets purchased by her husband, though the jury might consider the delay in her journey and the length of time she suffered the inconvenience and the mental distress incident to having to leave the train. A verdict of $500 as actual damages was held excessive, and would not be allowed to stand unless reduced to $75.—Ferguson v. Missouri Pacific (Mo.) 186 S. W., 1134.

Hours of Service Act—Derailment

After the derailment of a freight train, its crew, while awaiting the arrival of a derrick, proceeded about a mile and a half from the point of derailment to a farmhouse, where they left the engine in charge of a watchman and had luncheon and rested under the trees. The Circuit Court of Appeals, Eighth Circuit, holds that, as there was no superior officer present to release them, they were not released from duty within the hours of service act, and that time must be included in determining whether they were on duty for more than the 16-hour period allowed. In any event, however, the railroad would not be liable for the penalty under the act, a derailment being a casualty, and the crew in charge of a derailed train may be required to remain on duty for more than 16 hours.

Without ascertaining when tracks would be cleared, trains were despatched over tracks on which it was known there had been a wreck, so that the crews of the trains were kept on duty for more than 16 consecutive hours. It was held that the fact of the wreck furnished no defense to a prosecution for violation of the act, it being the duty of the railroad's servants to ascertain such facts before despatching trains.

The watchman having refused to watch the engine, claiming that he was afraid of the injector, the fireman volunteered to watch it, and was on duty more than 16 hours. It was held that the watchman's unforeseen insubordination was a casualty excusing the railroad from any violation of the act.—Denver & Rio Grande, 233 Fed., 62.

BELGIAN COAL.—The output of coal in Belgium in 1903 was 23,871,000 tons; in 1913 the output had declined to 22,858,000 tons. The production has been practically stationary for the past 20 years. While Belgian coal mining has thus made little or no progress of late, the output of coal in the United States increased between 1903 and 1913 to the extent of 60 per cent; that of Great Britain, 23 per cent; that of Germany, 18 per cent, and that of France, 15 per cent. As the production of pig-iron from Belgian blast furnaces was increasing before the war, it was necessary to import more coal from Germany. Of course the war has utterly disorganized Belgian metallurgy, coal mining, coal importing and other industries.—*Engineering.*

GERMAN SUBSTITUTES FOR COPPER.—War substitutes for the 6 per cent by weight of copper, which on the average goes into the manufacture of a German locomotive, are reported to be in part as follows: The fireboxes and stays, previously of copper, are now made of cast iron. All the smoke and steam tubes and the oiling cocks and thin pipes are of weldless drawn steel. For the rod-bracings, axles, grease-boxes and the bracing parts, the difficulty is believed to have been overcome by using cast iron and a special alloy called flange metal, which is a mixture of tin, lead and antimony. It is regarded as possibly dangerous to use this metal unless the pins and axle journals were previously bushed with white metal. Cast iron was used for piston-boxes, side valve rods, frames and lubricators, lubricator covers and step bearings. Bronze covered with vulcanized rubber, which was the standard metal for the various handwheels, is being replaced by cast-iron wheels covered with ordinary string or jute fabric. German engineers are now experimenting with a new rolling process for preparing the flange metal referred to, having an equivalent of bronze which will dispense with antimony. A question is raised as to the life of such engines.—*Iron Age.*

Railway Officers

Executive, Financial, Legal and Accounting

Ben C. Dey has been appointed general attorney of the Southern Pacific, with headquarters at Portland, Ore., succeeding William D. Fenton, resigned.

Robert S. Parsons, chief engineer of the Erie, with headquarters at New York, has been appointed assistant to the president and chief engineer. A portrait of Mr. Parsons and a sketch of his railway career were published in the *Railway Age Gazette* of January 21, 1916, page 143.

Howard V. Platt, who was elected vice-president of the Oregon Short Line on July 1, 1916, has also been elected first vice-president of the Los Angeles & Salt Lake, succeeding E. E. Calvin, resigned.

Operating

J. E. Stansbury has been appointed trainmaster of the Spokane, Portland & Seattle, with headquarters at Portland, Ore.

John McKay has been appointed service inspector of the International & Great Northern, with headquarters at Houston, Tex.

Patrick R. Leo has been appointed trainmaster of the Northern Pacific, with headquarters at Dilworth, Minn., vice John L. Glasgow, resigned.

J. G. Charland has been appointed trainmaster of the Spokane, Portland & Seattle at Vancouver, B. C., to succeed M. B. Le Bertew, transferred.

F. A. Peil has been appointed assistant to general manager of the Oregon-Washington Railroad & Navigation Company, with headquarters at Seattle, Wash.

L. L. Yates has been appointed general superintendent car department of the Pacific Fruit Express Company, with headquarters at San Francisco, Cal.

H. M. Hallock, general superintendent of the Chicago & Illinois Midland at Taylorville, Ill., has been appointed general manager, with offices at Taylorville, and the office of general superintendent has been abolished.

Charles Sloan Patton, whose appointment as superintendent of the Alabama division of the Seaboard Air Line, with headquarters at Savannah, Ga., has already been announced, was born on April 4, 1871, at Telford, Tenn. Mr. Patton was educated in the public schools and began railway work in 1892 as a brakeman on the Norfolk & Western. He later served as fireman and then as engineman on the same road until November 1, 1901, when he left the service of the Norfolk & Western to become engineman on the Seaboard Air Line. He later served as road foreman of engines, and then as trainmaster until 1905, when he again resumed the duties of road foreman of engines on the same road. In March, 1911, he was promoted to master mechanic, which position he held until his recent appointment as superintendent of the Alabama division of the same road, as above noted.

Announcement is made by W. Morcom, general manager of the Mexican Railway at Mexico City, that the first chief of the Constitutionalist army in charge of the executive power at Mexico ordered the return of the lines, stock and property of the Mexican Railway to that company on August 31. The organization of the different departments is as follows: Transportation—J. R. Hickman, superintendent of transportation, with office in City of Mexico, in place of Manuel Jimenez, deceased; Cristobal Lima, superintendent of the Mexican division, with office at Apizaco; J. F. Trevino, superintendent of the Vera Cruz division, with office at Orizaba. Conservation of track—W. T. Ingram, resident engineer, Mexico City. Traffic—E. G. Wuerpel, general freight and passenger agent, Mexico City. Express and baggage—C. Montiel, superintendent, Mexico City. Accounting—Manuel Merino, accountant in chief, Mexico City. Treasury—J. W. Hunter, general cashier, Mexico City. F. Ferrer, paymaster, first division of Mexico. M. Magallanes, paymaster second division of Vera Cruz. Sleeping and special cars—H. R. Bradbury, superintendent, Mexico City. Machinery and cars—C. H. Burk, locomotive superintendent, Orizaba. Materials—Paul Steffian, purchasing agent, Mexico City; J. E. Rabago, general storekeeper, Orizaba; M. Figarola, stationery storekeeper, Mexico City. Surgeon—Dr. Luis Morales Cortazar, chief surgeon, Mexico City. Car service—D. Tellez, accountant of cars, Mexico City.

Jesse J. Rounds, whose appointment as superintendent of telegraph of the Delaware & Hudson, with headquarters at Albany, N. Y., has been announced, was born on July 5, 1873, at Clifford, Susquehanna county, Pa. He was educated in the common schools and at a select school in Uniondale, Pa. Mr. Rounds began railway work in December, 1889, as a telegraph operator on the Erie, and in May, 1890, went to the New York, Ontario & Western, as telegraph operator on the Scranton division. He returned to the service of the Erie in September of the same year, and until October, 1899, served consecutively as telegraph operator, despatcher's copier and extra train despatcher at Carbondale, Pa. He then went to the Delaware & Hudson at Carbondale, Pa., and in 1900 entered the train despatcher's office of the D. & H. as a telegrapher. From February, 1902, to February, 1914, he served consecutively as train despatcher, assistant chief train despatcher, chief train despatcher and assistant trainmaster. In February, 1914, he was appointed trainmaster, which position he held at the time of his recent appointment as superintendent of telegraph of the same road, as above noted.

Traffic

Peter Frank Finnegan, whose appointment as general western freight agent of the Baltimore & Ohio, with headquarters at Chicago, has been announced, was born November 4, 1877, at Chicago, Ill. He attended in succession the public, grammar and high schools of that city, and later entered Chicago Business College, whence he graduated. In 1895 he entered the service of the Baltimore & Ohio in the transportation department at South Chicago, Ill. In 1900 he was transferred to the traffic department at Chicago, Ill., working through the various clerical positions of this company, and then, being appointed general freight and passenger agent of the Baltimore & Ohio Chicago Terminal at the time of its acquisition by the Baltimore & Ohio in 1910. In this capacity he was in entire charge of the traffic and industrial departments until September 1, 1916, when he was appointed to his present position.



P. F. Finnegan

S. S. Butler, commercial agent of the St. Louis-San Francisco at Houston, Tex., has been appointed general agent, with office at Pittsburgh, Pa.

W. G. Johnston has been appointed commercial agent of the Great Northern, with headquarters at Buffalo, N. Y., succeeding George B. Ogden, transferred.

E. D. Curtis, traveling live stock agent of the Baltimore & Ohio, has been appointed assistant general live stock agent, with headquarters at Pittsburgh, Pa.

Neil Mooney, general agent, passenger department, of the New York Central at Montreal, Que., has been appointed assistant general passenger agent, with office at New York.

J. T. Brooks, commercial agent of the St. Louis-San Francisco at San Antonio, Tex., has been appointed commercial agent, with headquarters at Houston, Tex., succeeding S. S. Butler, transferred.

Edward R. Cunningham has been appointed traveling agent of the Chicago, St. Paul, Minneapolis & Omaha, reporting to A. R. Witherspoon, general agent, with office at Winnipeg, Can.

F. F. Clayton, car service agent of the Los Angeles & Salt Lake (formerly the San Pedro, Los Angeles & Salt Lake), has also been assigned the duties pertaining to the office of general baggage agent, formerly performed by T. C. Davison, resigned.

Sydney J. Lamoreux, whose appointment as assistant general freight agent of the Western Maryland, with headquarters at Pittsburgh, Pa., has already been announced in these columns, was born on July 29, 1884, at Mayville, Wis. He was educated in the common schools, and began railway work on November 1, 1900, with the Wisconsin Central. He served consecutively as night telegraph operator, extra operator and as extra agent. From 1902 to 1903 he was agent for the Wisconsin Central; also express agent at various stations, and then was agent of the Wisconsin Central first at Amherst, Wis., and later at Menasha, Wis. From 1906 to 1909 he served as traveling freight agent at Cleveland, Ohio, of the same road, and then to 1912 as traveling freight agent of the Minneapolis, St. Paul & Sault Ste. Marie. On August 1, 1912, he was appointed general agent of the Western Maryland at Cleveland, Ohio; in December, 1913, he was transferred in the same capacity to Pittsburgh, Pa., and now becomes assistant general freight agent of the same road, with headquarters at Pittsburgh, as above noted.



S. J. Lamoreux

T. Herbert Fee, who has been appointed assistant general freight agent of the Western Maryland, with headquarters at Baltimore, Md., as has already been announced, was born on March 7, 1875, at Baltimore. Mr. Fee was educated in the public schools of Baltimore and began railway work in July, 1891, as a messenger in the general freight and passenger office of the Western Maryland, at Baltimore. He held various positions in the traffic department, including that of chief clerk until April 1, 1905, when he was promoted to division freight and passenger agent at Hanover, Pa. The following December he was transferred to Baltimore, in charge of special work in connection with the Interstate Commerce Commission. On May 1, 1910, he was promoted to freight tariff agent, which position he held at the time of his recent appointment as assistant general freight agent of the same road, as above noted. Mr. Fee's entire railroad service has been with the Western Maryland.

Engineering and Rolling Stock

R. A. Pyne has been appointed superintendent of motive power, eastern lines of the Canadian Pacific, succeeding J. T. Main, transferred.

B. V. Somerville, formerly principal assistant engineer, has been appointed resident engineer of the Pennsylvania Lines West, with headquarters at Detroit, Mich. This is a newly created position.

S. D. Moses has been appointed resident engineer of the Southern Railway, with headquarters at Spartanburg, S. C., succeeding L. G. Wallis, recently resigned to accept service with another company.

Purchasing

F. J. O'Connor has been appointed general storekeeper of the Chicago, Milwaukee & St. Paul, vice G. G. Allen, resigned.

O. H. Wood has been appointed assistant purchasing agent of the Great Northern, with office at Seattle, Wash., succeeding C. L. Bankson, resigned.

Hugh Greenfield, who was recently appointed acting purchasing agent of the Duluth, Missabe & Northern, with headquarters at Duluth, Minn., has been appointed purchasing agent.

N. V. Porter, formerly chief clerk to the division storekeeper of the Wabash, with headquarters at Decatur, Ill., has been appointed division storekeeper on the line between Danville, Ill., and Toledo, Ohio, succeeding E. L. Ensel, resigned.

OBITUARY

O. Skinner, division freight agent of the Atchison, Topeka & Santa Fe, died at Pueblo, Colo., on September 10, of heart disease.

Charles W. Kouns, general manager of the eastern lines of the Atchison, Topeka & Santa Fe, died at his home in Topeka, Kan., September 3, age 62. He was born October 22, 1854, at New Holland, Ohio, where he received his early education. He entered railway service in February, 1871, at a very early age, and was successively from this time to May, 1874, freight brakeman, telegraph operator and agent of the Kansas Pacific. From 1874 to the latter part of 1876 he was despatcher on this same road, leaving it in November, 1876, to become a train despatcher on the International & Great Northern, where he remained until January, 1877. From February to June, 1877, he was car accountant on the Galveston, Harrisburg & San Antonio, resigning this position to take employment with the International & Great Northern as freight conductor. From August, 1877, to November, 1879, he was chief train despatcher, and from November, 1879, to November, 1880, trainmaster of the same road. From February to September, 1881, he was train despatcher of the eastern division of the Missouri Pacific, and from September to October, 1881, chief clerk to the general superintendent of the Texas & Pacific. In October, 1881, he became trainmaster of the International & Great Northern, and held this position until July, 1883, when he was appointed master of transportation of the Galveston, Harrisburg & San Antonio. Subsequently he was assistant superintendent of the Nebraska division of the Union Pacific. From February, 1888, to October, 1889, he was chief clerk to the general superintendent of the Atchison, Topeka & Santa Fe, and from November, 1889, to February, 1901, he was superintendent of car service. In February, 1901, he was promoted to assistant general superintendent on the same road, and held that position until May, 1901. From May, 1901, to April, 1904, he was superintendent of transportation of the entire system. He was appointed general manager of the western lines, with office at Amarillo, Tex., in June, 1905, and remained in this capacity until January, 1907, when he was appointed assistant to the vice-president in charge of operation, Chicago, Ill. He held this position up to April, 1909, when he became general manager of the eastern lines, with headquarters at Topeka, Kan. Mr. Kouns died quite suddenly, having only shortly before returned from Washington, where he was a member of the Conference Committee of the Railways which handled the recent wage controversy with the train service employees.



C. W. Kouns

PROFITABLE RAILWAY.—The railway in the western hemisphere that produces the most revenue to the mile is in Brazil. It is the Sao Paulo Railway, 134 miles long, from Santos, by way of Sao Paulo to Jundiahy. The road carries more than one-half of the world's supply of coffee, and is said to be one of the best managed railways in South America.

Equipment and Supplies

LOCOMOTIVES

The New York, Chicago & St. Louis has ordered 10 Mikado type locomotives from the Lima Locomotive Corporation.

The Minnesota, Dakota & Western has ordered one Consolidation locomotive from the Baldwin Locomotive Works.

The Pere Marquette, reported in the *Railway Age Gazette* of September 1 as being in the market for a number of locomotives, is in the market for 13 locomotives.

FREIGHT CARS

The Chicago, Milwaukee & St. Paul is building 1,000 freight cars in its own shops.

The Atlantc Coast Line is in the market for from 50 to 100 double deck 40-ton stock cars.

The Central of New Jersey has placed an order with the American Car & Foundry Company to repair 250 box cars.

The American Refrigerator Transit Company has given an order to the Mt. Vernon Car Manufacturing Company to repair 300 refrigerator cars.

The Illinois Central, mentioned in the *Railway Age Gazette* of July 7 as about to order 500 refrigerator cars, has ordered these cars from the Haskell & Barker Car Company.

The Russian Government has ordered 4,000 steel gondola cars of 40-ton capacity from the Bettendorf Company, and is inquiring for additional rolling stock.

Wilson & Co., Chicago, mentioned in the *Railway Age Gazette* of September 1 as being in the market for 75 to 100 8,000-gal. tank cars, has ordered 25 40-ton 8,000-gal. tank cars from the American Tank Car Corporation.

The New York Central has ordered 1,000 steel underframe box cars from the Pressed Steel Car Company, and has ordered 1,000 box cars from the American Car & Foundry Company. The latter is in addition to the 1,000 box cars ordered from the same company and reported in the *Railway Age Gazette* of August 18.

PASSENGER CARS

The Union Pacific has ordered one private car from the Pullman Company.

The Philadelphia & Reading has ordered 4 cafe cars from the Pullman Company.

The Great Northern is in the market for 125 all steel passenger cars to replace Oriental limited equipment.

The Pennsylvania Equipment Company, Philadelphia, Pa., is in the market for one combination passenger and baggage coach and two passenger coaches.

IRON AND STEEL

The Atchison, Topeka & Santa Fe has purchased approximately 7,000 lb. of tie plates.

The Denver & Rio Grande has ordered three steel turntables to weigh 202 tons from the American Bridge Company. They will be installed at Denver, Colo., and at Pueblo.

The New York Public Service Commission, First district, recently opened bids for the supply of special work for the Southern boulevard and Westchester avenue branch of the Lexington avenue subway. The Ramapo Iron Works, New York City, was the lowest bidder at $11,427.

Supply Trade News

The American Car & Foundry Company has taken an order for 300,000 3-inch shells for the United States Navy Department.

D. R. McVay has been appointed railway sales representative of the Barrett Company, New York City, with headquarters at Cincinnati, Ohio.

B. H. Forsythe, formerly with the Hale & Kilborn Company, has entered the sales department of the Grip Nut Company, with offices in the McCormick building, Chicago, Ill.

The H. W. Johns-Manville Company, New York, announces that Harry Flanagan, formerly with the Grip Nut Company, will represent its railroad department in the Twin City territory.

George M. Judd has been elected secretary of the American Brake Shoe & Foundry Company, to succeed Henry C. Knox, resigned. Mr. Knox will remain as treasurer of the company.

The Chicago Bridge & Iron Works has opened an office in Jacksonville, Fla., in charge of Elwood G. Ladd. This office is in the Florida Life building. It will handle the company's sales in Georgia, Florida and Alabama.

Homer C. Johnstone, formerly with the Midvale Steel Company, has been appointed manager of the steel department of Gaston, Williams & Wigmore, Inc., New York. Mr. Johnstone served for 14 years as manager of the Chicago and New York offices of the Midvale Company.

J. E. Saunders, formerly electrical engineer of the Union Switch & Signal Company, has been promoted to assistant chief engineer. In last week's issue of the *Railway Age Gazette* it was incorrectly stated that D. R. Bell succeeded Mr. Saunders as electrical engineer. C. A. Beall succeeds Mr. Saunders.

The Harrison Railway Specialties Company, Chicago, Ill., has secured an order for Harrison dust guards for the 4,000 freight cars being built by the Bettendorf Company, of Bettendorf, Iowa, for the Russian government. The Harrison guard was passed upon and adopted by the Russian Imperial Railway Commission.

The United States Steel Corporation announces a gain of 66,765 tons in unfilled orders in a month, the total unfilled tonnage on its books on August 31 being 9,660,357 tons, as against 9,593,592 tons on July 31. The tonnage is almost double the business on hand a year ago, the report for August 31, 1915, showing 4,908,455 tons unfilled.

The Magor Car Corporation, New York City, has been chartered in New York with a capital of 7,500 shares, 4,000 shares at $100 each, and 3,500 shares of no par value. It purposes to carry on business with $417,500. Its object is to furnish cars, railroad supplies, rails, structures, bridges, etc. The incorporators are Walter F. Purcell, George C. Carey, Bigelow Watts and O. Z. Whitehead.

The Duntley Company, Fisher building, Chicago, has been made the sole western distributor for the Hudson Ballata belting and other products of the Hudson Mechanical Rubber Company. The market for this class of belting has been materially increased on account of the war. Leather being in considerable demand by the warring nations has caused an increase in the price of leather belting of about 40 per cent.

The Baldwin Locomotive Works has more employees on its payroll than ever before, the number being between 19,000 and 20,000, not including those employed in the affiliated companies at Eddystone. The company has enough orders for locomotives and repair work in hand to make it assured that the plant will be kept busy for several months to come. About 40 per cent of the locomotive business is represented by foreign orders.

W. D. Cloos, recently elected secretary and treasurer of the Lima Locomotive Corporation, Lima, Ohio, was born August 13, 1886, in Tioga County, Pa. After a preliminary education he entered Mansfield State Normal School, taking a four-year course from 1903 to 1907. Later he attended Mississippi State College,

leaving in 1908. He was connected with the Franklin Railway Supply Company, Franklin, Pa., until his present appointment became effective.

A new company has been formed with a capital of $400,000 to take over the defunct Nova Scotia Car Works, which were recently sold at auction for $157,000. The shareholders of the old company have been called to meet in Halifax, when it is expected that a new company will be organized with F. T. McCurdy, M. P., as president. The proposal for raising funds is that old shareholders be given the opportunity of one share of stock in the new company for every six shares held in the old concern.

The Edison Storage Battery Supply Company, Orange, N. J., announces the opening of its Los Angeles office on the fourth floor of the San Fernando building, corner Fourth and Main streets. James F. Rogan, who has been acting as local distributor of Edison storage batteries in Los Angeles, will become resident manager. This company also maintains two other offices on the Pacific Coast, one at 206 First street, San Francisco, in charge of District Manager E. M. Cutting, and another at 65 Columbia street, Seattle, under F. C. Gibson as resident manager.

The Union Metal Products Company, Chicago, has been granted sales rights to the grain tight car sill, which was described in the *Railway Age Gazette, Mechanical Edition*, February, 1914, page 81. This sill is in use on the Rock Island, Minneapolis & St. Louis, and the Denver & Rio Grande. A careful check on 4,000 cars equipped with this sill on the Rock Island, and which have been in service for 15 months, has shown that no claims for grain leakage have been paid, whereas, a check of 3,000 cars not so equipped has shown that claims were paid on 50 per cent of that number.

Charles D. Ettinger, for 45 years connected with the Murphy Varnish Company and president of the Ohio Injector Company of Illinois, died September 4, after a brief illness. Mr. Ettinger was born at Wadsworth, Ohio, June 20, 1838, and during the civil war served in the hospital division of the quartermaster's department. After the war he engaged in the drug business in Findlay, Ohio. In 1871 he moved to Cleveland and took charge of the railroad department of the Murphy Varnish Company, removing to Chicago in January, 1884. Mr. Ettinger was secretary of this company and one of its directors. He partially retired from the activities of business a number of years ago, spending the greater part of his time in developing his farm at Midlothian, Ill. He was a member of the Union League Club, Midlothian Country Club, South Shore Country Club and the Ohio Society of Chicago.



Charles D. Ettinger

The Railway Motor Car Company of America, Chicago, Ill., has acquired a 13-acre plant at Hammond, Ind., fully equipped, in which it will at once begin the manufacture of cars. These cars will be made under patents owned by the company, and will be different in transmission and construction from any cars now in use. It is stated that the section car will constitute a self-contained power plant available for all sorts of track repairs. Later the company will produce unit passenger cars and locomotives, using the same principle of construction. F. A. Lester is vice-president and sales manager, and will have his headquarters in the Westminster building, Chicago, Ill.

D. E. Cain, western manager of the Dearborn Chemical Works, whose death at Denver, Colo., was recently announced, was born September, 1862, in Chicago, Ill., where he received his early education. He first entered the service of the Chicago & North Western, and in 1881 became connected with the Atchison, Topeka & Santa Fe as cashier at Osage City, Kan. From that time to July, 1902, he was consecutively on this same road as agent at Osage City and Leavenworth, Kan.; chief clerk to general superintendent of machinery at Topeka, Kan.; chief clerk to general manager, and assistant to general manager. From July, 1902, to April, 1905, he was general superintendent of the Western grand division of the same road, with office at La Junta, Colo., and from April to June, 1905, he was general superintendent of the Eastern grand division, with headquarters at Topeka, Kan. In June, 1905, he was appointed general manager of the Southwestern & Choctaw districts of the Chicago, Rock Island & Pacific, with office at Topeka, Kan., from which position he resigned in December, 1906, at the time that the Southwestern & Choctaw districts were placed under the jurisdiction of one general manager. He then became western manager of the Dearborn Chemical Works, having his headquarters at Denver, Colo. He was identified with this concern up to two years ago when ill health overtook him, and he found it necessary to retire from active business. He died in Chicago, Ill., the city of his birth, on August 31, 1916.

The board of directors of the Lima Locomotive Corporation, Lima, Ohio, has elected W. E. Woodard vice-president, in charge of engineering and design, with offices at Lima, Ohio. Mr. Woodard was born in Utica, N. Y., in 1874, and attended the public schools at that place. He was graduated from Cornell University with the degree of mechanical engineer in 1896. For a time he was engaged in the laboratory and on road tests for the Baldwin Locomotive Works, but in 1897 entered the shop and drawing office of the Dickson Locomotive Works as elevation man. In 1900 he went with the Schenectady Locomotive Works, remaining with it and the American Locomotive Company, which succeeded it, up to the time of his present appointment. While with the American Locomotive Company he was employed in various capacities, including calculator, chief calculator, road testing work, foreman drawing office, assistant mechanical engineer, manager electric locomotive and truck department, and finally as assistant chief engineer, having supervision over the general drawing office at Schenectady, N. Y. Mr. Woodard has patented a number of devices which are extensively used on modern heavy car and locomotive equipment, including the lateral motion driving box and axle, constant resistance engine truck, throttle pipe and lever, plate frame car trucks, car body height adjuster, lateral motion bolster and car and tender trucks. He is a member of the American Society of Mechanical Engineers and the Engineers of Eastern New York.



W. E. Woodard

F. H. B. Paine, William McClellan and H. T. Campion announce the formation of the engineering partnership of Paine, McClellan & Campion, with offices at 25 Church street, New York, and 1420 Chestnut street, Philadelphia. Dr. William McClellan has for many years been interested in steam railroad electrification and has been a most active member of the electrification committee of the New York Railroad Club, serving for part of the time as chairman of the committee. He is best known as a consulting engineer and as the former chief engineer of the New York Public Service Commission for the Second district. He was recently appointed dean of the Wharton School of Finance and Commerce of the University of Pennsylvania. Mr. Paine has specialized as a consulting engineer and counsellor to public utilities companies, in valuations and appraisals, rate making, management and organization, and prob-

lems of intercorporate relations, contracts, etc. Previous to engaging in the consulting engineering business he had an extremely wide experience in electrical engineering and construction and commercial development, both in this country and abroad. Mr. Campion has had the greater part of his engineering experience in Philadelphia, particularly with the Philadelphia Rapid Transit Company, where he specialized more or less in the design and construction of car barns, sub-stations and power houses. In 1905 he took charge of the Philadelphia office of the Re-enforced Cement Construction Company, and in 1907 became associated with Dr. McClellan in the construction and consulting engineering business.

Allied Machinery Company

The Allied Machinery Company, New York, organized for the purpose of marketing American machine tools in Europe, and recently acquired as a subsidiary by the American International Corporation, has elected officers as follows: Chairman of board, Samuel McRoberts; president, R. B. Sheridan; vice-president, Charles E. Carpenter; vice-president and treasurer, R. P. Tinsley; secretary, Ames Higgins. Directors are as follows: G. J. Baldwin, John E. Gardin, Robert F. Herrick, Samuel McRoberts, Oscar E. Stevens, Charles E. Carpenter, J. F. Hartley, W. S. Kies, R. B. Sheridan, R. P. Tinsley. During the past year the business of the company has been exceptionally satisfactory, and plans for an extension of its activities and the development of its sales force abroad are being made. At present the company has branches in France, Russia and Italy.

TRADE PUBLICATIONS

Surveying Instruments.—Kolesch & Co., New York, have recently issued a catalogue in Spanish covering the line of Kolesch transits and levels for engineers, contractors and others.

Oxy-Acetylene Welding and Cutting Apparatus.—The Alexander Milburn Company, Baltimore, Md., has recently issued a 32-page catalogue dealing with its line of oxy-acetylene welding and cutting apparatus. The book shows the advantages of oxy-acetylene apparatus for various kinds of work, and describes the Milburn apparatus and accessories in detail. The catalogue is well illustrated.

Structural Waterproofing.—The Trus-Con Laboratories, Detroit, Mich., have issued a 52-page booklet explaining the purpose and character of an integral waterproofing with the name Trus-Con Waterproofing Paste (concentrated). This material is furnished in a paste form, and is added to the water used to mix the concrete. It forms a milk-like solution that insures uniformity of mixture. The method of using this material and the advantages to be secured are discussed in detail. The booklet is illustrated with views of many structures in which the material has been used. Part Two is devoted to technical discussions of various phases of the subject of waterproofing.

Exports of Ralway Supplies from England.—Up to the end of July there had been exported from the United Kingdom during the present year 60,822 tons of rails, chairs, metal ties and other maintenance of way material in iron and steel of the value of $3,500,000, as compared with material to the value of $1,000,000 in the first seven months of 1915. Locomotives to the value of $3,500,000 were exported during the same period as compared with those of the value of $7,000,000 in the corresponding period of 1915, and passenger cars to the value of $1,000,000, and freight cars of $2,000,000, as against $1,500,000 for passenger cars, and $3,800,000 for freight cars in 1915.

The Way to Handle Strawberry Traffic.—The August issue of the London and North Western Railway Gazette had an interesting article on the strawberry traffic, in which it is noted that Glasgow has had 10,000 baskets in one day from the Hampshire district. Dublin is very fond of strawberries, and it is not unusual for the Irish capital to have 3,000 baskets in one day. In order to avoid injury to the latter in their transhipment at Holyhead, they are packed in vans like those used for registered baggage to the continent, which are lifted bodily off the truck at Holyhead and placed on the deck of the steamer; one truck will carry three of the "lift" vans.

Railway Construction

Belle Fourche & Northwestern.—Surveys are being made for a new line to be called the Belle Fourche & Northwestern, projected from Belle Fourche, S. D., to Miles City, Mont., 204 miles.

Central of Georgia.—Under the name of the Chatham River Terminal Company a spur track has been constructed in West Savannah to provide a connection for some of the railroads entering Savannah with the Savannah Warehouse & Compress Company's facilities. (August 11, p. 260.)

Kettle Valley.—This company has opened for business a new district called the Third district, extending from Brookmere, B. C., west to Petain, 56.9 miles.

Lindsay Lumber & Export Company (Logging Road).—This company has awarded a contract to J. N. Gillis & Sons, Brewster, Ala., for the construction of about six miles of logging railroad in the timber lands adjacent to Saraland, Ala.

Louisville & Nashville.—Contracts have been let to Adams & Sullivan, Louisville, Ky., for the grading, and to the George M. Eady Company for the bridge work, on a line to be built from Hazard, Ky., to Walker's Branch, 1.50 miles. The work includes 50,000 cu. yd. of excavation and 25,000 cu. yd. of fill, and there will be a reinforced concrete bridge of 3 80-ft. spans over the North Fork of the Kentucky river. The line is being built to carry coal from the new mines of the Columbus Coal Mining Company.

New York Subways.—Engel & Hevenor, New York City, submitted the lowest bid, at $229,440, to the New York Public Service Commission, First district, for the installation of tracks on the Seventh avenue branch of the Lexington avenue Rapid Transit Railroad. (September 1, p. 391.)

The New York Public Service Commission, First district, will receive bids on September 28 for the construction of a railroad yard in connection with the White Plains road extension of the first subway. The yard will be located one block east of White Plains Road and will cover an area of several city blocks, beginning at a point a short distance north of Two Hundred and Thirty-ninth street. This yard will occupy about half of the space to be given over to rapid transit railroad yard purposes. The present portion to be constructed will be used for Interborough subway cars, while the eastern portion of the yard will ultimately be built for yardage purposes for cars of the Manhattan elevated lines. The whole space to be occupied by both yards is about 800 ft. by 1,100 ft. There will be storage room for nearly 600 cars in the subway yard, and about 300 cars in the elevated yard. It will be necessary to partially reconstruct the White Plains Road line, between the Neried avenue station and the Two Hundred and Forty-first street terminal station, to avoid a grade crossing for the tracks entering the yard.

North Carolina Roads.—Residents of Goldsboro are interested in a plan to build a railroad from Goldsoro, N. C., southeast to Seven Springs, about 15 miles. G. Norwood, Goldsboro, is said to be interested.

Pennsylvania Lines West.—This company is planning to extend its line from Toledo, Ohio, to a point near the city limits of Detroit, Mich., where connection will be made with the Pere Marquette, over which it will run into the Fort street depot. Approximately $40,000,000 will be used to build this line and a belt road for freight purposes, which will parallel the line of the Detroit Terminal.

Savannah, Hinesville & Western.—This company, formerly the Flemington, Hinesville & Western, which operates a line from McIntosh, Ga., northwest to Hinesville, 5.25 miles, is building an extension from Hinesville west to Glennville, 23 miles. Contracts for clearing the right of way and grading will be let in about 30 days. There will be one 40-ft. bridge on the line.

Winchester & Western.—Incorporated in Virginia, it is said, to build a railroad from Winchester, Va., southwest to Wardensville, W. Va., and to Lost River valley, about 40 miles. W. B.

Cornwall, president, and J. S. Zimmerman, secretary, Romney, W. Va.

RAILWAY STRUCTURES

BROWNWOOD, TEX.—The Gulf, Colorado & Santa Fe is planning to construct two large water storage reservoirs and pumping plants in Texas. One will be located near Brownwood, and will have a capacity of 300,000,000 gallons, and the other will be near Sweetwater, and will have a capacity of 290,450,000 gallons.

CARBONDALE, PA.—A contract has been given by the Delaware & Hudson to Porter Brothers for improvements to be carried out in the Carbondale yards. Contract has not yet been let for the proposed steel viaduct to be built at Carbondale.

CHICAGO, ILL.—The Chicago & Alton is developing plans for an entirely new freight terminal east of its existing station at Harrison street, made necessary by the vacation of the old station to make room for the new Union station. The new development will be located largely between the present station and the Chicago river.

LAFAYETTE, IND.—Bids have been received and contracts will be awarded in a few days by the Chicago, Indianapolis & Louisville, for the erection of a new freight house. The building will be of brick construction 50 ft. wide and 200 ft. long, and the part to be used for offices will be two stories high. There will be several team tracks, with a capacity of 35 cars. The paving around and between the tracks, as well as in front of the building itself, will be of vitrified brick. The approximate cost of these improvements is $35,000.

NORFOLK, VA.—An officer of the Seaboard Air Line is quoted as saying that plans will be made to rebuild a coach shed at Norfolk, which was destroyed by fire.

OKLAHOMA CITY, OKLA.—The St. Louis-San Francisco will construct a 10-stall roundhouse with engine pits and drop pits to cost approximately $52,000. In addition to this it will install a cinder pit to be operated with a locomotive crane, a machine shop, boiler house and blacksmith shop, car repair shed and a storehouse to cost in the neighborhood of $58,000, exclusive of machinery, which will involve another $36,000. It will also install a 50-ft., 150-ton track scale, and lay about 45,000 lineal feet of track. To complete these improvements, which will be done entirely by the company's own forces, will require an expenditure of $250,000.

PORT COLBORNE, ONT.—The Grand Trunk is making plans for building a new station and freight shed at Port Colborne. The work will probably be carried out by company forces.

POUGHKEEPSIE, N. Y.—A contract has been given to the Wells Brothers Company, New York, by the New York Central for building a passenger station and express building at a point north of Main street in Poughkeepsie. The building will have an elevation of 46 ft. on the east and 72 ft. on the west. It will be 63 ft. wide and 161 ft. long with an express wing 25 ft. by 79 ft, and will be of steel, concrete, brick and stone construction, with tile roof. (May 5, p. 1018.)

ROCHESTER, N. Y.—Plans have been approved by the city engineer, the New York Central and the Buffalo, Rochester & Pittsburgh for a subway to be constructed at Brown street. The work is to be carried out to eliminate a grade crossing, and will cost over $100,000. Contracts will be let as soon as the plans have been approved by the New York Public Service Commission.

ST. CATHARINES, ONT.—The Grand Trunk is making plans for a new station to be built at St. Catharines. The construction work will probably be carried out by company forces.

TIFTON, GA.—A contract is reported let to Little & Phillips, Cordele, Ga., to build the union station at Tifton for the joint use of the Atlantic Coast Line and the Georgia Southern & Florida. The station will be of brick construction and will cost about $25,000. (July 28, p. 174.)

TOPEKA, KAN.—The Atchison, Topeka & Santa Fe is adding three stories to its general office building. The structure is 150 ft. long and 75 ft. wide, and when completed will be 13 stories high.

Railway Financial News

BOSTON & MAINE.—This company has defaulted the semi-annual interest due September 1 on its outstanding $10,000,000 of 4 per cent 20-year plain bonds of 1926. No leased line stock dividends were due on that date, but interest on leased line bonds, including some of the Connecticut River road, was met.

Directors of the Boston & Maine, in a statement to the stockholders, defend the receivership petition, and ask proxies in connection with the special meeting to be held September 19. This meeting has been called in response to a petition from the Minority Stockholders' Protective Association.

CHICAGO, ROCK ISLAND & PACIFIC.—Foreclosure proceedings were filed in the United States District Court by attorneys for the Peabody committee, which represents the refunding bondholders. Members of the Amster reorganization committee declare that they will strenuously oppose the foreclosure bill.

NEW YORK, NEW HAVEN & HARTFORD.—Suit has been brought by five stockholders holding about $1,200,000 of stock for the recovery of nearly $300,000,000, alleged to have been squandered by the directors between 1890 and 1914.

PERE MARQUETTE.—The reorganization plan of this company has been approved by the Michigan Railroad Commission.

WABASH-PITTSBURGH TERMINAL.—Federal Judge Charles P. Orr in the U. S. District Court at Pittsburgh has handed down an opinion confirming the sale of the properties, which were purchased by the reorganization committee for $3,000,000. The action of the court set aside the objections of the Fearon committee, which claimed that the price was inadequate for the property acquired.

WHEELING & LAKE ERIE.—United States Judge Killits withheld his decision on the petition to reduce the price of this road from $18,500,000 to $2,000,000. The reduction in price was asked by the New York Trust Company, trustee for the bondholders. The road is in the hands of a receiver named by the federal courts, and a number of efforts to sell it at auction have failed.

DIFFERENCE IN TEMPERATURE CAUSES LOSS OF HEAT.—Loss of heat by radiation varies with the difference in temperature between the steam and the surrounding medium, the insulating quality or low conductivity of the covering and the amount of the exposed area. Variations in detail in different plants vary the monetary loss by radiation, but some idea of the magnitude of this loss in one plant may be gained from the statement that by the proper insulation of a pipe having an area of 65 sq. ft., carrying steam at 150 lb. pressure, with a room temperature of 65 degrees F., the condensation has been reduced from 74.40 to 11.58 lb. per hour. With coal at $4 per ton, and with an evaporation of 11 lb. of water per pound of coal, this would be equal to a saving of about 50 cents per year for each square foot of pipe.—*Power.*

SHELL V. LOCOMOTIVE MANUFACTURE.—That some concerns have lost money on their attempts to manufacture shells and fuses should have been no surprise. It was common knowledge nine months or more ago that the heads of some concerns had anathematized the day they closed such contracts, not because they considered it unneutral, but because they didn't thoroughly understand the business, and hadn't the skilled staff to supervise it. Some threw up their contracts last fall, when their sample shells were rejected. But that companies of the caliber of the locomotive companies, the electric companies, air brake manufacturers and so on couldn't master the intricacies of shell-making indicates a very low estimate of their industrial intelligence. All these companies face more difficult problems practically every day of their existence. In fact, if one were willing to be convinced, all he had to do was pause before the steam or electric locomotive that hauled his train each day to be satisfied that the difficulties of shell-making were as simple as a b c to designing and constructing a locomotive.—*Wall Street Journal.*

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The Railway Signal Association

The Railway Signal Association keeps up its reputation for solid work, despatched in a businesslike manner. The annual convention, reported in this issue, went off according to schedule, and at nearly all of the "division points"—the completion of discussion on a given committee report—was ahead of time. And this was not due to lack of material, but to the completeness of the work done by the committees. Many prominent members were absent, and the strike threat and infantile paralysis had caused the cancellation of scores of hotel reservations; but, as in former meetings, all interests were represented and no dictum of any committee "got by" unless it deserved to. The Journal of the association continues to be a useful compendium of current history. The report of Committee No. 8 at this meeting contains accounts of installations of alternating current signal apparatus on no less than 19 different lines—more than half of them standard steam railroads—all prepared by men thoroughly acquainted with their subject, and describing a great many novel devices and arrangements. Another example of the thoroughness of the Journal is to be found in an elaborate essay by F. L. Dodgson, filling 45 pages, on the efficiency of direct-current track relays of different resistances, and the susceptibility of such relays to foreign currents.

Seth Low and Railroad Labor Disputes

It may be said without exaggeration that Seth Low helped to make this country a better place to live in. A mere recitation of the various phases of his good work would make an impressive chapter in the history of municipal government. His influence as mayor of New York was national, not local. His work in connection with Tuskegee was of lasting benefit to this country as was also his work as president of Columbia University. It was principally due to the efforts of Seth Low and of Frank Trumbull, chairman of the Chesapeake & Ohio, that the Newlands act creating the board of mediation and conciliation was enacted and it was under the provisions of this act that Mr. Low and John H. Finley, president of the City College of New York, were chosen as the intermediate arbitrators to pass on the demands of the railroad conductors and trainmen in 1913-1914. Belief in conciliation was a fundamental part of Mr. Low's creed. He made a distinction between conciliation and compromise, however. He believed in effecting a settlement of differences in labor disputes and he recognized that labor as well as capital was out to get all that it could. He recognized the distinction between this attitude and the attitude of the socialists who want everything owned by the community and the still more revolutionary attitude of the I. W. W., that everything belongs solely to labor. Mr. Low believed that both sides were after all they could get and public interest demanded that no matter what the differences were they should be settled peacefully. In making the award in the conductors' and trainmen's arbitration, Mr. Low based his findings—Mr. Finley was guided largely by Mr. Low's judgment—not on general principles, but on an adjustment of differences. Just as the world needs fighters, men of single purpose who see on a right side and a wrong side to any question; so the world needs also men of Seth Low's type with broader, more philosophical vision. In his award in the conductors' and trainmen's case Mr. Low was wrong, a great many railroad officers believe, and Mr. Low in a postscript to the award acknowledged this himself in part. In his recognition of the interests of the public in the preservation of peace between railroad employees and the managements, he was at variance with some railroad executives. Even the gross injustice, which has just been done the railroads by President Wilson, did not shake Mr. Low's faith in the ultimate good that must result from a peaceful settlement of railroad labor disputes. Mr. Low was a big-hearted generous man, loved and respected universally.

Some Things That Are Not So

Among the many wild and ignorant statements made on the floor of Congress during the "consideration" of the "eight-hour" law and during its subsequent defense by democratic members, the blue ribbon should undoubtedly be awarded to Senator James A. Reed of Missouri, which is worth repeating as illustrating the amount of information on the subject possessed by some "statesmen" who voted for the bill. He said: "I talked with a man who is manifestly more than half a nervous wreck. He used to pull the Twentieth Century

Limited between Chicago and New York. He told me that by actual mathematics it could be demonstrated that upon that run the engineer holding that throttle had to read and record in his own brain six signals every second. Eight hours a day is long enough for that kind of labor. Eight hours is long enough for the passengers to ride behind a man under that kind of a strain." Senator Reed has apparently been listening to some of the talk of the brotherhood leaders, and has received the impression that the trainmen "pull" their trains without much assistance from the locomotive. He would probably be much surprised if informed of the actual facts, viz., that the engineers on the Twentieth Century are changed seven times in twenty hours between Chicago and New York; that not one of them runs for more than four hours a trip, and that each of them receives considerably more than a day's pay for each trip of three or four hours that he makes on the Century. He might pursue his investigation further and find that five hours, or 100 miles, is the basis for a day's pay for all passenger engineers on the eastern roads and that practically no passenger ever rides behind an engineer who works as many as eight hours a day. We do not blame the Senator for becoming excited about the six signals per second, but a little "actual mathematics" would have shown him that a train running 60 miles an hour traverses 88 feet in a second and he is doubtless enough of a traveler to know that the scenery along the New York Central is not obscured by a signal every 14 feet. The artless cerdulity shown by statesmen of the Reed and La Follette type when they are talking to members of the labor unions is only equalled by the impossibility of getting into their heads a single real fact or truth regarding railway matters.

FREIGHT CAR SITUATION GROWS WORSE

THE monthly bulletin of the Committee on Relations between Railroads of the American Railway Association for September 1, showed a gross shortage of 57,822 cars and a net shortage of 14,281 cars—the largest ever reported on that date. The only other net shortage previously recorded on September 1 was that of 1907, the first year of the compilation of these statistics, which was 10,400 cars. The car situation in that year continued to grow worse until October 30, when there was a net shortage of 86,811 cars. In commenting on the statistics for August 1 we pointed out the serious condition confronting railroads and shippers and urged their co-operation to make for the most efficient utilization of the car supply of the country. The September statistics indicate that there is further need for emphasizing what was said then. The statistics for car shortages and surpluses on September 1 for the last 10 years are as follows:

Freight Car Shortages and Surpluses on September 1

	Surplus	Shortage	Net Surplus	Net Shortage
1916	43,541	57,822	.....	14,281
1915	191,309	6,300	185,009	.....
1914	165,244	1,918	163,326	.....
1913	73,576	15,270	58,306	.....
1912	36,047	26,297	9,750	.....
1911	88,866	4,325	84,541	.....
1910	60,022	9,293	50,729	.....
1909	110,576	3,899	106,576	.....
1908	222,632	1,418	221,214	.....
1907	21,639	31,679	.....	10,040

The number of cars in service cannot be increased by any further orders the railroads may place with car builders. The problem to be solved by all concerned is to make the most of the equipment available. Since the large car shortage of 1906 the railroads have improved markedly in maintaining a rapid circulation of equipment. It is believed that greater efficiency can and will be achieved by the carriers in eliminating delays in shipments. The shippers, who are most vitally concerned, can do as much, if not more, to prevent the car shortage from seriously impeding business. Every effort should be made by shippers to keep cars moving by quick loading and unloading, and car space should be conserved by loading to capacity, if possible. No shipper can afford to assume a selfish attitude, as all cars held for an unnecessary length of time, either for storage purposes or on account of carelessness, will reduce the total number of cars available and make it increasingly difficult for all shippers to be supplied with sufficient cars.

REVENUES AND EXPENSES IN 1916

STATEMENTS of the revenues and expenses of railways for the whole of the fiscal year 1916 covering roads having annual operating revenues above $1,000,000 are now for the first time available. A compilation has been made by the Bureau of Railway Economics from the returns made by the railways to the Interstate Commerce Commission of the results for the month of June, thus completing the year.

Taken by themselves, or in comparison with the figures for the preceding year alone, these results seem to indicate an amazing degree of prosperity. Net operating revenue for June was $103,451,443, or $451 per mile of line, an increase of 24.6 per cent over the results for June, 1915. Operating income was $89,912,522, or $392 per mile of line, compared with $311 per mile of line in June, 1915, an increase of 25.9 per cent. This was in the face of an increase in taxes from $50 to $58 per mile of line, or 17.1 per cent.

The annual figures, however, are of chief importance. Total operating revenues during the fiscal year 1916 amounted to $3,396,808,234, an average of $14,818 per mile of line. Operating expenses were $2,220,004,233, or $9,684 per mile: and net operating revenue was $1,176,-804,001, or $5,134 per mile. Compared with the fiscal year 1915, the current year shows an increase in aggregate operating revenues of $508,359,921, or 16.9 per cent per mile. Aggregate operating expenses increased $188,807,393, or 8.6 per cent per mile; and net operating revenue increased $319,552,528, or 36.4 per cent per mile. Taxes increased $12,144,345, or 8.4 per cent per mile, leaving an increase in net operating income of $307,251,118, or 41.7 per cent per mile. The mileage covered in these returns is 229,229 miles.

Considered by sections and upon the per-mile basis, the operating revenues of the eastern group of railways increased 20.3 per cent; operating expenses increased 10.8 per cent; net operating revenue increased 45.0 per cent; taxes increased 5.6 per cent; operating income increased 52.4 per cent.

In the Southern district operating revenues increased 15.5 per cent; operating expenses increased 4.8 per cent; net operating revenue increased 44.6 per cent; taxes increased 10.8 per cent; operating income increased 51.2 per cent.

In the Western district operating revenues increased 14.0 per cent; operating expenses increased 7.9 per cent; net operating revenue increased 26.5 per cent; taxes increased 10.4 per cent; operating income increased 29.5 per cent.

The average mileage represented is 1,403 miles in excess of the average mileage represented in the results for 1915.

The comparative results in detail are shown in the accompanying tabulation, Table I:

Table I—Summary of Revenues and Expenses for the Fiscal Year 1916 Compared with Results for 1915

Compiled from monthly returns of the railways to the Interstate Commerce Commission and covering roads of Class I, i. e., roads with annual operating revenues above $1,000,000

Account	Amount, 1916	Per mile of line 1916	1915	Increase over 1915 Per cent
Total operating revenues	$3,396,808,234	$14,818	$12,678	16.9
Freight	2,409,393,699	10,511	8,720	20.5
Passenger	673,472,119	2,938	2,765	6.2
Mail	60,057,967	262	250	4.8
Express	81,014,684	353	303	16.6
All other	172,869,765	754	640	17.8

Total operating expenses	2,220,004,233	9,684	8,915	8.6
Maint. of way and structures	405,389,892	1,768	1,603	10.3
Maintenance of equipment	558,777,771	2,438	2,189	11.4
Traffic	60,604,496	264	261	1.4
Transportation	1,096,632,406	4,784	4,464	7.2
General	79,392,991	346	327	5.8
All other	19,206,677	84	71	17.7
Net operating revenue	1,176,804,001	5,134	3,763	36.4
Taxes	146,754,477	640	591	8.4
Uncollectible revenues	807,720	4	3	....
Operating income	1,029,241,804	4,490	3,169	41.7
Operating ratio—Per cent:				
1916		65.4		
1915		70.3		
Average mileage represented:				
1916		229,229		
1915		227,826		

The table shows an attractive column of increases, but in any real effort to determine the comparative prosperity of the railways the comparison will not be made with one of the worst of preceding years, as 1915 was, but rather with one showing a moderately satisfactory record. The fiscal year 1913 was such a period.

Comparison of the results of 1916 with those of 1913 shows clearly wherein the very substantial betterment of the record for last year largely consists. With an increase in total operating revenues of only 7.5 per cent, the roads yet showed net operating revenue 21.3 per cent better and operating income 22 per cent better than in 1913, but the increase in total operating expense was only 1.4 per cent. In other words, the improved showing for 1916 is due overwhelmingly to the greater efficiency of operation which the railways themselves have been able to bring about, and for which they are entitled to all the credit, and only in a comparatively small degree to the increased volume of business, which, especially under present conditions, is a highly adventitious circumstance. It is also to be noted that the railways performed their duty as citizens by contributing 14.7 per cent more in taxes than in the year 1913, though their average rate of taxation in the earlier year was abnormally high.

The statistics from which the above general conclusions are drawn are shown in Table II.

Taken by itself as a month which ordinarily does not show as good results as some of the months in the last half of the preceding calendar year the record for June is highly satisfactory. The total operating revenues for the month amounted to $298,907,697, an increase over 1915 of $49,412,652. Operating expenses were $195,456,254, an increase of $28,396,467. Net operating revenue amounted to $103,451,443, an increase of $21,016,185. Taxes were $13,411,539, an increase of $2,043,229, leaving $89,912,522 net operating income, an increase of $18,992,863. On a mileage basis, operating revenues per mile averaged $1,302, an increase of 19.0 per cent; operating expenses per mile averaged $851, an increase of 16.2 per cent; net operating revenue per mile averaged $451, an increase of 24.6 per cent; and net operating income per mile was $392, an increase of 25.9 per cent. Taxes per mile increased 17.1 per cent. This summary covers 229,589 miles of line, or about 90 per cent of the total steam railway mileage of the United States.

The results are shown in detail in Table III.

Table II Summary of Revenues and Expenses for the Fiscal Year 1916 Compared with Results for 1913

	1916		1913		Increase per mile over 1913	
	Amount	Per mile of line	Amount	Per mile of line	Amount	Per cent
Total operating revenues	$3,396,808,234	$14,818	$3,057,089,811	$13,781	$1,037	7.5
Total operating expenses	2,220,004,233	9,684	2,118,529,173	9,550	134	1.4
Net operating revenue	1,176,804,001	5,134	938,560,638	4,231	903	21.3
Taxes	146,754,477	640	123,682,118	558	82	14.7
Operating income	1,029,241,804	4,490	816,257,651	3,680	810	22.0
Average mileage represented	229,229		221,829			

Table III—Revenues and Expenses—June, 1916

Compiled from monthly returns of the railways to the Interstate Commerce Commission and covering roads of Class I, i. e., roads with annual operating revenues above $1,000,000

Account	Amount, 1916	Per mile of line 1916	1915	Increase over 1915 Per cent
Total operating revenues	$298,907,697	$1,302	$1,094	19.0
Freight	207,595,489	904	741	22.1
Passenger	61,548,716	268	246	9.0
Mail	4,999,116	22	20	5.4
Express	7,817,199	34	28	21.4
All other	16,947,177	74	59	24.7
Total operating expenses	195,456,254	851	732	16.2
Maint. of way and structures	38,580,593	168	150	11.8
Maintenance of equipment	48,954,679	213	176	21.2
Traffic	5,577,763	24	22	7.5
Transportation	93,831,731	408	349	16.9
General	7,316,048	32	29	9.5
All other	1,195,440	5	5	d 2.3
Net operating revenue	103,451,443	451	362	24.6
Taxes	13,411,539	58	50	17.1
Uncollectible revenues	127,382	1	1	....
Operating income	89,912,522	392	311	25.9
Operating ratio—Per cent:				
1916		65.4		
1915		67.0		
Average mileage represented:				
1916		229,589		
1915		227,966		

d Decrease.

By districts, operating revenues per mile of the eastern railways show an increase of 19.8 per cent as compared with June, 1915; operating expenses increased 20.9 per cent; net operating revenue increased 17.6 per cent; taxes increased 11.0 per cent; and operating income per mile increased 18.6 per cent.

In the Southern district, operating revenues per mile increased 18.4 per cent; operating expenses increased 6.4 per cent; net operating revenue increased 49.7 per cent; taxes increased 20.8 per cent; and operating income per mile increased 55.3 per cent.

In the Western district, operating revenues per mile increased 18.6 per cent; operating expenses increased 14.7 per cent; net operating revenue increased 26.1 per cent; taxes increased 22.0 per cent; and operating income per mile increased 26.9 per cent.

MORE LIES ABOUT RAILWAY SALARIES

THE American Railway Employees' Journal, in its September issue, publishes a table giving what it pretends to believe are the approximate salaries paid to the general officers of 225 railroads, in figures which would turn about 99 per cent of these officers green with envy if they were foolish enough to believe that many of the others were getting such big pay. For the refreshment of those who do not read that valued publication, but who may appreciate this opportunity to view their salaries through a magnifying glass, the table is reproduced herewith:

Railroad Official Salaries, 225 Railroads

Per annum, gifts and expenses	Average	
225 Presidents at	$75,000	$16,875,000
225 Assistant presidents at	20,000	4,500,000
225 General managers at	50,000	11,250,000
225 Assistant managers at	10,000	2,250,000
225 General superintendents at	12,500	2,712,000
225 Assistant superintendents at	5,000	1,125,000
900 Division superintendents at	5,000	4,500,000
900 Trainmasters at	3,600	3,240,000
225 General passenger agents at	40,000	9,000,000
225 General freight agents at	40,000	9,000,000
225 Traffic managers at	50,000	11,250,000
225 General attorneys at	25,000	5,625,000
225 Assistant attorneys at	10,000	2,250,000
		$83,577,000
"Good will" gifts will amount in one year to about		5,000,000
Annual expenses of these officers (low estimate)		25,000,000
Grand total		$113,577,000

"Of course, we know," the editor remarks, "that the exact

salaries are not known outside of the railroad official families, but enough is known to guarantee the above figures as being practically correct, though there are many railroad officials who are not enumerated in the above list, as we desire to stay within reason, considering the best information in hand."

As a matter of fact, the figures given are so wildly exaggerated that it is perfectly manifest that they are not based on any information whatever. The *Railway Age Gazette* is close enough to "railroad official families" to know that, with a very few exceptions on some of the largest railroad systems of the country, the salaries mentioned would be ridiculously absurd, even if stated as maxima instead of as averages. As to most of them, we have never heard of a single instance of an officer receiving a salary as high as that attributed to men of his rank in this table.

However, it is not necessary to take our word for it or to guess about it. The Interestate Commerce Commission has published sufficient data to show exactly what are the average salaries paid to railroad officers, and to demonstrate conclusively that even taking into consideration the high salaries paid to a very few, these averages are exceedingly modest. According to the Commission's latest detailed statistics on this subject there were 5,740 general officers on all the roads of the country in 1914, and their total compensation was $21,338,995, an average of only $3,717 a year. This includes all the classes of officers embraced in the Employees' Journal's list, and, in addition, some of the more highly paid classes not mentioned by it, such as vice-presidents, general counsel and the heads of the engineering and mechanical departments, as well as the majority who, of course, receive less than the average.

It will be observed that according to the estimate conceived in the flatulent imagination of the editor the first 450 officers, the presidents and their assistants, would have absorbed the entire compensation credited by the commission to all the general officers, leaving the remaining 5,290 with not a cent of income. The total salary list which he has concocted, excluding "gifts" and expenses, amounts to $83,000,000. Omitting the $9,000,000 of salaries which he credits to the superintendents, assistant superintendents and trainmasters, who are not general officers, leaves $51,000,000, which is entirely fictitious, to be divided among the 1,800 remaining officers on his list.

There may be one or two railroad presidents who receive $75,000 a year, but a large majority of those in charge even of 8,000 to 10,000-mile railroads receive far less than this, and the presidents of smaller roads do well when they get one-third to one-half as much as the figure mentioned. All the other salary figures given also are, as averages, wildly exaggerated. In most cases the classes of officers named receive only about one-fourth to one-half of the salaries stated, even on the larger roads.

A great many people like to answer almost any kind of an argument pertaining to railroad affairs with some poppycock about high salaries or watered stock, and they usually water the salaries even more than they claim the financiers have watered the stock. Many more waste time that might be more profitably devoted to getting their own salaries raised in figuring out how many automobiles they would buy if Mr. Rockefeller would only divide his reputed $1,000,000,000 among 100,000,000 people. The editor of the Employees' Journal reminds the public "that the above salaries all come out of your pockets." We have already shown that three-fourths of them do not come out of anybody's pocket, but out of hot air. For his benefit, let us refer to statement No. 24 of the Interstate Commerce Commission's Statistics of Railways for 1914, which shows that the total compensation for the year of all railroad officers, both general and other, including some that are less than the wages of some of their organized subordinates, amounted to just $45,586,150. This is less than the amount which Congress has just handed to the train employees to persuade them to kindly refrain from striking.

To have abolished the salaries of the officers of all of the railroads would have reduced the operating expenses of the roads by about 2 per cent. This is about half of the estimate given by our imaginative contemporary for a partial list of officers for 225 roads. And the figures of the Interstate Commerce Commission are for 1,297 operating roads.

This article in the American Railway Employees' Journal illustrates the monstrous and vicious lies on which railway employees are constantly fed by a large part of the journals published for their especial edification, and indicates one of the principal reasons why there is so much discontent and disloyalty among certain classes of employees.

SOME NOTES ON THE "BASIC EIGHT-HOUR DAY" QUESTION

THE questions raised by the wage controversy between the railways of the United States and their employees in train service have gotten into politics. Mr. Hughes, the Republican candidate for President, and Senator Borah and other leaders of the Republican party are vigorously denouncing the way in which the present national administration handled the crisis which this movement created. On the other hand, some of the Democratic newspapers and speakers are defending its course, and it is understood that when President Wilson takes the stump, he will do so. The *Railway Age Gazette* was discussing this matter before it ever got into partisan politics, and it intends to continue to discuss it until it is settled. This being the case, we feel that we should give some explanation of our position.

In the first place, this paper is not, and never has been, a political publication. It has been and is, however, devoted to the discussion of all matters pertaining to railway transportation, and when any such matter gets into politics it is within our province to continue to discuss it, to criticize those whose attitude toward it we consider unfair and unsound and to commend those whose attitude we consider fair and sound. In this connection it may be worth while to say that, so far have we been in the past from being antagonistic to the Democratic party or to President Wilson, that both the president of the Simmons-Boardman Publishing Company and the editor of the *Railway Age Gazette* voted for him for President in 1912.

In the second place, it is not true, as is so frequently charged, that the *Railway Age Gazette* is an organ of the railways. This paper is published by the Simmons-Boardman Publishing Company, a private corporation. Doubtless, the *Railway Age Gazette* is better informed regarding railway affairs in general, and the matters placed in controversy by this wage movement in particular, than any other publication, but at the same time it has no authority, direct or indirect, express or implied, to speak for the railways or any of them, and it has never done so and does not do so now. It tries to make the information it presents regarding railway affairs correct, and in this endeavor it receives the hearty co-operation of the railways, but the comment it publishes does not purport to express the views of any railway, officer or officers, and in many cases it is far from doing so. Some of our recent utterances on the methods used by President Wilson and Congress in dealing with the threatened strike have been condemned by some railway officers as unwise, and even unjust, but this paper is edited by American citizens who conceive it to be their duty to express their opinions regardless of the immediate consequences, and this is what we intend to continue to do.

The *Railway Age Gazette* in its issue for September 1 published an editorial entitled "Was It a Political Frame-

Up?" presenting a large amount of circumstantial evidence which seemed to indicate that the course of events leading up to the wage controversy passing into the hands of President Wilson, and the policy he adopted in dealing with it, were by no means accidental. This editorial has attracted widespread attention, and certain newspapers which are supporting Mr. Wilson for re-election have felt called upon to question the accuracy of our statements as well as the motives which prompted us in making them. The Knoxville (Tenn.) Sentinel refers to the editorial as a "Campaign Canard." It publishes a summary of it which first appeared in a leading newspaper of New York, and it refers especially to a letter written by a man in Washington on August 7 which was outlined in the editorial, without the author's name being given. It asks why the letter was not published until September 8, and says that the editorial "bears all the ear-marks of an anonymous and irresponsible libel."

If the Knoxville Sentinel was disposed to let its readers know all the facts indicating that there was a "frame-up," why did it not give all the evidence which the *Railway Age Gazette* presented, instead of confining itself to a single letter from which we quoted? Why, for example, did it not refer to the interview with Chairman Adamson, published in the Atlanta Constitution, while the matter was still in President Wilson's hands, in which Mr. Adamson stated that he had talked with the President four months before, and that the President decided at that time what he would do. Why did it not allude to the fact that the railways asked to have the wage controversy submitted to the Interstate Commerce Commission, and that the President wrote a letter to the president of the Boston Chamber of Commerce before he ever invited the two sides to the White House, going on record as being opposed to the plan which he knew that the railways would present to him? There were a number of persons mentioned by name in that editorial. Why did the Knoxville Sentinel confine its discussion to the single piece of evidence presented by us in connection with which no name was mentioned? If any one of the persons mentioned by name considers himself libelled he knows that he has recourse to the courts which try libel suits. The company which publishes the *Railway Age Gazette* is entirely responsible financially, and a proceeding in court would afford an excellent opportunity to compel a number of men to testify under oath as to whether there was a "frame-up" or not, and if so as to the details and participants.

The anonymous letter of which the Knoxville Sentinel complains is in no sense anonymous to the *Railway Age Gazette*. This paper knows when it was written, who wrote it and to whom it was written. The names of the writer and the recipient were not given because we were requested to keep this confidential, but, doubtless, in case of necessity they could be made available.

As to the relations between the national administration and the railway brotherhoods, certain highly interesting statements bearing on this phase of the matter appear in a circular sent out by the heads of the four labor brotherhoods from Washington on September 3, to all members of their organizations. In this letter they say: "On Friday, August 25, we requested the President to release us for the purpose of permitting the general chairman to go home and advised him that the railway officials then in Washington were familiar with our laws and customs *and knew that until the general chairman left Washington for home there was no probability of a strike.* We were requested to remain in Washington for at least 24 hours additional in the hope that the railway officials then conferring with the President would accede to his request. On Sunday, August 27, *after securing from the President what we believed equivalent to a release, the general chairmen left for their homes,* with the exception of a sub-committee consisting of one member from each of the associations for each of the organizations." The statement adds: "When it became known to President Wilson that the day and hour had been fixed for the strike to become effective he called the four chief executives (of the brotherhoods) to the White House and appealed to us to postpone the strike until he could present the matter to Congress for the enactment of some law on the subject."

The assertions, first, that President Wilson was advised that until the general chairmen left Washington there was no probability of a strike, and, second, that they left only after securing from him "what we believed was equivalent to a release" clearly imply that the President understood the significance of the exodus of the general chairmen from Washington on August 26. If he did, why was he surprised when he learned that the strike had been ordered? The *Railway Age Gazette* does not undertake to answer the question. Perhaps he wasn't so surprised after all. Perhaps there was merely a misunderstanding between him and the brotherhood leaders as to the intentions of the latter. Perhaps they intentionally misled him and in issuing their circular letter were merely trying to "save their faces" with their followers.

This paper stated in an editorial in its issue of September 8, regarding the counterfeit eight-hour day law passed, that "it is certainly the first law of such a character relating to the hours and wages of any class of employees of private business concerns ever passed in the history of the world." Confirmation of this statement has come from an unexpected source. Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers, has sent a letter dated September 11 and marked "confidential" to all the members of his brotherhood. In this he says: "Regarding the passage of the law, never before in the world's history have any working men, or union of labor, placed on the statutes of any country a law giving to the toilers a basic eight-hour day. It stands without a parallel."

The Congress of the United States has passed a law providing for an eight-hour day for employees in the service of the government. It has passed a law providing for an eight-hour day for men employed by concerns doing work for the government on contract. These laws were used by President Wilson and others as precedents in the argument for the so called "eight-hour day" which the brotherhoods were demanding, but now that the brotherhoods have got the "basic eight-hour day" enacted into law, Mr. Stone says that there never was such a law passed and "that it stands without a parallel."

Of course, the feature of it which stands without parallel is that it does not provide for an eight-hour day at all but, as Mr. Stone says, for a "basic eight-hour day" and that, therefore, although it purports to fix a working day of eight hours, it will not reduce the working day of a single human being, but will merely give those for whom it was passed an increase in wages at the expense of the public. It will be noted that in his letter Mr. Stone does not give Congress any credit for having passed the law, but implies that it was placed on the statutes by the labor unions. As to this matter he is quite right. Congress was merely the amanuensis of the labor unions.

In his letter to his followers Mr. Stone adds that it has been arranged to send "a reprint from the Congressional Record of September 1 and 2 of all the speeches made in both the House and Senate by our friends and enemies for and against the enactment of a law. We do this," he adds, "not in the interest of any political party but in order that you may have the true facts in the case. We believe the time has arrived when labor should know who is friendly to its interests and who is not. Important legislation will take place at the next session of Congress. It is important to you that men be elected who are friendly to you."

Of course, Mr. Stone did not send this letter out in the interest of any political party. Perish the thought! And,

of course, the fact that the heads of the brotherhoods are sending out circular letters to their followers strongly indicating to them how they should vote and that officers of their grand lodges are going all over the country during the political campaign attending lodge meetings and telling how the basic eight-hour day law was put over and indicating specifically who were the "friends" and the "enemies" of the brotherhoods at Washington has no political significance whatever. In fact, it is conclusive disproof of any imputation that there was a political frame-up, the terms of which the national administration on one side and the labor brotherhoods on the other have been diligently carrying out. Meantime, who do the other 80 per cent of railway employees and the general public think were their "friends" and their "enemies" when this law "without a parallel" was passed?

The *Railway Age Gazette* in a recent editorial recommended the entire abolition of the mileage basis of pay in train service. It contended that the railroads should take the stand from now on that if they must pay a day's wage for eight hours' work they must have at least eight hours' work for a day's pay. The Hartford (Conn.) Courant commented on this statement as follows:

"It has been said that the hours of employment in railroad service depend so much upon the length of the run that it is not always practicable to define the length of the day, but apparently this is a fallacy and, if it is, it should be discarded."

It appears that the meaning of our remarks was not clear to our contemporary and should be explained. It is not practicable in railway train service to establish an arbitrary working day of eight hours. The distances between the terminals between which trains must run vary considerably and the speeds at which trains can be run between the same terminals also vary greatly. Suppose, for example, we have a distance between two terminals of exactly 100 miles. A passenger train may easily make this run in three hours, and if it does the train crew under existing contracts earns a day's wage in three hours, because wages in train service are based on miles as well as hours. A through freight train may require eight hours to get over the run. A way freight train may require 12 hours. Now, it would be physically impracticable to reduce the running time of the way freight from 12 hours to eight hours, and if under the new law its running time should remain unchanged the railway would pay the train crew a day's wage for the eight hours it was on the road and half a day's wage for the remaining four hours. To the crew of the through freight which made the run of 100 miles in eight hours it would pay exactly a day's wage. But how about the crew of the passenger train which now makes the run in three hours and gets a full day's wage for it? How about the crew of a freight train handling perishables which may run the 100 miles in six hours, and under present arrangements gets a day's wage for it?

What the *Railway Age Gazette* meant was not that the running time of the way freight should or could be reduced to eight hours, but that its train crew should be paid overtime for the extra four hours, and that at the same time the working day of all employees who now receive on the mileage basis a day's wage for working less than eight hours should promptly be increased to eight hours a day. If the railways must pay a freight conductor a day's wage for eight hours work, why should they not be entitled, if he runs 100 miles in six hours, or if a passenger conductor runs 100 miles in four hours to compel them both to stay on the job until they have worked eight hours? Is not eight hours work for a day's pay the natural corollary of a day's wage for eight hours work?

It is an interesting question whether the "basic eight-hour day law" does not, as a matter of fact, require the railways to exact eight hours' work from every employee directly concerned in the operation of trains. This point is discussed in an address made by Samuel O. Dunn at the recent dinner of the Railway Signal Association, an abstract of which is presented in another column. There are some precedents bearing on that phase of the subject which are important, but which are not alluded to in that address. In 1907 Congress passed the "hours of service" law, the intention of which was absolutely to limit hours of work in train service. This act made it unlawful for any train employee concerned in the operation of trains "to be or remain on duty for a longer period than 16 consecutive hours," and provided that no train despatcher or telegraph operator sending orders pertaining to train movement should be "required or permitted to be or remain on duty for a longer period than nine hours in any 24-hour period." Here Congress meant to fix the *maximum* number of hours that these employees could be kept at work, and it expressly provided that they should not be kept on duty for longer periods than those mentioned.

If in passing the "eight-hour basic day law" it had meant to provide merely that *no longer period* than eight hours should be taken as the basis for computing daily wages, it is to be presumed that in accordance with the precedents set in the hours of service law it would have said so. But it did not say so. It said not that eight hours should be taken as the maximum basis, but that it should be taken as the exact basis—both minimum and maximum.

Suppose, now, that a passenger conductor makes a run of 100 miles in three hours and a railway should attempt to pay him a day's wage for doing so. Is it not clear that it would not be taking eight hours as a basis and that, therefore, it would be violating the law?

The *Railway Age Gazette* has said that if this law is maintained by the courts, the railways ought to exact at least eight hours work before paying any man a day's wages. It looks very much, from a more careful reading of the law, as if they not only ought to, but that they are required to.

We suggest, in view of these facts, that Mr. Stone and his fellow labor leaders might well put the soft pedal on boasts about having secured the enactment of a law "which stands without a parallel" until they find out what it really means. Perhaps if it is found that it means that passenger engineers in Eastern territory who are now on a daily basis of five hours or 100 miles, and passenger engineers in Western territory who are now on a basis of five hours and forty minutes or 100 miles, have got to begin working eight hours before they can get a day's pay, there will be some feeling within the brotherhoods which will make both their members and Mr. Stone much less happy than he apparently was when he wrote his letter!

NEW BOOKS

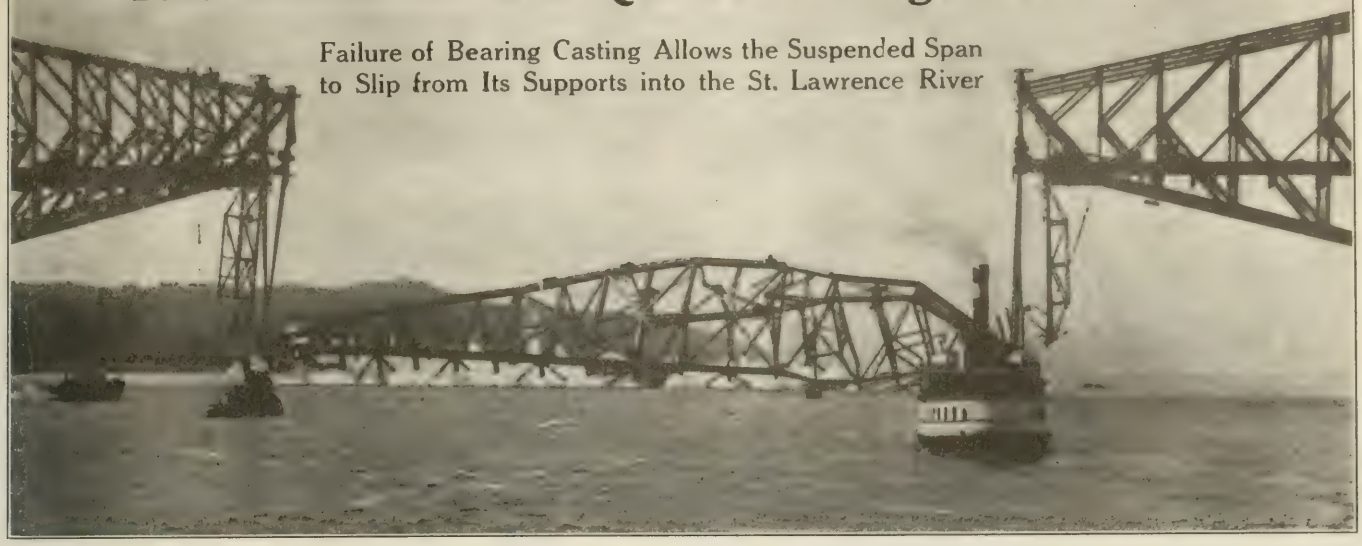
Universal Directory of Railway Officials, 1916. Compiled under the direction of S. Richardson Blundstone, editor of the Railway Engineer. Bound in cloth; 604 pages; size 6 in. by 9 in. Published by the Directory Publishing Company, Ltd., 15 Farrington avenue, London, E. C. Price, 10s.

Now that American railway supply firms ae seeking a market for their goods on the railways of foreign lands, this book will have an added use that was perhaps not contemplated by its compilers. The book is very similar to our own Pocket List, but, of course, has a much wider field. It contains the names of all the railways of the world, arranged alphabetically by countries and continents. For each railway it gives the following information: mileage, gage, equipment in cars, locomotives, motor buses, steamboats, lighters, etc., as well as the names and addresses of all the principal officers. To facilitate reference there is an alphabetical list of all the railways of the world and a similar list of all the officers whose names are given in the book.

The present number appears in the twenty-second year of publication. Owing to the war, it is not quite complete, the sections relating to the railways of Austria, Belgium, Bulgaria, Germany, Hungary, Serbia and Turkey having been omitted and those relating to the railways in certain parts of France and Russia not having been corrected.

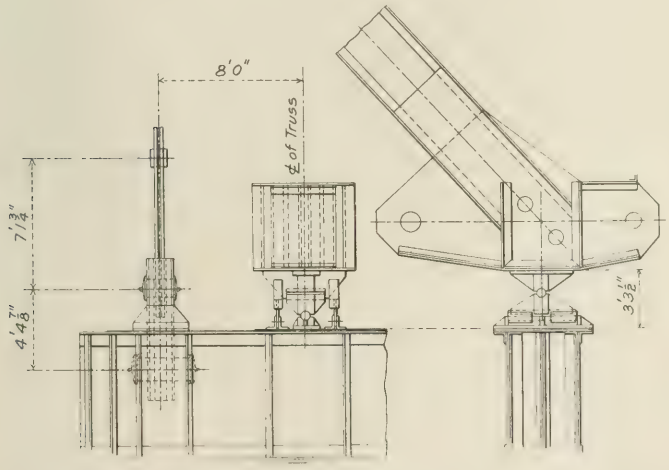
The Cause of the Quebec Bridge Disaster

Failure of Bearing Casting Allows the Suspended Span to Slip from Its Supports into the St. Lawrence River



The Span at the Moment of Collapse, Showing the Southwest Corner Under Water Before the Other Three Had Left Their Supports. Photo copyrighted by International Film Service.

WHEN the suspended span of the Quebec bridge fell into the St. Lawrence river on September 11, it was assumed that no evidence as to the cause of the accident was left above the water. Later investigations of the hoisting equipment have shown the contrary to be true and reveal exactly how and why the span fell. These investigations show conclusively that the collapse was due to the failure or breaking of the southwest supporting bearing allowing the span to drop down on the hoisting girder. The impact set up a rocking movement in this girder, which was kicked back in a southwesterly direction, and allowed the span to slip entirely from its support at this point. Immediately afterward it pulled or twisted away from its other supports and disappeared into the water. The manner of failure can best be shown by first describing the hoisting equipment.



Detail of the Lifting Girder, Showing the Casting That Failed

The Hoisting Apparatus

The hoisting apparatus consisted of a pair of supporting girders 6 ft. 11½ in. deep and 25 ft. long, braced together by bearing and pin-connecting diaphragms and cover plates which were placed under each corner of the span. The plate-lifting chains were pin-connected to these girders and were also riveted to the same girders and passed up through a set of upper and lower jacking girders to which they were alternately pin-connected as the jacks between the upper and lower jacking girders were operated. These jacking girders were each made up of two plate girders 9 ft. deep and 22 ft. 6 in. long, connected by cross bearing diaphragms and cover plates. The upper jacking girders were movable and slid up and down in the stiff built-up guides which were riveted into the lower jacking girders, passed up through the upper jacking girders and connected to the stiff hangers which led on up to the upper supporting girders. These upper supporting girders were placed on top of the CUO joints of the cantilever arms, and were of similar construction to the lower supporting girders. The load of the span was transferred to the upper and lower supporting girders by means of cast steel rocker bearings designed to allow the span to sway in any direction under the influence of external forces from the current and wind which might have acted while the span was being hoisted.

The total load carried by the hanger chains while lifting the span was 5,147 tons. The supporting girders, hanger chains, jacks and jacking girders and all their connections were designed throughout to carry this lifted load plus 20 per cent impact.

The work of hoisting was done by eight 1,000-ton hydraulic jacks, placed two at each corner of the span. These jacks were operated under a pressure of 4,500 lb. per sq. in., the water being supplied to them by a pair of direct-acting double plunger pumps operated by compressed air and located on the center line of the bridge floor at the ends of the cantilever arms. Valves placed in the feed pipe lines in front of the pumps controlled the water supply sent to each corner of the span. By this means and with the aid of an indicator, which showed any difference in elevation between the two sides of the span, it was kept approximately level. Another set of valves with a similar indicator attachment was located in front of each set of jacking girders and controlled the water supplied to each separate jack, by means of which the jacking girders were kept horizontal.

At 8:30 a. m. the tide had dropped sufficiently to make the pins bear at the ends of the slotted holes in the hanger links and the links themselves had straightened out. At 9 o'clock the tide had fallen about 1½ ft. further and the first jacking operation was commenced. Each operation of the jacks lifted the span 2 ft. During the lifting or upward stroke the 12-in. pins engaged the hanger chains through the dia-

phragms in the upper jacking girders. At the finish of the stroke the pins were entered in the diaphragms of the lower jacking girders to engage the hanger chains. The upper pins were then removed, the jacks and upper girders lowered, the upper pins again entered, the lower pins removed, and the jacks again operated. The first operation of the jacks was completed in 15 minutes; the second and third operations in about 13 minutes each. At the end of the third operation the span had lifted clear of the scows and the scows had drifted away and were taken care of by the waiting tugs, leaving the span supported entirely by the hoisting apparatus on the ends of the cantilever arms.

The Collapse Occurs

The sixth stroke had been completed and while the upper jacking girders were in the act of being lowered the cast steel bearing on the lower lifting girder supporting the span at the southwest corner failed. The span slipped off the support at this corner, and the sway and lateral bracing then collapsed, precipitating the span into the water. As it fell it turned over to the west and plunged to the bottom of the river, where it lies a mass of twisted steel, 200 ft. below the river surface.

The casting which failed and was the cause of the dis-

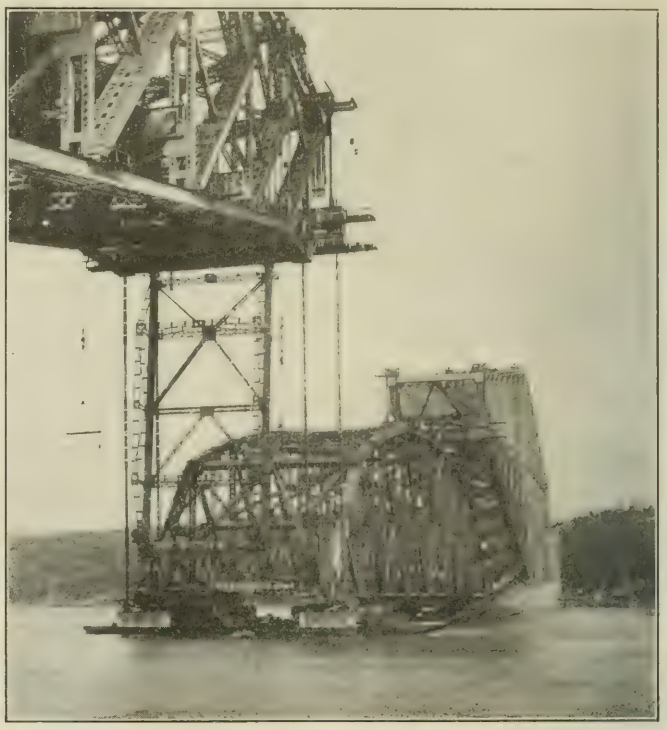


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The Cantilever Arm With the Mooring Truss Ready for Attachment to the Suspended Span

aster was a universal joint required during the erection of the span and during the time it was supported on falsework awaiting movement to the bridge. As shown in one of the drawings, it consisted of a steel shoe casting with a pin groove extending parallel to the bridge, carrying a pin 9½ in. in diameter and 46½ in. long. Another steel casting was supported on this pin and it in turn carried a transverse pin 8 in. in diameter and 26¾ in. long on which rested the upper shoe, supporting an end post of the suspended span.

From examinations of the hangers since the accident, it is evident that the intermediate or roller casting under the southwest hanger gave way. The fracture of the front lower pin bracket of this rocker threw the lower pin out of service and the concentration of the 1,200-ton load on the remaining pieces crushed and tipped the remainder of the rocker, at the same time kicking out the swinging girder and allowing the corner to fall. With the supports at this corner gone,



The Suspended Span In Position Ready for Hoisting. The Load Is Still on the Scows

the long, heavy span could not maintain its equilibrium and it dropped into the river.

As the load of the span was suddenly released from the ends of the cantilever arms these arms whipped back, vibrated and swayed to such an extent that a number of the workmen, engineers, and visiting members of the engineering profession, assembled to view the hoisting of the span, were thrown off their feet. These vibrations lasted for some seconds, and then gradually subsided, leaving the anchor and cantilever arms in the same condition as they were before they had taken the weight of the span. Check elevations have since been made and it has been established, after examination, that these arms are apparently uninjured in any manner, after having been subjected to a more severe test than would have been possible under ordinary service conditions.

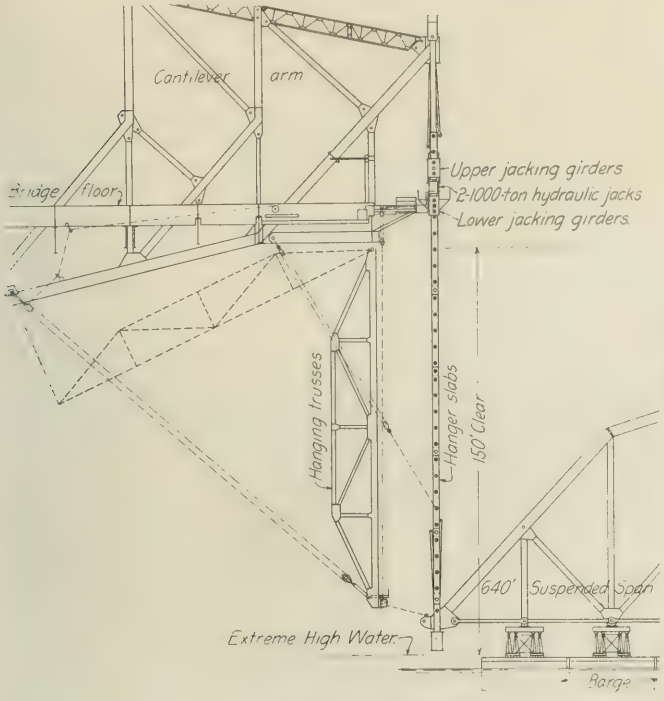
The workingmen who were on the suspended span when it fell were thrown into the water. Of these a number were saved by the small boats, but some 10 or 11 have not since been accounted for.

Erection of the Suspended Span

The erection of the north shore anchor and cantilever arms of the Quebec bridge was completed by the close of the season of 1915, the greater part of the steel for the anchor arm having been placed during 1914. The south shore anchor arm, including the main vertical post over the main pier, was also completely erected during 1915; and the assembling of the south shore cantilever arm proceeded as

soon as the season of 1916 opened. This arm was completed by July 28, 1916, when the main bridge was practically ready for the floating in and hoisting into place of the 5,000-ton suspended span.

The erection of the suspended span was carried on at the same time as the erection of the south cantilever arm, the erection site being located in the shallow waters of Victoria cove on the north shore of the St. Lawrence river, where the bed of the river is exposed at low tide. At this point there is a daily range of from 12 to 16 ft. between high and low tides. For this reason it was necessary to build a trestle



The Hoisting Apparatus

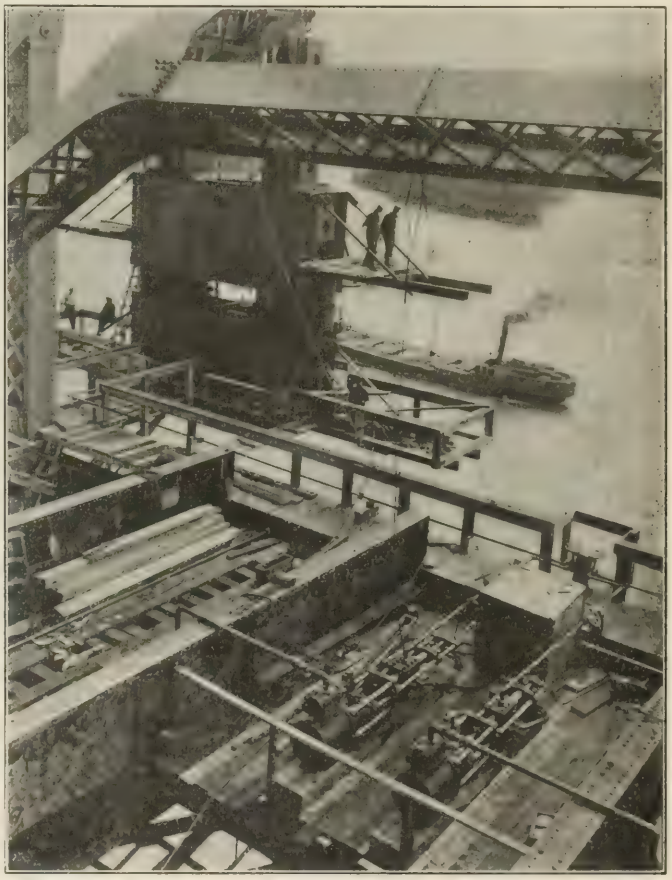
approach to the span, about 750 ft. long. This approach was made up of plate girder spans supported on wooden trestle bents, the spans varying in length from 75 ft. to 85 ft., centre to centre of supporting bents. The plate girders used for this approach track were the same ones that had been used on the anchor arm floors to carry the traveler track during the erection of these arms.

The suspended span trusses were of the Pratt truss design with curved top chords. The length, centre to centre of end eyebar suspenders, was 640 ft. and the width centre to centre of trusses was 88 ft. The trusses were 70 ft. deep at the hip and 110 ft., centre to centre of chords at the middle of the span. The main panel lengths varied from 65 ft. at the end of the trusses to 80 ft. for the centre panels. Each of the main panels was divided into sub-panels, the sub-panel floor load being transferred to the main panel points by means of a sub-tension vertical and a sub-compression diagonal in each main panel. The main diagonals of the web were primarily tension members, while the main verticals were designed to take principally compression stresses, except the verticals coming in at the hip joints, which were main tension members. Reversal of stress under live load occurred in the three main panels at the centre of the span.

Like the main bridge, the suspended span was designed to carry a double track railway floor, with two 5-ft. sidewalks. The tracks, which were spaced 32 ft. 6 in. centre to centre, were carried by four lines of through plate girders with sub-floorbeams and eyebeam track stringers. On the outside of each track, and carried by cantilever brackets attached to the outside through plate girders, were located the two 5-ft. sidewalks with handrails and 3½-in. concrete floors.

For the bottom chords and for the first main tension diagonals of the web, eyebars were used; all the remaining truss members were of built-up construction. The top chords were pin-connected at all the main panel points with shop or field splices at the intermediate sub-panel points. The web members were connected and riveted together at the main panel points of the top and bottom chords by means of gusset plates which engaged the pins of the top and bottom chord members. The bottom and top lateral systems, as well as the sway bracing located at each main compression vertical, were of the double intersection type with a floorbeam or strut at each panel point, each member being designed to take either tension or compression. All truss members and all members of the lateral system were manufactured, shipped, and handled, in sub-panel lengths.

Nickel steel was used for all parts of the trusses and bracing, except for the top lateral and sway bracing systems and the minor truss members, which carried no moving load stresses, where carbon steel was used. The greatest area of the top chord members was 434 sq. in. and in the centre panel of the bottom chord eyebars 311.5 sq. in.



The Jacking Girders Showing the 1000-Ton Jacks in Place

The span was supported during erection on staging bents located under each panel point. Each bent was built of two columns, spaced 6 ft. centre to centre and tied together by lacing angles and diaphragms. The bents rested on concrete foundations which had been prepared for them during the season of 1915 at periods of low tide. The preparation of these foundations and also those supporting the bents for the approach tracks was slow work, owing to the fact that progress could only be made during two or three hours of each day when the bed of the river was exposed by the falling tide.

The excavations for the foundations were mostly in rock, red shale, and sillery.

The outside columns of each bent were designed to take the weight of the bridge material, the reaction of the traveler from its own weight, and the lifted loads, and the vertical reaction from the wind on traveler and span. The inside columns of each bent were assumed to take care of the overturning effect from transverse wind shear applied at the top of the bent. Bracing placed in the plane of the outside columns of the bents, in the end panels and centre panels, resisted the longitudinal wind on the traveler and span.

The lengths of the members of the trusses as manufactured in the shop were calculated so that the trusses would have their geometrical shape after the span was erected and carrying its full dead and live loads; that is, the main truss members would be straight between main panel points, except for the effect of end moments due to pin friction and the consequent prevention of free turning on the pin. On account of this shop camber the faced ends of the top chords, where these members were spliced in the field, would not come to a square bearing when first put in place in the span. In order to obtain a square bearing at these points before riveting on the splice material, a special method of erection had to be adopted.

Sandjacks were placed on top of the outside columns of the staging bents, at the main panel points, the main vertical posts of the span bearing on these jacks. At the sub-panel points, and between the inside columns of the staging bents and the floorbeams, wood blocking was used in place of the sandjacks. The elevations of the bottom chord panel points during erection were calculated to suit the manufactured length of the truss members, or, in other words, the camber of the truss. The span being completely erected, except for the riveting of the top chord splices, which had only been bolted up with 50 per cent of the field holes filled with bolts, the timber blocking between the floorbeams and inside columns of the staging and also between the sub-verticals and outside columns of the staging was removed, and the sandjacks were lowered until the span rested on its bearings at the end staging bents, which then carried the full dead load, the nuts on the bolts in the top chord splices were loosened and the bearing surfaces allowed to come squarely together, the lengths of the sub-struts supporting the chords at the splices having been calculated so that the chords would be straight between main panel points for this condition. The chord splice material was then fully riveted.

Floating the Span

As soon as the suspended span was completely riveted up and rested on its end supports, the six scows which were used to transport the span to the site of the main bridge were floated into place under panel points L1, L2, L3, L15, L16 and L17, and, as the tide lowered, they came to a bearing on the concrete and timber beds provided for them. These scows were provided with a number of bottom valves of sufficient flowing area to allow the water to enter or drain out as fast as the tide rose or fell. These valves were opened as soon as the scows were placed in position under the span and remained open until the time of floating off arrived in order that the span would not be disturbed by the daily rise and fall of the tide.



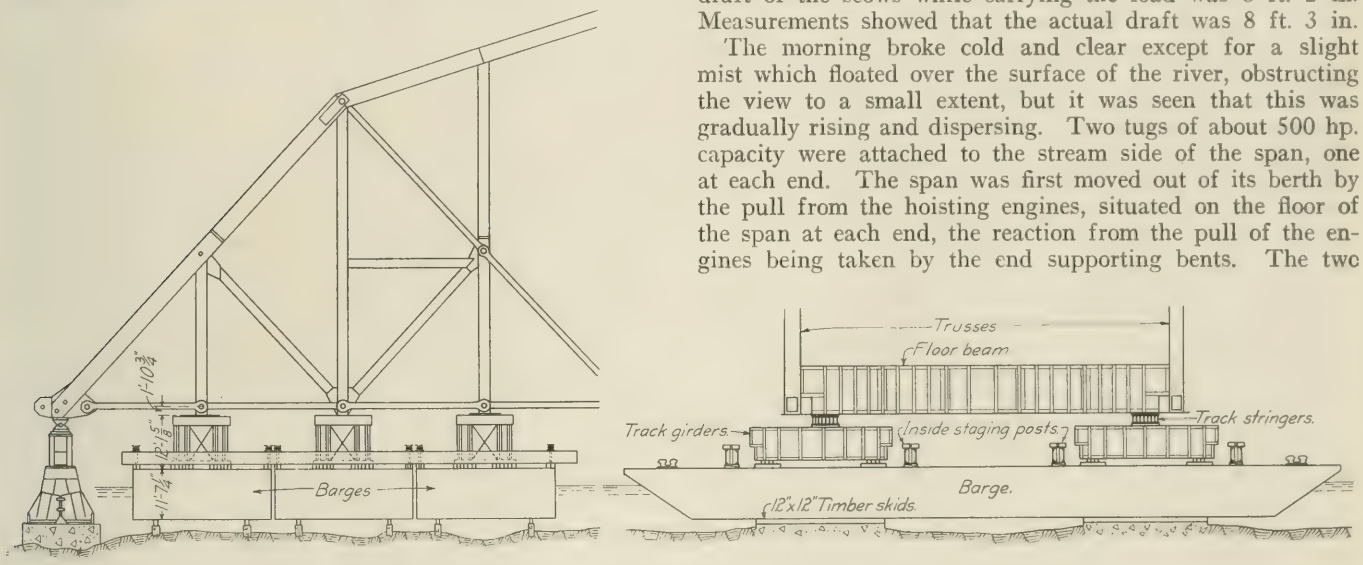
Rescuing Survivors After the Collapse

These scows were specially designed to suit the requirements of loading and the possible condition of the surface of the river during floating in operations; also so that they could be used for freight carrying purposes after their work of floating in the suspended span had been completed. In order to reduce the effect of wave action on the sway and lateral bracing of the span while floating, long and narrow scows would preferably have been used. The scows as built were 32 ft. 5½ in. wide, 164 ft. 6 in. long, and 11 ft. 7½ in. draft over bilge timbers. The framework for each scow is made up of three longitudinal steel trusses, spaced 10 ft. 6 in. centre to centre and braced together by four watertight steel bulkheads, with intermediate cross-frames between the bulkheads, spaced 8 ft. 4 in. centre to centre. The timber covering is made up of 11½ in. by 5½ in. cross beams, spaced 2 ft. 9 in. centre to centre and bolted to the steel framework of the scow and 4-in. planking spiked to these cross beams

with three ⅜-in. by 7/16-in. boat spikes at each intersection.

The load of the suspended span was transferred to the bulkheads by means of the cross girders and eyebeams. The bulkheads transferred this load to the longitudinal trusses of the scows which distributed it over the length of the scows. These eyebeams and cross girders were part of the permanent floor material of the span, the greater part of the floor steel and the railway track floor, except the main floorbeams, being left off during the operation of floating in and hoisting into place of the span. This floor material was to be placed afterwards by means of derrick cars. After placing these cross-girders and eyebeams in position they were firmly shimmed against the bottom flanges of the floorbeams from which they received their load. The total load carried by one scow under these conditions was 970 tons, distributed over four bulkheads; the draft of the unloaded scow was 1 ft. 6 in., and when carrying the load of 970 tons, 8 ft. 2 in.

The stresses in the truss members of the span while it was supported entirely by the scows were such that a tension connection had to be provided at the hip joints of the trusses. The truss members directly over the scows were also specially designed and stiffened to take reversal of stress while floating the span, and the bottom chord eyebars in the two main panels at each end of the span were stiffened temporarily with longitudinal timbers and transverse blocking and bolts.



Part Elevation and Section of the Suspended Span in Position on Scows

The three scows at each end of the span were braced and lashed together by four transverse girders, spaced about 42 ft., centre to centre, over the length of the scows and continuous over the three scows. These girders were connected to the steel cross frames of the scows, the girders and connections being designed to resist the stresses arising from the action of a 4-ft. wave having a length of about 40 ft. from crest to crest.

To keep the span in its position until the final decision to float away was made, timber bents were placed between panel points L0 and L18 and the adjacent scows, and also bents on the shore side of the span against which the scows guided themselves as the span was raised from its supports. These timber bents were loaded with rails to take care of the friction arising from the rubbing of the scows.

It had been decided to float the span on the morning of September 11, provided suitable weather conditions were predicted and existed. On September 10, at 11 a. m., the Weather Bureau at Toronto telephoned that there was a centre of low pressure over the western provinces, Saskatchewan in particular, the barometer reading there being 29.4 in., and that a centre of high pressure existed over the provinces of Ontario and Quebec, the barometer reading in these localities being 30.4 in. The forecast for wind was a fresh breeze from the northeast of about 20 miles an hour velocity. On the evening of September 10, at 11 p. m., the report came from Toronto of the existing meteorological conditions and the wind velocity forecast for the morning of September 11. The centre of low pressure had moved from Saskatchewan to Brandon, Manitoba, in twelve hours, the barometer reading being 29.18 in. The centre of high pressure was still over Ontario and Quebec, the barometer reading being 30.46 in., and the forecast for the wind was moderate easterly winds with a velocity of from 12 to 14 miles per hour. The electric storm detector at the bridge site showed no indications of any coming disturbances, and the night was clear and cold, with practically no wind. It was, therefore, decided to float the span.

The scows had all drained by 11 p. m. on September 10 and the tide was still falling. The valves in the bottom of the scows were, therefore, closed between 11:45 and 12:45 o'clock midnight. The tide gradually rose and at 3:30 a. m. the span was floating free of its end supports, the whole structure being carried by the scows. The calculated draft of the scows while carrying the load was 8 ft. 2 in. Measurements showed that the actual draft was 8 ft. 3 in.

The morning broke cold and clear except for a slight mist which floated over the surface of the river, obstructing the view to a small extent, but it was seen that this was gradually rising and dispersing. Two tugs of about 500 hp. capacity were attached to the stream side of the span, one at each end. The span was first moved out of its berth by the pull from the hoisting engines, situated on the floor of the span at each end, the reaction from the pull of the engines being taken by the end supporting bents. The two tugs took up the slack in their towing cables of about 3 in. in diameter at 4:38 a. m. and the span gradually moved out at the rate of about 10 ft. a minute. By 4:50 a. m. the span had moved 88 ft. and was clear of the supporting bents. Four minutes later the shore lines were cast off, except the one leading down stream which held the span against the four-mile upstream tidal current, and as the span moved out it swung about the anchorage point of this line as a centre. As the immense structure floated out there was not the slightest indication of any swaying or rocking motion, and it was practically as steady as if it had been resting on a solid foundation.

At 5:05 a. m. two more tugs took hold of the barges on the stream side of the span, one at each end. These tugs were of approximately 500 hp. capacity. At 5:13 the span had pivoted about the anchorage point of the mooring line until it was at an angle of approximately 45 deg. with the line of flow of the current. The mooring line was then cast off, and at this time a fifth tug of 1,000 hp. capacity with a 4½ in. hawser took hold of the middle of the span on the stream side. Five tugs were now holding the span against the pull of the tidal current, the tide being now at full flood and running up stream with a velocity of 4 or 5 miles per hour. Two more tugs of 500 hp. capacity prepared to take hold of

the scows on the opposite or upstream side of the span. Communication with each end of the span and the centre was kept up by telephone and the orders to the tugs were given by megaphone. At 5:22 a. m. the span was practically normal to the line of flow of the current, and began to float upstream under the restraint of the five tugs on the downstream side. At 5:23 the sun rose over the eastern hills and the mist gradually dispersed before a slight east breeze of about two to three miles per hour velocity. By 5:30 the span was moving upstream at a rate of about two miles an hour, the velocity of the current being about four miles an hour.

Ranges placed at measured distances apart along the shore recorded the advance and rate of progress of the span on its journey to the bridge site. The first range was passed at 5:33 a. m. and the second at 5:44 a. m. The distance between these ranges was 1,700 ft. and the rate of speed of the span had been 1¼ miles per hour. The distance between the second and third ranges was 2,460 ft. and the third range was passed at 5:53, the average speed of the span between these two ranges being 3 miles per hour. The distance to the fourth range was 4,200 ft. and it was passed at 6:05 a. m. at a speed of about 4 miles per hour. A float thrown out in front of the span showed the speed of the current to be between 4 and 5 miles per hour, and the span followed this float very closely until the seventh range was passed. At the seventh range the speed of the span was checked and it was brought practically to a standstill for a moment in order to show that the tugs had perfect control of the floating structure. It took approximately 3 minutes to stop the span. The span was then about three-quarters of a mile from the main bridge site, and from then on was allowed to move slowly forward at a speed of about 2 miles an hour, and as it approached the space between the two cantilever arms it was lined up parallel to the main bridge by ranges on the shore and normal to the bridge by centering targets suspended by wires at the middle of the opening between the cantilever arms.

At 6:50 a. m. the span arrived at the bridge site and the mooring lines were connected up to the cast steel snubbing posts located at each of the four corners of the suspended span. These 1¼ in. steel mooring ropes, eight in number, four at each end of the span, were calculated to take a pull of 75,000 lb. each and passed through sheaves at the lower corners of the mooring trusses and from there up to a nine-part ¾-in. wire rope tackle which led back to the drums of the derrick hoists, situated on the bridge floor at the ends of the cantilever arms. The span was pulled directly under its final position in the bridge by means of these 1¼-in. ropes and the derrick hoists. The hanger lifting chains which were to raise the span were then lowered and connected through the slotted holes at the lower ends to the pins at the top of the short hanger links connecting to the supporting girders under the end corners of the span. This connection was made at 7:40 a. m., when the current was practically at zero—that is, the tide had turned and the current was about to change from a westward to an easterly flow.

The mooring frames were made up of two steel trusses braced together, the bracing being designed to take a transverse pull from each end of the suspended span of 300,000 lb. They were pin-connected to the cantilever arm floor beams so that by means of the nine-part ⅞-in. wire rope tackle leading from the lower corners of the trusses to the connection to the floor between panel points CF5 and CF6 of the cantilever arm and from there to the main hoists, situated on the bridge floor, they could be raised so as not to obstruct the channel unnecessarily.

The hanger chains at each corner of the span were made up of four slabs to each chain, each slab being built up of two 30-in. by 1⅛-in. carbon steel plates. The slabs were manufactured and shipped in lengths of about 30 ft. centre to centre of end connecting pins. They were controlled, after being suspended from the jacking girders located at the elevation of the bottom chords of the cantilever arms, by means of a two-part tackle connecting to the cantilever arm trusses at the panel point CL2. The hoisting apparatus and the methods followed in jacking the span are fully described earlier in this article.

THE "EIGHT-HOUR" LAW IN THE POLITICAL CAMPAIGN

By H. F. Lane

WASHINGTON, D. C., September 19, 1916.

As was expected, the action of the national administration in allowing itself to be bluffed—if it was bluffed—by the railroad train service brotherhoods into legislating them an increase in pay for from seven to ten months, under the guise of an "eight-hour day" law, is coming to be one of the principal issues in the presidential campaign. Although the combined forces of Samuel Gompers and the Democratic party were not able to make much headway with it in Maine, it has been given out that President Wilson is preparing to meet the issue at once and will seek to show, either in a speech or in a letter to some inquisitive member of the Democratic party, that the law will permanently establish an eight-hour day as the basis for work in railroad train service. It is announced that he intends to make clear that he will not be satisfied until Congress enacts into law the remainder of the program which he recommended to it, including a plan for reimbursing the roads for the additional expense involved and for making a strike illegal pending an investigation. Judge William L. Chambers, of the United States Board of Mediation and Conciliation, was expected to confer with the President at Shadow Lawn this week to assist him in preparing his speech or letter on this subject. Meanwhile, it is stated, the President has already begun the consideration of the personnel of the board of investigation which is to study the effect of the new law for a period of six to nine months.

Apparently the President is finding that the particular method which he saw fit to adopt for the purpose of averting a strike possesses some of the elements of a boomerang, and that the publicity which has been given to the difference between an eight-hour day and an eight-hour basis for the payment of wages has rendered the slogan "eight-hour day" rather inadequate to the purpose in hand. He has, therefore, decided that it will be expedient to shift the issue slightly from what has been done to what may be done in the future—as usual, after election.

Officers of the brotherhoods are already seeking to show their gratitude by appealing to their members to support Congressmen who voted for the law. They do not appear to be showing the same solicitude for those who said they were in favor of a real eight-hour day, but that they were not in favor of legislating an increase in wages for a favored few of the railroad employees. Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers, has issued a circular letter to members of that organization promising to send them reprints from the Congressional Record of speeches made at the time of the passage of the law. "We do this," he said, "not in the interest of any particular party, but in order that you may know the true facts in the case. We believe the time has arrived when labor should know who is friendly to its interests and who is not. Important legislation will take place at the next session. It is important to you that men be elected who are friendly to you." W. G. Lee, president of the Brotherhood of Railroad Trainmen, has also isued a circular to his members, urging them to support President Wilson. It is understood that the other brotherhoods will take similar action and that Mr. Wilson will be supported in the brotherhood magazines.

Mr. Hughes started on his second western campaign trip

this week prepared to renew his attack on the passage of the law, and the Republican Congressional Committee has taken advantage of the issue, in a statement by Representative Simeon D. Fess, of Ohio, which it put out last week. The statement is, in part, as follows:

"Now that Congress has capitulated, the strike order been revoked, the threatened cessation of all transportation with the possibilities of untold suffering by the innocent averted, the government temporarily abdicated and permanently humiliated, it is not out of place for the public, who must pay the bill, to calmly inquire of the issue of the immediate future in the light of the recent past.

"To begin with, the 'eight-hour law,' so-called, is misnamed and its title is totally misleading. This law is not a statute fixing the hours of labor, but it is an increased wage grab. On Friday, September 1, Speaker Clark, in a ruling in the House, said:

" 'Of course, the Chair, like everyone else, has a great deal of respect for recommendations made by the President of the United States, but the Chair is surely not expected to rule under such propositions laid down by the President in that message. It might take six bills or it might take four, or it might take three. In the bill before the House there are two of the recommendations that the President made, and both of them affect the question of wages and do not affect anything else. Critically considered, the Speaker might have cut that message up and referred various parts of it to various committees, but he did not choose to do that. It was a hurried proceeding all around.'

"This measure was born in fright, fathered in fear, cradled in partisan politics, and carried through the final action under duress. I do not believe the history of legislation furnishes a duplicate of such action. This, in my judgment, was the high-water mark of national humiliation, if not degradation, as one member put it, as well as the low-water mark of national honor and dignity.

"The abandonment of arbitration when taken by the head of our government in an official command to the Congress sets a precedent against the best possible method of settling labor disputes, from which we will not recover soon. It opens the Pandora box. The action caused the President to cease to be a mediator and made him a partisan dictator."

If the President is going to try to make a real eight-hour day law out of the hastily prepared measure which he has already signed twice, and if he is going to try to make good on his implied promises to obtain increases in freight rates to pay for it, the railroad question seems assured of the spotlight during the next session of Congress if the Democrats remain in power. If they do not they may be expected to lose interest in the subject. A real eight-hour day would probably cost the railroads just as much, if not more, than the eight-hour basic day, although the money would go to more men. Representatives of the shippers may, of course, be expected to get on the job very quickly in view of any such proposed increase in the cost of transportation. Also, the same organizations for whose benefit the law was passed, and why are so enthusiastically Democratic at the present time, will be found in a different attitude if a serious effort is made to put a compulsory arbitration law on the statute books, to make strikes illegal pending a public investigation. Moreover, the 80 per cent of railway employees who are not engaged in the classes of service represented by the brotherhoods may be expected to do all they can to prevent any further discrimination against them at the hands of Congress. H. B. Perham, president of the Order of Railway Telegraphers, was in Washington and sat with the leaders of the train service organizations in the committee rooms just outside the House and Senate chambers while the law was being put through, and it has been rumored that he has counted on securing some crumbs from the feast for his members.

The unorganized employees, too, may be expected to be heard from. On the morning after President Wilson made his recommendations to Congress, Robert T. Frazier, Jr., on behalf of the unorganized employees, addressed to him a letter, saying: "It would seem that the legislation recommended would operate only to the benefit of 'the employees actually engaged in the work of operating trains in interstate transportation' (the 20 per cent), and that the great majority of railway employees, heretofore unorganized and unheard of, would be without protection or recourse under the law. If this is the design of the proposed law, and it is enacted so, I must respectfully warn you of the event sure to follow, which will place the industrial fabric of the nation in greater jeopardy than it stands at present—the 80 per cent must of necessity organize and present their demands for recognition and protection."

That Mr. Frazier used the words "unheard of" advisedly was indicated by the President's reply to him, in which he explained that the federal government could not deal with any employees except those engaged in "interstate" transportation. A good many "interstate" employees who are not engaged in train operation may call themselves to his attention when the occasion presents itself.

While Congress is being denounced for its part in the passage of the "eight-hour" law, a distinction should be noted between the majority who voted for the bill and those who tried their best to prevent Congress from being placed in the position in which it was placed. Fifty-six representatives and 28 senators voted against the bill, and many of them were courageous and outspoken in the expression of their opposition to the measure, even in the face of forthcoming elections. The issues of the Congressional Record since the adjournment contain many speeches on the subject which were delivered during the debate, as well as others that have been "extended" since that time. Some extracts from the statements made by various senators were published in the *Railway Age Gazette* of September 8. Interesting analyses of the phases of this legislation have also been made by members of the House, some of which are as follows:

William S. Bennet, New York: "I agree with Mr. Gompers that there are worse things than strikes. One of those things is the destruction of the American system of government. I shall vote against this bill. I was born in a railroad town and know railroad men. I was put into public life by union labor men. I have not always agreed with laboring men, but I have never deceived them. I shall not deceive them now, for this proposed legislation is the worst blow that anyone ever dealt to organized labor."

I. L. Lenroot, Wisconsin: "I expect to vote for this bill, but not as a measure of justice to the railroad men, for I do not know whether it is just or not, and there are not a dozen members of the House who have any judgment based on facts as to whether it is just or not. We have the choice of voting blindly today or having a strike. In my judgment one who must share the responsibility for this awful condition is the President of the United States. The President, without investigation of the facts, decided the major portion of the controversy in the interest of the railway employees, and after he did it I want to say that the heads of these brotherhoods are not so greatly to blame for the position they have now taken. I want it distinctly understood that I vote for it to avert this strike and not because I have any opinion as to whether the merits of the bill are correct or not. I have a primary coming on. The easy way for me would be simply to vote for this bill and say nothing. But when I go out of the halls of this Congress for the last time I propose to take with me my self-respect."

E. E. Denison, Illinois: "I think we ought to be honest and plain, and if we are enacting this legislation because we believe in the enactment of an eight-hour law it ought to apply to all employees engaged in interstate commerce."

R. W. Parker, New Jersey: "Congress should not fix

wages without full investigation, and no one should be able to force Congress to act in that regard without the opportunity to have such an investigation made. The government might well order that all these men should hold their places as public servants free from any right of their employers to discharge them and free from any right on their part to go out as a body and upset public business."

J. A. Sterling, Illinois: "We may console ourselves now by saying that this is a temporary measure, but the same influences that prompt us to pass this bill today will prevent Congress from ever changing it. The same powerful organization will be here at the doors of Congress forbidding that the change shall be made, if after the investigation provided for it is found that the increase is unjust."

F. H. Gillett, Massachusetts: "Under threats from men who refuse to arbitrate you are going to enact legislation of whose merits you are ignorant. You are passing this bill not because it is right, but because you are threatened. That is not only humiliating, but is sure to breed future threats. Arbitration is the only fair method we know to determine what is just. Of course, the blame for this rests primarily upon the President."

F. L. Greene, Vermont: "The merits of this dispute are no longer involved until the Congress of the United States asserts its dignity and majesty and self-respect and refuses to be held up by anybody at any time under any threat or under duress. Once begun, where is this surrendering to end? Where will the moral responsibility rest when the people of the United States wake up and find out who did this thing?"

R. C. Johnson, South Dakota: "This is not an eight-hour day dispute. It is a wage dispute, and if you are going to pass legislation affecting one side you ought to be fair and pass legislation affecting the other side. We ought to have arbitration and compulsory arbitration, and I want to say that I was forced to this conclusion by arguments of railroad employees. The people of the United States should never again be put up against a situation of this kind, with a shotgun held at their breast."

J. H. Moore, Pennsylvania: "There is another side to this question than the economic side, and that is the side that is purely political. This matter has certainly been pending for a long time, and it is just possible that it may have been held up until the campaign opened so that the President and his party could make the most of it. If this was the play apparently it has not succeeded. Instead of coming out the hero of the workingmen of the country the President appears to have aided in putting the working men up against a strike to the very great detriment of the people of the United States who will be affected thereby, and from which we are expected to extricate those concerned. The real responsibility for the deplorable condition, for the strike itself if it should occur, will rest largely upon the present incumbent of the White House, although I am inclined to include with him the chairman of the Committee on Interstate and Foreign Commerce, who assured us last July that no strike would take place."

W. J. Browning, New Jersey: "Since I have been in Congress I have voted for all legislation that I believe would benefit labor, but I do not believe this bill is in the real interest of the laboring man. It may, and in all probability it will, avoid a strike temporarily, but, in my opinion, this would be merely postponing the actual settlement of the whole matter."

E. W. Gray, New Jersey: "The Congress is one of the three co-ordinate branches of the federal government possessing distinct and independent rights as outlined by the Constitution. Yet a small unofficial body of our people have served notice on us, along with the President, that unless we enact certain legislation for their particular benefit between now and tomorrow evening they will call their strike."

Edmund Platt, New York: "These four men—or, shall I say, the President of the United States, in fear of the votes they may influence in the coming campaign—having refused to agree to arbitration, now demand that the Congress of the United States shall abdicate its position as a deliberative representative body and pass this bill forthwith. I, for one, decline to be either bluffed or coerced into participation into hasty, ill-considered, makeshift legislation, the far-reaching effects of which we cannot foresee."

J. R. Mann, Illinois: "I believe I could have voted for the President's program if proposed in a bill before the House. It at least made the pretense of an effort to prevent similar situations in the future. But the President now backs water and now urges Congress to pass a bill which leaves out most of the essential things which he then proposed. If we are going to yield to the emergencies of the present moment we ought at least to do something toward preventing disaster in the future."

Frank Clark, Florida: "I am in favor of an eight-hour day for all kinds of labor. But this is not an eight-hour day proposition. It is simply a proposition to have Congress exert its power to raise the wages of certain classes of people in this country. I question our constitutional right to do it, and I have no doubt whatever as to the fact that we have no moral right to do it."

C. N. McArthur, Oregon: "I know hundreds of members of the various brotherhoods and I cannot believe that the rank and file of these splendid organizations approve of the methods employed to pass this bill. I am in sympathy with eight-hour legislation, but I do not approve of the measure just passed nor of the manner of its passage. I do not believe it is the function of Congress to legislate as to the wages of employees other than those in the government service. If my political enemies desire to make a campaign issue out of my action I shall take the question direct to the people of my district."

A. P. Gardner, Massachusetts: "This is no more like the true eight-hour principle than chalk is like cheese. I am mighty sorry to vote against this bill. Of course, I know it will hurt on election day, and I am under obligations to the brotherhoods for helping me out of a tight place politically a few years ago. Nevertheless, every now and then a Congressman is face to face with the question as to whether he is going to be a man or a mouse? Just for once I made up my mind to be a man and take the consequences."

F. W. Dallinger, Massachusetts: "That the hurried passage of this hastily drafted bill is a bad thing for all concerned is the real belief of practically every member of this House. That it is ill-advised from every point of view is the overwhelming opinion of the people of the United States. That it will not accomplish its avowed purpose, but is simply another gold brick put forth by the party in power as a means of getting votes at the approaching election must be evident to every intelligent observer."

J. H. Moore, Pennsylvania: "I contend that this whole strike legislation was 'set up' on the House. I repeat that charge now, that it was brought in here as a political dodge, as a campaign measure, and that the gentleman from Georgia (Representative Adamson), whether he did it intentionally or not, was the instrument of a shrewd political dictator who saw what he thought was an opportunity to win 400,000 labor votes. The President has put his foot in it and that shoe pinches. The Democratic party, which thought it had made a ten-strike in 'saving the baby's milk' on Labor Day, is hearing from the newspapers of the country."

W. W. Coleman, Pennsylvania: "The Adamson bill, in my judgment, violates the fifth amendment to the Constitution, and is, so far as it purports to grant an eight-hour workday and an increase of wages to the railroad trainmen, a fraudulent and deceptive piece of legislation. Nor does the bill settle the railroad strike. It has but postponed the evil day. It must be evident to us all that the real battle is to come when an attempt is made to enforce the law."

Railway Signal Association's Annual Meeting

Continued Progress in Perfecting Standards of Signal Construction; Current History in the Making

THE twenty-first annual meeting of the Railway Signal Association was held at the Grand Hotel, Mackinac Island, Mich., on September 12, 13 and 14, with W. J. Eck (Southern Ry.), president of the association, in the chair and an attendance of over 300 members, friends and guests.

President Eck in his annual address referred to the small beginnings of the association—then The Railway Signaling Clubs—in Chicago, in 1895, and reviewed its rapid growth. From the first its work was important, and it began early to fix standards of signal construction and practice. Now the work of the association is such that its records fill 700 pages a year and its permanent publications, altogether, to this time have aggregated 11,453 pages. Its index to signal literature is indispensable to the student and its manual is a guide to practice on all the railroads. The membership, now numbering 1,268, includes operating and higher officers, signalmen from every state in the union, and individuals from 15 foreign countries. American signalmen have developed power-operated switch and signal apparatus, alternating-current electric apparatus in place of the former simple devices, and the "position light" signal; and have vastly improved all the details of signal apparatus. The future has in store still greater demands on the members of the profession.

C. C. Rosenberg, secretary-treasurer, reported that through representative members 68 railroads have 776 votes in the association. The annual financial statement shows: August 31, 1915, on hand, $2,152; dues received, $2,709; sales of publications, $3,726; miscellaneous receipts, $3,318; total, $11,905. The expenses totaled $9,452; cash on hand August 31, this year, $2,453.

The Board of Direction reported that it had authorized the establishment of an employment bureau at the secretary's office, which for a small fee will register applicants for employment in the signaling field. The board recommends the increase of the annual dues from $3 to $4. It has increased the secretary's annual allowance for clerical assistance by $600. It has discussed, but reached no decision, on proposals to hold the annual meetings always at one place, and to have only one other meeting during the year. Dr. William Robinson, of Brooklyn, N. Y., inventor of the closed track circuit, and a pioneer in other features of signal development, has been made an honorary member of the association.

The first report was that of the special committee on harmonizing specifications, H. S. Balliet, chairman, which was presented by R. B. Elsworth. It recommended a large number of changes in the style of reports, and of nomenclature to be used in specifications, and proposed more accurate terms for use where loose practice in wording has become common. The bulk of the report is taken up with proposed changes in (a) general provisions for specifications for signal installations; (b) general electrical requirements; (c) detail provisions, and (d) unit specifications.

Under the first head, one section, Section 8, the contractor's guarantee of safety, reliability and economy, in relation to which one member of the committee had dissented from the majority, was the subject of a long discussion in the meeting. A. R. Fugina (L. & N.), moved to cut out the section entirely. It was declared that a guaranty of 25,000 movements of an automatic signal per failure tended to encourage low standards; that to call upon the contractor to guarantee ties or switches, batteries, wires or other things furnished by the purchaser would be grossly unfair, and that the absence of any clause binding the purchaser to provide suitable material and adequate maintenance left the contract palpably inequitable. For the committee it was pointed out that no road need use Section 8; but to this it was replied that if used even by a few it increased the burden on the contractor and so added to the cost of his work as a whole. The defenders of the report said that long experience had shown contracts of this tenor to be useful and satisfactory to the purchaser; they served, at least, to put each party on notice, in the beginning of negotiations, to call upon the other for all things due from him. To the objection that contracts like this would not stand the scrutiny of the courts, it was replied that they never get into the courts; they are mainly a basis for preliminary negotiations and compromise. Requiring the contractor to approve parts put in by a previous contractor tends to secure uniformity; railroads will order new material from the same maker who furnished the old. Finally, it was declared that any reputable manufacturer will be willing to do what this form requires him to do; there is no penalty clause in the contract, but the contractor who fails to carry out its terms is penalized by not getting his pay.

Suggestions were made that a clause be added defining some of the purchaser's duties, and that the committee be directed to confer with contractors; but, on a rising vote, the whole of Section 8 was rejected; after which it was observed that Section 10, clause b, contained the most objectionable part of Section 8. The whole of the "general provisions," however, except Section 8, was accepted and ordered to letter ballot.

The general electrical requirement, Section 41, were withdrawn, and Sections 40 and 42 were referred back to the committee. Detail specifications, Sections 50, 51, 52, 54, 60 and 61, were ordered to letter ballot, without discussion. The same action was taken, after brief discussion, on the matter on pages 441-448 of the report.

Signaling Practice

The report of Committee No. 1, on signaling practice, C. C. Anthony, chairman, was presented by W. H. Elliott. It dealt with requisites for switch indicators; the problems of signaling single-track roads with reference to the effect of signaling and proper location of passing sidings on the capacity of the line, and the signal schemes which have been presented to the association. The revised statement of the purposes and requisites of switch indicators, published in the May Journal was recommended for submission to letter ballot as a substitute for the matter adopted in 1914. The second installment of the analysis of the location of passing sidings on single track, submitted at the May meeting, contained several errors which are being corrected and a revision will be printed in a later issue of the Journal. The exposition of the three schemes of signaling, published in the March Journal, was presented as information with the recommendation that a reference to it be placed in the manual.

The recommended practice of the association—that the day indications of semaphore signals be given in the upper right-hand quadrant—does not meet the necessities of various electrified lines and it was recommended that the clause read: "b. The day aspects of semaphore signals shall be formed by positions of the arm or arms in one of the upper quadrants."

The revised switch-indicator requisites were approved and

ordered to letter ballot; and the same action was taken on the recommendation of the committee as to approving both left-hand and right-hand quadrant semaphore aspects. This change will necessitate changes in the wording of seven standard specifications.

Specifications for Manual Interlocking

Committee No. 2, C. J. Kelloway, chairman, presented a complete revision of the specifications for mechanical interlocking. This was accepted, with very few changes, to go to letter ballot; but not until after Chairman Kelloway had answered many questions concerning individual paragraphs. The committee finds that counterweights on switch levers, formerly common, but latterly not much used, are still desirable under some conditions. There is some demand for pipe-line cranks 9 in. by 9 in., instead of the standard 11¾ in. by 11¾ in. Gage plates are specified as of hard steel; the figures were objected to by some as too hard; but Mr. Elliott said that the New York Central, after tests and long experience had found the committee's formula not too hard. The formula is: carbon, .35 to .45; manganese, .40 to .60; sulphur, not to exceed .04; phosphorus, not to exceed .04. In the discussion of painting, it was brought out that for many castings, to be used indoors, a dipping coat of black had been found to be all the treatment needed at the factory. The coat of red lead, on the coarser parts of the machine, was thought by some to be unnecessary.

The meeting accepted the standard plans for leadaways presented by the committee.

This committee also presented a complete code of specifications for electro-mechanical interlocking. Three sections—40, 41 and 42—are the same as those recommended by the harmonizing committee, and were referred back. On the rest of the code, filling 35 pages, there were numerous questions, but no changes were made except in wording, and the whole code was ordered to letter ballot. The committee's recommended code of requirements at movable bridges was accepted, to be sent to letter ballot.

Standard Designs

Committee No. 6, F. P. Patenall, chairman, presented eleven drawings for standard designs, asking that they be approved for submission to letter ballot, and also asked confirmation of 16 designs which had been before the association at the last two meetings. Among these 27 plans are:

1016—Screw and Solid Jaws. (Revised.)
1019—Jaws, Tang End and Adjustable Link.
1082—Mechanical Semaphore Bearing. (Revised.)
1094—One-inch Pipe Line Insulation. (Revised.)
1227—Battery Elevators. (Revised.)
1390—Switch Adjustment—Details. (Revised.)
1391—Switch Adjustment—Non-insulated. (Revised.)
1392—Switch Adjustment—Insulated. (New.)
1393—Two-way Separate-pin Horizontal Crank Stand. (New.)
1197—Two-lever Wall Machine. (Revised.)
1226—Stuffing Box for Wire. (Revised.)
1235—Semaphore Spectacle—Design "C." (New.)
1357—Ladder for Two-way Single Lamp Signal. (New.)
1399—Low Target Stand. (New.)

All of the committee's propositions were adopted, unanimously. In connection with plan No. 1019 the committee was asked to prepare a drawing of screw jaws and appurtenances, assembled, and agreed to do so.

In connection with plan No. 1227 a member voiced a demand for a battery elevator to hold four cells, but the meeting was satisfied with the present design, holding three cells. Many track circuits are now operated with only two cells of caustic soda battery. The committee intends to present a design for a concrete battery box. The switch adjustment bracket (plan No. 1390) was criticized as too light, but Mr. Elliott assured the meeting that the New York Central, with 5 years' experience, had found it amply strong.

This committee expects to present at a future meeting a standard lantern globe and a code of symbols.

Wires and Cables

Committee No. 9, Wires and Cables, recommended that the definitions of terms used in wire and cable specifications, published in the March Journal, be submitted to letter ballot, also the specifications for aerial aluminum cable, published in the March Journal, the revisions in the existing specifications for friction tape, and the revision in the existing specification for rubber insulating tape. The report was adopted after a brief discussion.

Maintenance and Operation

The committee on this subject, No. 5, reported progress.

Direct Current Relays

Committee No. 7, E. W. Kolb, chairman, which had been directed to prepare specifications for direct current relays, presented a report consisting mainly of an essay by F. L. Dodgson (Gen. Ry. Signal Co.) on the efficiency of track relays of different resistances.

Mr. Dodgson compared the relative efficiency of track relays of different resistances under five heads, viz., shunting qualities, qualities for detection of broken rails, operation under adverse conditions, length of circuits which can be operated, and energy consumed. Four different resistances were considered, 7 ohms, 4 ohms, 3 ohms and 1.9 ohms, these being the resistances of full-wound coils with standard wire with single cotton insulation of Nos. 19, 18, 17 and 16, respectively. He went into considerable detail in a discussion of the susceptibility of relays to foreign current and the current from adjoining sections.

On Mr. Dodgson's paper the committee based the following eight conclusions:

1. Where four-ohm, four-point track relays are used with potash batteries the limiting resistance in series with the battery shall not be less than 0.3 ohm.

2. When two or four contacts are to be operated by a track relay from potash battery, the resistance of the relay shall be 1.9 ohms and the limiting resistance in series with the battery shall not be less than 0.4 ohm.

3. The use where practicable of a fixed resistance to be connected in series with the track relay coils after the front contacts of the relays have been made, this resistance to be 3.5 ohms where 4-ohm relays are used and 1.4 ohms where 1.9-ohm relays are used.

4. That the use of electrically-deposited silver for a contact material be prohibited.

5. That the use of bone for the support of contact fingers be prohibited and that the material used should be inert, so that it will not change its form in service.

6. That on account of the unavoidable resistance in contacts, the number of series contacts in the operating circuit be kept as low as possible.

7. That ventilation of the relay cases surrounding the contacts be provided.

8. That the track relay should preferably have only one contact, that controlling, where necessary, a local relay, said local relay operating as many contacts as are necessary at that location.

On the first and second conclusions, naming a minimum limit for the resistance to be used in series with a track battery, there was considerable discussion. Track circuits are in extensive use where this resistance is only 1.9 ohms, but there was much questioning as to the propriety of using so little. It was the consensus of opinion that to get conclusions satisfactory to the majority there should be numerous tests of low resistance relays, under varying conditions and extending over a considerable time.

Mr. Stevens (A. T. & S. F.) (by letter) and others expressed a willingness to make such tests. The committee's dictum that electrically deposited silver should not be used on graphite for relay contacts was explained as based on the

difficulty of using a sulphuric acid bath as is done in preparing such contacts, without leaving acid in the graphite; which may cause the formation of sulphate of silver, and this introduces resistance. Mr. Patenall (B. & O.) has ordered 50 relays of 1.9 ohms resistance, and expects to report the results of their service.

There was considerable discussion of the committee's recommendation that relay cases (not relay boxes) should be ventilated. Mr. Lunn reported excellent service from glass cases made tight with rubber gaskets. For iron relay boxes cork lining, to delay changes in temperature, has been used with satisfaction. L. R. Mann (Mo. Pac.) believed the main desideratum to be to avoid having any direct path for warm air from underground conduits to the relay in the box.

Electrical Testing

The special committee on electrical testing, W. N. Manuel, chairman, has investigated the subject of standard marking of relay contact posts. Many roads seem to follow no standard, and the committee will send out a circular to learn the practice and the opinion of members.

As to standard ranges for electrical measuring instruments, the committee finds no satisfactory settled practice. It believes it desirable to have two standard instruments, one to measure above and the other below an agreed dividing line.

Signaling on Electric Railways

Committee No. 8, C. H. Morrison, chairman, presented a report of 57 pages about three-fourths of which was taken up with descriptive accounts of a number of installations of signaling in which alternating current apparatus is used. Among the installations thus described are the following:

New York State Railways, Rochester & Eastern line;
Pennsylvania Railroad, Philadelphia to Paoli;
Norfolk & Western;
Grand Trunk, Victoria Bridge;
Michigan United Railways;
Illinois Central (Chicago);
Ohio Electric Company;
Fort Wayne & Northern Indiana;
Gary & Interurban;
Union Traction Company of Indiana;
Southern Pacific: (a) Lucin cutoff, (b) Rose Creek, Nev., and (c) Truckee, Cal.;
Pittsburgh & Lake Erie;
Central of New Jersey;
Cincinnati, N. O. & T. P.;
Kansas City, Clay County & St. Joseph;
Long Island;
East St. Louis Suburban;
El Paso & S. W.;
Salt Lake & Utah.

This committee reported complete codes of specifications for alternating current relays and for single phase line transformers. All were unanimously adopted without discussion, to be sent to letter ballot; and the committee was commended for the thoroughness of its work; also for the excellent style of the paragraphs presented, in which there are no blanks to be filled in, except on four blanks containing lists of requisites. The committee at every stage of its work had consulted freely with manufacturers.

Petroleum Asphaltum

Committee No. 3, Power Interlocking, F. B. Wiegand, chairman, presented eight drawings showing typical circuit plans for electro pneumatic interlocking installations, which were approved in substance at the meetings last March and last May; and these were all accepted as information.

The committee reported on petroleum asphaltum, with revised specifications. The report, after brief discussion, was referred back, the melting point named by the committee being declared too low for warm climates.

Automatic Block Signaling

Committee No. 4, Direct Current Automatic Block Signaling, W. M. Vandersluis, chairman, presented revised specifications for capping and trunking, which, with slight modifications, were accepted and ordered to letter ballot. The same course was taken with specifications for direct current automatic signals, low voltage, and for fibre and metal conduit. Matter presented on sizes of line wire was accepted as information.

Storage Battery

Committee No. 10, R. B. Elsworth, chairman, presented a revised code of specifications for lead type, portable storage battery for signaling; for composite type stationary storage battery; and five standard drawings for use in connection with storage batteries. All of the matter was accepted, after brief discussion, and the recommendations of the committee adopted.

Annual Dues

The meeting adopted, after a brief discussion, the proposition of C. C. Anthony and others to amend the constitution so as to require active and associate members to pay annual dues of $4. For junior members the rate will remain $3.

Election of Officers

The place chosen for next year's meeting is Atlantic City, N. J.

The tellers who counted the votes for officers of the association for the ensuing year reported 214 votes, all for the nominees presented by the committee. The men chosen are:

President, C. A. Dunham (Great Northern); first vice-president, W. H. Elliott (N. Y. C.) holds over from last year; second vice-president, R. E. Trout (Frisco); directors, F. E. Whitcomb (B. & A.); I. S. Raymer (P. & L. E.); F. W. Pfleging (U. P.); L. R. Mann (Mo. Pac.).

The Signal Appliance Association, at its meeting Thursday, chose the following officers: Chairman, Fred C. Cameron, Corning Glass Works; vice-chairman, Geo. C. Isbester, The Rail Joint Company; secretary-treasurer, F. W. Edmonds, Dressel Lamp Works, New York City; executive committee, W. J. Gillingham, Hall Signal Company; J. D. Underhill, The Okonite Company; Carl Henze, Federal Signal Company; C. E. Brown, Central Electric Company, and J. S. Hobson, U. S. & S.

Banquet

The annual dinner of the association on Wednesday evening was, as usual, a great success. The speakers were Marcus A. Dow, general safety agent of the New York Central Lines, who spoke on "Safety First," alluding to "R. S. A." as meaning "Real Safety Association," and Samuel O. Dunn, editor of the *Railway Age Gazette,* whose address, dealing with recent events at Washington, was entitled "The New Tyranny."

New Russian Line.—The Russian ice-free port in the Northern Sea is likely to be in railway communication with Petrograd before December, as there is only one section of 215 miles (out of a total of 910 miles) which is not quite completed.

Nicaraguan Railway Agreement.—Formal approval of the agreement between the Nicaraguan Government and the Pacific Railroad of Nicaragua has been given by both houses of the Nicaraguan Congress and is promulgated by the President in La Gaceta of June 28. Under the terms of this agreement the railroad company, which is financed in New York City, will construct and operate a railway from the Atlantic coast to the present Pacific railway system of Nicaragua or to the steamship lines owned by the same company. The total length of the new railway will be about 200 miles, and it will supply much needed transportation facilities from the Atlantic coast.

DISCIPLINE ON THE NEW YORK CENTRAL*

By G. H. Wilson,

Superintendent Electric Division, New York Central, New York City.

On the New York Central a system of suspended sentences is in effect. The first principle of good discipline is a thorough and intelligent investigation of all cases requiring discipline. These investigations should be held by the heads of the departments, to whom the men report, viz., chief train despatcher, trainmasters, master mechanics, etc., except, of course, important cases of accidents on the main lines, which should be held by the superintendent personally. If investigations are thorough, and if impartial discipline is applied; if the reason for the action taken is thoroughly explained to the employee, and he is made to understand the reason for it, and to acknowledge that what he did was wrong, the discipline will not only hold, but almost any system of discipline will be successful.

I have known a number of superintendents who endeavored to investigate every minor case personally, with the result that they could not accomplish that which they had set out to do. At the same time the men would lose respect for the authority of the division officers under the superintendent. In other words, make your subordinates as big men as possible, and you have started your discipline on the right road.

The Brown system of discipline or modifications thereof, which is purely a demerit and merit proposition, is effective and reasonable in probably eight or nine-tenths of the cases, but there are a few men in the service of all roads who do not heed either the personal warnings of the officer, or the placing of demerits against their records. There are also serious offenses committed by employees occasionally, and particularly by the small class referred to, that would seem to warrant an actual suspension, in order to get better results from them in the way of future conduct. While this may be a harsh opinion of some of the men, it seems true that suspended sentences hanging over them constitute the greatest incentive to future good service. They realize that money loss is coming to them unless they mend their ways.

The amount of discipline should be decided at a staff meeting held once each week by the superintendent, he having present the assistant superintendent, chief train despatcher, trainmasters, master mechanic, foreman of car department and all others to whom the men report. The head of the department should make his recommendation in writing, giving full details of each case, with the service record of the man; and after being reviewed by the superintendent and the staff meeting, if he or any other member of the staff believes that the recommendation is wrong, it should be modified or increased in accordance with the judgment of all the members of the staff; the superintendent, however, reserving the right to apply the discipline, if he is satisfied the recommendations of the others are wrong.

After these meetings a written record is made and given to the head of the department concerned, who personally delivers it to the employee disciplined, having the proper understanding with him as to the reasons therefor; and a copy is placed in his envelope record.

Only four kinds of discipline should be recognized, viz.: Reprimands, suspended sentences, actual suspensions, dismissals.

All discipline should be applied for three reasons:

(1) To get better service.

(2) To avoid taking men out of service, resulting in loss of money to them, and, if they are competent men, loss of efficiency to the company.

(3) Keeping the men out of debt and making them of greater benefit to their families.

When a man is first suspended a certain number of days, the sentence should be suspended pending good behavior, and on the stipulation that he keep out of any further trouble.

After the expiration of one year, the man should not be required to serve any actual suspension; but it will still remain a part of his record.

If within one year, he offends to the extent that a suspension is necessary, he will be called upon to serve the suspended sentence; and a new suspension will be placed against him for another period of one year. Slight infractions which call for reprimands only, should not cause a man to serve a suspended sentence.

The system with which I have had experience does not involve the elimination of anything from the man's record, the items being cumulative. It is inadvisable to eliminate entirely from a man's record gross carelessness, personal bad habits, etc., and for that reason it is pretty hard to draw a line whereby any system of discipline should take anything from a man's record.

Meritorious service is that which is performed by an employee when going out of his regular line of duty, and not the prompt and proper application of good judgment in his regular line of duty, which is expected of everyone at all times.

An employee who is not on duty and sees a dangerous condition and takes action which prevents an accident; or an employee while on duty, who takes action of this kind to prevent an employee in another grade of the service from causing an accident, is termed meritorious, and the facts entered upon his record. These will be given proper consideration if it becomes necessary to apply discipline to that individual at some future date.

In a period of four and a half years we find a greatly improved service because of the above method of handling investigations and discipline. For the past four years no discipline has been annulled, and for the past three years only one or two cases have been modified. For the six months ending June 30 last, the total number of dismissals was five; total number of suspensions served on account of previous offenses, 148; total suspensions imposed but not served, 751; reprimands, 181. This record is that of a force of 2,717, including 350 conductors, 75 assistant conductors, 900 brakemen, 350 enginemen, and 400 firemen; 300 operators, signal men and station men; 22 yardmasters; 280 trainmen in yard service, and 40 switch tenders. Of the trainmen in road service, about 40 per cent are employees of the New York, New Haven & Hartford. These men run over 12 miles of the New York Central, as compared with runs of 25 to 35 miles, on this division, of the men who are employees of the New York Central.

(It will be noted that in the half year the number of suspensions served on account of previous offenses is about one-fifth of the number of new suspensions; approximately one-sixth of the men who are disciplined, other than by reprimand, are believed to require something more severe than an entry on a book, to impress upon them the seriousness of their misconduct or neglect.

Mr. Wilson's territory includes the Grand Central passenger terminal, and 55 miles of main line; one small freight classification yard, and 47 freight and passenger stations.

A supplement to the paper gives an example of a discipline record, that of John Doe and Frank Jones, conductor and brakeman, for backing through a switch which was wrong, distorting the switch points so that a short time afterwards an engine was derailed. Damage was done to the amount of $125. The conductor was adjudged worthy of suspension for three days, and the brakeman for five days, for passing through a switch without knowing whether it was in the right position. Both sentences were suspended; but Conductor Doe was required to lie off three days because of a record standing against him for a slight collision which had occurred four months previous.)

*A paper read before the American Association of Railroad Superintendents at Memphis, Tenn., August 16.

Master Car and Locomotive Painters' Convention

Report of the 47th Annual Meeting Held Last Week; Subjects Include Purchasing Paints on Specifications

THE forty-seventh annual convention of the Master Car and Locomotive Painters' Association of the United States and Canada was held at the Breakers Hotel, Atlantic City, N. J., September 12-15, H. Hengefeld, master painter of the Atlantic Coast Line, presiding. The association was welcomed to Atlantic City by a representative of the mayor. In his address President Hengefeld dwelt on the relations of the members with their superior officers, and laid stress on the need for economy under the present conditions affecting wages and the price of materials. The secretary-treasurer reported a membership of 305, which is a gain of 13 over last year.

Report of Test Committee

The Committee on Tests, of which J. W. Gibbons (Santa Fe) is chairman, presented a report from which the following is taken: The committee last year proved by a number of tests that heat treated linseed oil made the best paint vehicle for the protection of iron and steel. To further substantiate the proof submitted, we have secured paints made with the same pigments, but the vehicle in one set was raw linseed oil and in the other heat treated linseed oil. These paints were applied on sandblasted steel plates, and when dry the plates were fastened on the roof of a passenger car.

The plates on which the paint mixed with raw linseed oil was applied are badly corroded. The others are in fair condition. A number of the plates were painted with different compositions of red lead and inert materials mixed with the different oils, but we did not have sufficient exposure to secure definite results; film tests made of these materials indicate that comparatively the same results may be anticipated. These films were allowed to dry for ten months, then submerged in water for 60 days, taken out and allowed to dry for one week, then submerged for 30 days.

Discussion.—It was brought out in the discussion that red lead, with from 10 to 15 per cent of litharge, will give the best service in painting steel cars. The Norfolk & Western has tried pure red lead and has had to purchase litharge to mix with it in order to get the proper drying qualities.

Treatment of Steel Passenger Equipment Roofs and Decks

H. Hefflefinger (Penna.)—There seems to be only one way to guarantee a thorough cleansing of these parts and that is by sandblasting, either before or after assembling. The roof should not receive less than three coats of a well-tried-out elastic mixture. The decks, deck screens and deck sash should be primed outside and inside with the same kind of material used as a primer on the body. The outside of these parts should then be followed up with two coats of body color and two coats of the same kind of finishing varnish as is applied to the body outside. The painted finish of the inside of the decks and deck sash after being well primed depends on the finish the interior of the body is to have up to the varnish coats.

To get the maximum wear out of painted surfaces on the interior of steel passenger equipment cars they must be covered with as slow a rubbing varnish as possible, sacrificing to some extent the finer finish a quicker rubbing varnish would make. Unless this is done a checked surface will develop in a short time. If the roof is badly rusted it should be sandblasted and painted the same as if new. If not badly rusted, it would be gone over with wire brushes and scrapers and given at least two coats of a well-brushed-out elastic paint.

J. D. Wright (B. & O.).—Corrosion of steel roofs, decks, deck screens, etc., is the principal cause of their deterioration and the metal in these parts should be protected adequately from the outset to prevent the corrosion from getting a start.

During the process of construction all overlapping joints should be filled in with a thick protective mixture and made water tight. The underside of the roof sheets, the back of all deck sheets, and all hidden parts should be thoroughly cleaned and receive two coats of a good metal preservative paint before being covered, after which the exposed surfaces are ready for the initial treatment.

The cleaning of the metal is the first and one of the most important steps in the initial treatment. All oil, grease, dirt, scale and rust should be entirely removed before any coatings are applied for the protection of the metal. Benzine will remove the oil and grease, but the sandblast is by far the best means of preparing the steel for the paint coatings. It not only removes the dirt, scale and rust, but also roughens up the surface of the metal so that the priming coat has a better opportunity to "hold on" to the steel.

For the first, or priming coat, we consider it good practice to apply a thin paint carrying a small quantity of very finely ground pigment so that it will penetrate as far as possible into the pores of the metal. This coat should be applied immediately after the metal has been cleaned with the sand blast, before there is time for corrosion to form on the freshly cleaned metal, and it should be well brushed during its application. The succeeding coats should have good body, a generous supply of pigment being used in the mixtures. We have found good oxide of iron paints suitable for these intermediate coats. The finishing coat must conform to the standards of the different railroads.

To overcome the abrasion caused by cinders, also the troubles due to hot cinders falling on the steel roofs and burning out the life of the paint film, we find it good practice to sprinkle sand in the last coat of paint at the initial treatment.

It is now almost universal practice to apply to the exterior body of new steel passenger equipment cars, from three to five coats of surfacer, two of color, and three of exterior finishing varnish, or a total of eight to ten coats, and our observations lead us to believe the bodies are pretty well protected. The roofs, decks, deck screens, etc., however, get only three or four coats as a rule, though the exposure is much more severe on these parts. From this it would seem that we may be applying more coats than is actually necessary for the protection of the steel on the bodies, and less than necessary on the roofs, decks, etc.

The maintenance of the roofs, decks, deck screens, etc., is fully as important as the initial treatment. I hardly think it feasible to lay down hard and fast rules stating the exact time these parts should be repainted, for on the mountain divisions where there are numerous grades and tunnels, a few months' service may be more severe than a year's service in a prairie country where there are few grades, and no tunnels, or where oil is used as fuel in the locomotives. Again, some cars make considerable more mileage than others. Watchful care is more essential than anything else to the preservation of these parts of the car. A paint with only moderate wearing properties, applied at the right time to prevent corrosion, will give better results than the best mate-

rials applied at irregular intervals, or after the parts have become corroded.

O. P. Wilkins (N. & W.)—There are three elements that must enter into a proper protection for steel passenger car roofs, decks, screens, sash, etc.; namely, the preparation of the steel, the quality of paint, and the application of the material. No matter how well the surface is prepared, if the right kind of material is not used, the effort is practically lost; and no matter how well we prepare the surface, nor with what care the coating is compounded, if it is improperly applied, we may look for an early failure.

We have more or less trouble in protecting the upper parts of our steel passenger cars, and the main reason is that we have adopted the same method as that employed in protecting locomotive cab roofs; this method, not being a cure-all, did not produce the same results.

First, thoroughly sandblast the surface and prime immediately with a first class primer. It is of the utmost importance that the priming be done before the accumulation of any moisture, otherwise the sandblasting would be of little value. Red lead and raw linseed oil have been adopted exclusively as a primer, as a result of tests, for all structural steel. Having primed the roof, when thoroughly dry, apply three coats of high grade roof paint, allowing ample time between each coat for proper drying. For this operation we recommend a high oil carrying capacity pigment such as lamp black, graphite, and finely divided iron oxide. The hood ends are improved and offer greater resistance to the cinders if the last coat of roof color is given a liberal sprinkling of sand.

For maintaining the steel roof, we suggest that it is of paramount importance to have a thoroughly competent man to inspect it at terminals; when he finds the paint film breaking, he should not lose any time in applying a coat of standard roof paint. Employees reicing and watering cars should be required to wear rubber heels on all shoes to prevent the nails from scratching the painted surface.

Discussion.—The New York Central has found it best to sand only the curved portion of the roof. There is no need of sanding the level surface as cinders cut out only on the curved surface; sanding on the level surface helps to carry the moisture down to the surface of the steel. The experience of the Lackawanna has been similar. The Pullman Company is sanding its roofs all over, but it is believed that it is poor practice. Attention was called to the fact that weather conditions under which steel is painted have an effect on the service of the paint. Priming should not be done when the humidity is great. One member believed that metal should be painted only when it is warm enough to drive off all moisture. One road uses special pneumatic tools to clean the steel and has abandoned the sandblast. J. W. Gibbons of the Santa Fe stated that the quality of the steel is an important point. It must be free from impurities that are aggravated by moisture getting under the paint. It was decided by vote that it was the consensus of opinion of the convention that it is detrimental to apply sand on the flat surfaces of a steel roof.

Treatment of Interior and Exterior of Tenders

A committee report on this subject was presented by W. A. Buchanan (D. L. & W.), chairman. It was stated that many roads do not paint the interior of tenders. For the exterior some method should be used thoroughly to clean the steel, the sandblast being considered preferable. A good coat of elastic primer should then be used, followed by the usual finishing coats, the process varying on different roads.

Discussion.—One member considered that the process referred to in the report took too much time for present day locomotive service. It was also stated that no paint will withstand the action of the water in tanks and particularly the action of treated water and that the painting of the inside of tanks was considered a waste of time and material. The Santa Fe uses treated water and it has been found that this forms a protective coating on the inside of the tanks, which is a better protective agent than any paint.

Address by F. W. Brazier

F. W. Brazier, superintendent of rolling stock, New York Central, addressed the association and said a number of encouraging things to the younger men. He referred to the fact that the car department is recognized as it should be on but few roads and that its men should be just as eligible to promotion as men who are engaged in locomotive work.

Removal of Trimmings from Passenger Cars

J. W. Fryer (N. C. & St. L.)—I am convinced that considerable trouble is caused by the trimmings not being removed at the proper time. If locks, hinges, sash and blind lifts, etc., are not removed, and properly cleaned, they will later mar the appearance of the car, and their removal will save time and expense trying to keep varnish and paint off them.

Discussion.—The New York Central removes all interior trimmings when painting the insides of cars. One member stated that he always insists on the removal of all sash. In washing the interior, care must be taken to prevent water getting through the holes used for screws, etc., after the parts are removed, as it will damage the inside surface of the steel, as well as the insulation. Most members believed that all sash should be removed in making repairs of whatever class and it was the consensus of opinion that all interior trimmings should be removed.

Effects of Water and Oil Cleaning Methods on Paint

A paper was presented by W. A. Buchanan (D. L. & W.) on the special method in use on that road, in which it was stated that the water which is used in this process should not be considered hot, as it is about 90 deg., and is not over 70 deg. when it strikes the surface. In two years' use at East Buffalo, no trouble has been experienced with painted surfaces due to heat, although there has been some due to wear. The process has greatly reduced the cost of cleaning locomotives and has caused no trouble from hot boxes or other causes of like nature. The interior of the cab is cleaned about every fifteen days, and as the engines are always clean, it assists materially in keeping the men clean and facilitates inspection and repairs.

Discussion.—J. W. Gibbons of the Santa Fe believed that there was a film of oil left on the varnished surface and favored the use of dry waste on such surfaces or something that will not leave a coating that will catch dust and dirt. He believed the spraying method was entirely satisfactory for the running gear, but not for the jacket and other varnished surfaces. B. E. Miller of the Lackawanna stated that a film of oil does form on the surface and while it is annoying and sometimes obscures the lettering, it is largely due to improper handling and the use of too much oil. It has lately been found practicable on the Lackawanna to occasionally wipe passenger locomotives with waste to remove this film. Several members considered the process injurious to varnish and paint, while others said that all the trouble lies in the improper installation and operation, they having had trouble at first, but the difficulties having been eliminated with the correction in the use of the machine. It was decided by a vote of the convention that the process was considered satisfactory for the running gear of the locomotive, but detrimental to the painted and varnished surfaces.

Railway Legislation and Its Effect on Business

J. W. Gibbons, Atchison, Topeka & Santa Fe, presented a paper from which the following is taken: Many of the men who have advocated stringent regulation of the railroads are

honest and have given expression to their conviction after careful consideration of the question, but a certain class of politicians who are ever ready to influence the minds of the people with the hope that they may ride into power on the wave of discontent they help to create, took advantage of the state of political unrest that prevails in our country, magnified the real grievances and multiplied the imaginary ones until some of the people thought the panacea of all their social and political ills was the confiscation or annihilation of the railroad companies. The multiplicity of the rate making and regulating commissions, the ignorance of some of them of the fundamental principles of railroad business, the clamorous cry of the demagogue, the selfish demands of near-sighted shippers, all had a tendency to create distrust in the minds of the investor as to the security of funds invested in railway stocks and bonds and made it impossible



Fig. 1—Interior of Car No. 4579

to obtain the money necessary to make extensions or purchase equipment to take care of the natural growth of the business in the territory which they served.

The first to feel the disturbed condition of railroad business was the railway employee, then the retail merchant, whose customers could not meet their bills, next the wholesale house and finally the manufacturer and producer.

In spite of the increased mileage and the natural growth of the business of the country, 104,374 men were deprived of the positions that they had on the railroads in 1907. In spite of the great saving this appears to be on its face for the railroads, at the close of the year 1915 there were 20,143 miles of railroads in the hands of receivers as against 317 at the close of year 1907, and yet, during this period of depression upon railroads, our country has been blessed with good crops, the foreign wars have created an unusual demand for the products of our farms, mines and factories, prices have soared and the expense of operation has increased.

The railroads have used up all their available material, their equipment and track has been worked to the limit and must be renewed if the business of the country is to be handled properly. The indirect loss to the country is immeasurable. Owing to the lack of funds to purchase equipment and build terminal facilities, many of our lines have become blockaded in the last six months, due to the rush of war munitions to the east.

How many towns and counties in our country are lying dormant or going back because of the lack of confidence of men with capital in the future ability of the railroads to pay a reasonable return on the investment? For fifty years the policy of our government has been to levy a tariff on imports sufficient to protect the American farmer and working man from competition of the cheap labor and products of foreign countries. The degree of protection necessary has been the only difference of opinion among our statesmen. The railway companies and their more than one and one-half million employees are not asking for a protective tariff, but are earnestly pleading for a tariff sufficient to pay a living wage to the employees and a fair interest on the money invested.

Let us hope that out of the chaos that has brought the railroads of our country to the verge of financial disaster, there will be an evolution that will place them on a firmer business basis and that the people will have a better and clearer appreciation of their work.

Shopping Passenger Cars for Classified Repairs

H. A. Polhemus (Erie Railroad)—The proper practice to employ at the terminals to prolong the life of the finish is to use a good oil cleaner once in six months, rubbing the surface with a bead scrub brush or curled hair, removing all the dirt and wiping thoroughly with dry waste. This will keep the body in a more suitable condition for wiping with dry waste between the oil cleaning periods.

The shopping of equipment should be done in a systematic way by an inspector (a painter would be preferred) using his best judgment to get the bad cars through the shop first. At present, the transportation department sends the cars to the shop for general repairs, regardless of their condition. Very often cars get into the shop which should remain in



Fig. 2—Interior of Car No. 1717

service from six to twelve months longer and they are stripped and scrubbed before the mistake is discovered.

J. A. Allen (N. Y., N. H. & H.)—The shopping of passenger cars should be done under the supervision of the master painter. He knows after a certain time the condition of cars without even seeing them, owing to his familiarity with certain surfaces, colors, varnish, etc. He also knows that if he could call in cars at a certain period and were allowed to proceed on this plan, he could keep up the equipment with fewer men, less track capacity and considerably less expense.

W. L. Shaffer (Penna.)—The shopping of passenger car equipment should be left to the master painter in charge, inasmuch as the classifying of the equipment is governed by

the condition of the paint. He is the one who must be in constant touch with the situation, making periodical inspections, and is consequently familiar with the repairs previously given to the car. Therefore, he can most efficiently judge the proper classification needed in each instance.

Discussion. It was decided by a vote of the convention that it was the consensus of opinion of the members that the master painter should have charge of deciding what class of repairs is necessary for passenger cars.

Purchase of Paint on Railroad Specifications

W. O. Quest (P. & L. E.)—When a railroad asks a paint making concern to put its lowest selling price on its own specified formulation for paint, it does so at its own risk, because in so ordering its paint supplies on an open market the buyer assumes all of the responsibility for quality value. On the other hand, when the railroad buys the guaranteed specialty paint of the reputable railroad paint maker at the usual, fair, established market value, there is no buyer's risk.

The more I studied this subject, the more I became convinced that it is positive economy for a railroad to buy paint from the specialist maker. As a matter of business, the transaction is safer, because such reliable people have a business reputation to sustain, which, as a rule, they will back up.

There have been thousands of demonstrations that have taught that the best paint that can be bought is the cheapest in the long run. As a consequence, it does not matter whether the best paint is a reputable manufacturer's or a railroad specification paint, just so long as the purchasing company gets its money's worth. If the railroad specification paint is

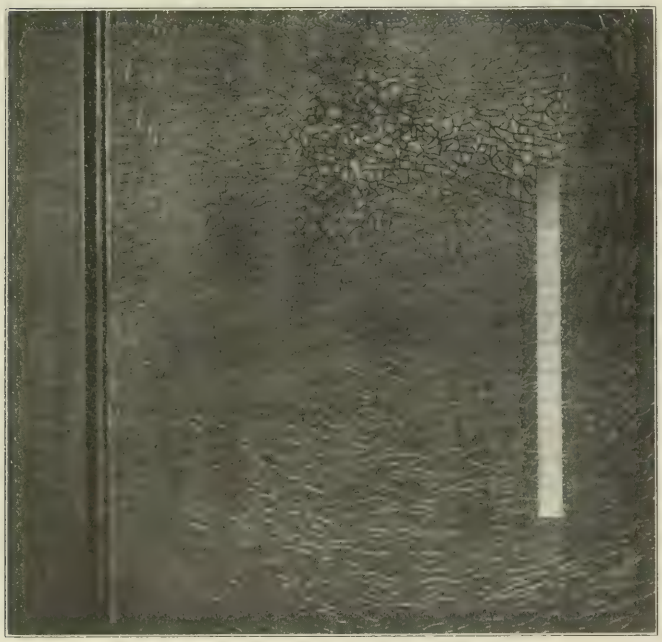


Fig. 3—Interior of Car No. 1621

the best, let us have it, but not in its hazardous cheapest-in-price form.

Dr. M. E. McDonald (Penna.)—In the question before us for discussion I shall consider the word "paint" in its broader sense so as to include the varnish used in coach and locomotive painting operations. There are evidently two sides to this question, but there should be only one. If chemists knew the best paint for each particular application, and if they could write a specification for each in such a manner that they could be complied with, and if all paint products not complying with the specifications could be rejected, there would be but one side to the question. A specification informs the purchasing agent and the manufacturers just what is wanted and affords a fair basis for competition, and there is no reason why any consumer should buy something which he does not want.

On the occasion of a recent visit to the factory of a large paint company, which has apparently organized an advertising propaganda against paint specifications, a request came in for a quotation on a large order for paint oil. The railroad sales manager said, "Now what do you suppose is wanted? We can make paint oil covering a wide range of merit, composition and price. We do not know what this prospective customer wants to pay or how to deal with such inquiries." He could have said exactly the same thing with



Fig. 4—Exterior of Car No. 1775

reference to a paint inquiry which was not accompanied by a specification. It would almost seem that the main objects in trying to break down paint specifications is to avoid competition.

It is argued by some that paint specifications retard progress by fixing standards. Such argument has little weight, for any paint consumer would change his specification if he were convinced that it could be improved upon.

It would not be fair to assert that all of the criticism against paint specifications is unjust. In drawing up a specification, it is important to first ascertain by experience what will meet the practical requirements of service. The composition called for should not be unnecessarily restricted; it must be a product readily available. It is also important that the purchaser can make the necessary tests, to compel compliance with the specification. To state what is desired without insisting on compliance with the requirements is unfair to competing manufacturers, and does not protect the consumer. There is a tendency in certain quarters to write specifications which cannot be enforced. The fact that some specifications are written without due consideration does not condemn a sound principle. It would be just as fair to condemn the practice of medicine because some quack doctor without any knowledge of medicine is allowed to practice.

It is not practicable with our present knowledge to control the purchase of all paint produced on chemical test. In such cases, physical tests can be devised, which we believe will be fair to competing manufacturers, and at the same time protect the consumer. Varnish is a good example of a product which, in our opinion, cannot now be controlled chemically, yet we believe it is possible to devise a specification under which it can be purchased on a competitive basis.

To indicate the necessity for such tests, the accompanying illustrations are shown. Fig. 1 shows the interior of a 54-ft.

compartment car No. 4579 completed May 29, 1912, which received class repairs including color on the exterior and varnish throughout, which were completed on May 21, 1913. It was photographed February 7, 1915. The car had consequently been in service 1 year, 8 months and 17 days, following class repairs.

Fig. 2 shows the interior condition of a 70-ft. passenger car No. 1717, completed by another car builder September 1, 1908, which received class repairs, including color and varnish on exterior and interior, which were completed on February 11, 1910. It was photographed about December 1, 1911, after 1 year, 9 months and approximately 20 days' service, following class repairs.

Fig. 3 shows the interior condition of a 70-ft. passenger car No. 1621, which was new January 20, 1910, and photographed on or about December 1, 1911, after 1 year, 10 months and approximately 20 days' service and before it had received any class repairs.



Fig. 6—Interior of Car Shown in Fig. 5

Fig. 4 shows the exterior condition of a 70-ft. passenger car No. 1775, which was new in January, 1909, received class repairs, including exterior color and varnish, which were completed on April 13, 1910. It was photographed on or about December 1, 1911, after 1 year and approximately 7½ months' service, following class repairs.

The appearance of the cars just described is far from satisfactory. Ignoring class repairs, one of these cars had been in service less than two years, two were less than three years old, and the fourth car, which was the oldest, had been built only three years and three months.

Fig. 5 shows what is possible in the way of durability. This car was completed in January, 1913, and photographed 3 years, 4 months and 14 days later, before it had received any class repairs. Fig. 6 shows the interior condition of the same car. With such examples confronting our officers, it



Fig. 5—An Example of the Possibilities of Paint Durability

was considered necessary to more rigidly control the purchase of varnish. It is but fair to state that this car No. 156 was painted by the baking process. The varnish was one of four selected from panel tests of a large number of baking varnishes. The tests showed that many of the samples submitted by manufacturers were inapplicable. The result of these trials on baking varnish were so convincing that it was decided to have the same tests applied to other kinds of varnish. A method was accordingly worked out and put in



Fig. 7—Method of Exposing Test Samples on the Pennsylvania

effect January 1, 1915, and while all varnishes are now virtually bought on specification, we are confident that the manufacturer is not limited in the exercise of his ingenuity.

The fact that a test was started on some 50 brands of varnish this month shows that the method does not prevent competition.

The method is largely practical, the tests being made on standard sandblasted steel panels made from sheet steel which was purchased for the construction of passenger cars. Each panel is 14 in. by 30 in. in size. One side of a large number of such panels is prepared by applying a suitable surfacing system and two coats of flat Tuscan red, excepting a space 3 in. by 30 in. at one edge, which is left bare. Each panel is then laid off into six sections, and each section is numbered consecutively, the figures being white, and a white stripe is applied lengthwise across the panel over the Tuscan red. The object of the white stripe is to make possible a better judgment of the color of the varnishes, under test, dark varnish being objectionable.

The varnish samples to be tested are divided into groups, made up of the various classes which are used. On the third day following the application of the last coat of varnish, all test panels are placed in a vertical position on a rack having a southeastern exposure, and observations for checking are made at intervals of two or three days. Fig. 7 shows the test rack as it existed on September 1.

In the purchase of varnish, it is our practice to place requisitions for any of the brands which are on an approved list. Samples from all shipments received are tested, and if the quality is found to be below standard such brands are dropped from the approved list and purchase of them discontinued. New brands of varnish are also added to the approved list from time to time, after the test as outlined has shown them to be entitled to this recognition.

We believe it is possible to formulate and apply specifications for the various classes of paint products, including varnish, which will be a stimulus to greater effort on the part of the manufacturers, and which will reward them for creditable efforts. The consumer will also reap the benefit of such improvement, and the painter will feel better satisfied with his work.

Painting or Oiling the Interior of Steel Hopper Cars

J. Gratton (B. R. & P.)—Corrosion starts principally from the interior of the car, eating its way through the floor, hopper and side sheets, making necessary the shopping of the car to renew the sheets. On account of the present high cost of labor and material this is an expensive operation. Furthermore, the loss of revenue resulting from withdrawing the cars from service when so badly needed is large.

On the Buffalo, Rochester & Pittsburgh, to determine the benefits which would be derived from coating the interior of the cars with oil, we arranged some time ago when cars were shopped for exterior painting or were undergoing heavy repairs, to thoroughly clean and remove all scale and rust from the interior of the car by the use of the hammer and by blowing out with a compressed air jet. The sheets were then given a coat of oil with a paint spraying machine. The cars, after being put back in service, were periodically examined; we found that the oil evaporated very quickly, resulting in very little permanent benefit. At present we are experimenting with more cars, applying a coat of elastic paint with the spraying machine. We find the machine to give better results than can be had applying the paint by hand with a brush, as the corners and crevices around the rivet heads are better filled and all openings at the seams are penetrated by the paint spray. We find this practice to have some advantage and as long as the paint or oil lasts it retards the wasting away of the sheets. When we examine the cars which we have oiled or painted, after they have been loaded, we find that much of the paint has been rubbed off in service by the loading and discharging of the lading. However, the principal wear is on the broad faces of the sheets and if the cars are kept constantly in service this wearing has a polishing or scouring effect which helps to offset corrosion.

If we direct our attention to the seams, corners, etc., and around the rivet heads, which are the vital points, we find that the same scouring effect is not noticeable, and that unless the coating has well protected the parts there will be a mass of rust and scale which constantly and slowly will destroy the steel, whether the car is in service or not, greatly weakening the structure and diminishing the life of the car.

Discussion.—In reply to a question by J. W. Gibbons of the Santa Fe, the author stated that the oil used is a Pennsylvania oil with a paraffine base. Mr. Gibbons stated that he believed it would be desirable to have tests made, using an oil which had an asphalt base. The cost for labor in doing this work on the Buffalo, Rochester & Pittsburg is 28 cents per car. A committee was appointed to continue investigation on this subject. W. O. Quest (P. & L. E.) said that paint is of no use for the protection of the insides of steel freight cars, as it either burns or wears off. The Norfolk & Western has applied oil with a spray for protective purposes, and has lately changed to painting, using one coat of red lead and one of carbon black.

Varnish Remover for Removing Paint

George H. Hammond (Soo Line)—Varnish removers which soften varnish and paint rapidly, but evaporate slowly and do not separate or settle, are found to be the most economical and efficient.

With the use of proper appliances, such as spray machines, vacuum machines and specially constructed brushes, both hand and power, maximum efficiency is obtained. Thus equipped, and with skillful labor, the paint on the wall surfaces of the interior of a steel passenger car can be removed at a cost of 50 cents per foot of car length, 60 per cent of this being expended for labor and 40 per cent for material. The cost to remove the paint with varnish remover from the outside is practically the same, but the ratio of expense for labor and material is different, as it requires less labor, but more material, 45 per cent going for labor and 55 per cent for material. This estimate applies to steel plate construction with rivets exposed.

In shops where the necessary facilities are installed, a quicker and less expensive way to remove the paint from the outside of a steel passenger car is by sand-blasting. The cost is 7½ cents per foot of car length for labor. Sand, air and wear on sanding equipment will be approximately 2½ cents, making in all 10 cents per foot of car length, or $8.00 for an 80 ft. car, a saving of 80 per cent of the cost of removing with varnish remover. These figures will, of course, vary. It is not practical to use the sandblast on the interior surface of a steel passenger car.

In summing up, it is believed that there is nothing superior to varnish remover for removing paint from the interior of steel passenger cars, also the outside of cars of steel construction imitating wood sheathing; but for the outside of cars having steel plate construction, sandblasting is far superior, costing only one-fifth as much as with the use of varnish remover.

Discussion.—The Santa Fe has successfully used the sandblast method for cleaning cars with the finish made in imitation of wood. The cost is 7.1 mills per square foot; as this is a beaded surface, the cost is probably a little more than would be necessary on a smooth surface. O. P. Wilkins (N. & W.) doubted if the sandblasting described by Mr. Gibbons could be carried out many times, as it would wear out the metal. In reply Mr. Gibbons stated that this has been considered, but the amount of removed metal is so small that the car can be sandblasted probably four times without

injury. It was decided by a vote that it was the consensus of opinion of the meeting that there is nothing superior to varnish remover for use on the inside and sandblasting for use on the outside of steel cars for removing paint.

Use of Soap in Cleaning Passenger Cars Preparatory to Varnishing

W. Mullendorf (Ill. Cent.)—It is evident from the investigations of the foremost chemical authorities, and the experience of many of the leading railways, that soap and water cleaning hastens the destruction of paint or varnish and that it is not true economy to clean cars in that way. A large proportion of the leading railway systems do not use soap and water for cleaning cars, but depend on special car cleaners manufactured for the purpose.

Discussion.—The New York Central uses for cleaning cars a solution of muriatic acid, followed by a weak soap solution and pumice preparatory to painting. This does a very thorough job with a decrease in the labor necessary. The strength of the acid is varied according to the condition of the cars and is never more than three parts of water. For general use, nine parts of water to one part of acid was recommended. The Denver & Rio Grande washes all cars every sixty days with oxalic acid, and renovates them. On the Santa Fe it is considered that if the soap used is good and is properly handled, it will give satisfactory results. It was also brought out that the success obtained with acid cleaners depends largely on the manner in which they are mixed and used.

Other Business

Chicago received the greatest number of votes for the next place of meeting. The following officers were elected for the ensuing year: President, John Gearhart, Pennsylvania Railroad; first vice-president, J. W. Gibbons, Atchison, Topeka & Santa Fe; second vice-president, E. L. Younger, Missouri Pacific; secretary-treasurer, A. P. Dane, Boston & Maine.

"THE NEW TYRANNY"*

By Samuel O. Dunn

President Wilson is the author of a recent book entitled "The New Freedom." It relates principally to the emancipation of our nation from the domination of predatory wealth. Personally, I value very little a process of emancipation which releases me from one form of tyranny merely to subject me to another, and instead of talking about "The New Freedom," I intend to say something about "The New Tyranny."

The greatest menace to democratic government in modern times, and especially in the United States, is the tendency of the people to break into sectional or class groups and to try by group action to get control of the government and use it to further the selfish interests of the group or groups in control. Some years ago it looked as if there was danger that the governments of our states and nation would pass under the control of a plutocracy. A comparatively few men had acquired an enormous economic power. In order to prevent interference with them in the exercise of this power for their own selfish ends they had gone into politics and built up potent political machines in the nation and in almost every state. Through their hired lobbyists and political machines the railways and other large business interests controlled nominations and elections. They secured the passage of many laws conferring special privileges and benefits on them and when they were unable to get such laws passed they were usually able to at least prevent the passage and enforcement of laws needed for the proper control of large business concerns.

But finally the situation became too unrighteous and harmful to be endured by the patience of the American people. They arose against the "malefactors of great wealth"; they destroyed their political machines and drove their lobbyists from the halls of legislation. They caused the passage and stringent enforcement of anti-trust laws, of laws for the regulation of life insurance companies, of laws for the regulation of railways. In their indignation they in many cases carried the movement for reform so far that it became one of persecution. Today, however, the group composed of persons described by a former president as "malefactors of great wealth" no longer dominates in our public affairs.

While the successful warfare against this group has been waging, another group has been trying to seize upon the power which the former has been losing. The development and growth of labor organizations has been coincident with the development and growth of large corporations and combinations of corporations. Like the corporation, the labor union has its proper place in our economic system. But the great labor organizations, like the great corporations, have not been satisfied to confine themselves to the performance of those functions which make them not only of benefit to their members, but also to society. Like the great corporations, they have reached out to seize political power in order to use it for their own purposes.

The railway brotherhoods, and the various unions composing the American Federation of Labor, have created lobbies which work openly to control nominations and elections to public office and to dictate the passage and administration of state and national laws. Lobbyists of great corporations, when other means failed, used money to accomplish their purposes. The labor organizations employ a more insidious, but not less immortal or effective, form of bribery. They tacitly or expressly offer to pay with their votes lawmakers and other public officials who help them to secure through class legislation the special privileges and immunities which they demand. The suffrage is conferred upon the citizen just as public office is conferred on him, not for his own selfish purposes, but to promote the welfare of the nation. It is a prostitution of a man's suffrage to use it to secure unjust class legislation for the special benefit of himself or the class to which he belongs. It is an act of perfidy and dishonor for a public official to participate in enacting, or in securing the enactment of, unjust class legislation at the expense of the public in order to gain votes for himself.

But these prostitutions of the suffrage and of public office have become only too common, and as labor unions are supposed to represent many voters, their influence over government has waxed amazingly. Their leaders have succeeded the "malefactors of great wealth" as our modern feudal barons. This is especially true of the railway labor brotherhoods. For about 10 years now these brotherhoods have been engaged in securing in practically all of the states, and even at Washington, the adoption of numerous laws for the benefit of their members, and which impose heavy burdens directly upon the railways and indirectly upon the public. Such, for example, are the laws requiring extra men to be employed in train crews. They have also used their power to defeat laws which are greatly needed in the public interest. For example, more than one-half of all the people who meet fatal accidents on our railways are killed while trespassing, and yet the labor brotherhoods have repeatedly defeated anti-trespassing laws for no better reason than that in cases of strikes they would probably have the effect of prohibiting former employees from going upon railway property. Five thousand people must be killed every year while trespassing rather than that striking railway employees shall merely incur the risk of being kept off railway property if they strike.

The Sherman anti-trust law formerly was held to prohibit not only combinations of capital, but also combinations

*Abstract of an address before the Annual Dinner of the Railway Signal Association held at Mackinac Island, Mich., on September 13.

of labor in restraint of trade and commerce. The labor organizations under the present national administration succeeded in getting the law so amended by the Clayton act as specifically to provide that it should not apply to combinations of labor.

And how numerous is the body of citizens who can thus dictate to our government? It is reliably estimated that of all the persons in this country engaged in "gainful occupations" not more than 6 per cent belong to labor unions. Therefore, to the extent that this group has got control we are being governed by a group whose members no more justify its dominance than the numbers of the "malefactors of great wealth" justified their dominance. The recent threat of a nation-wide strike on all the railways and the means which were adopted to prevent it showed in a striking and startling manner the amount of irresponsible power certain labor organizations have acquired.

The railway managements repeatedly offered to arbitrate all the matters in controversy. The vote to strike was actually taken. The strike itself seemed imminent. Then, at last, President Wilson intervened. But President Wilson did not insist on settlement as provided by law. He announced at once that the demand of the train employees for a so-called eight-hour day raised a question that was not arbitrable; that the railways ought to grant it at once, and that an arrangement should be made to investigate the other points in controversy.

The presidents of the railways having enough courage and sense of duty to decline such a proposition, there were two means available to the government for preventing the strike. One was promptly to pass legislation repealing the exemption of labor organization from the anti-trust law and making it a criminal offense for a strike to be ordered in railway train service until after an investigation by some public body of the points in controversy. That would have been the patriotic and courageous course to take. It was not the railways that were threatening to strike. It was the employees who were threatening to act precipitately and bring ruin and suffering upon the country, and, therefore, they were the persons to whom any special legislation required for the protection of the country should have been applied The second course open to the government was to pass the legislation providing for a 20 per cent increase in wages, disguised as an eight-hour day, which the employees said was the minimum which they would accept before calling off the strike.

The government took this latter cowardly, unjust and outrageous course. It passed the law the strikers demanded, thus buying them off with a bribe of $60,000,000 a year, which must be paid directly by the railroads and indirectly by the American people. It may be, however, that the bribe was not paid in real money. This law does not limit the number of hours that railway employees may work in a day. It merely limits the number of hours that the railway may require them to work before it pays them a day's wage. Now, while the government may be able constitutionally to regulate the working day of railway employees, it seems most questionable whether it can regulate their payday.

But suppose that it can, what does the regulation adopted by Congress actually mean? The law passed specifically provides that "eight-hours shall, in contracts for labor and service, be deemed a day's work and the measure or standard of a day's work for the purpose of reckoning the compensation of all employees who are employed in any capacity in the operation of trains." There are now many train service employees who work more than eight hours for a day's wage. There are also many in both passenger and freight service who make their run of 100 miles, which is now the equivalent of a day's work, in less than eight hours, and yet get a full day's pay for it. It is certain that under this law, if it should be upheld, the railways would have to pay a day's wage for eight hours' work. But is it not equally obvious that the law prohibits them from paying any employees in train service a day's wage before he has done at least eight hours' work? The law does not say that eight hours or less shall be the standard of a day's work for the purpose of reckoning wages. It says that eight hours, no more and no less, shall be the standard. It would appear, therefore, that under this provision if the railways should pay any employee a day's wage for less than eight hours' work they would violate the law and subject themselves to its pains and penalties.

If the law really means not only that the railways must pay every man a day's wage when he has worked eight hours, but also that they must not pay a day's wage to any employee who has not worked eight hours, then the leaders of the brotherhoods, by getting this law passed, have destroyed all the arbitrary privileges and immunities which now enable their members in many cases to get a day's pay not merely for less than 10 hours, but even for less than 8 or 7 or 6 or 5 or 4 hours—privileges and immunities they have struggled 30 years to wring from the railways.

The entire situation shows clearly that under existing laws the country can never be free from the menace of disastrous railway strikes and that, therefore, some additional legislation must be passed specifically to remove this danger. In dealing with the railway labor problem and the conditions which have given rise to it and to which it is related, we must, however, go deeper and farther than we will go if we merely enact a law to provide for a compulsory investigation of disputes that threaten to interrupt transportation. As I have already indicated, the immunity which organized labor has secured from the law prohibiting conspiracies in restraint of trade and commerce, the special legislation which the railway labor brotherhoods have secured in many states and at Washington, and the recent disgraceful surrender to the labor organizations at Washington, are symptoms of a national disease of the most dangerous character. Are the patriotic citizens of this country going to remain inert and let this disease continue its ravages? Are they going to let the barons of organized labor secure a stronger and stronger hold on their government until this nation will be converted into a mere mobocracy? Or are they going to rise and attack and overthrow the new tyranny of organized labor as they have attacked and overthrown the recent tyranny of organized capital?

We must not, while we are enjoying a great but perhaps temporary prosperity, overlook the fact that our entire future as a nation depends upon the establishment of sound principles in our government and on their maintenance and application in such a manner as to do justice between all classes of our people, rich or poor, high or low. Permanent progress and prosperity cannot be based on cowardice and injustice in the government of a country and an inert disregard of these qualities by its citizens.

SERBIAN RAILWAYMEN IN FRANCE.—Since Serbia has been in enemy occupation, France has extended a warm welcome to the railwaymen of that country. A number, mostly men who have at some time or other performed their military service, recently arrived in Paris, where they were received at the Gare de Lyon and the Gare d'Austerlitz by representatives of the Orléans and Paris, Lyons & Mediterranean Railways. A number of the Serbian railway men have already settled at Tours, Orléans and Châteaurenault, where the Orléans company has organized special courses of study, under Serbian engineers, for teaching the men French, as well as for technical purposes. French engineers are aiding in this work, and in the meantime the Serbs are receiving regular pay. Altogether, the Orléans and Paris, Lyons & Mediterranean companies have accorded hospitality, of the most practical nature, to nearly 500 Serbian railwaymen.

CONGRESS AND THE RAILWAYS

The Railway Business Association is sending out to its members Bulletin No. 19, entitled "Congress and the Railways," from which the following is taken:

Congress has organized a joint committee of its members "to investigate the conditions relating to interstate and foreign commerce and the necessity of further legislation relating thereto," and to report in January, 1917. Hearings have been set to begin November 20.

Proposals for measures to promote equitable adjustment of railway labor disputes will be dealt with separately and with them this leaflet has nothing to do, but the enormous increase in operating expenses compelled by the eight-hour law accentuates the necessity for general legislation designed to bring regulation into proper relation with the facts of the business as they exist.

The Slow Down

(1) Improvement of existing railways and construction of new lines has been seriously retarded.

To find a five-year period in which the increase per cent in miles of duplicate tracks was smaller than 1914 over 1909 we have to go back to 1899 over 1894, a period of business disaster. Miles of track other than single increased 22.1 per cent, 1914 over 1909. This compares with 26 per cent, 1909 over 1904, and 34.5 per cent, 1904 over 1899. Miles of single track, indicating length of road, increased 1914 over 1909, 8.9 per cent. This compares with 10.9 per cent, 1909 over 1904, and 12.1 per cent, 1904 over 1899. On length of road, therefore, it is also necessary to go back to the panic in the '90s to find a smaller increase per cent than that shown in 1914 over 1909.

Commerce the Foundation for Defense

(2) Transportation development primarily for commercial and agricultural purposes is the foundation of transportation for defense.

Transportation facilities this year have been hardly anywhere equal to the strain and at some points have broken down utterly. Yet what is this traffic which the roads could not handle promptly? Before the tonnage connected with munitions manufacture and delivery began to move there was unemployment and privation, with meager railway traffic. The war requisitions of Europe were the basis of the activity since the fall of 1915. This American output of war fabrics has at no time equalled more than a small percentage of the requirements of even one first-class power. It does not begin to suggest the quantities which the United States would have to find if attacked by such a power.

We have shipped some clothing, food and supplies to belligerents. An American war would vastly multiply this. Soldiers, moreover, would be added to the traffic. The trains transporting men would have rights of way to which every freight train must defer. This would cut down the capacity of track and rolling stock for despatch of armament and other military commodities. Yet we are eye-witnesses that a mere modicum of the war traffic which an American embroilment would entail, superimposed upon lax general business, has exhausted our transportation resources. We cannot begin to make a defense machine out of a railway until we have first developed it into an instrumentality effective for business.

Apprehension of Investors

(3) Cessation of railway development is due to the belief of investors that governmental influences will keep railway earnings too low in proportion to inescapable railway expenses.

Not even the great increase in gross earnings due to the carriage of war munitions and the accumulation of available capital accrued from munitions profits has availed to draw new investment in appreciable volume into the improvement or construction of railways. Persons somewhat remote from railway management or from the processes of large-scale investment are prone to look upon any temporary improvement in railway earnings as obviating necessity for remedial action. Railway managers and those who have the responsibility of investment cannot dismiss their apprehension so lightheartedly. The expenses of a railway it must meet in every year of the decade. Its resources are the total earnings for the decade. The condition of the company, therefore, is only to be gaged by setting the large earnings of one year against the small earnings or deficits of other years. Investors look forward past the fat year to the lean year. They insist upon assurance that railway earnings in ratio to railway expenses will not be held down below the danger line. They await correction of the defects in the regulatory system.

Problem Is National

(4) Upon Congress in the main rests the burden of reorganizing the system of supervision over railways.

Railways, formerly local or state instrumentalities, have become interstate highways. Congress, having under the Constitution, power to regulate interstate commerce, has exercised that power in part. States have continued to regulate the same instrumentalities. Test cases carried to the highest court have established the supremacy of the national government over whatever factors may influence interstate commerce. The question involved is what spheres it is wise for the federal government at this time to take under its authority.

Multiple Charters

(5) Incorporation and the regulation of security issues should be federal.

As corporations, most of the large railway systems are under conflicting regulation of more states than one. This especially affects them in the matter of capitalization. What is permitted in one state is forbidden by another. Even when the various masters concur, the process of obtaining sanction is long and costly.

Chaos in Rates

(6) Supervision over rates which affect interstate commerce should be made federal by statute.

Rates, classifications and regulations affecting revenue are the subject of conflict between federal and state and between the several state authorities. This is in spite of the widespread belief that existing law as interpreted by the Supreme Court gives the Interstate Commerce Commission authority over all rates which influence interstate commerce. Some Interstate Commerce Commissioners doubt their power in this respect.

Power to Raise Rates

(7) The Interstate Commerce Commission should have power to fix minimum as well as maximum rates.

The Interstate Commerce Commission has authority, when declaring a given rate unlawful, to fix in its place the maximum which may be charged, but not to fix the minimum. Many of the most important adjudications by the Commission involve the relation of one rate to another. The Commission is unable, in readjusting a rate schedule for the primary purpose of eliminating discrimination, to protect the carriers involved as a whole from impairment of their total revenue.

Restriction, But No Protection

(8) Congress should by statute declare it the policy of the government to permit such rate systems as will yield the roads revenue sufficient to perform adequate service and to attract investments for improvements and extensions.

Protection to the revenue of the carrier is a fundamental

function not imposed upon the Commission by the law and vigorously repudiated as a proper function by some of the commissioners. It has constantly been urged that the Commission, under the language of the act, could only consider one rate at a time and never whole rate fabrics in the light of total earnings and total needs. The law, in other words, intends to prevent individual rates which would be too high, but does not intend to prevent rate systems which, as a whole, are too low.

It was proposed in connection with the eight-hour day legislation that the Interstate Commerce Commission should be directed to consider wage advances in fixing rates. The Commission should have a standing rule from Congress to consider, in fixing rates, not only wages, but every other factor affecting expense.

Auxiliaries to the Commission

(9) Congress should authorize the creation of regional sub-commissions appointed by the President, subordinate to the Interstate Commerce Commission, and exercising administrative jurisdiction over areas corresponding to traffic movement.

Shippers and railways complain that in the field where federal regulation is now exercised the Interstate Commerce commissioners are too overburdened to give personal attention to administration and are acting upon the reports of examiners. It is also said that administration is slow and complicated and that litigants are obliged to travel to Washington for hearings in matters which, while necessary to be adjudicated, do not justify such an expenditure of time and money. It is proposed to meet this situation by having sub-commissions, composed of men of such calibre as to be confirmed by the Senate, empowered to make orders which will be valid unless appealed to the Interstate Commerce Commission. The form which legislation should take will be determined by the usual process of hearings, conferences and general exchange through the platform and press. The general purpose is unity and order of regulation, strengthening of the federal mechanism of regulation and a statutory declaration of policy providing protection to railways where now the law prescribes restriction only.

SAFETY POINTS FOR INVENTORS

By Parker Cook

Every week the United States patent office declares a number of interferences; that is a proceedings to establish by taking testimony, who is the first inventor where two or more inventors have filed an application covering substantially the same idea or subject-matter There have been to date nearly 40,000 interferences before the proper patent office tribunals. If inventors will consider carefully what follows, their chances of prevailing in the matter of priority will be greatly enhanced.

It is of value to be familiar with a few of the rules followed by the patent office, to understand how it sets out to determine who was really the first inventor; and especially the five essential points or requirements that the office has the inventor start with. In these five requirements, the different arrangements or combination of arrangements of dates lead to different results in regard to the outcome of the interference. It is necessary therefore to have a clear conception in regard to these requirements, which the office requires the inventor to set out under oath after the interference has been declared, and really before the fight begins. These requirements are set out in what is called a "preliminary statement." When the office notifies two or more parties that their applications contain claims for substantially the same invention, they are each required to file a preliminary statement in which must be set out answers to the following questions (Rule 110):

A—The date of original conception of the invention set forth in the declaration of interference; *B*—The date on which the first drawing of the invention was made and the date on which the first written description of the invention was made; *C*—The date on which the invention was first disclosed to others; *D*—The date of the reduction to practice of the invention; *E*—A statement showing the extent of use of the invention.

There is also a requirement set out stating that the applicant shall give the number and date of any application filed abroad, but which we will not consider in this article. There is still another requirement stating that if a drawing has not been made, or if a written description of the invention has not been made, or if the invention has not been reduced to practice or disclosed to others or used to any extent, the statement must specifically disclose these facts.

Now let us skip to Rule 116, which is one of the most important of all the rules in regard to interference, and which must be taken up in conjunction with Rule 110, just mentioned: "The parties to an interference will be presumed to have made the invention in the chronological order in which they filed their completed application for patents, clearly disclosing the invention; *and the burden of proof will rest upon the party who shall seek to establish a different state of facts.*"

In other words the party first to file his application in the office is known as the senior party and the burden of proof to establish all the dates set out in the former rule is placed upon the party that filed after the senior party or the party otherwise known as the junior party. It is therefore a great advantage to be the first to file the application as the senior party may literally rest on his oars while the junior party has to clearly establish all his contentions set out in the preliminary statement, which is often no small matter. It might be here mentioned that to try to establish the facts set out in Rule 110 testimony is taken and all exhibits and documentary evidence that can be used is produced to establish the matters set out; that is *A, B, C, D,* and *E* of Rule 110.

The first safety move is to file the application for an invention in the patent office as soon as it is carefully and completely worked out.

Let us consider now the five points as set out in Rule 110. First, taking up *A*; the invention as set forth in the declaration of interference means the claims of the application which are in interference, and which are then known as counts; that is claim 1 of an invention might conflict with claim 3 of the other party's, and these two claims would be known as count 1. As it is of course essential at the time of taking testimony to clearly substantiate all the dates set out in the preliminary statement it is well to try to connect the conception of the invention with some time, place, event or object, so that you can clearly establish this date of conception when called on in the taking of the testimony.

Considering now point *B*; the second part of this requirement has just been incorporated in the Rules of Practice; that is, since January 1, 1916. It is intended that this will not leave too much leeway for the inventor to make a sketch of the device and later read his sketch in an entirely different light. Moreover, in thousands of instances a party would allege that a sketch was made, but not preserved. It is more than likely that if a sketch is made and also a written description the matter will be preserved, and if not preserved it will count unfavorably for the inventor.

Therefore the second safety point for inventors is to make a drawing or sketch, not necessarily a scale drawing or a commercial drawing, but one that in itself would enable any other skilled in the art to fully comprehend and understand what was intended. Although no decisions that the author is aware of have yet been rendered in regard to the written description, it is naturally to be presumed that in this instance the description will not have to be a lengthy

or elaborate one. As the dates are as important as the sketches, it is of course well to put them on both the description and the sketches and also have them witnessed; or probably the best plan of all is to take the sketches and description before a notary and make a short affidavit that on such and such a date the sketches and description were made. This should be done immediately upon the completion of the description and the sketches.

Taking up now point *C;* as the testimony of the applicant himself has hardly any weight with the tribunals of the office, there has been incorporated this rule. It is therefore desirable to disclose the invention to others, so that they may be called on as witnesses to substantiate the inventor's statement as to conception, sketches, etc. As a safeguard, when you first conceive of the invention, or possibly after you have made sketches, and a written description, disclose or tell a few friends of the invention, discussing the gist of the matter with them, asking that they make a note of the date, or fix it in their mind with some other happening, so that if called upon they can be of material assistance to you. If you have a draftsman make the sketches or drawings, let him also keep some record of it as a draftsman always makes a good witness.

Now as to point *D*; possibly more could be said upon this subject than on all the other points combined, as it really counts more with the office than anything else, with the possible exception of Rule 116; but this we cannot always provide against whereas point *D*, or reduction to practice, is generally within possibility. This matter cannot be gone into fully but a few of the essentials may be set out. First, the filing of an application is known as a constructive reduction to practice, although it is not as persuasive as the actual reduction to practice which means the building and completion of an operative device, which is put into use. There is a difference between simply a test and a reduction to practice, but tests may result in reduction to practice. It will be readily seen that where the one inventor conceives of the idea and simply makes sketches and then files his application it will not be looked on as favorably, other things being equal, as the case of the man who not only conceives of the invention and makes sketches, but actually makes or builds one of the devices, tries it out, and has it in operation, or lets others operate it for him. The invention, although on paper in the first instance, might develop serious unseen difficulties, whereas in the actual reduction to practice it will either stand up under use, or fail. If it does stand up, it will have great weight with the office tribunals in deciding who is the first inventor. Therefore if possible, construct a device according to your conception, note and preserve the dates relative to the construction and the reduction to practice and preserve if possible the device itself. Of course if the invention is a large one, this cannot always be done, but if the device is built, be sure and preserve all records pertaining to it.

As regards point *E*; if the invention is a small one, the greater the use and the greater the number manufactured, the greater the weight with the examiner of interferences, the officer of the patent office before whom the matter is tried. This statement will be readily understood as the question of abandonment comes in here, in that if an inventor simply builds one of the articles he may abandon his rights to it by not furthering the matter. He will thus relinquish his rights to the inventor who may have filed later and conceived later, but who entered the field and gave the public the results of his invention. This naturally brings up the subject of laches, or delay, and the question of abandonment, but all that is necessary to avoid this point is to not delay unnecessarily between the "reduction to practice and the filing of an application," nor delay between the "conception and the reduction to practice" as the time will all have to be carefully accounted for, and it must be remembered that the law favors the diligent.

As mentioned earlier, there are a good many combinations wherein the outcome of the interference will depend. For instance the first to conceive and the last to file will have to give way to the second to conceive but the first to file, the second being diligent and the first guilty of laches. Some of these combinations cannot be guarded against but if the rule that "the law favors the diligent" be carefully observed the chances for prevailing are greatly enhanced.

Summing up briefly, therefore; first, file the application as soon as possible after its conception and completion. This will cover the points of diligence, laches and abandonment; second, fix the date of conception thoroughly in the mind; third, make sketches and descriptions and preserve them, and also affix the dates and have them witnessed or sworn to; fourth, disclose the invention to others, so that they may be relied on to substantiate your statements; fifth, reduce the invention to practice if possible.

AN OPEN LETTER TO HENRY FORD ON THE WAGE CONTROVERSY

Henry Ford, the automobile manufacturer, recently wrote a letter criticising the course of the railways in the recent wage controversy. Frank Trumbull, chairman of the Railway Executives' Advisory Committee, has written the following vigorous open letter in reply:

"My attention has been called to a published interview with you, under date of September 2, in regard to the recent railroad wage controversy, and as it has not been contradicted I am making this answer public. Your conspicuous position gives you a wide audience and erroneous statements published in your name are, therefore, all the more dangerous and harmful and should not go unchallenged.

"You say that 'the real power back of them [the railroads] is located in and around Wall Street.' This is an inaccurate and threadbare generalization, frequently heard and quickly disproved by the facts.

"The real owners of our railroads are some 607,630 individual stockholders, excluding railway corporations and duplicate holdings. When allowance is made for the fact that some of these individual holders are brokers, holding in one name for several different owners, and that trustees or executors similarly hold for numerous others, it can be readily seen that the total aforementioned is an understatement.

"Moreover, if we add to the aggregate of stockholders all those who virtually own railroad bonds: insurance policyholders and savings bank depositors, of whom there are 30,000,000 of the former and 11,000,000 of the latter class, whose premiums and deposits, jointly, are secured by an aggregate ownership of railroad bonds totalling $2,300,000,000, it is apparent that the ownership of America's railroads is not only widely, but democratically, diffused instead of being concentrated in the hands of a few individuals in 'Wall Street.'

"Broadly speaking, the bankers are simply middlemen, who buy railroad securities and sell them to the public. You refer to the railroad presidents as 'messenger boys for Wall Street.' I think you cannot cite a single instance of direction, either oral or written, from any Wall Street banker to any railroad president in connection with the discussion of the *so-called* eight-hour movement in the last few months: but, if you can, will you do so?

"You say: 'The railroads evidently are determined to get from the American public a still greater share of their earnings through freight rates, and that is what they are playing for.' If you believe, and can prove this statement, you owe a duty to yourself and to the nation to come forward with your proofs immediately. But since you use the word 'evidently,' I apprehend you will not attempt to substantiate what you must realize is not true, and which is cal-

culated to work both injury and injustice to the railroads.

"The railroads were not playing a game. The wage question was not of their seeking. They did nothing either to instigate or precipitate it. They were, on the other hand, unwillingly and irresistibly compelled to join issue with the employees, in an endeavor to maintain right and justice. They took a determined stand for democracy and its essential principles against class government and the rule of might, and their attitude has been approved very generally by press and public. Men of intelligence, certainly, see in their conduct a fitting sense of the obligation of trusteeship reposing in them for their owners, their other employees, and for the public at large, and a conscientious adherence to principle.

"You further say:

'If the roads were run more to serve the public, run more by the men who really have to operate them, run as railroad properties and not as mere instruments of financial juggling, we could have lower rates, better service, higher wages, and still leave a profit for every dollar legitimately invested. The roads could make double the profits at present rate of fares and pay all increases of wages demanded.'

"In using the word 'roads,' I assume you mean all of the roads of the country, but perhaps you will list the roads which are now being used 'as mere instruments of financial juggling.' The gross earnings of the roads of Class One (excluding smaller lines) for the fiscal year ended June 30, 1916, were about $3,400,000,000. The profit from the operation of these roads for the year, after paying taxes, hire of equipment and rentals, was about $1,000,000,000, or only about seventeen times the reputed profit of the Ford Motor Car Company alone for the same period, and the $1,000,000,000 referred to was not over 6 per cent return on the actual value of approximately 225,000 miles of road involved; that is to say, the $1,000,000,000 was the amount available for interest on debt, dividends on stock, additions and betterments and reserves.

"As you are a student of economic affairs you doubtless know that the railroads of the United States have the lowest capitalization per mile of any civilized country in the world. You must know also that our railroads, in addition, pay the highest wages known to railroad labor the world over, and render service for the smallest compensation recorded by any country.

"Now, I am sure you will earn the further gratitude of one hundred million people if you will show how 'the roads' could double their profits. Bear in mind, that practically all of the expenses of a railroad are made up of labor and material. How would you save a billion dollars? Out of which items would you take it?

"The proposition of the railroads was that all these questions be arbitrated before some impartial tribunal and the facts established as a basis for judgment and action. They made no proposals 'to tie up the country' or 'to bring untold suffering to millions of people.' Such proposals came only from the heads of four highly organized bodies of railroad employees, representing the best paid labor in the world, and aggregating less than one-fifth of the total number employed in railroad service. As these men were asking for more than their share, 'the voice raised by the God of Greed,' to quote your words again, must have been in their behalf.

"It is just such ignorance of the facts about the railroad situation as displayed in your published statement that make imperative and obvious the need of public investigation and public knowledge before speech or action in these matters."

RAILWAY UNREST IN SPAIN.—The Spanish Government has issued a decree in regard to the recent railway strike, providing for the settlement of disputes by arbitration, and obliging the companies officially to recognize the men's trade unions and associations. There are further signs of unrest among the railwaymen at Saragossa, Barcelona and Valentia.

TRAIN HANDLING ON HEAVY GRADES

By Edward F. McKenzie

Passenger Engineman, Pennsylvania Railroad.

In order to handle trains on heavy grades successfully, three things are necessary; viz.:

Knowledge of the physical characteristics of the road; obedience to rules, and good judgment.

The officers of the Pittsburgh Division of the Pennsylvania, realizing the difficulties incident to handling large trains on the different grades, and on account of the very large tonnage on this division have established at five terminals Motive Power Instruction Rooms in charge of a competent instructor; there every piece of the air brake is cut in sections and coupled to another active piece by a rod, so that the pupil can see what the inside looks like when it is working.

The instructor teaches his class in complete detail and at least every three years examines all enginemen and conductors. The firemen have to pass first, second and third year examinations; and with this intelligent co-operation from a whole corps of trained men good results are obtained.

We use the Westinghouse equipment and all road freight engines have two 9½-in. air pumps, or one 8½-inch cross compound pump, with a main reservoir capacity of from 54,000 to 74,000 cubic inches.

In some freight yards, terminal test plants are established and here, after a train is made up the inspectors charge it up and make a terminal test. This consists of full brake pipe pressure, 70 lb. first; a full service application of the brake; and all the cars and brake rigging, pistons, etc., are looked at. No piston can have less than 6 inches or over 9 inches travel. The brake rigging must be adjusted to suit these standards.

After seeing that all brakes are on, they are released and again looked at, and the result marked on the front of the train. A train crew receiving this train need only make the road test, which consists in pumping up full 70 lb. pressure and making a full service application. When the flagman or the engineman of the pusher sees the brake set on rear car he signals to release; and when you have done this you are ready to proceed. This road test, to make certain that all angle cocks are open, is the only means of knowing that you have all your train in service. It is the rule of the company to make it wherever cars are set off or taken on, or where an engine is cut off.

A terminal test must be made by trainmen on all cars before moving off any siding, in order to see if the brakes work, as otherwise the lawful percentage might be cut down; and in that case the cars would have to be put back on the siding.

On account of the grades on this division varying from level to nearly 4 per cent. special instructions are issued for the very heavy grades.

The air pressure maintained on trains running on these particular branches and the eastern slope of the Allegheny mountains is 95 to 100 per cent brake pipe. All retaining valves are set in 50 lb. position on loaded trains unless there are 15 or more cars together in a train which have the old style 15 lb. retainers; in that case all cars back of them have retainers set at 25 lb. Sixty per cent empty cars rates a train as empty and brake pipe pressure is 70 lb.; and only 60 per cent of retainers are set in the 25 lb. position.

Before turning the hill at Gallitzin (the top of the mountain), a terminal test is made by inspectors. After they report and the block signal shows proceed, the engineman makes a road test and is ready to go; first consulting with the conductor as to how many hand brakes will be used to help hold the train. This is the feature which the company leaves to the men's judgment. Having hauled the

train already 75 miles or more they have knowledge of its condition not possessed by anyone else.

As most trains consist of 60 to 100 cars they usually have four engines on; and great care must be exercised in starting in order to avoid damage to the cars. The majority of the cars have capacities from 55 to 70 tons.

Only the leading engine in front and the rear engine in the rear use steam until it is necessary to supplement their power by using the engines next to the train. If necessary to take the slack, the leading engine does it. If the train cannot be started after leading engine stretches it out the rear one takes the slack.

After starting at Gallitzin and as soon as the train gains speed the runner of the leading engine gradually shuts off, and allows the pushers to shove him through the tunnel; coming out, a 10 lb. to 12 lb. application of the brake has been found to be best, followed by more if this does not check the speed of the train; if it does slacken the train properly, the brake is released and the results noted. If the train moves along slowly, the retainers are doing good work and light applications of from 3 lb. to 5 lb. will take you down alright. If the train starts to gain speed after the first release, the next application must be heavy and must be held on until the train is nearly stopped; for it is evident the retainers are not holding well.

A certain number of minutes must be put in between each two telegraph offices—the time being 40 minutes for the whole distance of 12 miles.

The rules require one blast of the whistle as a signal for train men to apply more hand brakes; for two blasts the crew will apply all of the hand brakes which work with the air, and the flagman gradually opens the angle cock on the rear end of the train. Continuous calling for brakes, means no air and the crew must apply all brakes on the train; and then the engineman must not apply air brakes until he signals "off brakes" to avoid injuring the men who are using brakes and pulling opposite to the air apparatus.

If a train breaks, or the engine is cut off, a sufficient number of hand brakes must be applied to hold the train, beginning at the front end on descending grades and the rear end of ascending.

On some of the branches, the grades are from 2.6 feet to 3.8 feet to the 100 feet, and on the latter, all retainers and hand brakes are used, and as the road test before starting is made with all hand brakes on, enough hand brakes are let off at the front end of the train to get started and immediately put on again, the brakemen using a whole pick handle for a brake stick.

On the heaviest grades, which include these steep humps and the east slope of the Allegheny mountain, 100 lb. brake pipe pressure is used and the engineman must so manipulate the brake that the pressure will not fall below 65 lb. He must stop and pump up before proceeding, if it does fall below 65 lb.

The rule to not allow air pressure to fall below 65 lb. on specified branches and the east slope of Allegheny mountain, was made necessary when engines had only one air pump and smaller reservoirs, and when the train equipment was not kept up to the present standard. The men were not so expert in handling trains, and the 65 lb. mark was the lowest the company felt a man could stop with. Having stopped, the hand brakes held the train while the air pressure was pumped up.

Poor or leaking retaining valves (which hold air in brake cylinders while recharging train), brake pipe leaks, or poor manipulation of brake used to necessitate stopping sometimes, on the east slope and on some of the branches. This has been almost entirely overcome by the schooling given to the men of all departments; by the better upkeep of equipment and especially by the schooling given to the enginemen; and it is a rare thing to have to stop to regain air pressure.

If a train is under control at the bottom of the mountain, the engineman signals off brakes and the crew turn down the retainers, beginning at the rear of the train.

All firemen promoted to the position of freight engineman must take five trains down the east slope of the mountain successfully under the eye of a special engineman before being allowed to haul a through train alone.

The number of freight cars taken down the eastern slope, Gallitzin to Altoona, in the year 1913, was 1,155,331, or an average of 3,165 cars a day. These figures will give some idea of the high efficiency required. The monthly totals were as follows:

January	101,934	July	95,895
February	91,545	August	98,530
March	99,359	September	91,520
April	87,723	October	101,773
May	97,896	November	94,428
June	94,382	December	100,116

Passenger Train Handling

In order to avoid annoyance to passengers, the company requires, where two engines are coupled to a train, that the lead engine do the starting or taking slack when necessary, the engine next to the train following up when needed.

At all terminals a complete test of the brake is required. This consists of 110 lb. brake pipe pressure, a full service application of the brakes, to be looked at by the inspector who signals with the communicating whistle-signal to release.

The inspector looks at all the cars to see if the brakes are released and notifies the engineman and conductor how many cars are in the train and on how many the brakes are working.

In stopping, the first reduction is about 8 lb., followed with such other reductions as will reduce speed to about 15 miles an hour, releasing and making second application to stop, holding this on until stopped, if nine cars or over; if less than 9 cars, brake is released just before stopping, to avoid a rough stop.

At top of mountain (Gallitzin) a running test of 8 lb. to 10 lb. is made to be sure the brakes are all right. Going down the eastern slope of the mountain light applications are the rule. This makes a steady run.

In slackening speed for switches and curves a reduction of 8 lb. is made, followed by enough to come within the required speed limit. The idea of the initial reduction of 8 lb. is on account of the heavy Pullman cars on the rear of the trains and to insure the application of the latest designs of brake equipment, which require at least 6 lb. to operate them.

An engineman, being promoted from freight to passenger, after passing all other tests must take one train over the division and down the eastern slope of the mountain successfully, under the eye of an assistant road foreman; and must be recommended by all the passenger enginemen with whom he has made trial trips before being allowed to take a train out alone.

Since March 1 last, all enginemen who have successfully passed their air brake examination, and have proved their efficiency in handling trains, need only appear for instructions on old brake equipment every two years; but they must pass a new examination if they fail to appear, or if they have had an air brake failure; and of course there are new examinations if new brake equipment is added to that which has been in use.

Railways in Spain.—The total length of the railways in Spain is now 9,377 miles, of which more than three-quarters is of standard gage. The receipts of the railways decreased $3,000,000 in 1914, from receipts of 1913.

Roadmasters' Thirty-Fourth Annual Convention

Abstract of Proceedings of an Unusually Successful Meeting of This Association Held This Week in New York

THE thirty-fourth annual convention of the Roadmasters' and Maintenance of Way Association was held at the Hotel McAlpin, New York, on September 19 to 22. The convention exceeded all previous records in attendance, over 250 members registering. An important feature contributing to the large attendance was the placing of a special train at the disposal of the Western members on which about 175 roadmasters, supply men and members of their families came from Chicago.

The officers of the association during the past year were, president, Coleman King, supervisor, Long Island Railroad, Jamaica, N. Y.; vice-president, M. Burke, roadmaster, Chicago, Milwaukee & St. Paul, Chicago, Ill.; second vice-president, A. Grills, general roadmaster, Grand Trunk, St. Thomas, Ont.; secretary, P. J. McAndrews, roadmaster, Chicago & North Western, Sterling, Ill.; treasurer, W. H. Kofmehl, roadmaster, Chicago, Milwaukee & St. Paul, Elgin, Ill. The convention was called to order at 10 o'clock Tuesday morning by President King, who introduced J. M. Rice, general secretary of the Railroad Y. M. C. A. of New York, who opened the convention with prayer.

Ralph Peters Addresses Meeting

Ralph Peters, president of the Long Island Railroad, welcomed the convention to New York on behalf of the railways. After paying a tribute to the loyalty and efficiency of the roadmasters as a class, and citing numerous experiences arising in his personal contact with them as an operating officer, he said in part as follows:

"Let me suggest that you consider among other subjects how to restore the old time loyalty and faith of the mass of employees, as well as of the public, in the integrity and honesty of those conducting railway business. You roadmasters, through your section foremen, and your general organization, are close to the farmers and to the local population along the lines of your respective roads. You know that your executives as well as your operating and maintenance officers are striving at all times to upbuild their properties, to give good service and to increase the traffic. You know how we are bowed down by rigid laws and regulations especially in the manner of accounting for all the work that we do so that proper charges may be made for depreciation for property abandoned, for additions and betterments and all the numerous details that have been placed upon the maintenance department in recent years, so that today practically every section foreman must have a clerk to keep his time and distribution books, while a supervisor or roadmaster must have a large force to make out all the reports required of him by the Commission.

"These things are the result of a lack of appreciation by the general public of the constructive work and upbuilding that is being done by the railroads. You men, by the force of example, as well as by the word of mouth can make friends for your companies, can make the people along the lines of your road understand definitely what the real facts are concerning the railroads, and the railroad management.

"The officers responsible for your work are just as devoted and faithful in their efforts to get successful results as you men are individually. Trust in your officers and join with them in trying to put the railroads in a proper light before the people of the country in order that those who are elected to the legislature, to congress or to higher positions may stop the foolish, unreasonable multiplication of laws affecting every branch of the railroad service; laws that are depriving men of the individual rights guaranteed to them by the constitution. We all know your loyalty. We all know and appreciate your honesty, sincerity and fidelity as displayed in your everyday work. Let the people you come in contact with everywhere know that every man in the railroad service is loyal and faithful in the discharge of his duties and is entitled to the respect of the community in which he lives. This will help the whole railroad situation more than anything else I can think of."

James Burke, superintendent, Erie Railroad, Chicago, and one of the pioneer members of this association, replied to Mr. Peters on its behalf. He was followed by E. T. Howson, engineering editor of the *Railway Age Gazette,* who spoke on "The Objects and Ideals of the Association."

Marcus M. Marks, president of the Borough of Manhattan, welcomed the association to New York on behalf of the city. He was followed by W. M. Camp, editor of the Railway Review, who spoke on "The Roadmaster"; by Robert Black, president of the association in 1894, who spoke on early reminiscences of this association before the formation of the American Railway Engineering Association, the Railway Signal Association and the other organizations in this branch of railway activities, and by J. V. Neubert, engineer of track, New York Central, who emphasized particularly the importance of the section foreman to the railway.

In his presidential address, Coleman King reviewed the activities of the past year. He stated that the number of new members received was larger than any previous year in the history of the association. He urged close attention to the sessions of the convention and participation in the discussion of the reports presented.

The report of the treasurer showed a balance of $714.55 in the treasury, a material increase over last year.

Seasonable Distribution of Forces

In general the committee is of the opinion that all regular section work can be carried upon a practically uniform basis without regard to geographical locations or climatic conditions. The actual time of year, however, to start and finish work must depend upon the local conditions of the particular section or line.

The committee is in favor of a monthly payroll allowance and a yearly material allowance. A monthly payroll allowance gives a chance for quick curtailment in expenses which invariably affects the maintenance department first and at the same time gives maintenance officers opportunity to keep their payroll expenses well in hand. Heavy maintenance work often shows up quickly which cannot be foreseen and provided for in a yearly allowance. A yearly material allowance permits the company to purchase material at advantageous prices.

The committee is not in favor of standard maintenance forces the year around.

If section work could be distributed throughout the year there is no question but that a uniform force would be desirable and efficient.

The minimum "winter force" should be used, outside of handling snow and ice, in regaging and rolling rails, tightening spikes and bolts, repairing right-of-way fences, shimming, cleaning up right-of-way and ditching. In the late fall or early spring all ties for the next year's renewals should be distributed by work trains upon sections along the line

of road where they are to be applied. As soon as the frost is out of the ground, the entire section should be gone over, taking out shims, lining track and surfacing up bad spots. The full allowance of summer forces to take care of heavy section work should be put on about April 1. Tie renewals should start about this time in main tracks and be completed not later than July 1. At the completion of the tie renewals in the main tracks, these tracks should be surfaced out of face, and the alinement corrected where necessary. Following the main track work in the late summer, come the tie renewals and other work on sidings, including the renewal of switch timber. Track work should be discontinued a sufficient time in the latter part of August to permit the mowing and cleaning up of the right of way.

Only in emergency cases should section forces be required to lay new rail or take care of new ballast, which ought to be handled by extra gangs. The size of gangs should be determined by the amount of work to be done. At least half a day per week, preferably Saturday afternoon, should be devoted to cleaning up around station grounds, freight driveways and station buildings.

The final work of the season is the shaping up of shoulders, widening ditches, trimming grass lines and going over the track for any poor surface or line which may have developed after the heavy summer travel. The committee recommended a monthly payroll allowance and a yearly material allowance.

M. P. CONDON,
New York, New Haven & Hartford (chairman).

Discussion.—That part of the report relating to the maintenance of uniform forces throughout the year created a great deal of discussion and revealed a strong division of opinion. P. J. McAndrews (C. & N. W.) advocated latitude in the building up of winter forces. He did not believe that an excessively large force should be retained throughout the winter, but that it was possible to arrive at a practical mean. All supervisors want more men and if they secure them, they can find sufficient productive work to keep them busy. He did not believe, however, that any capable supervisor would advocate employing more men than he thought the work actually justified.

Coleman King (L. I.) took issue with the committee and strongly advocated a permanent section force. This system has been employed on his line during the last four years and as a result he has been able to effect a considerable reduction in the number of men employed because of their increased efficiency. The road is now in better condition than when the permanent track force system was inaugurated, in spite of the fact that a smaller number of men are now employed. During the present year, when most of the roads have been suffering from a severe shortage of labor, this condition is evident only to a slight degree on the Long Island. He believed that a road is ahead at the end of the year, even if the company pays for some unproductive time during the winter, because of the increased efficiency secured from the experienced men during the summer.

C. T. Kimbrough (Indiana Harbor Belt) stated that he had been able to hold practically all of his men this summer to whom he had given employment last winter, although adjoining roads were very short of labor.

W. Shea (C. M. & St. P.) stated that he believed the sole cause of a shortage of track labor lies with the section foreman. This man is the only one who comes in direct contact with the track laborer. He stated that he has not a single foreign laborer on his line, but that by careful attention the foremen are able to secure all the native labor they desire. He advocated maintaining the position of section foreman in such a way that a man is placed on an equality with other artisans in the community in which he lives and that his family shall be able to enjoy the same privileges enjoyed by those of similar rank.

J. B. Oatman (B. R. & P.) strongly advocated a permanent force. He now has only 75 per cent of his full force, but of the men remaining in his employ, practically all are those with one year of service or more. He has lost practically none of the men held during last winter, even though contractors and others have offered higher wages. He advocated taking good care of the men, protecting them in their tenure of employment and seeing that the company provides comfortable and well-maintained houses for them to live in. He believed that six men employed the year round will do more work than four employed in the winter and eight in the summer.

F. Barnoski (C. M. & St. P.) stated that one experienced man is worth two inexperienced ones and that for this reason he favored a thorough trial of the system whereby permanent forces are maintained.

After further discussion the report was amended to read that the association favors going towards the plan of more uniform maintenance forces, wherever possible, and entirely, where practical. To be consistent the association then voted to eliminate paragraphs b, c, d and e of section 3 and sections 4, 5 and 6 entirely.

A recommendation of the committee in favor of a yearly material allowance created further discussion. W. Shea opposed a yearly allowance of material because of the inability of a road to determine the amount of work it could undertake so far in advance, because of variations in earnings.

Henry Ferguson (G. T.) stated that he has been working on monthly and yearly allowances for some time and has found that they work out to considerable advantage in normal seasons. In a year such as this, when both materials and labor are difficult to secure, the amount of work which it is possible to do is governed more by the amount of material and the number of men which can be secured than by the amount of money which is available.

ANCHORING TRACK

Tracks creep in the direction of heaviest tonnage, fastest speed and descending grades on single track and in the direction of traffic on multiple tracks, the creeping conditions in either case being aggravated by a soft or springy condition of the roadbed, often found in low or wet districts. The creeping of rails and ties causes track to become rough, and shortens the life of the rails through a disturbance of an equal and proper expansion at the joints, which open at the points of least resistance and close entirely where the creeping tendency is resisted.

Where light ballast is used it is noticeable that the outside rail of double track creeps more rapidly than the inside rail, which causes joint ties when spiked in slots to slew across the track at more or less of an angle, this condition causing bad alinement and uneven gage and contributing very much to poor riding and in a limited way to unsafe track conditions. The correction of these conditions entails a large expenditure for labor and is damaging to ties through frequent spacing.

A most dangerous track condition resulting from creeping, is the disturbance of alinement at railroad crossings, disturbances of line and especially of gage at cross-over switches and sun kinking of track on portions of the line where expansion closes during cool weather.

Many and varied have been the efforts put forth to prevent the creeping of track, the most common of all being the spiking of slots in angle bars; or—antedating the use of angle bars—spiking in slots cut in the ends of the railbase or cut out of the base at quarters and centers. This helped some, while the slot spike held.

After the adoption of angle bar joint fastenings, holes were drilled in the web of the rail and either an entire or more often a half angle bar was bolted to the rail at centers so that the slots could be spiked for anchorage. This served

very well until the corners wore off the slots or partly cut the spikes so that the angle bar worked by, or often pushed out of line or gage. If this did not occur the tie was crowded forward.

Under the conditions described, it is not surprising that some one started to design a separate appliance to prevent rails from creeping. Persistent effort was finally rewarded and for a number of years rail anchors or anti-creepers have been available that will anchor track, and which if properly applied in quantities commensurate with the traffic conditions, will effectually hold the rails where originally laid.

The Use of Rail Anchors

Very little argument should be required to convince the most skeptical as to the saving resulting from the use of efficient rail anchors. An annual saving approximates $250 to $400 per mile which is otherwise spent in driving back rail, squaring up slewed ties, renewing ties which have had their service shortened by former spacing, and surfacing tracks that might have served in a satisfactory manner with a little and comparatively cheap smoothing up if the roadbed were not disturbed by creeping and by driving back the rail and in spacing ties.

No set rule as to the number of rail anchors to use per mile can be made, as local conditions, such as swamps, undulating subgrade, descending grades, heavy braking districts, etc., govern. It is our judgment, however, that, under favorable conditions, with stone ballast and heavy section rail, not less than four anchors to a 33-ft. rail should be used. These should be placed without any reference to the joints, but should always be opposite each other and against the same tie, one pair preferably in each quarter rail length.

The cost of rail anchors in place is estimated below:

Four anchors per rail, 1,280 per mile at 16 cents each	$204.80
Labor applying at .013 each	16.64
Total	$221.44

It is apparent from this that the cost of material and labor in the application of this number of anchors is less per mile than for one readjusting of track affected by creeping. Assuming that the anchors will prevent creeping, there can be no consistent argument against their general use where necessary.

Discussion.—T. F. Donahoe (B. & O.) thought that the figures given in the report, of $250 to $400 necessary to correct conditions created by the creeping of rails, was too high in many instances. P. J. McAndrews (C. & N. W.) thought that this figure was correct in many cases if the loss of material as well as of labor was considered. Driving rails back results in damage to the rail and to bolts and other track materials.

The entire question of the advisability of anchoring single tracks created considerable discussion. J. V. Neubert (N. Y. C.) stated that his road has applied more anchors on single tracks than on multiple track lines. The instructions are that anchors shall be used wherever needed on all main tracks. E. Keough (C. P. R.) stated that he has applied anchors to hold the track from moving in either direction on many single track lines, particularly in the muskeg country.

C. Hickey (M. C.) emphasized the necessity of applying anchors in the vicinity of interlocking plants, drawbridges and other points where the results of rail creeping are particularly serious. He advocated the use of at least two anchors per panel on all double track roads and as many as six per panel where necessary to restrain the movement of the rail. He has found that the creeping of rails seriously affects the maintenance of insulated joints. All anchoring should be done at the point of origin rather than at the point where its serious results are noted. If anchors are applied only at the point of trouble, serious results may follow. Only a close inspection of the track will determine the proper number of anchors required.

At the close of a discussion on this subject, J. V. Neubert presented an analysis of 25,550 derailments of main and side tracks in which it was found that 32.5 per cent were due to defects of equipment, 51.9 per cent to operating causes, 11.4 per cent to unavoidable causes, and 4.2 per cent to defective maintenance of way.

Cross Ties

George E. Rex, manager of treating plants, Atchison, Topeka & Santa Fe, delivered an illustrated lecture on Cross Ties before the convention on Wednesday morning, of which the following is an extract:

From a monetary standpoint ties are second in importance only to labor in the maintenance of way department. Accurate statistics of tie consumption are difficult to obtain, but the last official statement of the census bureau (1911) showed 401,653 miles of railway tracks with an annual renewal of 135,053,000 ties or an average of 336 ties per mile of track, which gives an average life of somewhat less than nine years. Of this amount only 23 per cent was treated.

The Santa Fe was one of the earliest roads in the United States to undertake the preservation of ties. It has been continually treating its ties since 1885, until today of the 30,422,416 ties in the tracks of the parent system covering a mileage of 9,552 miles, over 80 per cent of the ties are treated, and as far as possible every tie that goes into the track, including white oak, is now treated. The result of this practice is shown by the statement that while an average of 336 ties is replaced per mile of track annually throughout the country we have reduced our renewal to considerably less than 200 ties per mile, which indicates an average life of 15 years.

Of recent years the treatment of ties has made such rapid strides in affording protection to inferior timbers that if their mechanical protection could be controlled as it should be, ties could be treated in such a manner that the railroads could be absolutely secured of 20 years life from them. Treatment alone cannot accomplish this result, though it is the largest single factor in doing so. In treating ties one should be sure that the sap wood is early impregnated and the heart wood will then last if the treated area is sufficient to compel every bit of moisture in the timber to pass through the treated layer of wood, and become thoroughly sterilized.

The way to get the full benefit of treatment is to adopt the four following steps: (1) Insure a sound interior condition of the tie. (2) Bore a hole for the spike so that it does not break down the fibre. This will also assure treatment around the spike hole. (3) Make two perfect parallel bearings for the rail, by adzing the tie before treatment. (4) Stamp the tie with the date of treatment, kind of wood and the weight of rail for which it is bored.

In conclusion, treatment and mechanical protection of ties cost money, but if these methods were put in general practice the average life of ties as shown by the census in 1911 can be more than doubled, which will mean a large saving in dollars.

Uniform Spacing of Ties

Cross ties in main track should be evenly spaced, a uniform distance being maintained between the edges of ties instead of spacing them a uniform distance center to center. With the common practice of using 7-in. by 9-in. squared ties and 20 ties per 33-ft. rail, a distance slightly more than 11 in. between the edges of ties is provided, while with ties having an 8-in. face, and using the same number per rail, the space between ties will be 13.8 in.

Ties should be spaced regardless of joints, which can be done where no reinforcement extends below the base of rail or the top of tie. Where the spacing is uniform and with ties having a nine-inch face the portion of rails within the

joint fastening will be supported either by two ties near the ends of the joint or by one tie near the center, thus insuring at all times either a suspended or a supported joint, either being considered satisfactory by most track engineers.

This method of tie spacing will give a more even bearing on the roadbed and an even working of the track under traffic. After careful consideration, we have reached the conclusion that uniform spacing of ties throughout the entire track structure is more important than the arbitrary spacing at joints.

Respacing the joint ties in connection with the relaying of rail throws that portion of the track on a softer roadbed than the rest of the track, and even with the most careful handling of the work it is necessary to surface the track immediately. This could often be avoided if the ties were spaced without regard to joints.

From information from various parts of the country, we estimate the average cost of respacing joint ties and surfacing track (on account of respacing) to approximate $350 per mile on a stone ballasted line where rails are laid with staggered joints. The adoption of the uniform spacing of ties and the elimination of special spacing at joints, therefore, means a large annual saving to our railways.

Elimination of Slot Spiking

The principal reason that joint fastenings were slotted for spiking was to prevent rail creeping. This, we know, was not effective and we believe that the use of joint fastenings as rail anchors was imposing an additional burden on the joint, which has always been the weakest part of the track structure.

The result of this anchoring at joints was and is apparent in several ways, which tend to weaken track and increase maintenance expenses. Joint ties were slewed out of proper position, slots in angle bars became worthless with the stripping off of the bases of bars by the strain of resisting the rail creeping, an extra strain was placed on track bolts, which caused much of the stretching so often blamed on the ignorant track laborer.

To maintain good track under any ordinary conditions it is not necessary to have joints slotted for spiking, and we believe that the elimination of slots and punch holes in joint fastenings adds much to the strength and life of the joint. reduces maintenance costs through avoiding disturbances of track at the joints, and that track will be more satisfactory with the non-slotted joint than when a slotted and spiked joint is used for anchorage. This, however, is only feasible where rail anchors are used in sufficient numbers to keep the rail from creeping, and we believe that track creeping can be prevented by the use of rail anchors at a reasonable cost, and that a considerable saving can be made in maintenance costs by their use.

P. M. Dinan,
Supervisor, Lehigh Valley (chairman).

Equating Track Values

The primary purpose of a study of Equating Track Values is to determine how the proper standard of maintenance may be obtained best and most economically and at the same time assign equal or equivalent duties to all trackmen. The constantly increasing cost of labor and material required to maintain track in proper condition to handle the present exceedingly heavy modern trains, is now one of the most serious questions before the railroads. It is, therefore, of vital importance that the cost of track work should be subjected to careful analysis.

It is the opinion of the committee that this investigation should be conducted in the following manner: (a) Classification of railroads on the basis of traffic handled. (b) Determination of the proper standard of maintenance for main track, sidings, switches, etc., and the relative amounts of work required to attain same. (c) The selection of special test sections from which accurate records of the distribution of labor shall be kept in order to obtain the above information. The committee has adopted forms showing the manner in which the distribution of labor is to be kept, and is now collecting data from test sections on eight different railroads. These forms are being filled out each month and will be summarized and the results analyzed at the end of the year.

In addition to the statistics on labor the committee is also collecting information in regard to the general characteristics of the test sections; that is mileages, the number of switches, weight of rail, kind of ballast, ties, drainage, subgrade, curvature, gradients, weather conditions, etc., all of which are of vital importance in determining the final equating values.

From present available data the committee has prepared the following table of Equated Track Values for practical application, realizing that these figures may be more or less modified by the results obtained from actual tests:

Class		Force, one foreman and	Equiv. mileage or sect.	Men per mile with foreman	Men per mile without foreman	Miles per man with foreman	Miles per man without foreman
A. Double track	S	6 men	9	0.78	0.67	1.29	1.50
Lines	W	3 men		0.44	0.33	2.25	3.00
A. Single track	S	4 men	6	0.83	0.66	1.20	1.50
Lines	W	3 men		0.66	0.50	1.50	2.00
B. Single track	S	4 men	7	0.71	0.57	1.40	1.75
Lines	W	2 men		0.57	0.43	1.75	2.33
C. Single track	S	3 men	8	0.50	0.37	2.00	2.67
Lines	W	2 men		0.37	0.25	2.67	4.00

Each supervisor should have a permanent extra gang on his district on the following percentage of the actual main line and siding mileage (not equated):

Class A—Summer, 10 per cent; winter, 5 per cent.
Class B and C—Summer, 6 per cent; winter, 3 per cent.

PROPOSED EQUATED TRACK MILEAGE VALUE

2 miles of passing track equal 1 mile of main track.
2½ miles all other sidings equal 1 mile of main track.
15 switches equal 1 mile of main track.
24 single derails connected with tower or switch stands equal 1 mile of main track.
12 single track railway crossings equal 1 mile of main track.
15 single highway crossings (public roads) equal 1 mile of main track.
10 single highway crossings (city streets) equal 1 mile of main track.

CLASSIFICATION TRACK

Class A railways are those having more than one track, or a single track with the following traffic per mile:

Freight cars per year equal 150,000, or 5,000,000 tons.
Passenger cars per year equal 10,000.
Maximum passenger speed of 50 miles per hour.

Class B roads are those single-track lines having the following traffic per mile:

Freight cars per year equal 50,000, or 1,670,000 tons.
Passenger cars per year equal 5,000.
Maximum passenger speed of 40 miles per hour.

Class C lines are single-track lines not meeting the minimum requirements of Class B.

A. Grills,
General Roadmaster, Grand Trunk (chairman).

Entertainment Features

Wednesday afternoon was spent on an inspection trip over the Long Island between the Pennsylvania Terminal, New York, and Long Beach, on Long Island. At the latter point a demonstration of the pneumatic tie-tamping machine was witnessed. On Thursday afternoon the members and guests made an inspection of the Grand Central Terminal and the electrified portion of the New York, New Haven & Hartford between New York City and Stamford, Conn. On Friday afternoon the party went to Asbury Park on the Central of New Jersey boat, returning to Jersey City by rail.

The annual banquet given the Roadmasters' Association by the Track Supply Association was held in the McAlpin Hotel on Thursday evening. About 250 roadmasters and engineers of track were present. Short addresses were made by Judge Tompkins, of the New York Supreme Court; by F.

D. Underwood, president of the Erie Railroad, and by others.

Election of Officers

The following officers were elected: President, M. Burke, roadmaster, C. M. & St. P., Chicago; first vice-president, A. Grills, superintendent of track, Grand Trunk, St. Thomas, Ont.; second vice-president, J. B. Oatman, B. R. & P.; secretary, P. J. McAndrews, roadmaster, C. & N. W., Sterling, Ill.; treasurer, W. H. Kosmehl, Elgin, Ill. Member of executive committee, J. W. Powers, supervisor, New York Central, Oswego, N. Y. The 1917 convention will be held in Chicago.

The Track Supply Association

The fifth annual exhibit of the Track Supply Association was held in a room adjoining the convention hall. Over 60 firms exhibited devices, a number larger than at any previous convention.

The officers of the Track Supply Association for the past year were: President, F. A. Preston, the P. & M. Co., Chicago; vice-president, R. A. Van Houton, Sellers Manufacturing Co., Chicago; secretary-treasurer, W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y.; members of executive committee, E. M. Fisher, Fairbanks, Morse & Co., Chicago, Ill.; E. T. Howson, *Railway Age Gazette*, Chicago, and J. J. Cozzens, Union Switch & Signal Co., New York.

The Railway Supply Association, at its meeting on Thursday morning, elected the following officers for the ensuing year: President, R. A. Van Houton, Sellers Manufacturing Co., Chicago; vice-president, E. T. Howson, engineering editor, *Railway Age Gazette*, Chicago; secretary-treasurer, W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y.; executive committee members, F. Barbey, Frictionless Rail Company, Boston, Mass., and J. J. Cozzens, Union Switch & Signal Company, New York.

The firms exhibiting with the names of their representatives and their exhibits are given below:

List of Exhibitors

Ajax Rail Anchor Co., Chicago, Ill.—"Ajax" rail anchors. Represented by H. G. Elfborg, Paul Hoffman and G. N. Holmberg.

American Hoist & Derrick Co., St. Paul, Minn.—Transparent photographs of the "American" ditcher at work. Represented by Edward Coleman and Frank W. Hatten.

American Steel & Wire Co., Chicago, Ill.—Woven wire fencing and steel posts. Represented by A. W. Fronde.

American Valve & Meter Co., Cincinnati, Ohio.—"Anderson Economy" switch stand, the "Anderson" interlocking switch stand and switch lock. Represented by J. T. McGarry and F. C. Anderson.

Call Switch Co., New York, N. Y.—Operating model of the Call switch. Represented by Ira A. Call, Harry A. Pike, R. V. Call and J. J. Lytton.

Carbic Mfg. Co., Duluth, Minn.—Portable carbic lights, carbic cakes. Represented by G. B. Van Buren and S. K. Ferris.

The Carborundum Co., Niagara Falls, N. Y.—Track grinder. Represented by H. P. Frost.

Carnegie Steel Co., Pittsburgh, Pa.—"Braddock" insulated rail joint. Represented by Norman Hench.

Chicago Malleable Castings Co., Chicago, Ill.—"Thomas" rail anchor tie plate. Represented by J. W. Thomas and Warren Osborn.

The Creep Check Co., New York, N. Y.—"Creepcheck" anticreepers. Represented by C. H. Geuscher.

Crerar, Adams & Co., Chicago, Ill.—Track and bonding drills, track jacks, "Emerson" rail benders, die starters. Represented by Russell Wallace and W. I. Clock.

Dressel Railway Lamp Works, New York, N. Y.—"Dressel" railway lamps. Represented by F. W. Dressel, Robt. Black and F. W. Edmonds.

The Duff Mfg. Co., Pittsburgh, Pa.—Track jacks. Represented by C. E. Hale, C. A. Methfessel and E. A. Johnson.

Empire Railway Appliance Corporation, New York, N. Y.—Combined rail anchor and tie plate. Represented by D. L. Braine.

Engineering News, New York, N. Y. Represented by Elmer E. Smith, W. Buxman, W. G. Conley, H. K. Hottenstein, L. E. Ives and J. E. Sample.

Equipment Improvement Co., New York, N. Y.—"Davis" adjustable track gage. Represented by C. W. Cross.

Fairbanks, Morse & Co., Chicago, Ill. Represented by A. A. Taylor, F. M. Condit, J. L. Jones, G. Howard and C. T. Fugitt.

The Frictionless Rail, Boston, Mass.—Frictionless rail. Represented by F. A. Barbey, J. W. McManama and T. F. Dwyer, Jr.

Hatfield Rail Joint Mfg. Co., Macon, Ga.—"Hatfield" rail joint. Represented by U. R. Hatfield.

Hauck Manufacturing Co., Brooklyn, N. Y.—Portable oil burners and torches, thawing outfit. Represented by G. A. Nelson.

Hayes Track Appliance Co., Richmond, Ind.—"Hayes" derails. Represented by E. L. Ruby.

Robt. W. Hunt & Co., Chicago, Ill.—Samples of special inspection sheets and photographs. Represented by C. W. Gennet, Jr.

Hyatt Roller Bearing Co., Newark, N. J. "Hyatt" roller bearings for motor cars. Represented by C. M. Day, Walter R. Bylund, R. A. Holme, Geo. J. Helmstaedter, J. M. Mooney and C. A. Sloan.

Indianapolis Switch & Frog Co., Springfield, Ohio.—"R-N-R" solid manganese frog. Represented by J. A. Foulks.

Ingersoll-Rand Co., New York, N. Y.—"Imperial" tamping outfit, transparent photographs of "Imperial" pneumatic tampers at work. Represented by W. H. Armstrong, Chas. Dougherty and D. H. Seeley.

Interlocking Rail Joint Co., New York, N. Y.—Interlocking rail joint. Represented by E. W. Coughlin.

The O. F. Jordan Co., East Chicago.—The "Jordan" spreader, ballast shaper, bank builder and snow plow. Represented by J. P. McNally.

Keystone Grinder & Mfg. Co., Pittsburgh, Pa.—"Keystone" portable tool grinder. Represented by John S. Wincrantz.

Lackawanna Steel Co., Buffalo, N. Y.—Joint plates, tie plates, improved angle bars. Represented by A. H. Weston.

John Lundie, New York, N. Y.—The "Lundie" tie plate. Represented by Wallace Bigelow.

The Madden Co., Chicago, Ill.—"Richter" blue flag derail, "Blair" tie spacer, "Wagner" switch point straightener. Represented by T. D. Crowley.

The Alexander Milburn Co., Baltimore, Md.—"Milburn" portable lights, oxy-acetylene cutting apparatus, and track-walkers' hand lamp. Represented by C. L. Pollard.

W. M. Mitchell Co., Louisville, Ky.—"Mitchell" rail anchor, "Betts" safety guard rail. Represented by L. C. Ryan.

Mudge & Co., Chicago, Ill.—Motor car literature. Represented by C. W. Cross.

National Lock Washer Co., Newark, N. J.—"Hipower" nut locks. Represented by F. B. Archibald, R. F. Horsey and J. H. Horn.

The National Malleable Castings Co., Cleveland, Ohio.—Rail anchors, malleable rail braces, malleable tie plates. Represented by J. J. Byers.

P. & M. Co., Chicago, Ill.—"Vaughan" rail anchor, "P. & M." rail anchor. Represented by Fred A. Preston.

Pocket List of Railroad Officials, New York, N. Y.—Copies of pocket list. Represented by J. Alexander Brown and Harold A. Brown.

Positive Rail Anchor Co., Marion, Ind.—"Positive" rail anchor, guard rail brace. Represented by Frank M. Robbins.

Q & C Co., New York, N. Y.—"Bonzano" rail joint, rolled steel step joints, adjustable derails, guard rail clamps, "Fewing's" car retracker, magnetic wig-wag, "Whitman" adjustable rail brace. Represented by C. F. Quincy, E. R. Packer, W. W. Hoyt, J. L. Terry, E. M. Smith, L. T. Burwell, and Edmund Quincy.

The Rail Joint Co., New York, N. Y.—Rail joints. Represented by V. C. Armstrong.

Railroad Supply Co., Chicago, Ill.—Tie plates and derailer. Represented by H. M. Buck, G. W. Daves and A. H. Smith.

Railway Review, Chicago, Ill.—Copies of papers. Represented by A. E. Hooven, W. M. Camp and L. A. Collier.

Ramapo Iron Works, Hillburn, N. Y.—Guard rail clamp, slide plate, automatic switch stand. Represented by W. C. Kidd, Thomas Akers, Arthur Gemunder, Edward Banker, E. C. Bigelow and James B. Strong.

Reading Specialties Co., Reading, Pa.—Guard rail clamps, rail bender, semi-universal tie spacer, "Reading" rerailer and clamp, and "Reading" compromise joint. Represented by Leonard Schuetz.

Roller Lock Nut Co., Inc., New York, N. Y.—Lock nuts and literature. Represented by H. L. C. Wenk.

Sellers Mfg. Co., Chicago, Ill.—Tie plates. Represented by R. A. Van Houten and George M. Hogan.

The Seltite Co., New York, N. Y.—"Seltite" self-tightening washer. Represented by J. Morris Butler and Charles M. Young.

Silver Steel Tie Co., Salt Lake City, Utah.—"Silver" steel tie. Represented by Joseph A. Silver.

Simmons-Boardman Publishing Co., New York, N. Y.—Railway Maintenance Engineer, *Railway Age Gazette*. Represented by E. T. Howson, Henry Lee, C. R. Mills, J. H. Cross, J. G. Little, F. C. Koch and H. H. Beardsley.

Southern Railway Supply & Equipment Co., St. Louis, Mo.—"Saunders" car stopper. Represented by W. D. Achuff and Lawrence Boswell.

Templeton-Kenly & Co., Ltd., Chicago, Ill.—"Simplex" track, pole and emergency jacks. Represented by H. W. Finnel and A. C. Mills.

Track Specialties Co., New York, N. Y.—"Trasco" guard rail clamp, "Superior" compromise joint, "Superior" derailers, "Superior" rail joint, "Superior" rail bender, "Trasco" guard rail brace, "Trasco" rail brace, "Trasco" tie plate, "Trasco" padded tie plate. Represented by W. B. Lee and J. A. Bodkin.

Union Switch & Signal Co., Swissvale, Pa.—"Keystone" insulated rail joint model 14. Represented by J. J. Cozzens and J. C. Donaldson.

Verona Tool Works, Pittsburgh, Pa.—Lining bars, track wrenches, picks and other tools. Represented by Henry Fischer.

Wm. Wharton, Jr., & Co., Easton, Pa.—Switch stands, insulated gage rods and switch rods. Represented by G. R. Lyman and Thomas O'Brien.

Wyoming Shovel Works, Wyoming, Pa.—Track shovels. Represented by H. T. Potter.

RAILWAY ADVISORY COMMITTEE MEETING

An all-day meeting of the Railway Executives Advisory Committee, representing over 85 per cent of the railways of the United States, was held at 91 Broadway, New York, on Wednesday of this week. The morning session was devoted to an informal discussion of the Adamson eight-hour law, recently passed by Congress at the urgent request of President Wilson, and the afternoon meeting was taken up with a consideration of the presentation of testimony before the Newlands Joint Committee of the Senate and the House, which has been appointed to consider the railroad question and which will hold its first public hearing on November 20. No definite conclusion was reached on any point, and it was decided to hold another conference in the near future.

New Illinois Central Station at Chicago

Plans Submitted Provide for a Large Terminal at Twelfth Street Designed to Accommodate Other Roads

ON Wednesday, September 20, the Illinois Central submitted to the Chicago City Council the plans for a proposed passenger terminal to be located in Twelfth street near the site of the present passenger station of that road. The proposed station is not intended merely to replace the existing terminal, but is designed to provide adequate passenger terminal facilities for all the railroads now using the Grand Central, the La Salle and the Dearborn stations, or in other words, all of the roads entering the city except those now using the Chicago & North Western and the Union stations. The plans submitted conform to and are based on the project to widen Twelfth street and extend it east of Michigan avenue and to construct a lake shore park extending south from Grant park between the lake and the Illinois Central tracks, a project involving complex negotiations to which the railroad, the city of Chicago, the Chicago South Park Commission and the United States War Department are parties. The plans provide further that both the structural treatment and the location of the station will be such as to produce architectural harmony with the Field museum, a monumental structure now being built in Grant park to the east of the proposed station.

In offering terminal facilities to the other roads, the Illinois Central is giving new life to a movement by certain interests in the city to provide passenger terminals for all the railroads entering the city (except the North Western) on a location along the south side of Twelfth street. This agitation was especially active some years ago, but there has been little discussion of the subject since the railroads using the Union station obtained a franchise for a new terminal on substantially the old location. Another feature of the proposed terminal plan that is exciting particular notice in the city is an arrangement for the suburban trains which, because of the subway involved, implies the use of electric traction for the suburban traffic.

The Old Station

The new station will supplant the existing one which was built in 1893 with a frontage on Park Row, a short street extending east from Michigan avenue about a half block north of Twelfth street. Thus the station in its present position offers a definite obstacle to the extension of Twelfth street eastward beyond Michigan avenue. The station is served by a multiple-track main line extending to the south along the lake front and by an east and west line known as the St. Charles air line which branches off just north of Sixteenth street and serves as a transfer connection and an outlet to the Illinois Central's Omaha line. Although Chicago is a terminal for all trains entering the station, the latter is of the through type. The building stands over the tracks which pass through it at the street level. This arrangement was followed to permit the suburban trains to continue north to the stations at Van Buren and Randolph streets, located conveniently to the business center of the city. Several freight tracks also extend north of Twelfth street to provide access to an extensive local freight terminal in the vicinity of the Chicago river. These suburban and freight tracks occupy a depressed right of way in Grant park, parallel and some 200 ft. east of Michigan avenue.

Studies for a new station were governed by a number of definite conditions, chief among which was the fixing of a location on the south side of the new widened Twelfth street, the elimination of any grade crossings of tracks with this street, the continued operation of the suburban and freight service north of Twelfth street and provision for ample terminal track space to provide adequately for the trains of all roads that might possibly use the station. The proposed plans contemplate a maximum development of 48 station tracks on two levels, one above the street and the other below, the lower level to include the suburban tracks which would pass under Twelfth street to reach the stations to the north. It is intended actually to build only such portions of this complete layout as will be necessary to serve the roads which finally agree to enter into the project.

In considering the design of a passenger terminal to accommodate all the roads entering stations east of the Chicago river, a study was made of the Chicago terminal situation, to ascertain what connections and routings would be required for the various roads to reach the station and it was found that this could be arranged without much difficulty and that a material reduction in the lengths of the routes would be obtained in most cases. The most important new connecting line called for by this plan would be a line extending west from the Illinois Central tracks in the vicinity of Eighteenth street to secure a connection with the tracks of the Rock Island, the New York Central, the Western Indiana. The existing St. Charles air line cannot readily serve this purpose because it is located too far north to afford an entrance to the train shed without requiring reverse movements.

The Proposed Station

The new station will have a beautiful setting, located on the south side of the widened Twelfth street which will have a total width of 120 ft. between property lines. It will face north overlooking Grant park and Michigan boulevard, while to the east it will command the lake shore, the new park, and the Field museum.

To provide adequate headroom for the tracks which must pass underneath the street, Twelfth street will rise in approaching the station from Michigan avenue to a sufficient elevation to bring it to the same grade as the upper level station tracks. As a result an exceedingly simple station layout is possible in so far as it concerns the through passenger trains. The plan resolves itself into a spacious central waiting room, located between the street and a concourse serving the ends of the station tracks and platforms. Auxiliary facilities will surround the waiting room and all functions of the terminal with which the passenger must deal in passing from the street to the trains or vice versa are located on a single level. A large space for carriages and automobiles is provided at the east end of the station building, while directly over it on a second or mezzanine floor a spacious gallery almost entirely enclosed in glass will afford a most unusual opportunity for a view of the lake and the park.

The baggage, express and mail facilities will be provided below the waiting room and track level at about the present grade of the streets. Direct communication with this level will be obtained by vehicles on Indiana avenue which will be extended north from its present terminus, parallel to the railroad to a junction with Twelfth street. Should it be found necessary to provide passenger tracks on both a lower and an upper level, this baggage and express space will serve both levels and communication will be provided by baggage-truck elevators at suitable intervals.

The extension of Indiana avenue suggests provision for direct street car communication with the station and the plans

provide for a car line north on Indiana avenue to Twelfth street and west on Twelfth to a connection with the existing street car line on Wabash avenue. For the purpose of avoiding congestion with the traffic on Michigan avenue and to facilitate the loading and unloading of street car passengers at the station, it is proposed to run the street cars into the station building on the east side of Indiana avenue just south of Twelfth street where a street car station is to be provided. North from this point the cars are to pass into a subway under Twelfth street to the west line of Michigan avenue, then over an incline cars return to the surface at Wabash avenue.

The street car station in the building will be arranged to provide direct communication with either the suburban or the through train levels. The suburban trains will pass through the station on tracks occupying a third or lower level which will be depressed a sufficient amount to provide adequate clearance underneath the baggage room or street level. The suburban station facilities are to be located at the street level on the west side of the building immediately adjacent to the street car station. These facilities will include a separate waiting room with its ticket offices, toilet facilities, etc., and with stairways leading up to Twelfth street and to the main waiting room level and down to the suburban track level. The principal means of communication with the street, however, will be a subway crossing underneath Twelfth street to an open depressed passage way just north of the street which will provide a direct connection with Michigan avenue. Four suburban tracks will be provided, two for express and two for local trains which will be arranged on opposite sides of north-bound and south-bound platforms.

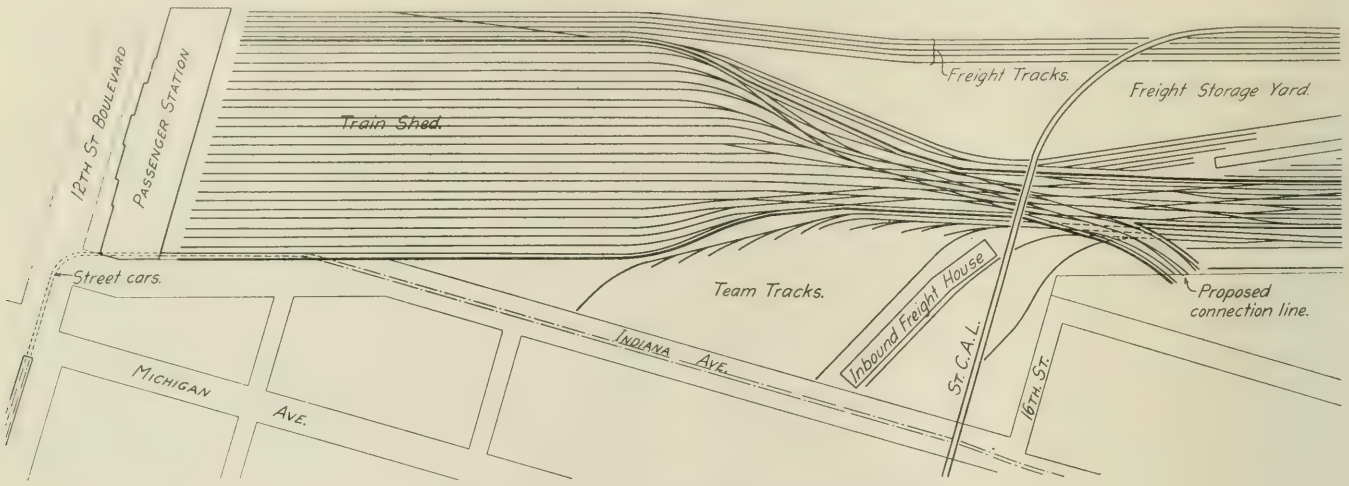
The Track Arrangement

The accompanying drawings show a tentative plan for the arrangement of the tracks as required for the new project and which involves a complete reconstruction of the present layout for a long distance south of the station. The plan contemplates a complete coach and passenger engine terminal in addition to a freight storage yard and a local freight house and team tracks, adjacent to Indiana avenue, near Sixteenth street.

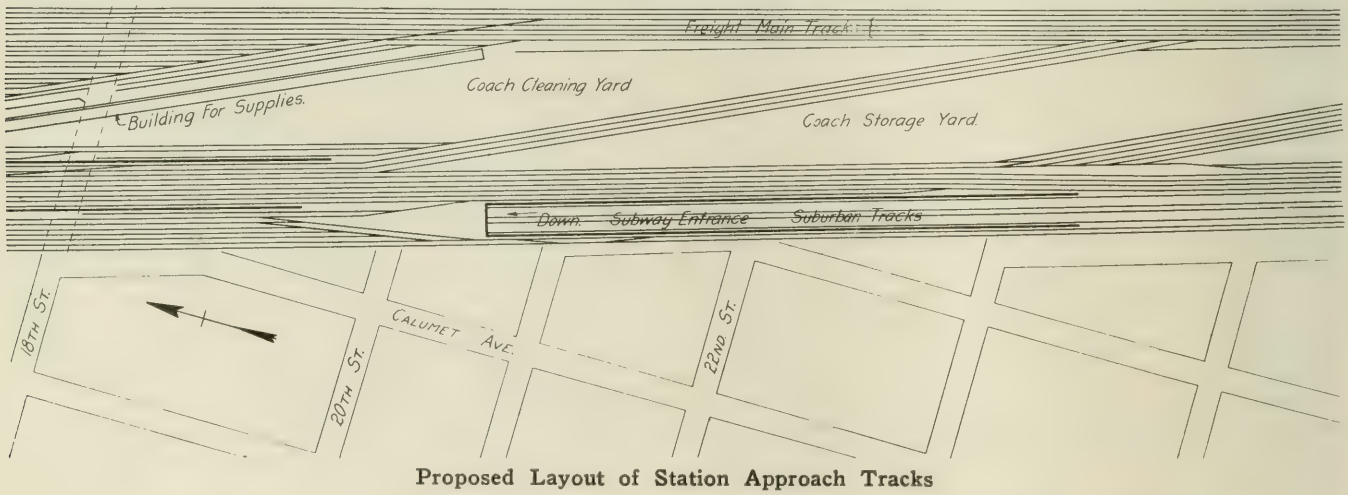
In the immediate vicinity of the station the tracks are on three distinct levels, the freight tracks and freight yards along the east side and the freight house and team tracks along the west side are to be located approximately at the present level. The passenger track which occupies the center of the layout will be on an upper level and the suburban tracks on a lower level. This arrangement necessitates a system of ramps commencing a considerable distance south of the station. The suburban tracks will enter a subway near Twentieth street and being under cover for a distance of nearly a mile will necessitate the abandoning of steam operation in so far as it concerns the suburban trains.

The station tracks for the through trains will occupy a train shed about 1,500 ft. long and are arranged for separate baggage and passenger platforms. A system of crossovers in the vicinity of Sixteenth street will provide for the connection with the proposed line running west along Eighteenth street, while the St. Charles air line will make a connection with the freight tracks on a curve toward the south in place of the curve toward the north as at present.

The demands of the public for communication with the



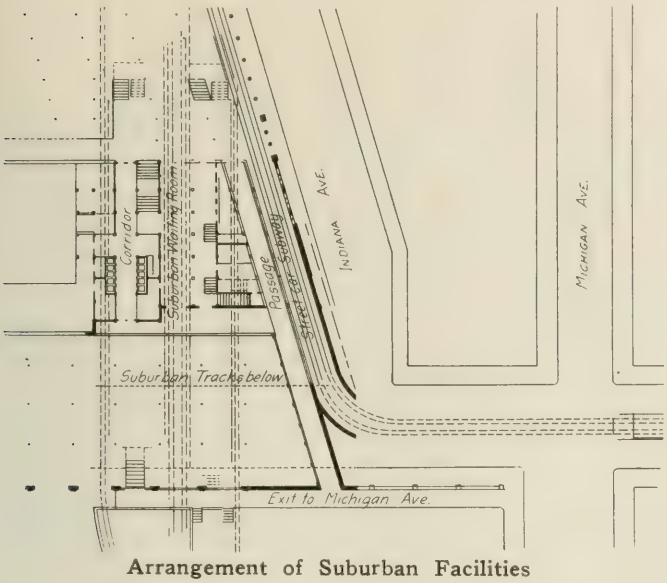
Proposed Layout of Passenger Station Tracks



Proposed Layout of Station Approach Tracks

proposed lake front park at frequent intervals south of Twelfth street, introduces the problem of street crossings over or under tracks. It is proposed to provide a subway at Eighteenth street and a viaduct at Thirty-first street, from which point south viaducts may be provided wherever deemed necessary.

The Illinois Central owns the property facing on Twelfth



Arrangement of Suburban Facilities

street between Michigan avenue and the proposed extension of Indiana avenue. This is to be utilized to add a distinct feature to the plan in the form of a large hotel, which will be given an exterior design to harmonize with that of the station building. The plan also calls for a bridge over Indiana avenue which will provide direct connection between the passenger station and the hotel at several floor levels.

NATIONAL SAFETY COUNCIL; ANNUAL MEETING

The National Safety Council will hold its fifth annual safety congress at Detroit, Mich., October 17, 18, 19, 20. Headquarters will be at Hotel Statler. The steam railroad section will have meetings on Wednesday and Thursday, both morning and afternoon.

The chairman of the steam railroad section is M. A. Dow (N. Y. C.). The principal speakers at the railroad meetings will be R. C. Richards (C. & N. W.), G. L. Wright (C., St. P., M. & O.), A. A. Krause (M. K. & T.), J. S. Rockwell (B. R. & P.), E. R. Scoville (B. & O.), J. M. Guild (U. P.), Chas. T. Banks (Erie), B. C. Winston (Wabash), F. M. Metcalf (N. P.), W. C. Wilson (D. L. & W.), and G. S. Locker (D. & I. R.).

The National Safety Council is an employers' organization. It was started a little less than three years ago for the purpose of establishing a clearing house of information on accident prevention, sanitation, health conservation, etc. Starting with 40 members, the council now has more than 2,200. Sixty railroad companies are now represented in it. It has extended its influence to many foreign countries. The unique feature of the Council's service is five bulletins a week to each member, transmitting to the employer the very best means and methods of reducing accidents. In the meetings at Detroit there will be altogether 140 speakers. There will be an extensive safety exhibit, where the latest types of safety devices will be shown. Mr. Dow, chairman of the railroad section, is also director of exhibits for all the sections, and is a member of the executive committee of the Council.

SANTA FE TO TEST EIGHT-HOUR LAW IN COURTS

In an open letter to the public and to the employees of his road, E. P. Ripley, president of the Atchison, Topeka & Santa Fe, announces that his company will not comply with the provisions of the Adamson act, "except as and when ordered to do so by the court of last resort." The text of the letter is as follows:

"To Santa Fe Employees and the Public:

"This is the position of the Atchison, Topeka & Santa Fe Railway Company regarding the controversy with its train-service employees over their demand for increased compensation. Congress, hastily acting under a threat of four leaders of labor organizations, enacted a so-called eight-hour law which is nothing more nor less than an advance of 20 to 25 per cent in the wages of the best paid men in railway service.

"It is only fair to our employees and the public to say that the Atchison, Topeka & Santa Fe Railway Company does not intend to comply with the law except as and when ordered to do so by the court of last resort.

"The merits of the case have been fully explained in the last few months and need no further mention.

"Should the courts finally decide that the increase must be paid, there will be an immediate demand from the remaining classes of labor, resulting in entire inability to pay without heavy increases in rates to be paid by the public—especially the farming class.

"IS THE PUBLIC PREPARED TO MEET THE DEMAND?

"This notice is for the information of all concerned."

W. S. STONE ON THE "BASIC EIGHT-HOUR LAW"

Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers, on September 11 addressed the following "confidential" letter to members of that organization:

"The final report on the co-operative wage movement has been mailed to all the divisions and chairmen. We ask a careful reading of same.

"In addition to this you will receive, in the near future, a printed report of the public hearing before the Senate committee on the eight-hour bill. We have also arranged for a reprint from the Congressional Record of September 1 and 2 of all the speeches made in both the House and Senate by our friends and enemies, for and against the enactment of the law. We do this, not in the interest of any political party, but in order that you may have the true facts in the case. We believe the time has arrived when labor should know who is friendly to its interest, and who is not. Important legislation will ake place at the next session of Congress. It is important to you that men be elected who are friendly to YOU.

"Regarding the passage of the law, never before in the world's history have any working men, or union of labor, placed on the statutes of any country a law giving to the toilers a basic eight-hour day. It stands without a parallel.

"Regarding its application, you will read in a subsidized press that the act is illegal. Don't believe it. Many of the best constitutional lawyers in both the House and Senate have given their opinion that it is legal.

"We would advise all general chairmen and committees to wait a while before taking up the question of its application to their present schedule. Time works wonders. Give the other side a chance to cool off, and their ragged nerves a chance to heal before taking up the question.

"The events of the last month should make clear to you, if not fully understood before, the importance of having in the organization every man who is eligible to membership. This is a splendid time to do some missionary work. Are you willing to do your share?"

General News Department

In the United States District Court at Lynchburg, Va., September 13, the Chesapeake & Ohio was fined $1,500 for violations of the hours of service law. The violations were in connection with train movements on the James River division.

The exhibit of historical locomotives and cars and safety appliances of the Baltimore & Ohio, which has been shown in international and industrial expositions in various sections of the country, is to be displayed at Detroit on the occasion of the Safety Congress during the week of October 16.

The Chicago, Milwaukee & St. Paul has obtained a delay of 90 days in the action of the city council of St. Paul, Minn., on a proposed ordinance barring steam locomotives from the St. Paul "Short Line." The "Short Line" extends through a residence district of St. Paul and thence to Minneapolis.

An automobile which arrived in New York City from San Francisco September 19 is reported as having made the trip across the continent in five days, three hours, 31 minutes. The car was a "Hudson," and was driven by A. H. Patterson and others. The time is calculated as 14 hours 59 minutes better than the best previous record.

The Baltimore & Ohio has started an anti-spitting campaign, and on a designated day each month (the 15th) will distribute through the coaches of its trains a small card on which attention is directed to the danger of spreading disease. Public health authorities in the states through which the road runs have lent their approval to the campaign.

The Louisiana State Board of Health has put into service a laboratory railroad car, fully equipped for the investigation of diseases traced to the water supply. The car includes a laboratory for chemical and bacteriological work, a power plant, a dark room for photographic work, a toilet room, berths, lockers, an office, and a "garage" at one end for a small automobile.

The "Safety First" car, which has been fitted up by the Baltimore & Ohio, began its tour of the state of Ohio on Monday last. Victor T. Noonan, director of safety of the Ohio Industrial Commission, and several officers of the railroad, took part in the exercises preceding the departure of the car. The trip is to consume about two months. The car will be placed in proximity to the manufacturing plants where it stops, and everything will be readily accessible to the workmen, who will not be required to lose time in order to go through the exhibits.

In the United States Court at Martinsburg, W. Va., September 17, Charles Harrison confessed to robbery of an express car on a train of the Baltimore & Ohio, near Central Station, W. Va., in October last, and was sentenced to twelve years' imprisonment. The reports say that another robber is to be tried, and that a third is still at large. In this robbery unsigned bank notes to the amount of $100,000 were stolen.

An innovation has been adopted by the commissary department of the Chicago, Burlington & Quincy, which is installing soda fountains on some of its popular passenger trains. The first of the fountains to be put into use are in the lounging cars now in regular service on the Minnesota Limited, which leaves Chicago daily at 6:30 p. m. for St. Paul and Minneapolis, and its companion eastbound train. The soda fountain service will be a continuous feature on these two trains and the menu in accordance with the season—cold drinks in hot weather and hot drinks in cold weather.

The shopmen of 19 railroads west of Chicago have received through the committees of their unions the terms upon which the railroads will meet their demands for an increase in wages and a shorter working day. The unions ask for an eight-hour day and an increase of five cents an hour in wages, whereas the railroads, which are dealing with the men individually, are offering an advance of from one to two cents an hour and an eight-hour day for the back shops. A vote is being taken by the unions on the proposition offered by the roads. The vote will not be a strike vote, but merely an expression of sentiment preliminary to a renewal of negotiations with the railroads on or about October 1.

Railway Earnings and Expenses for 1916

The Interstate Commerce Commission has issued its preliminary summary, subject to revision, of the monthly reports of roads having operating revenues above $1,000,000 for the fiscal year ending June 30, 1916. The table, giving comparisons with 1915 for the per mile figures, is as follows:

REVENUES AND EXPENSES OF CLASS I ROADS FOR 1916

	United States			Eastern District			Southern District			Western District		
	Amount 1916	Per Mile 1916	Per Mile 1915	Amount 1916	Per Mile 1916	Per Mile 1915	Amount 1916	Per Mile 1916	Per Mile 1915	Amount 1916	Per Mile 1916	Per Mile 1915
Avg. number of miles operated..	229,229.09	.....	.....	58,963.34	.....	.....	42,298.42	.....	.....	127,967.33	.....	.....
Revenues:	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Freight	2,409,393,699	10,517	8,720	1,095,212,344	18,574	14,912	364,286,202	8,612	7,250	949,895,153	7,423	6,335
Passenger	673,472,119	2,938	2,765	296,368,985	4,026	4,704	90,888,840	2,149	2,034	286,214,294	2,236	2,108
Mail	60,057,967	262	250	22,307,082	378	352	7,635,992	180	179	30,114,893	235	226
Express	81,014,684	353	303	37,800,328	641	525	11,932,516	282	245	31,281,840	244	219
All other transportation	97,380,150	425	368	55,131,315	935	791	7,338,895	174	156	34,909,940	273	242
Incidental	73,263,346	319	262	39,446,818	669	519	8,482,950	200	174	25,333,548	198	173
Joint facility—Cr.	3,599,323	16	15	1,683,186	29	27	874.809	21	17	1,041,329	8	9
Joint facility—Dr.	1,373,054	6	5	776,013	13	13	285.314	7	4	311,727	2	2
Railway operating revenues	3,396,808,234	14,818	12,678	1,547,174,074	26,239	21,817	491,154,890	11,611	10,051	1,358,479,270	10,615	9,310
Expenses:												
Maint. of way and structures.	405,389,892	1,768	1,603	169,457,277	2,874	2,621	60,468,583	1,430	1,389	175,464,032	1,371	1,202
Maintenance of equipment	558,777,771	2,438	2,189	266,676,512	4,523	4,010	90,931,616	2,150	1,918	201,169,643	1,572	1,434
Traffic	60,604,496	264	261	22,675,779	384	383	11,205,518	265	260	26,723,199	209	204
Transportation	1,096,632,406	4,784	4,464	526,768,850	8,934	8,060	148,831,589	3,518	3,472	421,031,967	3,290	3,126
Miscellaneous operations	25,712,804	112	102	11,683,819	198	180	2,415,766	57	52	11,613,219	91	82
General	79,392,991	346	327	34,601,888	587	542	12,626,114	298	283	32,164,989	251	242
Transport'n for investm't—Cr.	6,506,127	28	31	751,371	13	13	1,146,858	27	33	4,607,898	36	38
Railway operating expenses	2,220,004,233	9,684	8,915	1,031,112,754	17,487	15,783	325,332,328	7,691	7,341	863,559,151	6,748	6,252
Net rev. from railway operations.	1,176,804.001	5,134	3,763	516,061,320	8,752	6,034	165,822,562	3,920	2,710	494,920,119	3,867	3,058
Railway tax accruals	146,754,477	640	591	58,657,157	995	942	20,621,130	488	440	67,476,190	527	478
Uncollectible railway revenues..	807,720	4	3	262,923	4	3	187,392	4	3	357,405	3	3
Railway operating income	1,029,241,804	4,490	3,169	457,141,240	7,753	5,089	145,014,040	3,428	2,267	427,086,524	3,337	2,577

Revenues and Expenses of Express Companies for May, 1916

The following statement, which is subject to revision, has been compiled by the Interstate Commerce Commission from the monthly reports of operating revenues and operating expenses of the principal express companies for May, 1916 (the express companies have three months in which to report):

A—For the Month of May

Item	Adams Express Co. 1916	Adams Express Co. 1915	American Express Co. 1916	American Express Co. 1915	Canadian Express Co. 1916	Canadian Express Co. 1915	Globe Express Co.* 1916	Globe Express Co.* 1915	Great Northern Express Co. 1916	Great Northern Express Co. 1915
Mileage of all lines covered (miles)	44,973.36	44,936.22	76,988.67	73,909.69	10,238.13	9,676.50	.....	.....	9,582.80	9,557.73
Charges for transportation	$3,962,510	$3,092,137	$5,467,570	$4,274,145	$376,244	$273,231	$6	$3,299	$293,495	$263,126
Express privileges—Dr.	1,932,839	1,462,863	2,753,701	2,149,067	179,802	127,628	...	3,784	178,982	159,676
Operations other than transp.	57,210	46,165	246,024	244,000	21,775	5,125	...	49	5,507	4,859
Total operating revenues	2,086,880	1,675,439	2,959,894	2,369,078	218,214	150,733	6	‡ 435	120,020	108,309
Operating expenses	1,845,017	1,463,598	2,641,482	2,039,133	167,624	127,533	86	5,809	91,678	86,132
Net operating revenue	241,869	211,840	318,411	329,945	50,590	23,109	† 80	† 6,245	28,342	22,175
Uncollectible revenue from transp.	443	687	1,230	413	43	6	...	...	3	15
Express taxes	22,550	13,733	60,567	49,480	4,200	4,000	....	250	3,588	3,443
Operating income	218,859	197,419	256,624	280,051	46,347	19,193	† 80	† 6,495	24,749	18,717

Item	Northern Express Co. 1916	Northern Express Co. 1915	Southern Express Co. 1916	Southern Express Co. 1915	Wells Fargo & Co. 1916	Wells Fargo & Co. 1915	Western Express Co. 1916	Western Express Co. 1915	Total for Companies Named. 1916	Total for Companies Named. 1915
Mileage of all lines covered (miles)	8,233.03	8,118.34	34,821.60	34,679.60	109,324.31	114,923.23	5,232.87	5,174.26	296,394.77	300,975.57
Charges for transportation	$263,484	$231,878	$1,460,245	$1,273,385	$4,216,801	$3,476,102	$126,580	$109,664	$16,166,940	$12,996,966
Express privileges—Dr.	141,493	126,601	759,361	664,328	2,159,329	1,778,131	61,338	49,466	8,165,850	6,521,543
Operations other than transp.	4,196	3,505	32,958	25,130	95,554	68,692	3,924	3,259	467,150	400,789
Total operating revenues	126,187	108,778	733,842	634,187	2,153,026	1,766,663	69,166	63,457	8,467,240	6,876,212
Operating expenses	96,874	85,356	574,565	526,435	1,587,048	1,501,777	61,362	52,131	7,267,940	5,887,909
Net operating revenue	29,312	23,421	159,277	107,761	365,977	264,885	5,604	11,325	1,109,300	988,303
Uncollectible revenue from transp.	48	44	92	66	1,228	559	4	10	3,093	1,804
Express taxes	5,000	5,000	15,456	14,147	34,149	31,563	1,211	925	146,713	122,544
Operating income	24,264	18,377	143,729	93,537	330,600	232,762	4,389	10,390	1,049,494	863,955

B—For the Eleven Months Ending with May

Item	Adams Express Co. 1916	Adams Express Co. 1915	American Express Co. 1916	American Express Co. 1915	Canadian Express Co. 1916	Canadian Express Co. 1915	Globe Express Co.* 1916	Globe Express Co.* 1915	Great Northern Express Co. 1916	Great Northern Express Co. 1915
Charges for transportation	$38,520,475	$31,443,347	$52,238,900	$42,472,971	$3,540,349	$2,844,241	$1,367	$596,398	$3,079,990	$2,839,093
Express privileges—Dr.	18,933,896	15,670,229	26,198,341	21,327,319	1,813,164	1,417,936	447	301,142	1,878,430	1,731,170
Operations other than transp.	530,272	459,002	2,867,924	2,088,674	85,623	55,119	10	8,102	53,569	47,848
Total operating revenues	20,116,851	16,232,120	28,908,573	23,234,326	1,820,809	1,481,424	931	303,359	1,255,129	1,155,772
Operating expenses	17,958,775	16,558,991	25,348,953	22,539,592	1,531,096	1,411,289	6,101	296,558	969,522	972,476
Net operating revenue	2,158,076	† 326,870	3,559,619	694,733	289,712	70,135	† 5,170	6,800	285,607	183,295
Uncollectible revenue from transp.	6,187	5,558	9,159	2,615	498	95	...	...	205	103
Express taxes	208,893	182,522	502,827	378,541	46,200	44,000	4,200	10,850	41,027	41,446
Operating income	1,942,995	† 514,952	3,047,692	813,576	243,013	26,040	†9,370	† 4,049	244,374	141,745

Item	Northern Express Co. 1916	Northern Express Co. 1915	Southern Express Co. 1916	Southern Express Co. 1915	Wells Fargo & Co. 1916	Wells Fargo & Co. 1915	Western Express Co. 1916	Western Express Co. 1915	Total for Companies Named. 1916	Total for Companies Named. 1915
Charges for transportation	$2,758,767	$2,493,745	$15,143,364	$12,964,423	$41,374,293	$34,966,740	$1,290,187	$1,063,588	$157,955,886	$131,634,551
Express privileges—Dr.	1,497,055	1,362,709	7,791,913	6,701,404	21,337,970	17,891,945	619,923	546,681	80,071,142	66,950,540
Operations other than transp.	43,104	36,381	322,654	277,985	1,037,222	660,966	40,385	34,071	4,980,768	3,668,152
Total operating revenues	1,304,816	1,167,417	7,674,106	6,541,004	21,073,644	17,735,760	710,649	550,977	82,865,512	68,402,163
Operating expenses	982,209	970,297	6,068,224	5,787,900	18,022,952	16,304,982	605,400	569,968	71,493,327	65,412,057
Net operating revenue	322,516	197,110	1,605,881	753,103	3,050,691	1,430,778	105,248	† 18,991	11,372,185	2,990,106
Uncollectible revenue from transp.	716	195	1,035	194	12,259	9,557	71	102	30,133	18,822
Express taxes	55,000	55,000	158,528	160,035	366,153	382,579	12,769	10,911	1,395,630	1,265,688
Operating income	266,800	141,924	1,446,318	592,473	2,572,248	1,038,642	92,407	† 30,004	9,946,422	1,705,396

* Discontinued operations on April 30, 1915. † Deficit or loss. ‡ Debit item.

Collision at Grandville, Mich.

The collision at Grandville, Mich., July 15, reported in the *Railway Age Gazette* September 1, page 369, should not have been included in the table of train accidents. It belongs in the class usually noticed at the end of the monthly accident notes—"Electric Car Accidents." The steam locomotive was on a track leading to an industry, and at the crossing was struck by the electric car, the car having run past a signal set against it.

Railway Supply Manufacturers' Association

Announcement has been made by President Oscar F. Ostby, of the Railway Supply Manufacturers' Association, which had charge of the annual convention of the Master Car Builders' and American Railway Master Mechanics' associations held in Atlantic City, N. J., in June, that the exhibitors will this year receive rebates of the rental for space amounting to six cents a square foot, which means a total of $4,500. The money for this refund has been derived from two sources. The Hotel Men's Association of Atlantic City has always contributed 10 per cent of the receipts of the hotels from the convention crowd toward the expenses of the exhibitors in making the necessary changes and improvements to the pier on which the convention is held each year. This year the entire sum received from the association, amounting to $3,100, can be paid to the exhibitors. There has been added to this the sum of $1,400, being the surplus as the result of the economical management of the association during the year, which makes a total of $4,500.

Traveling Engineers' Association

The twenty-fourth annual convention of the Traveling Engineers' Association will be held at the Hotel Sherman, Chicago, Ill., October 24 to October 27, inclusive. The convention was to have been held on September 5, and was postponed on account of the then impending railroad strike.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, New Orleans, La.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.

American Electric Railway Association.—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.

American Electric Railway Manufacturers' Association.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Railway Association.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Denver, Colo.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, Gruenwald Hotel, New Orleans, La.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

Association of Manufacturers of Chilled Car Wheels.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

Association of Transportation and Car Accounting Officers.—G. F. Conrad, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

Bridge and Building Supply Men's Association.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

Maintenance of Way and Master Painters' Association of the United States and Canada.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

Railway Development Association.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next meeting, November 9-10, La Salle Hotel, Chicago.

Railway Fire Protection Association.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Annual meeting, October 3-5, Hotel Astor, New York.

Railway Real Estate Association.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 11-13, 1916, Chicago.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

Roadmasters' and Maintenance of Way Association.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, Hotel McAlpin, New York.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Society of Railway Financial Officers.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Washington, D. C.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Annual convention, October 24-27, Hotel Sherman, Chicago.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Association of Short Line Railroads.—Clarence M. Oddie, Mills Bldg., San Francisco. Annual meeting, November 15, Brown Palace Hotel, Denver, Colo.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The Traffic Club of Pittsburgh held its annual outing at Willows, near Oakmont, Pa., on September 11.

Luther M. Walter, of Chicago, gave an address before the Milwaukee Traffic Club on September 21 on the legal aspects of the Adamson eight-hour act.

The Economist (London) estimated, on August 1, that war had reduced the tonnage of the world's merchant ships available for ordinary commercial traffic by 12,451,000 tons; or from 25,609,000 tons to 13,158,000 tons.

The Jacksonville Traffic Bureau has been instrumental in getting the Florida Railroad Commission to greatly reduce the rates on Florida-grown corn to Jacksonville on the Atlantic Coast Line and the Seaboard Air Line.

The Interstate Commerce Commission has suspended until January 16, 1917, the effective date of increased rates on bituminous coal from Colorado to points in Kansas, Nebraska, Missouri and Iowa, provided for in tariffs filed by the Denver & Salt Lake.

More freight passed through the Panama Canal in July than in any month for a year. According to an official bulletin 76 vessels passed from the Atlantic to the Pacific; 83 in the reverse direction. They paid tolls of $460,123. Of the number of ships using the canal in July, 27 were American, 75 British and 11 Japanese.

The New York & Cuba Mail Steamship Company will soon inaugurate direct freight and passenger service from New York to west coast ports of Central America, and to Salina Cruz, Mex., by way of the Panama Canal. The first vessel will sail on September 30 from New York, and there will be sailings every 21 days theerafter.

At the annual meeting of the General Agents' Association of Chicago the following officers were elected: Chairman, C. C. Clark, general agent, passenger department, Michigan Central; vice-chairman, A. J. Puhl, general agent, passenger department, Chicago, Burlington & Quincy; secretary, A. C. Odenbaugh, general agent, passenger department, Northern Pacific.

The passenger traffic officers of the Baltimore & Ohio will hold their annual staff meeting at Pittsburgh next Monday and Tuesday. The sessions will be presided over by A. W. Thompson, vice-president, who recently assumed the direction of that department, and about 200 passenger representatives of the company from points all over the United States will be present.

According to statistics compiled by the United States Geological Survey for 50 important coal-carrying railroads, 451,611 carloads of bituminous coal and 51,656 carloads of beehive coke were shipped during August, 1916. This is an increase in shipments of bituminous coal of 10 per cent over August, 1915, and 13 per cent over July, 1916. The corresponding increases in beehive coke shipments were 9.5 per cent and 9 per cent.

Representatives of the railroads of the country convened in New York City this week to confer on the preparation of briefs on the form of the uniform bill of lading provided for in recent federal legislation. Hearings on the bill-of-lading form were recently held in New York, Chicago, San Francisco, New Orleans and Atlanta. The briefs will be filed with the Interstate Commerce Commission on October 10, and oral arguments will be presented before the Commission on October 20.

According to Pittsburgh papers, manufacturers and shippers in that region already feel a serious freight car shortage. In the coal fields operators say that it is not possible to obtain much more than half the cars actually needed. The Connellsville coke fields are being forced to curtail coke production as much because of the scarcity of cars as by lack of labor. The lake coal movement is an important factor in the situation. The movement for the Northwest is further behind this season than ever before, owing to long extended strikes of miners, scarcity of vessel capacity and dock labor strikes in the Northwest.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended from September 15 to January 13 tariffs providing for numerous increases in rates on smoking tobacco and other tobacco products from Virginia and North Carolina points to southeastern destinations.

The Interstate Commerce Commission has suspended until January 8, 1917, the effective date of the rule of the Western Trunk Line Committee, recently adopted, which was intended to cancel provisions for the free shipment of goods to replace freight lost or damaged in transit.

A number of coal companies in Ohio have filed a complaint with the Commission, protesting against a change in rates on coal from the southern Ohio coal district to Indiana and Michigan points, which they say will create an unreasonable preference in favor of West Virginia, Kentucky and Tennessee coal operators.

The Interstate Commerce Commission has suspended from September 15 to January 13 the operation of tariffs providing for the cancellation of express rates on fish from Selkirk, East Selkirk and other points in Manitoba, Canada, to Detroit, Buffalo and New York, and for the future application of class rates on such traffic.

Representatives of a large number of iron and steel companies appeared at a hearing before the suspension board of the Interstate Commerce Commission on September 18 to protest against the proposed cancellation of export rates on iron and steel articles, effective on October 1, which would leave in effect the higher domestic rates.

The Interstate Commerce Commission has suspended until November 16 its order in the St. Louis Business Men's League case establishing a passenger fare of 2.4 cents a mile between St. Louis, Mo., and Keokuk, Iowa, and Illinois points.

The Commission has set a hearing to be held at St. Louis October 2, on the questions concerning freight rates in the case of the Business Men's League of St. Louis. It will be before Examiner Gutheim. The League complains that St. Louis is discriminated against in favor of Illinois points, because the Illinois commission did not allow a five per cent increase on intrastate freight traffic when that increase went into effect on interstate business.

The Merchants' Exchange of St. Louis has filed a complaint with the Interstate Commerce Commission against the Great Lakes Transit Corporation and eastern rail lines, charging discrimination against St. Louis in new rates on grain products and by-products from Chicago to Buffalo by lake, and thence to eastern destinations by rail. It is stated that in establishing joint through rates from Chicago, Milwaukee, Duluth, Superior and Minneapolis the carriers have failed to establish joint through rates from St. Louis so that the only rail-lake-and-rail rates available to St. Louis shippers to certain destinations via the lines of the Great Lakes Transit Corporation are the rates published by that company from Chicago and the local rates from St. Louis, which make a combination higher than the rates formerly in effect from St. Louis.

The Boston Chamber of Commerce and a large number of New England commercial organizations have filed a complaint with the Interstate Commerce Commission against the principal rail and water carriers serving the southeastern states, protesting against a change in the relation of the rates from New England points, and through the ports of Boston and Providence via ocean and rail through the Virginia and South Atlantic ports to Georgia, Florida, Alabama, Mississippi, Louisiana, Tennessee and Kentucky, as compared with those from New York to the same destinations. It is alleged that prior to January 1, 1916, the same class and commodity rates were published from New York as from Boston and Providence, and that the rates from other New England points were higher by certain differentials, but that on that date, in "purporting" to comply with fourth section orders of the commission, rates had been filed higher from Boston and Providence by 2, 3 and 4 cents per 100 lb. than from New York, thereby disturbing a relation on which business had been established and subjecting the complainants to an unreasonable discrimination. It is stated that the water carriers were responsible for the change, and that the rail lines were opposed to it.

The Louisiana Railroad Commission has filed with the Interstate Commerce Commission a petition charging the Texas Railroad Commission with interfering with the adjustment of rates sought to be brought about by the federal commission in its decision of July 7 in the Shreveport case. The petition states that the federal commission in its opinion had said that the carriers had filed a list of commodities on which they were willing to apply rates between Shreveport and Texas stations equivalent to the current Texas rates or those recently approved by the Texas commission; that the complainants had expressed themselves as satisfied with this plan, and that the commission therefore made no specific finding as to these rates. The petition then states that on August 28 the Texas commission had issued an order, effective on September 1, cancelling the rates then in effect, and which had been in effect at the time of the Interstate Commerce Commission's decision, and restoring rates which had been in effect prior to a recent 10 per cent advance. The petition alleges that the rates in effect on August 28 were reasonable, but that the old rates restored are unjustly discriminatory to Louisiana shippers, and will deprive them of a large part of the relief prayed for in the original petition in the case. The Interstate Commerce Commission is asked to issue a specific order as to the rates on the commodities involved, which include wool, cement, fertilizers, lime, salt, sugar, molasses, logs, packinghouse products and fresh meats, canned goods and others. The Commission has issued an order directing the Texas roads to show cause on October 7 why they should not put into effect the commodity rates in question—those which the Texas commission has cancelled. Carriers have secured an injunction in the Federal Court, restraining the Texas commission from enforcing its cancellation order.

COURT NEWS

A suit against the Wabash to impose fines amounting to $13,500 was recently filed in the United States District Court at Council Bluffs, Iowa. Twenty-seven violations of the hours of service law are charged, all dealing with trainmen's time, on runs between Council Bluffs, Iowa, and Stanberry, Mo.

Carmack Amendment—Foreign Carrier's Negligence

The South Carolina Supreme Court holds that the Carmack amendment does not make a domestic carrier liable for loss occasioned by the negligence of a foreign carrier or for transportation to foreign countries, but only as to commerce between the states and territories within the United States.—Aldrich v. Atlantic Coast Line (S. Car.), 89 S. E., 315.

Rebate by Compromise of Claim

The Texas Court of Civil Appeals holds that an agreement of a railroad to pay a certain amount in compromise of an unliquidated claim for damages for alleged negligence, in consideration of the claimant making all his subsequent interstate shipments over the railroad's line, violates the law against rebating. — St. Louis, Iron Mountain & Southern (Tex.), 187 S. W., 358.

Excursion Fares—Necessity for Tickets

In an action for unlawful ejectment it appeared that the plaintiff went to the defendant's station to purchase advertised round trip excursion tickets. After failing to obtain tickets before the train's arrival by reason of the ticket agent's absence, he tried to purchase tickets after the train blew the station signal, but was unable to do so on account of the crowd. After the conductor had failed to hold the train until he could purchase the tickets, he boarded it without a ticket. He demanded of the conductor that he be carried to and from the show at

excursion rates, and demanded a return ticket as a condition of paying his fare. The South Carolina Supreme Court holds that, in view of the law forbidding discrimination of rates, and his failure to pay the only rate the conductor was allowed to receive, he was not entitled to passage on the train, and could not recover for his ejection.—Ashe v. Southern (S. Car.), 89 S. E., 482.

Posting Tariffs at Stations

The South Carolina Supreme Court holds that, under section 6 of the Interstate Commerce Act, where a railroad filed proper schedules of rates with the secretary of the Interstate Commerce Commission, filed a copy of the schedules in its division freight office, and tacked a tin sign in a conspicuous place at stations, giving notice that freight schedules were on file in the division freight office, such schedules were legal though not posted in the office from which shipments were made.—Southern v. Wilmont Oil Mills (S. Car.), 89 S. E., 476.

Storage Charges on Structural Steel

The builder of a hotel arranged with the railroad to store the steel until used. The hotel company went into bankruptcy, and the receivers sold the steel. The railroad claimed storage charges, for which the receivers denied liability. The Delaware Court of Chancery held that to avoid liability the receivers were bound to show that by the hotel company's contract with the builder, the latter was ultimately liable for such charges, and in the absence of such evidence the inference arose that the owner was ultimately liable.—*In re* Arlington Hotel Co., 98 Atl., 186.

Stopping Special Excursion Trains

The Mississippi Supreme Court, on suggestion of error, has reversed its opinion in 70 So. 898, in an action for damages for failure to stop an excursion train at a flag station. It holds that where it was the annual custom of a railroad company to run an excursion train, which always stopped on flag at a certain station to take on passengers, and no notice was given to the public that the custom would be changed, the plaintiff was invited and had a right to take passage, and when he was denied this right had a cause of action against the company.—Gulf & Ship Island v. Dixon (Miss.), 71 So., 906.

Yard Accident to Callboy

Action was brought for personal injuries to a railroad callboy 14 years old, employed in the defendant's yard, received by being struck by a train. The Texas Court of Civil Appeals held that, although a child of very tender years may be presumed as a matter of law not to have sufficient discretion to appreciate dangers obvious to one of maturer ages, no such presumption can be indulged in favor of a boy 14 years old. He knew and appreciated the danger of trains in the yard as well as anyone else. Therefore the company's failure to warn him did not constitute negligence. Nor was the company liable on the theory that it was negligent in employing so immature a person.—Galveston, Houston & Henderson v. Anderson (Tex.), 187 S. W., 491.

Separate Coach Law

In an action against a railroad company for damages for placing white passengers in a coach also occupied by negroes, on a train from Austin to San Antonio, it appeared that unusual flood conditions caused the want of proper equipment, and there was an unusually large crowd on the train. The Texas Court of Civil Appeals held that these were circumstances to be taken into consideration in determining whether the plaintiffs were humiliated or mortified, and, if so, in measuring the equivalent thereof in money. They could not recover even nominal damages against the railroad for infraction of the separate coach law without showing that they were injured. Evidence that the two races were commingled because the negro coach was disabled, that they were separated by large signs, one portion of the coach being set off for the negroes, and that many of the white passengers were soon placed in Pullman and chair cars, had such a bearing on the question as to whether white passengers suffered shame and humiliation that, if it was erroneously admitted, the error did not necessitate a reversal.—Weller v. Missouri, K. & T. (Tex.), 187 S. W., 374.

Exemption of Logging Cars Strictly Construed

In two suits against the Northwestern Pacific, the federal district court, northern district of California, Second division, decides against the road on its claim that large logging cars, which are substantially like standard freight cars, come within the exemption of the safety appliance acts, under which small logging cars are not subject to the requirements of the law. District Judge Van Fleet, in a lucid and forcible opinion, holds:

1. Eight-wheel standard logging cars, although used exclusively in the transportation of logs, are comprehended within the terms of the Federal safety appliance acts if the height of such cars from the top of rail to the center line of coupling exceeds 25 inches.

2. Liability of a common carrier for the penalty provided in such acts for "permitting" the use on its line of equipment not in conformity with the requirements thereof is not confined to equipment operated by employees of that carrier alone, but extends to that used by another carrier over the former's line pursuant to a contract authorizing the latter to use the tracks of the former.

3. The word "permitting" as used in the statute is not to be construed as implying knowledge of the thing permitted, and the duty of carriers to exclude from their lines the use of defective equipment is an absolute one.

Delivery to Consignee Named in Straight Bill of Lading

Action was brought against the Southern Pacific for the value of merchandise delivered to it by plaintiff for shipment from New York to Ft. Worth, on a straight bill of lading as follows: "M [M] C, care, Western National Bank, Ft. Worth, for A. J. Cohen, 601 May street, Tex." The goods were delivered to Cohen at Ft. Worth without production of the bill of lading. The plaintiff claimed a wrongful delivery. The Municipal Court of the City of New York held that the goods were properly delivered to Cohen, if he was the consignee mentioned in the bill of lading. "M [M] C" was a fictitious designation, and must be disregarded. It might be that delivery to the Western National Bank would have relieved the railroad from liability. But it did not follow that such delivery was the only good delivery. The plaintiff could have guarded himself against delivery before payment by using an order bill of lading, or notifying the carrier that the goods should not be delivered except on payment. Having failed to do so the carrier was not bound to know the arrangements between the consignor and the consignee. The symbol did not put the carrier upon inquiry as to an arrangement between consignor and consignee, as it would have done in the case of an order bill of lading.—Mayer v. Southern Pac., 159 N. Y. Supp., 93.

Binding Character of Filed Regulations

Action was brought against the New York Central for damages to a shipment from Detroit to New York. The goods were packed by the plaintiff in a car at Detroit on the Michigan Central. The bill of lading had a notation: "Car to be opened by consignee," but it was opened by the defendant's employees. The plaintiff's witnesses testified that in the course of unloading some of the goods were damaged. The defendant gave evidence to the effect that the car was improperly loaded by the plaintiff's representatives at Detroit. On appeal from a judgment for the plaintiff, the New York Appellate Division holds first, that, as the New York Central had filed with the Interstate Commerce Commission rules and regulations providing that that company should unload all cars consigned to this [Franklin street] station, the Michigan Central had no authority to vary that regulation ;following the rule as to the binding character of the tariffs and regulations filed with the Interstate Commerce Commission. It was also held that an instruction requested by the defendant should have been given that "if the jury find that the damage was due to the improper packing by the shipper, the defendant is not liable." Judgment was therefore reversed and a new trial ordered.—Greenwald v. New York Central, 159 N. Y. Supp., 15.

Railway Officers

Executive, Financial, Legal and Accounting

J. S. Bache has been elected a vice-president of the Ann Arbor, with headquarters at New York.

P. E. Crowley, assistant vice-president of the New York Central at New York, has been appointed vice-president in charge of operation of the New York Central and the Ottawa & New York, with headquarters at New York. He was born in August, 1864, at Cattaraugus, N. Y., and began railway work with the Erie as messenger boy in 1878. The following year he was promoted to telegraph operator, and was later station agent and then train despatcher on the same road. In 1890 he entered the service of the New York Central & Hudson River as train despatcher on the Rome, Watertown & Ogdensburg division, and in 1891 was promoted to chief despatcher. The same year he was made trainmaster, and in September, 1900, was appointed chief trainmaster of the Pennsylvania division. He was promoted to superintendent of the Pennsylvania division in August, 1901; assistant general superintendent in December, 1904; general superintendent in June, 1905, and assistant general manager in March, 1907. He remained in that position until April, 1912. He was then general manager until January 1, 1915, when he was appointed assistant vice-president of the New York Central Railroad, which took over the New York Central & Hudson River and the Lake Shore & Michigan Southern. On the 14th of this month he was appointed vice-president in charge of operation of the same road and the Ottawa & New York, succeeding A. T. Hardin.



P. E. Crowley

George R. Martin, whose election as vice-president of the Great Northern has already been announced, was born July 3, 1864, at Evans Mills, N. Y. He received his early education at this place, and entered railway service in 1885, since which time he has been consecutively up to January 1, 1887, telegraph operator and agent of the Chicago & North Western; from January 1, 1887, to July, 1890, station agent, train despatcher and chief clerk to the superintendent of the Minneapolis, St. Paul & Sault Ste. Marie. From July 1, 1890, to August 1, 1894, he was in the accounting department of the Great Northern, and from August 1, 1894, to January 1, 1897, he was assistant auditor of disbursements of this same road. From January 1, 1897, to March 1, 1897, he was special superintendent of the Great Northern, and from March 1, 1897, to March 1, 1898, general superintendent of the Montana Central, a subsidiary of the Great Northern. He returned to the Great Northern on March 1, 1898, as general superintendent of the Central district, and held this position until March 1, 1899, when he was appointed auditor of disbursements ,and remained in this capacity up to November 1, 1902. From this date to January 1, 1905, he was general auditor on this same road, being assigned to special duty in the president's office from January 1, 1905, to May 15, 1905. On the latter date he was appointed assistant to the controller, and held this position until January 1, 1906, when he became assistant controller. He was elected controller June 1, 1911. His present election took effect September 1, 1916. In addition to the new duties he is also vice-president of the Great Northern Steamship Company and of the Northern Steamship Company; chairman of the pension board of the Great Northern Railway; vice-chairman of the Great Northern Employees Investment Company, and controller of the Great Northern Express Company, as well as controller of all the minor railway and subsidiary companies of the Great Northern System.



G. R. Martin

Abraham Tracy Hardin, vice-president of the New York Central, in charge of operation, has been promoted to a position in which he is assistant to the president regardless of department, and in connection with lines not directly operated; and his place as head of the operating department is taken by P. E. Crowley. Mr. Hardin continues as vice-president of the New York Central, and at the same time is appointed vice-president of the Ottawa & New York, the Michigan Central and the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at New York. He was born in 1868, in South Carolina, and graduated from the University of South Carolina with the degree of civil engineer in 1894. In 1882 he had been a telegraph operator on the Richmond & Danville, and from 1882 to 1890 he was agent, and then stenographer, on that road. He attended college from 1890 to 1894, and then for four years was in the maintenance of way department of the Southern Railway. From 1898 to September, 1899, he was supervisor and division engineer on the Eastern division of the New York Central & Hudson River. He was then promoted to engineer of track, and from February, 1903, to July, 1905, he was engineer of maintenance of way; then for about one year he was assistant to the general manager. From June, 1906, to April, 1912, he was assistant general manager; he was then appointed assistant vice-president, and in April, 1913, became vice-president. On January 1, 1915, he was appointed vice-president, in charge of operation, of the New York Central Railroad, the new company which took over the New York Central & Hudson River, and the Lake Shore & Michigan Southern; and on September 14, 1916, was appointed vice-president of the New York Central, the Ottawa & New York, the Michigan Central and the Cleveland, Cincinnati, Chicago & St. Louis.



A. T. Hardin

W. M. Wadden, treasurer of the Ann Arbor, has been elected vice-president and treasurer, with office at New York City.

Edward L. Brown, whose election to the presidency of the Minneapolis & St. Louis in succession to Newman Erb, resigned, has just been announced, was born in Iowa in 1864. He entered railway service with the Chicago, Rock Island & Pacific in 1875 as a messenger boy. From 1887 to 1890 he was consecutively telegraph operator, station agent and train despatcher on this same road. In 1883 he was appointed joint agent of the Chicago, Rock Island & Pacific, the Wabash and the Iowa Central, in which capacity he served until 1888. From this time up to April, 1891, he was general agent of the St. Paul &

Duluth, with office at West Superior, Wis., and from April, 1891, to November, 1891, he was commercial agent on this same road, with headquarters at St. Paul, Minn. In November and December of 1891 he was chief despatcher and superintendent of telegraph, and from December, 1891, to March, 1896, he was master of transportation on this same road, being promoted superintendent in March, 1896, and retaining this position until June, 1900. From June 15, 1900, to February 1, 1902, he was superintendent of the Lake Superior division of the Northern Pacific, with office at Duluth, Minn., and from February, 1902, to April, 1903, he was general superintendent of the Montana Central. In April, 1903, he was appointed general superintendent of the Eastern district of the Great Northern, and held this connection until March, 1907, when he became general superintendent of the same district, with headquarters at St. Paul, Minn., which position he filled until October, 1907. From October, 1907, to February, 1912, he was general superintendent of the Western district of this same road, having his headquarters at Seattle and Tacoma, Wash. From February, 1912, to July, 1913, he was vice-president of the Denver & Rio Grande at Denver, Colo. In July, 1913, he was elected vice-president of the Western Pacific also, and transferred his headquarters to San Francisco, Cal. Mr. Brown held these latter two offices up to the time of his present election, September 1, 1916.

Operating

W. N. Bickler has been appointed trainmaster of the Northern Pacific, with headquarters at Butte, Mont.

W. N. Richler has been appointed trainmaster of the Montana division of the Northern Pacific, with headquarters at Butte, Mont.

J. J. O'Connor has been appointed assistant general manager of the operating department of the Milwaukee Refrigerator Transit & Car Company, with office at Milwaukee, Wis.

G. G. Derby, trainmaster of the Atchison, Topeka & Santa Fe, with office at Newton, Kan., has been appointed division superintendent, with headquarters at Arkansas City, Kan., succeeding W. K. Etter, promoted.

G. G. Allen, who resigned as general storekeeper of the Chicago, Milwaukee & St. Paul, has been appointed assistant general manager in charge of the manufacturing department of the Milwaukee Refrigerator Transit & Car Company, with office at Milwaukee, Wis.

C. E. Hill, road foreman of engines on the first district of the Albuquerque division of the Atchison, Topeka & Santa Fe, has been appointed trainmaster, with office at Gallup, N. M., succeeding A. R. Woods, transferred to Winslow, Ariz., relieving E. H. Duffield, resigned.

W. K. Etter, division superintendent of the Atchison, Topeka & Santa Fe, with office at Arkansas City, Kan., has been appointed general superintendent of the western district of the eastern lines, with headquarters at Newton, Kan., succeeding Edward Raymond, promoted.

John A. Ahern, trainmaster of the Boston & Maine at Lyndonville, Vt., has been appointed assistant superintendent, with office at Lyndonville, succeeding George W. Cree, deceased; George F. Ferguson has been appointed trainmaster, succeeding Mr. Ahern, and Ray L. Lilley has been appointed chief train despatcher, succeeding Mr. Ferguson.

Edward Raymond, general superintendent of the western district, eastern lines, Atchison, Topeka & Santa Fe, with office at Newton, Kan., has been appointed general superintendent of the eastern district, eastern lines, with headquarters at Topeka, Kan., succeeding R. J. Parker, appointed general manager of the western lines, at Amarillo, Tex.

F. M. Brown, chief train despatcher of the Pittsburgh & Lake Erie at Pittsburgh, Pa., has been appointed superintendent, with office at Pittsburgh. Mr. Brown was born on January 4, 1871, at Monmouth, Ill., and was educated in the common schools. He began railway work on June 4, 1888, with the Pittsburgh & Lake Erie, and served consecutively as train despatcher, night chief despatcher and chief train despatcher until 1907, when he became superintendent of telegraph. In 1909 he was appointed assistant trainmaster, and since 1912 served as chief train despatcher, until his recent appointment as superintendent of the same road, with office at Pittsburgh, as above noted.

Fred C. Fox, who has been appointed general manager of the eastern lines of the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kan., was born October 9, 1863, at Marysville, Ohio. He was educated in the schools of this city, and entered railway service in 1880, from which time and up to July 1, 1881, he was a telegraph operator on the Cleveland, Columbus, Cincinnati & Indianapolis. From July 4, 1881, to September, 1890, he was telegraph operator, relief agent, and freight and ticket agent on the New Mexico and Rio Grande divisions of the Atchison, Topeka & Santa Fe, at various stations along the line. From September, 1890, to June, 1892, he was chief despatcher on the Rio Grande division, and from 1893 to February, 1897, trainmaster of this same division. From February, 1897, to December 15, 1900, he was trainmaster on the New Mexico division, and from December 15, 1900, to January 21, 1901, he was superintendent of the western division, with headquarters at La Junta, Colo. He was made superintendent of the New Mexico and Rio Grande division at Las Vegas, New Mexico, in January, 1901. From March, 1903, to April, 1905, he was superintendent of the Middle division at Newton, Kan., and from April to June of the year 1905 he was general superintendent of the Western Grand division, with office at La Junta, Colo. Since June, 1905, he has been general superintendent of the Eastern Grand division at Topeka, Kan., and then general manager of the western lines, with office at Amarillo, Tex. In addition to these connections on the Atchison, Topeka & Santa Fe proper, he is also vice-president and general manager of the Pecos & Northern Texas, the Pecos River Road and the Southern Kansas Railway of Texas.



F. C. Fox

Traffic

Robert Hunter has been appointed commercial agent of the Carolina, Clinchfield & Ohio, with headquarters at Pittsburgh, Pa.

W. E. Shurtleff, commercial agent of the Pere Marquette, with office at Cleveland, Ohio, has resigned to engage in another line of business.

E. S. Banks has been appointed traffic manager of the Houston & Brazos Valley, with office at Freeport, Tex., succeeding J. W. Knightlinger, resigned.

C. W. Mount, district freight and passenger agent of the Oregon-Washington Railroad & Navigation Company, with headquarters at Seattle, Wash., has resigned.

C. S. Stephens, commercial agent of the Pere Marquette, with headquarters at Indianapolis, Ind., has been appointed commercial agent at Cleveland, Ohio, succeeding W. E. Shurtleff, resigned.

C. H. Walter, traveling freight agent of the Pere Marquette, with headquarters at Toledo, Ohio, has been appointed commercial agent at Indianapolis, Ind., succeeding C. S. Stephens, promoted.

H. C. Hanley, contracting freight agent of the Atchison, Topeka & Santa Fe, with office at Chicago, Ill., has resigned to accept employment with the Belt Railway Company of Chicago as commercial agent at Kansas City, Mo.

W. S. Elliott has been appointed district freight and passenger agent of the Oregon-Washington Railroad & Navigation

Company, with headquarters at Spokane, Wash., and W. R. Skey has been appointed district freight and passenger agent at Wallace, Idaho, with jurisdiction over territory east of Tekoa and Bell, Wash.

Engineering and Rolling Stock

W. F. Fourrier has been appointed assistant engineer of the Atchison, Topeka & Santa Fe coast lines, with headquarters at Needles, Cal., vice B. H. Quinham, resigned.

W. T. Wiechert has been appointed road foreman of engines on the Montana division of the Northern Pacific, with headquarters at Butte, Mont., succeeding William Dean, resigned.

E. J. Snell, master mechanic of the New York Central at Corning, N. Y., has been appointed master mechanic, with office at Watertown in place of W. D. Chaffee, who has been transferred as master mechanic to Corning in place of Mr. Snell.

Charles F. Nye, who has been appointed supervisor of water supply of the Wheeling & Lake Erie, with headquarters at Brewster, Ohio, was born in Canton, Ohio, July 24, 1892. He received his preliminary education in the schools of this city, and entered railway service in June, 1908, taking employment in the water supply department of the Wheeling & Lake Erie. In 1913 he was promoted to water gang foreman, and retained this connection until his present appointment became effective, September 1, succeeding his father, A. Nye, deceased.

OBITUARY

William J. Calhoun, formerly minister to China, and from 1898 to 1900 a member of the Interstate Commerce Commission, died at his home in Chicago September 19, at the age of 68.

John Moore James, superintendent of the Renovo division of the Pennsylvania Railroad, with headquarters at Renovo, Pa., died on September 17 of acute pneumonia in the Erie (Pa.) hospital, at the age of 41. A portrait of Mr. James and a sketch of his railway career were published in the *Railway Age Gazette* of May 5, 1916, page 1012, at the time he was appointed superintendent of the Renovo division.

Swiss Federal Railway Receipts.—The Swiss Federal Railway receipts decreased from $41,055,153 in 1913 to $35,199,340 in 1914, the approximate decrease during the last five months of 1914 being 30 per cent. The operating expenses also decreased from $25,722,654 in 1913 to $24,958,567 in 1914. The surplus in 1914 available for railway reconstruction and the renewal of railway material, as well as for special funds, was therefore only $10,240,773, as compared wtth $15,332,499 in 1913.

Indian Railway Management.—The question of providing adequate railway facilities for the growing commerce of India is one of the most serious problems with which the Indian government is confronted. An important step has been taken by the Indian Railway Board with a view to determining a definite policy for the future. In a communication from Simla to the leading commercial bodies of India it is stated that the investigation by the board of the comparative advantages of the management of railways by companies on the one hand, and by the state on the other, has now been completed, and it has been found impossible to base any definite finding upon the statistical results worked out. The board has, accordingly, frankly adopted the course of inviting the opinion of commercial bodies on the subject. These bodies have had practical experience of the virtues and failings of railway management, and they are asked to state whether in their opinion state-managed or company-managed lines have given the best services to the public. Mr. Couchman, member of the railway board, has been making what is known as a monsoon tour. He was last spoken of as at Naini Tal, where he inspected existing arrangements and examined proposals for a wire rope tramway. Later on Mr. Couchman was to proceed to Bareilly, where he was to inspect the Rohilkhand and Kumaon Railway. Still later he was to proceed to Lucknow for the purpose of conferring with the agent of the Oudh Rohilkhand Railway. At Dhanbaid, Mr. Couchman was to devote his time to sundry proposals relating to collieries, and he was to accompany Sir G. Barnes through the local coalfields, returning subsequently to Calcutta.—*Engineering, London.*

Equipment and Supplies

LOCOMOTIVES

The Cambria & Indiana is inquiring for one Mikado type locomotive.

The Belt Railway of Chicago is inquiring for 5 ten-wheel switching locomotives.

The Nevada Consolidated Copper Company is inquiring for 2 0-6-2 type locomotives.

The Delaware, Lackawanna & Western is inquiring for 5 Pacific type locomotives.

The Bush Terminal Company has ordered 1 four-wheel switching locomotive from the Baldwin Locomotive Works.

The Bethlehem Steel Company has ordered 4 four-wheel switching locomotives from the Baldwin Locomotive Works.

The Maryland Steel Company has ordered 2 six-wheel switching locomotives from the Baldwin Locomotive Works.

The Standard Oil Company, Bay Way, N. J., has ordered one 0-4-0 type locomotive from the Baldwin Locomotive Works.

The New York Central, reported in the *Railway Age Gazette* of September 8 as contemplating the purchase of 230 locomotives, has placed an order for 115 locomotives with the American Locomotive Company, and has ordered 115 from the Lima Locomotive Corporation.

FREIGHT CARS

The Chicago & Alton is inquiring for 200 automobile cars.

The Seaboard Air Line is inquiring for 50 to 100 stock cars.

The Pere Marquette is in the market for 1,000 40-ton box cars.

The Chesapeake & Ohio is in the market for 1,000 hopper cars.

The Missouri Pacific is reported as inquiring for 2,000 general service cars.

The Western Maryland is in the market for 2,000 50-ton steel hopper cars.

The Chicago, Burlington & Quincy is reported in the market for a number of freight cars.

The Utah Copper Company has ordered 24 mine cars from the Pressed Steel Car Company.

The New York, Chicago & St. Louis has ordered 500 steel center frames from the Ryan Car Company.

The Wheeling & Lake Erie is inquiring for 500 to 1,500 70-ton flat cars, and 500 70-ton hopper cars.

The Western Pacific has ordered 1,000 box cars and 150 stock cars from the Mount Vernon Car Manufacturing Company.

The Armour Car Lines are inquiring for 300 center underframes. They will also build 300 refrigerator cars in their own shops.

The Bethlehem Steel Company has ordered 30 coke cars from the Pressed Steel Car Company. This company is also in the market for 150 70-ton steel ore cars.

The Minneapolis, St. Paul & Sault Sainte Marie, reported in the *Railway Age Gazette* of August 25 as being in the market for 250 ore cars, has ordered these cars from the Haskell & Barker Car Company.

PASSENGER CARS

The Great Northern.—The item in the *Railway Age Gazette* of September 15, to the effect that this road is in the market for 125 all steel passenger cars, has been denied.

The New York Central, reported in the *Railway Age Gazette* of September 8 as inquiring for 10 70-ft. coaches, has ordered 10 passenger coaches from the Pressed Steel Car Company.

The Lehigh Valley, reported in the *Railway Age Gazette* of August 18 as being in the market for 25 all-steel 60-ft. baggage and express cars, has ordered this equipment from the Pullman Company.

IRON AND STEEL

The Southern Railway is in the market for 7,000 tons of steel for bridges.

The Pittsburgh & Lake Erie has ordered 700 tons of steel from the American Bridge Company.

The Crucible Steel Company has given a contract to the American Bridge Company for fabricating and erecting 2,000 tons of steel for a new plant addition at Pittsburgh.

The Minneapolis, St. Paul & Sault Ste. Marie has ordered 375 tons of spans and girders from the Minneapolis Steel & Machinery Company for the approach to the Ashland ore dock.

The Atchison, Topeka & Santa Fe has purchased 7,000 tons of tie plates. This was incorrectly reported as 7,000 lb. in the *Railway Age Gazette* of September 15. The company has also bought 1,500 tons of tie plates for Pueblo, Colo., delivery from the Railroad Supply Company, and has bought angle bars for 90 miles of track to be delivered about April 1, 1917, from the Illinois Steel Company.

MISCELLANEOUS

The Chicago & Alton is now contracting for its miscellaneous track and specialty supplies for 1917.

The Chicago & Northwestern is inquiring for 9,000,000 ft. of timber for ore dock No. 4 at Ashland, Wis.

The Chicago, Milwaukee & St. Paul is asking for bids on 10,000,000 ft. of lumber for car cooperage purposes.

The Pere Marquette has awarded a contract to the Roberts & Schaefer Company for building a large three-track reinforced concrete automatic electric counterbalanced bucket coaling plant at Flint, Mich. In this station will be installed three power operated "RandS" measuring coal loaders for measuring and recording all coal issued to locomotives. Contract price, $19,000.

The Pennsylvania Railroad has ordered a 20,000 kw., 11,000-volt, 25-cycle turbine unit complete with a 24,000 sq. ft. surface condenser and auxiliaries from the Westinghouse Electric and Manufacturing Company. This turbine is for installation in the railroad's Long Island City powerhouse, which supplies power for the operation of the Pennsylvania Terminal and the Long Island Railroad.

Railway Construction by Bolivian Government.—The call of the Bolivian government for bids on the construction of the Potosi-Sucre Railway has been annulled. No bids having been received, the government has decided to proceed with the construction of the railway through the Department of Public Works. The Potosi-Sucre Railway is an extension of the Rio Mulato branch of the Antofagasta & Bolivia Railway.

Powdered Fuel for Swedish Railways.—A recent report of the Swedish Department of Commerce states that the Swedish State Railways have been experimenting with powdered peat as fuel for locomotives, and the railway directors have recommended an appropriation of more than $300,000 for a factory to produce sufficient powdered peat to supply all the locomotives on one of the State railway lines.

A Glasgow Forfeit.—In a specification recently issued for a 6,000 kw. turbine by the Glasgow Corporation, the following clause was inserted: "Should the contractor fail to meet the guaranteed steam consumption, the contractor shall pay to the corporation the sum of £750 for every quarter of a pound or part of a quarter of a pound consumed over and above the figure of guaranteed steam consumption per kilowatt-hour."—*Power.*

Supply Trade News

Warren S. Corning has been appointed general sales agent of the Fox River Iron Company, Aurora, Ill., with headquarters in the Transportation building, Chicago, Ill.

A. T. Whiting, vice-president and secretary of the Whiting Foundry & Equipment Company, Harvey, Ill., died at his home in Chicago, September 12, after only a few days' illness.

Reuben C. Hallett, for many years active in railway supply circles, and for several years past connected with the Duntley Products Sales Company, Chicago, Ill., died at his home in Chicago, September 10.

Herman Voelker, assistant general foreman of the American Car & Foundry Company, has resigned to accept employment as general foreman of the wood car department of the Ralston Steel Car Company, Columbus, Ohio.

H. K. Ellyson has been appointed eastern representative of the railroad and steamship department of the West Disinfecting Company, making his headquarters at the home office, 12 East Forty-second street, New York City. Mr. Ellyson has been connected with this company for some time in various capacities.

Frank Taylor Hyndman, superintendent of motive power and cars of the Wheeling & Lake Erie, has been appointed general manager of the Damascus Brake Beam Company, with office at Cleveland, Ohio, effective August 1, 1916, with full charge of plant operation and production. He was born on September 29, 1858, and began railway work in 1872 as machinist apprentice on the Central of New Jersey at Ashley, Pa., and from 1874 to 1877 was an apprentice in the shops of the Lehigh Valley at Wilkes-Barre; then, for about three years, was brakeman and fireman on the Central of New Jersey. From March to November, 1880, he was a machinist on the Atchison, Topeka & Santa Fe at Raton, New Mexico, and from March, 1881, to August, 1883, was machinist on the Pittsburgh & Western and with the Pittsburgh Locomotive Works, becoming an engineman on the Pittsburgh & Western in August, 1883. He remained in that position until September, 1895, when he was made trainmaster, and from April, 1896, to November, 1902, was master mechanic of the same road at Allegheny. He was then, for one month, master mechanic on the Baltimore & Ohio at Pittsburgh, and from December, 1902, to July, 1904, was master mechanic on the Buffalo, Rochester & Pittsburgh. In July, 1904, he was appointed superintendent of motive power of the same road at Dubois, Pa., and the following November went to the New York, New Haven & Hartford as general master mechanic at New Haven, Conn. He became mechanical superintendent of that road in May, 1906, resigning from that position on July 15, 1907, to enter the railway supply business. He was the Philadelphia representative of S. F. Bowser & Co., Inc., Fort Wayne, Ind., in July, 1913, when he was appointed superintendent of motive power and cars of the Wheeling & Lake Erie, which position he held until he was appointed general manager of the Damascus Brake Beam Company on August 1, as above noted.



F. T. Hyndman

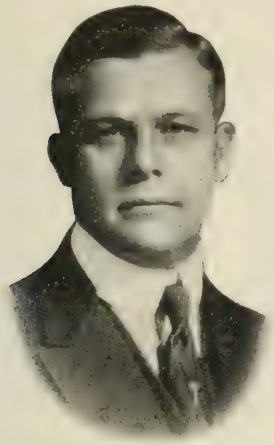
The Van Dorn Electric Tool Company, Cleveland, Ohio, has recently completed and moved into a new plant, which will

make possible the doubling of the output of its line of portable electric tools. The buildings are of steel, brick and concrete construction, and are two and three stories in height.

W. E. Donaldson, head of the transportation and labor departments, and chief of the slag sales division of the Carnegie Steel Company's mills in the Youngstown district, has been transferred to Pittsburgh as special agent of the United States Steel Corporation, and head of the slag sales department. He will be succeeded by Williams Griffin, head of the district safety department, and George Davis will succeed Mr. Griffin.

To meet the growing demand for Armstrong tool holders a 50-ft. by 70-ft. steel and brick addition to its drop forging department is being built by the Armstrong Bros. Tool Company, Chicago. A new four-story building, 60 ft. by 130 ft., is also being erected. This is of reinforced concrete, fireproof construction, and, in addition to producing a warehouse for finished stock, will house the shipping department and the offices.

The Railway & Mine Supply Company and the Kincaid Foundry & Machine Company, newly incorporated, have opened joint offices in the McCormick building, Chicago, Ill. The officers of the supply company are L. G. Binkley, president, and G. H. Peabody, vice-president; and of the foundry company, G. H. Peabody, president, and L. G. Binkley, vice-president. The Railway & Mine Supply Company will conduct a general jobbing business in railway and mine supplies. The Kincaid Foundry & Machine Company, which is the successor of the Hershfield & Piper Machine Company, formerly located at Taylorsville, Ill., is building a foundry at Kincaid, Ill. Kincaid is located on the Chicago & Illinois Midland about 90 miles from St. Louis, Mo. It is expected that the new foundry will be in operation some time in the month of December. The company will do a general foundry business in both gray and chilled iron, specializing in all kinds of castings for the railroad and mine business. G. H. Peabody, president of the Kincaid Foundry & Machine Company, was born in New York City in 1883. For several years he was engaged in the brokerage business in Wall street, following which he went to Chicago to open the first western branch office of the Lima Locomotive Corporation. He remained there as western manager of that company until 1914, when he returned to New York to become manager of the benzol department of the Lackawanna Steel Company. A year later he joined the sales force of the Griffin Wheel Company at Chicago, and remained with that organization until recently, when he resigned to accept the presidency of the Kincaid Foundry & Machine Company. L. G. Binkley, president of the Railway & Mine Supply Company, was born at Marion, Ill., in 1882. In 1904 he entered the employ of the Egyptian Powder Company, Alton, Ill., manufacturers of explosives for coal mining purposes. He remained with this company for 13 years, rising to the office of vice-president. He was also sales manager of the Equitable Powder Company, Alton, Ill., when he resigned from both positions on April 1, 1916, to promote the organization of the companies with which Mr. Peabody and he are now connected.



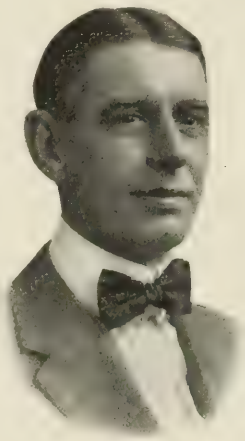
L. G. Binkley



G. H. Peabody

Burton W. Mudge, of Mudge & Co., who was recently elected president of the Safety First Manufacturing Company of Chicago, Ill., also, wishes to correct a statement given out from his office in connection with the territory to be covered by the latter concern, in its handling of the Franklin Manufacturing Company's products. Announcement was made that the Safety First Manufacturing Company would handle western territory in general for the products of the Franklin Manufacturing Company, but this is modified as follows: E. R. Rayburn, manager of the Chicago office of the latter company, will still continue to handle all of its products as heretofore; that is, all of the waste packing products, throughout the entire western part of the United States. The items to be handled by the Safety First Manufacturing Company, in connection with its association with the Franklin Manufacturing Company, will be their magnesia and asbestos lines, and the territory covered by such sales as made will pass along the western boundaries of Minnesota, Iowa, Missouri and Arkansas, and run from the northwestern corner of Louisiana through New Orleans.

H. E. Daniels, formerly western representative of the West Disinfecting Company, of New York City, has been appointed manager of the railroad and steamship department, with headquarters in the Railway Exchange, Chicago. Mr. Daniels was born in Boston, Mass., in 1873, where he received his early education and training. Upon graduating from school he took employment in the transportation department of the old Concord Railroad, now a part of the Southern division of the Boston & Maine. Later he entered the mechanical department of the New York, New Haven & Hartford as a fireman, and was later promoted to engineer. He was connected with this company nearly eight years, resigning to accept service with his present employer. Mr. Daniels will have his headquarters in the Railway Exchange, Chicago, Ill.



H. E. Daniels

TRADE PUBLICATIONS

Hydrated Lime.—The hydrated lime bureau of the National Lime Manufacturers' Association, Pittsburgh, Pa., has issued bulletin A2, which describes and explains the influence of hydrated lime on the work, ability, segregation, uniformity, strength and permeability of concrete. Particular reference is made to the use of the hydrated lime as an integral waterproofing compound, and attention is called to its advantages in concrete that is to be spouted because of the increased plasticity obtained.

Prussian Railroad Receipts.—Receipts of the Prussian State Railways for the transportation of freight in the second year of the war exceeded by 5 per cent the former high record, made in 1913. The receipts in 1915 were $417,802,800, as compared with $359,443,800 in 1914, and $398,032,200 in 1913. Receipts for the transportation of passengers and freight in 1915 exceeded those of the previous year by $2,620,000. Thus far in the present year there has been a further increase of more than 5 per cent in the revenue from transportation of passengers and freight.

Railway Construction

Belle Fourche & Northwestern.—Bids are being received by R. F. Furnish, vice-president and general manager for grading work and ties for a section of this line. Surveys are now being made out of Belle Fourche. The plans call for building from Belle Fourche, S. D., to Miles, Mont., 204 miles. H. F. Albers is president and James Mulcahy is a director, both of Miles City. The headquarters of the company is at Belle Fourche, S. D. (September 15, p. 479.)

Lubbock & Great Northern.—A contract for building this line has been let to J. P. Nelson, San Antonio, Tex., it is said, for $3,500,000. The proposed route is from Lubbock, Tex., northeast to Hollis, Okla., about 150 miles. Large quantities of construction material are being assembled at Lubbock preparatory to beginning grading and track laying. Residents of Kansas City and San Antonio and interests that are closely identified with the Missouri, Kansas & Texas are said to be back of the project. The incorporators include J. M. Elliott, S. S. Houston and F. V. Leak. (August 4, p. 213.)

Monongahela Railway.—Surveys are now being made, it is said, for an extension to be built from Fairmont, W. Va., southwest to Clarksburg, thence southeast to Belington, about 50 miles, where connection is to be made with the Western Maryland and the Coal & Coke Railroad.

South Carolina Roads.—Plans have been made for building a line from Greenville, S. C., to connect with Brevard, N. C., Hendersonville and Asheville, about 50 miles. It is understood that surveys are being made. Russell N. Edwards, Indianapolis, Ind., may be addressed.

RAILWAY STRUCTURES

Alexandria, Va.—The Southern Railway will carry out improvements at Alexandria to provide modern engine terminal facilities at Alexandria, consisting of a 20-stall roundhouse and 100-ft. turntable capable of handling the heaviest locomotives, mechanical coal handling plant with 100,000 tons storage capacity, electrically operated cinder pits, water tank, sand plant, small shop for running repairs, storehouse for oil and other supplies, wash and locker room for employees, together with the necessary tracks, on property owned just south of the National cemetery. Contract for the foundation work for the roundhouse and turntable has been awarded to J. P. Pettyjohn & Company, Lynchburg, Va.

Birmingham, Ala.—The Alabama Great Southern will construct at an early date a concrete coal chute and sand house at Birmingham to provide modern facilities for supplying coal and sand to locomotives. Other improvements will also be made at Birmingham, consisting of a water station at Pratt yard and a 50-ft., 150-ton track scale at Twenty-second street yard.

Coatesville, Pa.—A contract has been let to Bennett & Randal, Lebanon, Pa., to build a reinforced concrete bridge over the west branch of Brandywine Creek for the Philadelphia & Reading. It will be a four-span, single track deck structure 37 ft. 6 in. between centers of piers.

Dallas, Tex.—The new $5,000,000 union passenger station was opened up to the general public here September 15. The structure follows in all essential features the big new Kansas City terminal.

Decatur, Ala.—Improvements to the union passenger station are to be carried out by the Southern Railway, it is said, at a cost of $10,000.

Granby, Que.—Bids were received September 15 by the Montreal & Southern Counties for building a brick and reinforced concrete car barn at Granby. The building will be 22 ft. high, 60 ft. wide and 180 ft. long, and will cost about $20,000.

Railway Financial News

Erie.—Tilney, Ladd & Co., New York, have sold at 83, $1,000,000 first consolidated mortgage 4 per cent bonds of 1895-1996. At this price the bonds yield about 4.85 per cent. The total authorized and outstanding issue of these bonds is $35,000,000. They are secured by direct mortgage on 789 miles of road, constituting practically the entire main line of the Erie system from Jersey City to Buffalo, subject to only $36,406,600 prior liens. According to the terms of this mortgage, all but $8,241,000 of the above $36,406,600 prior lien bonds will be retired in 1920 by the issue of general mortgage 4s, which are a junior security.

In addition, through the deposit of securities, these bonds are in effect a second lien on nearly the entire main line from Buffalo to Chicago. A total of $64,654,850 par value stock and bonds of various affiliated companies, operating 1,070 miles of road is deposited with the trustee.

This closed issue of $35,000,000 prior lien 4s underlies $35,885,000 general lien 4s, $40,642,130 convertible 4s and $176,271,300 preferred and common stock.

The earnings for the seven months of 1916, have increased more than $7,000,000 and net earnings more than $2,000,000.

Since 1901 the company has expended over $100,000,000 for additions and betterments. The physical character of the company in 1901 limited its gross earnings to about $40,000,000 per annum, whereas improvements now nearly completed, it is stated, will afford a capacity sufficient to yield a gross income of $100,000,000 per annum.

These bonds are listed on the New York Stock Exchange. They may be made permanently tax-free in New York State by payment of $5.40 per bond.

New York, Chicago & St. Louis.—The Guaranty Trust Company of New York is offering $1,100,000 4½ per cent equipment trust certificates of the New York, Chicago & St. Louis, dated August 1, 1916, at prices for the various maturities to yield approximately 4.6 per cent on the investment.

Philadelphia, Baltimore, & Washington.—This company, without change in name, has absorbed the Philadelphia & Baltimore Central and the Elkton & Middleton. The Delaware Railroad and the Delaware, Maryland & Virginia are leased to the Philadelphia, Baltimore & Washington for long terms. These leases will now accrue to the consolidated Philadelphia, Baltimore & Washington. The corporate identity of the Delaware Railroad and the Delaware, Maryland & Virginia will not be abolished, and they are not included in the merger.

Operations of the Peruvian Corporation (Ltd.).—The European war has adversely affected both Peru and Bolivia, and as a consequence the traffic on the various transportation lines operated by the Peruvian Corporation was seriously diminished during the year ended June 30, 1915. There was a decrease of $1,194,311 in income as compared with the year ended June 30, 1914. The revenue account and balance sheet of the corporation for the financial year shows a profit of $797,317, after deducting the usual charges and the debenture interest at the reduced rate of 4 per cent. A dividend of one-fourth per cent was paid on the preferred stock, which amounts to $36,498,750. This carries with it a payment of 4 per cent on the debentures, which are valued at about $24,332,500 at the present time. This corporation also carries common stock to the amount of about $48,798,500. The traffic lines operated by the Peruvian Corporation are as follows: The Central Railway, which includes the Morococha branch and the Oroya-Huancayo extension; the Southern Railway, including the Cuzco extension; the Guaqui-La Paz Railway; the steamers on Lake Titicaca and River Desaguadero; the Ilo-Moquegua Railway; the Trujillo Railway; Paita to Piura Railway; the Pacasmayo & Guadalupe Railway (including the extension to Chilete); the Chimbote Railway, and the Pisco to Ica Railway. It also maintains and administers the Chira Canal. The temporary arrangement with the Peruvian government for the working of the Ilo-Moquegua Railway was terminated in 1915, the line being taken over by the government.

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*Illustrated.

No Pussy Footing on Eight-Hour Pay Day Law

A sedulous effort has been made recently to mislead the public into believing that the managers of the railways suddenly have changed their attitude regarding the Adamson eight-hour pay day law. One reading what has appeared in a number of newspapers would be led to think that all thought of contesting the law in the courts had been abandoned; that the roads were now disposed to lick the hand that recently swatted them, and that all they ask now is the privilege of passing the burden of the increase in wages along to the dear public. All such reports are baseless fabrications, and they are probably sent abroad for political purposes. There are, of course, some railway managers who hold different views from the great majority, but it can be stated with the utmost emphasis that the great majority of them still regard the way the Adamson law was jammed through as outrageous in every respect, and still consider the law itself as an unrighteous imposition on the railways and the American public. Of course, now that the law is in effect, what steps shall be taken with reference to it is a matter for careful and thorough consideration, but to say that the railways have abandoned the struggle against the counterfeit eight-hour day which the brotherhoods and the politicians have tried to force upon them is grossly misleading. If the railway managers should quit the fight at this stage of the game, with all the repudiation of their past professions and the abandonment of sound principles which this would involve, they would merit, and they know they would merit, the contempt of every self-respecting American citizen.

Mechanical Department and Needs of the Future

Railway officers expect and endeavor to create increased traffic from year to year. They expect that sooner or later grades will have to be reduced, second track will have to be laid and various other improvements carried out in order adequately to take care of increasing business. It would seem the part of wisdom for the railways to have their mechanical departments make similar preparations for the future. Increased tonnage will require heavier locomotives, higher capacity cars will be demanded, and for both cars and locomotives improved shop facilities will be essential if they are to return adequate service. The mechanical department should be in a position to study not only the present operating conditions, but the probable conditions of several years from now. If its officers are so situated that they can do this, carefully studying the present motive power and car equipment and preparing designs for equipment of greater capacity for the future, they will be prepared, when it is decided that the time has come for the introduction of such equipment, to present designs which will produce with the greatest economy the results desired instead of having to call upon the manufacturers to hurriedly build locomotives and cars from designs prepared on short notice. It may be said that the builders are better equipped than the railways to produce good equipment designs. With conditions as they are at present, this is undoubtedly true; but it should not be. The officers who are in charge of a railway ought to be more familiar with what is required to make it produce the maximum net revenue than any outsider, and if the mechanical department is provided with an adequate appropriation—an appropriation that would permit of a sufficient number of capable officers and men to effectively carry out the necessary work of supervision, designing and testing—a constructive program of preparation for the road's future needs can be carried out. It is worth while to cite the example of the Pennsylvania Railroad. The work done by its mechanical department in producing locomotives and cars to most effectively and at the same time economically conduct the road's transportation has not only had its effect in improving the conditions on the Pennsylvania, but on all the railways of this continent. It is not intended to suggest that every American railway can or should have a test department as elaborately fitted out as that at Altoona, but every American railway should have a capably manned and organized mechanical department and such a department can accomplish a great deal toward improving any railway's operating conditions even with facilities considerably less than those of the Pennsylvania. What executive officers have got to realize, if they are going to get the most effective work from their mechanical department, is that it must be so con-

ducted that its officers will not need to spend all of their time in settling matters that are picayune, and many of which could be adequately taken care of by an assistant mechanical engineer or a chief draftsman. The mechanical department of the Pennsylvania Railroad is not organized or conducted on the basis of today's requirements only; the future of the road is as much looked after in this department as in any other and the same condition should obtain in the mechanical department of every American railway.

REASONABLE FREIGHT RATES (TEX.)

THE famous Shreveport rate case, in which the freight rates that constitute an important factor in the commercial life of at least two states have been juggled for three or four years between the railroads, the shippers, the Texas and Louisiana railroad commissions and the Interstate Commerce Commission and the federal circuit and Supreme courts, is again before the federal commission and the United States courts, on the petition of the Louisiana commission and of the railroads. If any special justification were needed at this time for the investigation of the entire subject of railroad regulation, about to be undertaken by the Newlands commission, the mere existence of the Texas Railroad Commission would be sufficient. Anyone who is at all in doubt as to the necessity for some change in the present method of regulating freight rates partly by state and partly by federal authority need look no further than a statement recently issued by Earle B. Mayfield, one of the members of that commission, in explanation of the reasons for the newest phase of the protracted Shreveport litigation

It will doubtless be recalled that this case had its inception when the Louisiana Railroad Commission requested the Interstate Commerce Commission to remove a discrimination against the shippers of Shreveport, La. These shippers desired to sell goods in Texas, on the theory that it was all a part of the United States, but had been prevented from doing so with any great success by the fact that their competitors in Texas could ship to the same points on rates made, not for the benefit of the people of the United States, but, at least in theory, for the benefit of those of Texas.

After some litigation, several hearings and some experimentation the Interstate Commerce Commission has prescribed what it considers to be reasonable rates both from Shreveport and from Texas points to the same destinations, which, needless to say, are somewhat higher than the rates made in Texas by Texans and for Texans. It is understood that the railroads were prepared to put these rates into effect on November 1.

As to the principal facts in the present phase of the controversy there seems to be little dispute. During the hearings which preceded the latest decision of the Interstate Commerce Commission in the case, rendered on July 7, the Texas railroads agreed voluntarily to establish between Shreveport and Texas points rates on a given list of commodities which had been fixed by the Texas commission and which the roads considered more nearly reasonable than the rates they were accustomed to because they had recently been advanced by the Texas commission by about 10 per cent. In view of this agreement the Interstate Commerce Commission, when it ordered other Texas rates advanced to avoid discrimination against Louisiana shippers, made no specific finding as to the rates agreed upon. But, apparently in a fit of pique because the railroads were not satisfied with certain other rates made by the Texas commission, that body on August 28 withdrew the advances which it had allowed after a year of investigation and by an order effective on September 1 restored the old rates which the roads had been trying for two years to have raised by 15 per cent. The roads have secured a restraining order from Judge Pardee of the United States court and the Louisiana Railroad Commission has petitioned the Interstate Commerce Commission to make a specific order as to the rates in question.

Commissioner Mayfield has issued a statement of some three or four newspaper columns to explain that the action of the commission in withdrawing the advances it had allowed "was not one of retaliation," that "the Railroad Commission of Texas does not conduct business along any such lines," but that it was based on "good reasons" which "on account of the injunction it would not be prudent to discuss." He does not mind admitting, however, in order to be "frank and honest with the people of Texas," that its order increasing certain rates was made, not because it wanted to raise rates, or because it believed the rates were too low for the health of Texas commercial interests, but was "due to the fact that the Shreveport case was standing constantly before us like Banquo's ghost and would not down;" that in the long run it would be much better and cheaper for the people of Texas to stand a reasonable (Tex.) increase in rates "than to run the risk of having much higher rates forced on the people of Texas in case the courts should decide against us."

The railroad attorneys had told the Texas commission, he says, that if it would give them reasonable rates they would just as soon work under them as under Interstate Commerce Commission rates, and that they had no desire to prolong the Shreveport litigation. Therefore, Mr. Mayfield charges, "the railroads broke faith with the commission," when they decided to accept the rates fixed by the Interstate Commerce Commission in preference to some which had been fixed by the Texas commission and not included in the agreement as to the specific list of commodities. This reason for the commission's cancellation of the advances it had approved Mr. Mayfield feels "can be discussed" in spite of the injunction.

Mr. Mayfield's statement reviews in detail the entire history of the Shreveport case. Two of the railroad attorneys have issued another long statement in reply to it. In many respects the commissioner's statement is a more convincing refutation of its own arguments than the other is. He is so explicit and frank except on the main points on which his argument rests that attention is at once fixed on the absence of details when he gets down to his charges of "double-crossing." A vital point in the argument seems to depend on the definition of the word "reasonable." The railroads said that if the Texas commission would give them "reasonable" rates they would accept them. The Texas commission made some "reasonable" rates and the Interstate Commerce Commission made some more "reasonable" rates. The railroads appear to have preferred the rule of reason applied by the Interstate Commerce Commission, thereby "breaking faith with the Texas commission, which thereupon issued an order saying that rates 10 per cent lower than the ones it had just made would be "reasonable" after September 1.

Commissioner Mayfield explains the situation very clearly. He says: "The Texas commission's maximum rate on first-class freight was 80 cents. The Interstate Commerce Commission had already told the Texas railroads they could charge as high a rate as $1.06 on first class freight in that part of Texas east of a line drawn from Gainesville down through Fort Worth via the Brazos river to the Gulf of Mexico, and the Louisiana interests had petitioned the Interstate Commerce Commission to enlarge its order and spread this $1.06 rate over the entire state of Texas. We had a well-grounded suspicion that the Interstate Commerce Commission would make the attempt.

"The Texas commission raised its rate on first-class freight to 90 cents, expecting that the railroads would do what they had said they would do, viz.: put that 90-cent rate in between Shreveport and Texas points and thus eliminate the entire Shreveport controversy. It was our opinion that it would be cheaper for the people of Texas to pay the 90-cent rate than to experience four or five years of expensive rate

litigation and turmoil and at the same time take the chance of having a $1.06 rate saddled on their backs in the end by a federal court. Upon this theory the Texas commission proceeded to revise and readjust a number of its tariffs and issued rates that were more than fair and reasonable to the Texas railroads, with the expectation that the carriers would apply said rates between Shreveport and Texas points and thus put to an end a controversy that surely would be fruitful of nothing except ill results to the people of Texas.

"On July 7, 1916, the Interstate Commerce Commission rendered a final decision in the Shreveport case and did exactly what we had expected it to do. It granted the new petition of Shreveport and undertook to control the rate situation of our entire state and said to the Texas railroads that they were at liberty to establish the $1.06 rate on first-class freight throughout the state of Texas, provided they charged the same rate between Shreveport and Texas points, and also numerous other rates to apply on purely state traffic which were exceedingly higher than the increased rates granted by the Texas commission.

"The Texas commission had endeavored to be fair to the carriers and had even thought it had been liberal, but it appears that the carriers have not thought so. There is going to be long and expensive litigation; confusion will exist as to what are the proper rates and commercial conditions will be greatly disturbed. The Texas commission sought to avoid that very situation and went more than half way to meet the exigencies of the case. Let the responsibility rest where it should—on the shoulders of the Texas railroads."

If the Texas commission "went more than half way" in its labored efforts to be reasonable, Mr. Mayfield has chosen an unfortunate illustration. Half way from 80 cents to $1.06 would be somewhat more than 90 cents. But he also explains in detail with what travail the Texas commission managed to persuade itself to go as far as it did. On January 26, 1914, he says, the Texas railroads filed their application for a 15 per cent general increase in freight rates throughout the state. The commission, on August 26, issued notice of a hearing thereon. The hearing was postponed and finally set for March 4, 1915, and on that date was begun. Some adjournments were taken, but on September 1, 1915, the hearings were resumed. They consumed several weeks. The railroad attorneys were given the widest latitude in cross-examination of the commission's experts, thereby seriously delaying the otherwise swift course of Texas justice. Mr. Mayfield recalls "how the patience of the commission was taxed by the cross-examination of Mr. Emerson, which lasted five or six days, and the efforts made to humiliate this brilliant young efficiency expert." On October 26, 1915, the final hearing was held for the purpose of hearing argument. "No tribunal intrusted with similar powers ever conducted a more thorough investigation or ever gave more careful consideration to matters at issue."

During all this time the Shreveport case was pending before the Interstate Commerce Commission. The special counsel of the Texas commission filed a motion in September that further hearing of the Texas case be indefinitely postponed because the roads "were seeking to get their increase in rates from the Interstate Commerce Commission while denying the jurisdiction of the Texas commission to control the very rates which they had petitioned the commission to advance." With infinite patience, however, the Texas commission continued its efforts to be reasonable, even liberal. It dismissed the motion to postpone. In December while the Texas case was still "under advisement and consideration" the Interstate Commerce Commission hearing came on at Houston. Not as a party to the case, but as an innocent bystander. Mr. Mayfield attended and "witnessed the spectacle of the Texas railroads presenting for the consideration of the Interstate Commerce Commission greatly increased tariffs to apply on purely state traffic." They even "at great expense" had prepared and introduced "every particle of evidence that had been presented to the Texas commission."

That was too much. Mr. Mayfield could bear his cross no longer. He did not hesitate to state that the Texas commission had nothing further to consider and that it would dismiss the case. Mr. Mayfield is telling the story and we do not know what the other Texas commissioners were doing at this time.

But hope springs eternal in the human breast. The commission was again patient. On January 12, 1916, it received a letter from Messrs. Terry and Garwood, the railroad attorneys, saying: "If this commission (Texas) shall see fit to install just and reasonable tariffs it will be the endeavor of the carriers to install the same tariffs to and from Shreveport. Should this be done, the Shreveport case is of course eliminated."

"Taking this suggestion of the attorneys of the railroads as made in good faith," the Texas commission "proceeded to make certain changes in its rates." Two years after the application of the railroads was filed it decided to beat the Interstate Commerce Commission to it—to appease "Banquo's ghost." "With a desire to be fair to the railroads and at the same time to carefully guard the interests of the people," after weeping and wailing and gnashing of teeth, the Texas commission decided to advance some rates. Some more than others apparently, because the railroads agreed to accept some, but as to the others continued to present their evidence to the Interstate Commerce Commission.

The Interstate Commerce Commission "did exactly as we had expected it to," says Mr. Mayfield. The greedy railroads did just what anyone would have expected them to do and the Texas commission did just what might have been expected of it. It welched. Mr. Mayfield is "frank to say" that he proposed that the Texas commission "wipe the slate clean and meet the attack in the manner it deserves to be met." The injunction "will be fought out and determined in the courts." But Mr. Mayfield has one more grievance. "There is, of course, a chance for the Texas commission to lose, and, if it should, the higher rates granted by the Interstate Commerce Commission will be the lawful rates."

"Why go to Georgia for an injunction," he asks, "when there was Judge Burns of Houston, a fair and just judge, living just across the street from the railroad's general attorney? Why take this case from Texas borders to be tried?"

We have heretofore quoted entirely from Mr. Mayfield. Let us now give Messrs. Terry and Garwood a chance to reply to him. They say that Judge Burns, the only federal judge in the limits of the state, was at a distant point on his vacation, and that Judge Pardee, of Atlanta, Ga., is the senior circuit judge of the circuit which includes Texas. Otherwise they would have doubtless been pleased to patronize home industry.

"Banquo's ghost," which according to Shakespeare was seen only by the murderer, will not down. The Shreveport case is still with us. The "damned spot" is not yet "out." The Texas commission's confidence has been betrayed. Its liberality has been spurned and its motives have been impugned. Still worse, pending the injunction "it would not be prudent to discuss its real reasons." It must suffer in silence. The 90-cent rate which it thought might be cheaper than a $1.06 rate, though more expensive than an 80-cent rate, is not so attractive in the eyes of the railroads that must pay Texas taxes and Texas damage suit lawyers as the $1.06, which, while bearing the stamp of federal approval, is still good coin of the realm in the sovereign state of Texas.

PRESIDENT WILSON ON THE EIGHT-HOUR PAY DAY LAW

"Oh, what a tangled web we weave,
When first we practice to deceive."

PRESIDENT WILSON in a speech on September 23 offered his first defense of the Adamson eight-hour day law. It is painful to be obliged to charge the President of the United States with making a deliberate effort to mislead the people of the United States. This, however, is what Mr. Wilson did. He flatly misstated the facts as to what the train service employees demanded of the railways and by direct implication he as grossly misrepresented the provisions of the Adamson law. He was equally disingenuous in his statements regarding the circumstances under which this law was passed.

The President ascertained, he said, "that the points in controversy were very simple indeed; that the men demanded an eight-hour day, and that in order to make the eight-hour day work they demanded that the railroads pay them one-half more for overtime than they paid them for the time in the regular day." The men did not demand an eight-hour day, and President Wilson knows it. They did not demand any change whatever in their working hours. They merely demanded that they should be paid the same wage for eight hours' work as for ten hours' work, and that the railways should begin to pay them for overtime after the expiration of eight hours instead of after the expiration of ten hours. Under their plan thousands of employees might make a day's wage while working less, and even much less, than eight hours; thousands more, by running more than 100 miles in eight hours might make more than a day's wage in eight hours; and thousands more by running trains averaging more than 12½ miles an hour might work anywhere from eight to sixteen hours without receiving any overtime. Mr. Wilson knows not only that these men were not asking for a real eight-hour work day but that if the railways had proposed a day's wage for eight-hours' work, and also full eight hours' work for every day's wage the proposal would have been rejected.

Furthermore the President and Congress, by passing the Adamson law, did not as Mr. Wilson implies, provide for an eight-hour day. The Adamson law says on its face as plainly as the fact can be expressed in the English language that it is not an eight-hour *work* day law, but an eight-hour *pay* day law, and that if it goes into effect it will not necessarily reduce by one second the working day of a single human being.

It happens that the present national administration did recently put into effect on one railroad a real eight-hour work day, and it is illuminating to compare the language used in establishing this real eight-hour day on the Panama Railroad with the language used in providing for an eight-hour pay day on the railroads of the United States. We present below in parallel columns the language of the executive order made effective on September 1 on the Panama Railroad and the language of the Adamson law providing for an eight-hour pay day on the railroads of the United States.

On the Panama Railroad	On United States Railroads
"Effective September 1 the working day for train crews and switching engine crews will be *limited to eight hours except in cases of emergency when authority for overtime must be obtained through the proper channels either from the executive office or from the superintendent of the Panama Railroad.*" — Extract from order issued by Col. Goethals as Governor of the Canal and President of the Panama Canal.	"Beginning January 1, 1917, eight hours shall in contracts for labor and service be deemed a day's work *for the purpose of reckoning the compensation* for service of all employees . . . engaged in any capacity in the operation of trains. . . . For all necessary time in excess of eight hours, such employees shall be paid at a rate not less than the pro-rata rate."—Verbatim provisions of Adamson Law.

On the Panama Railroad the Government of the United States says that the working day will be limited to eight hours, except in cases of emergency. There can be no question about the meaning of that. It establishes a real eight-hour day. As to the railroads of the United States the Government says, in the Adamson law, "That eight hours shall be deemed a day's work" for one purpose, and one only, namely, for the purpose of reckoning compensation. Why did Congress pass the law in this form, instead of providing, as Governor Goethals did at Panama, that eight hours should be a day's work except in cases of emergency? Simply because the Brotherhoods demanded that the legislation should be given this form. And they demanded that it be given this form because this would give them an increase of wages, and that is all they were seeking. President Wilson went on to say: "We believe in the eight-hour day because a man does better work within eight hours than he does within a more extended day. * * * His spirit and his work are improved, and the moral and physical vigor of the man is added to."

It may be true that men in railway train service who now work more than eight hours would be better off if their working day were limited to eight hours. It may be true that the public welfare demands that the working day of these men should be restricted, as it has been on the Panama Railroad, to eight hours except in cases of emergency. If so, then Congress deliberately disregarded the interests of these men and of the public. What the men needed, on this theory, was a reduction in their working hours. What Congress gave them was an increase in wages. What the public welfare demanded, on this theory, was that the working hours of these men should be reduced. What the government actually did was not to reduce their working hours, but to burden the public with an increase in their pay.

President Wilson also said that "these men (the representatives of the railways and the brotherhoods) were dealing with one another as if the only thing to settle was between themselves, whereas the real thing to settle was what rights had the 100,000,000 people of the United States." How could he make such a statement when he knows that the railways repeatedly demanded arbitration on the ground that the public was the chief party concerned, and therefore had a right to have the controversy settled by some impartial board representing itself? The President attempted to make it appear that the government in jamming through the Adamson law was not influenced so much by fear of a strike as it was by the belief that the legislation was right. Such statements are so contrary to the facts that they sound like irony.

It is highly significant that Democratic writers and speakers, led by President Wilson, are deliberately avoiding discussion of the actual provisions of the Adamson pay day law, and devoting themselves to academic discussions of the merits of an eight-hour day. No better evidence could be afforded that the actual provisions of the Adamson law cannot be defended before the bar of public opinion.

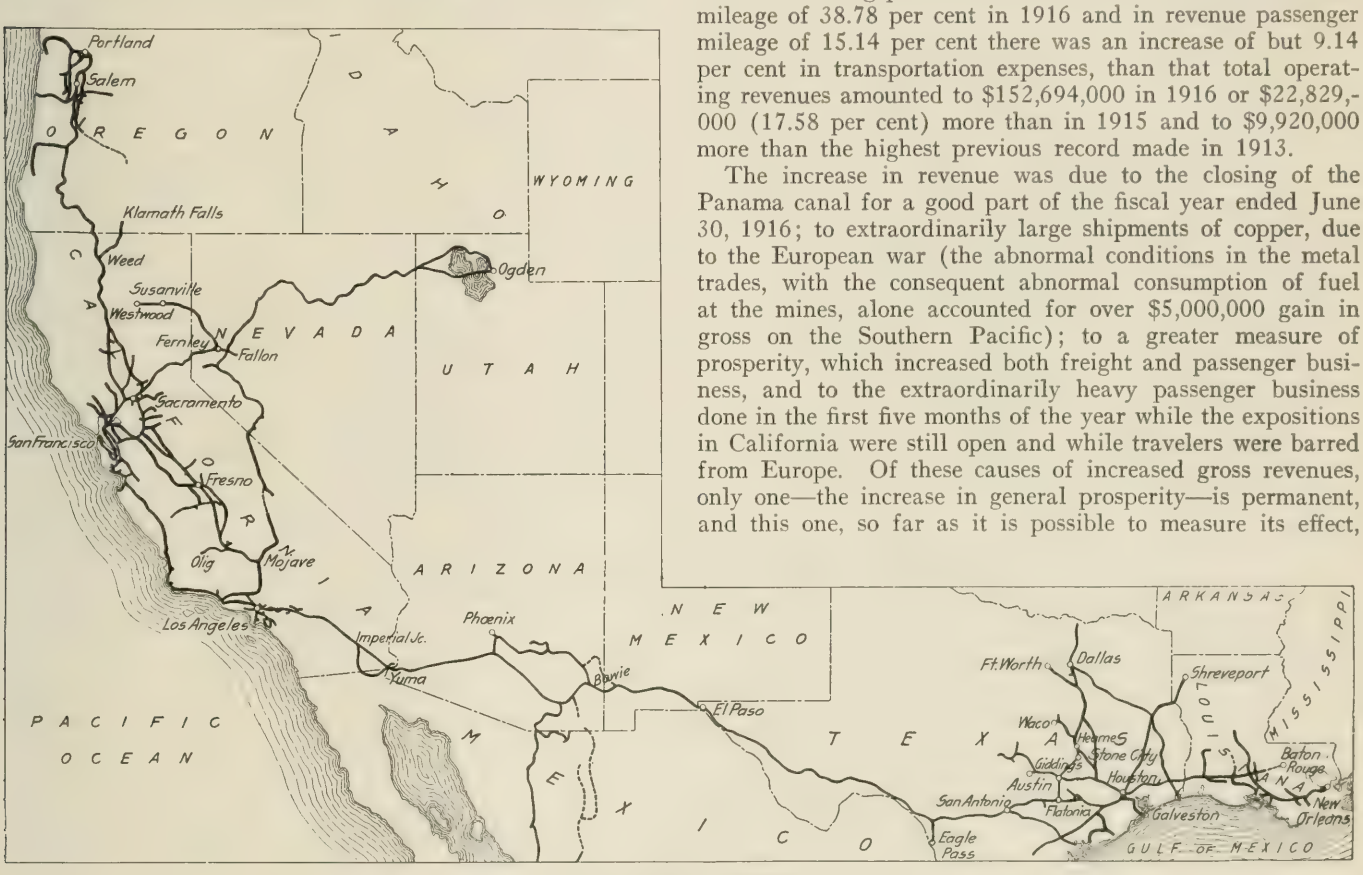
RAILWAYS EARNED 5.6 PER CENT IN 1916

WHEN the prosperity of the railroads during the fiscal year just closed is stated in terms of the return earned on the investment in property devoted to the service of the public the results are less striking than those obtained by comparing the gross and net earnings with those of previous years. In last week's issue it was shown that the chief difference in the results for 1916 and for 1913, which was the last prosperous year which the railroads had, lay in the success with which the managements were able to hold down operating expenses. It should be noted also that while the earnings of the roads were the largest in their history, the capital investment on which they must earn a return if they are to continue to attract capital into the business was also the largest in their history.

The Interstate Commerce Commission has not yet reported the property investment for 1916, but if, as may be conservatively assumed, it increased as fast in proportion during the past year as it did during the preceding four years it amounted on June 30, 1916, to $79,559 per mile, for the roads earning over $1,000,000 a year, and the operating income of $4,490 per mile earned during 1916 by these roads represents a return of only 5.6 per cent on this investment. In 1907 the railways earned 5.83 per cent out of total revenues of only $2,589,000,000, as compared with $3,397,000,000 in 1916. But from 1907 to 1915 alone the property investment, according to the Interstate Commerce Commission's reports, increased from $13,030,000,000 to $17,247,000,000, or over $4,000,000,000.

While this was an amount less than should have been expended to enable the roads to keep pace with the progress of the country, it was at the rate of about $500,000,000 a year. A return of 5.6 per cent on the investment in the year of the largest gross and net earnings the railroads ever enjoyed seems exceedingly modest, especially when it is considered in connection with the fact that it follows years in which the return was very much less. In 1915 the rate of return on property investment was only 4.04 per cent and in 1914 it was only 3.94 per cent, while even in 1913 it was only 4.83 per cent.

A rate of 5.6 per cent is insignificant indeed when compared with some of the profits that are being garnered during the present period of prosperity by industrial companies, particularly in the automobile and steel businesses. The recent report of the Ford Motor Company for the year showed net earnings of nearly $60,000,000 or 3,000 per cent on its capitalization of $2,000,000. This company was able to pay a dividend of 60 per cent and still retain a surplus for the year for reinvestment in the business of over $58,000,000. Several other automobile companies have earned from 20 to 30 per cent on their capitalization and the head of one of the large steel companies was recently quoted in the Wall Street Journal as saying that many of the steel companies could pay dividends for the next 10 years out of their surplus earnings after the present period of prosperity is over without earning another dollar. Railroad investments are hardly to be compared with such cases as these, but the comparison indicates the foolishness of regarding the present earnings of the railways as especially enormous.



The Southern Pacific

SOUTHERN PACIFIC

THE largest operating income in the history of the Southern Pacific—that earned in the fiscal year ended June 30, 1916—was the result of an extraordinary increase in gross earnings from causes many of which are temporary and from gains in operating efficiency which, if they can be maintained, are a much sounder bull point on Southern Pacific stock than the record gross earnings. In the long run it is a much more favorable indication of the Southern Pacific's earning power that with an increase in revenue ton mileage of 38.78 per cent in 1916 and in revenue passenger mileage of 15.14 per cent there was an increase of but 9.14 per cent in transportation expenses, than that total operating revenues amounted to $152,694,000 in 1916 or $22,829,000 (17.58 per cent) more than in 1915 and to $9,920,000 more than the highest previous record made in 1913.

The increase in revenue was due to the closing of the Panama canal for a good part of the fiscal year ended June 30, 1916; to extraordinarily large shipments of copper, due to the European war (the abnormal conditions in the metal trades, with the consequent abnormal consumption of fuel at the mines, alone accounted for over $5,000,000 gain in gross on the Southern Pacific); to a greater measure of prosperity, which increased both freight and passenger business, and to the extraordinarily heavy passenger business done in the first five months of the year while the expositions in California were still open and while travelers were barred from Europe. Of these causes of increased gross revenues, only one—the increase in general prosperity—is permanent, and this one, so far as it is possible to measure its effect, directly accounts for a smaller percentage of gain in gross than any one of the other causes named. The full measure of the increase in business done is not shown by the percentage of increase of gross revenue. The average ton-mile rate received by the Southern Pacific was 9.77 mills in 1916, comparing with 10.99 mills in 1915, a decrease of 11.10 per cent. The average revenue per passenger per mile was 2.069 cents in 1916, comparing with 2.173 cents in 1915, a decrease of 4.79 per cent. The decrease in the ton-mile rate is the result of the much larger proportion of low grade traffic carried and the decrease in the passenger-mile rate is apparently in part due to the greater proportion of long haul business, probably done at excursion rates.

If there were no qualifying factors to the progress made

by the operating organization in effecting more economical movement of freight and passengers and to the standard of upkeep which the Southern Pacific has attained it would be hard to over-rate the value of these factors as indications of the great prosperity which the company should enjoy. The Southern Pacific is a magnificent transportation machine for long haul business, which machine even in 1916 had not, except in some few comparatively unimportant instances, reached by any means its limit of handling increased business at a decreased ratio of transportation expenses to gross, other factors remaining the same. An average daily freight car mileage of 34.96 miles (a gain of 26.44 per cent over 1915); an average loading per loaded freight car of 22.89 tons (a gain of 10.15 per cent over 1915); an average trainload of 526 tons (a gain of 13.50 per cent), and a reduction of 32.01 per cent in payments for loss and damage to freight, despite an increase of 38.78 per cent in revenue ton mileage, are pretty clear indications that the Southern Pacific has a management and organization capable of developing the potentialities of the property. There are indications, however, that the management thinks that with a trend of conditions as they are now it is fast approaching the limit of further operating economies. The prices of materials have gone up to an astonishing extent—Pacific type locomotives 30 per cent since 1913; tank cars, 28 per cent; plate girder bridges, 97 per cent; journal bearings, 99 per cent; bar iron, 143 per cent. If the wages of enginemen, firemen, conductors and brakemen are increased, as is the intention of the Wilson-Adamson bill, this will add $2,500,000 absolutely unproductive expense to the Southern Pacific's transportation expenses alone. There may be larger increases in wages.

An estimate of the relative weight of the forces which are at play in the Southern Pacific situation would be little more than pure guesswork. Panama canal competition may or may not take away more traffic from the Southern Pacific than a sustained period of general prosperity will bring to the road. Heavy shipments of ores and mineral products may quite possibly continue for a very considerable period, even after the termination of the present European war. On the other hand, the high prices of materials may also continue, which would make expansion of facilities extremely costly.

In the meantime the physical condition of the property is being maintained at a very high standard. At the close of the fiscal year there were 15 per cent fewer locomotives and 50 per cent fewer freight cars awaiting repairs than at the end of the previous year. With a single exception, the Southern Pacific has not killed a passenger in train accidents for seven years and 11 months, and with a movement of 60,703,000 locomotive-miles during the year only 10 employees lost their lives in train accidents.

The financial resources of the Southern Pacific are enormous. During 1916 $31,259,000 was invested in additions to and betterments of the property, while the outstanding funded debt of the company was reduced by approximately $2,000,000. Cash on hand and on deposit as of June 30, 1916, amounted to $18,528,000, or $2,220,000 more than at the beginning of the year, and there were no loans and bills payable.

In addition to the assets shown on its balance sheet, the Southern Pacific has an interest in oil lands which, if its title is upheld by the Supreme Court, will add very greatly to the value of its assets other than railroad property. It also has an interest in the Oregon & California Railroad's land grant, which, if the United States Supreme Court upholds the Southern Pacific's contention that it can sell the timber on this land separately from the land in all cases where it can sell the land without all or part of the timber on it at the maximum price prescribed in the land grant, will give it another very large asset not indicated on the balance sheet.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	10,956	10,554
Freight revenue	$98,567,886	$80,020,751
Passenger revenue	40,338,316	36,864,998
Total operating revenues	152,694,228	129,865,675
Maintenance of way and structures	18,367,137	15,356,356
Maintenance of equipment	21,866,636	19,815,973
Traffic expenses	3,131,404	2,915,010
Transportation expenses	48,027,904	44,006,753
General expenses	3,913,399	3,955,027
Total operating expenses	97,443,658	87,753,842
Taxes	7,023,326	6,371,273
Operating income	48,189,971	35,689,614
Gross income	60,393,006	49,647,992
Net income	30,885,254	20,570,319
Sinking and reserve funds	934,838	939,725
Dividends	16,361,086	16,360,984
Surplus	13,589,330	3,269,610

ATCHISON, TOPEKA & SANTA FE

PRESIDENT RIPLEY comes to very much the same conclusion in regard to the increased revenues of the Santa Fe in 1916 as we express elsewhere in this issue in regard to the increased gross earnings of the Southern Pacific, namely, that "close analysis of operations for the year clearly indicates the enhanced earnings to be almost wholly due to the war in Europe." Whatever the causes, however, of the increase in gross earnings the Atchison, Topeka & Santa Fe, in spite of three disasters which in the terms of insurance policies were "acts of God," had a very prosperous year and earned net available for dividends $32,580,000, comparing with $24,131,000 net available for dividends in the year ended June 30, 1915. The 5 per cent on the preferred stock and 6 per cent on the common called for approximately $18,600,000. Half of the remaining surplus of nearly $14,000,000 was appropriated for additional investment in physical property and the remainder credited to profit and loss.

The three disasters which occurred on the Sante Fe were the Galveston flood, the explosion of a carload of gasolene at Ardmore, Okla., and rain storms in California and Arizona that washed out many miles of track and bridges and interrupted operation of some lines for a month. The extraordinary cost due to these three unfortunate events was about $2,500,000, all of which is included in the operating expenses of the fiscal year ended June 30, 1916.

Total operating expenses amounted to $83,731,000 in 1916, an increase as compared with the previous year of $7,639,000. Of this increase approximately $3,000,000 was for maintenance of way and structures, and in this item there must have been included a considerable part of the extraordinary expenditures caused by the two floods.

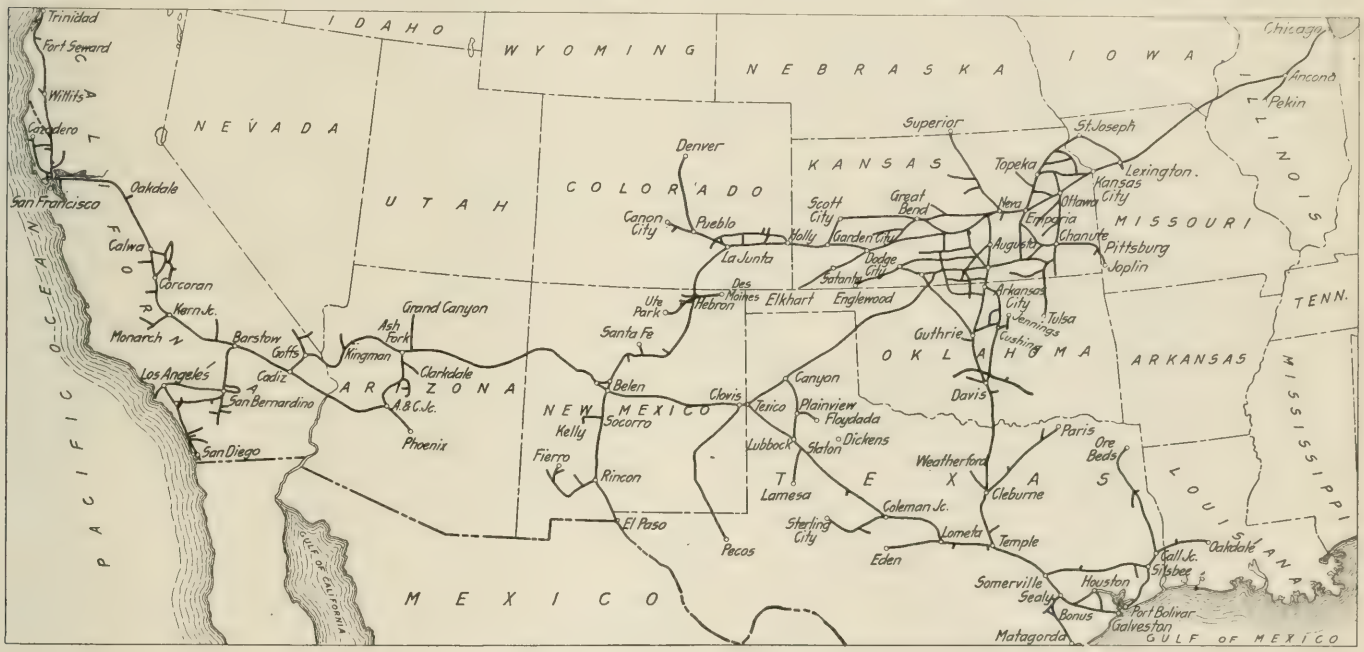
Transportation expenses amounted to $38,281,000 in 1916, an increase of $3,453,000. This is an increase of a little less than 10 per cent in transportation expenses and in this increase are included some of the extraordinary expenses due to the floods and the explosion of gasolene. The total ton mileage, including both revenue and company freight, in the fiscal year ended June 30, 1916, amounted to 11,465,000,000, which was 14.41 per cent more than the ton mileage in the previous year. The number of passengers carried one mile in 1916 was 1,584,000,000, or 18.10 per cent more than in the previous year. The average ton-mile rate received for freight was 9.29 mills in 1916 as against 9.74 mills in 1915, and the average receipts per passenger per mile were 1.992 cents in 1916 as against 2.074 cents in 1915. The average trainload in 1916 was 468 tons as against 442 tons in 1915. The length of haul for freight was about the same in both years—316 miles; but the average passenger journey was 106 miles in 1916, comparing with 92 miles in 1915. The gain in trainloading was helped by the larger proportion of low grade tonnage, the tonnage of ores and bullion totaling 4,648,000 in 1916 as against

2,759,000 in 1915. If a comparison between the trainload on the Santa Fe and on the Southern Pacific is made it should be borne in mind that on its New Orleans-Los Angeles line the Southern Pacific has no such heavy grades as the Santa Fe has over Raton Pass in New Mexico. On the other hand, the Southern Pacific has very heavy grades on some of the divisions north of San Francisco and climbs the Cascade mountains with its San Francisco-Salt Lake line.

Passenger business furnishes, when we include with it revenue from mail and express, a little less than a third of the total operating revenues of the Atchison, Topeka & Santa Fe. In 1916 passenger revenue proper amounted to $31,569,000, an increase over the previous year of $3,746,000, and mail and express revenue amounted to $10,761,000, an increase over the previous year of $1,423,000. This does not fully measure the increase in passenger business because, as has previously been mentioned, the average passenger-mile rate was lower in 1916 than in 1915, due to the larger proportion of tourist business carried at excursion rates. A part of the increase in passenger business in 1916 is accounted for by the San Diego and San Francisco fairs, but a part of it, President Ripley says, in his annual report, is due to a continually growing appreciation of the wonderful southern California country. The Santa Fe can well afford to make low rates from the east if such rates will make it possible for a very much larger number of people to become acquainted with southern California than would be possible under the first-class one way regular rate. The growth of the population of southern California means the growth of earning power of the Santa Fe.

Many people think that the Atchison, Topeka & Santa Fe offers an opportunity for the soundest investment of any railroad property west of the Mississippi. President Ripley is sometimes spoken of as being a pessimist on the railroad situation as a whole, but an optimist on the Atchison. It is below net income in the income account that the strength of the company is most striking. In 1916 net operating income amounted to $43,780,000, and with only $3,307,000 "other income" there was $32,580,000 available for dividends after paying interest and rental charges. In other words, the fixed charges of the Santa Fe are in proportion to its mileage and gross earnings extraordinarily small. This is the result of skillful financing with bond issues bearing low rates of interest (4½ per cent); the farsighted and conservative expenditure of over $318,000,000 for extension and improvement to the property since 1896, and the fact that a considerable proportion of this expenditure was made with stockholders' money and no securities issued against it. Taking the investment as a whole, regardless of whether securities were issued to raise funds, or dividends were held down to permit the investment of surplus, the Santa Fe earned in 1916 the largest percentage in the history of the company, namely, 6.19 per cent. This is not a very high rate of return when it is remembered that from it must be paid not only bond interest and dividends but such capital expenditures as are necessary to maintain the credit of the company and earning power of the property. In 1916 the directors appropriated $7,000,000 for this purpose, and the total amount spent for additions and betterments to property, exclusive of new construction and the purchase of fuel lands and real estate held for future purposes, was $6,566,000.

During the year there were two sales of securities. The company sold $10,000,000 preferred stock and an issue of $5,545,000 Transcontinental Short Line first mortgage 4 per cent bonds. The total discount on the sale of these two issues was $737,000, which was debited to profit and loss. The smallness of this amount is apparent when it is remembered that it was 5 per cent stock and 4 per cent bonds that the company was selling in a money market in which the combined credit of England and France was back of government 5 per cent bonds being sold at a very considerable discount. At the end of 1916 the Atchison, Topeka & Santa Fe, with no loans and bills payable, had cash on hand of $43,699,000.



The Atchison, Topeka & Santa Fe

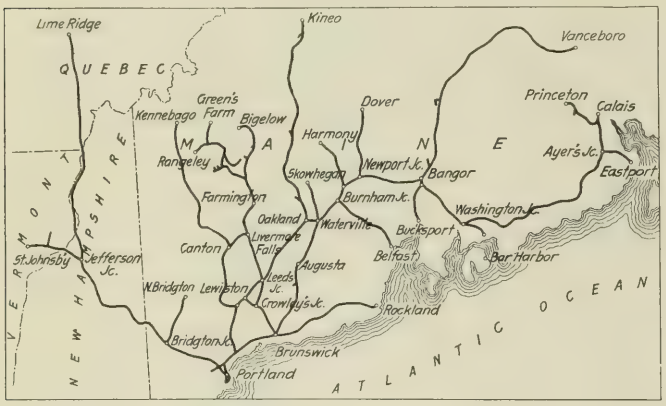
The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	11,247	11,114
Freight revenue	$91,432,429	$80,504,393
Passenger revenue	31,568,601	27,823,064
Total operating revenues	133,762,392	117,665,587
Maintenance of way and structures	19,518,635	16,514,468
Maintenance of equipment	20,514,960	19,764,535
Traffic expenses	2,755,736	2,649,175
Transportation expenses	38,281,054	34,827,705
General expenses	2,904,040	2,476,595
Total operating expenses	83,730,960	76,091,554
Taxes	6,210,366	5,497,317
Operating income	43,779,993	36,051,401
Gross income	47,087,123	39,048,551
Net income	32,579,735	24,130,862
Dividends	18,690,965	17,550,017
Appropriations for investment in physical property	7,000,000	6,513,397
Surplus	6,819,091	.....

MAINE CENTRAL

THE Maine Central is the only comparatively large New England road that is in a satisfactory financial condition. In the fiscal year ended June 30, 1916, it paid its regular annual dividends of 6 per cent on the common stock, the first two quarterly dividends of 1¼ per cent on its $3,000,000 new preferred stock, and 1 per cent additional on common stock exchanged for first and refunding mortgage 4½ per cent series A bonds, and appropriated nearly $200,000 for investment from income in property and had a surplus of $248,000. At the end of the year there was $2,514,000 cash on hand and $2,492,000 demand loans and deposits. Against this latter there was a liability of $2,492,000 for Maine Railways Company's 5 per cent notes assumed by the Maine Central.

It will be recalled that in accordance with an agreement entered into in April, 1914, the Maine Central Railroad, through the formation of the Maine Railways Company, bought approximately $16,000,000 of Maine Central stock from the Boston & Maine at $95.25 per $100 share. The details of the transactions connected with the sale by the Boston & Maine of a majority of the stock of the Maine Central are complicated, but the substance of the transaction was this: The holder of the majority stock of the Maine Central, namely, the Boston & Maine, agreed to sell back to the Maine Central its own stock and thus to turn over to the minority stockholders all of the stock. The authorized



The Maine Central

total capital stock of the Maine Central is $25,000,000. During the fiscal year ended June 30, 1916, the outstanding common stock was reduced from $24,888,000 to $14,888,000 by the conversion of $7,000,000 of common stock into first and refunding mortgage 4½ per cent bonds, and $3,000,000 common stock into $3,000,000 preferred stock. The plan is to distribute the stock which was bought from the Boston & Maine to individual investors. In this way the Maine Central has been converted from a company controlled by the Boston & Maine, which was in turn controlled by the New York, New Haven & Hartford, into an independent company. As of June 30, 1916, there were 1,459 common stockholders, with average holdings of 82 shares. Of the total number of common stockholders 957 were residents of Maine and 275 of Massachusetts. There were only 100 stockholders outside of New England.

The Boston & Maine operates 1,221 miles of road, of which only 76 miles is double track. Its gross earnings per mile are between nine and ten thousand dollars a year. In the fiscal year ended June 30, 1916, the total tonnage of freight carried was 7,548,000. Of this, 2,622,000 tons was lumber and other forest products, 1,228,000 tons was products of agriculture and 1,669,000 tons was manufactures. The total tonnage in 1916 was greater by 585,000 tons, or between 8 and 9 per cent than the tonnage in 1915. The three principal commodities showing increases were lumber, with an increase of 220,000 tons; pulp wood, with an increase of 201,000 tons, and paper (one of the items included in manufactures), 126,000 tons.

Total operating expenses in 1916 were $8,193,000, an increase of only $49,000 over the previous year. In part this result was obtained by a decrease of $53,000 in the amount spent for maintenance of equipment and an increase of only $88,000 in transportation expenses, notwithstanding the much larger business.

In 1916 the average revenue freight trainload was 318 tons, an increase of 28 tons over the previous year; the average length of haul was 97 miles as against 94 miles in the previous year, and the average ton-mile rate was 1.060 cents as against 1.097 cents in the previous year.

About a quarter of the total operating revenue of the Maine Central comes from passenger business, and total passenger revenue in 1916 amounted to $3,327,000, an increase of only $24,000 over the previous year. The average passenger journey was about the same in both years—a little over 38 miles; and the average rate per passenger per mile was 2.304 cents in 1916 and 2.278 cents in 1915.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	1,220	1,216
Freight revenue	$7,741,542	$7,179,701
Passenger revenue	3,327,166	3,302,911
Total operating revenues	12,001,673	11,350,423
Maintenance of way and structures	1,644,715	1,630,530
Maintenance of equipment	1,691,646	1,745,053
Traffic expenses	137,860	135,733
Transportation expenses	4,272,541	4,184,314
General expenses	247,911	332,890
Total operating expenses	8,192,578	8,143,965
Taxes	636,423	644,785
Operating income	3,171,505	2,561,482
Gross income	3,792,837	3,386,060
Net income	1,600,476	1,618,080
Sinking fund	42,867	40,051
Dividends	1,111,123	1,483,002
Income appropriated for investment	189,628	74,643
Surplus	247,858	20,384

NEW BOOKS

Poor's Manual of Industrials for 1916. Published by Poor's Manual Company, 80 Lafayette street, New York. Price $5.

This is the seventh annual number of the Manual of Industrials and, like Poor's Manual of Railroads, it is the best thing of its kind published. The public interest in industrial stock which has developed in the last year and a half makes this issue of the Manual of Industrials invaluable to a larger number than ever before. The book contains the latest income account and balance sheet of manufacturing, mining and miscellaneous companies and in most cases the figures are presented in comparative form. The general information in the book is revised to August 15 and the book also contains an appendix giving recent information on steam railroads and public utilities, the 1916 manuals for railroads and for public utilities having been published some weeks ago.

RAILWAY CONSTRUCTION IN WESTERN AUSTRALIA.—At the opening of the Lake Grace Railway (25 miles), the latest agricultural railway extension in Western Australia, the Premier stated that during the last four and one-half years the government had constructed 900 miles of railways. The expenditure on these extensions was perfectly justified and a continuance of such a policy was essential to the best interests of agriculture and the state as a whole. The new line provides long-looked for facilities for the settlers of the Wagin-Kukerin and Lake Grace districts to forward their wheat and other produce to market.

Locomotive Problems That Demand Solution*

A Few of the More Important Phases of Design and Operation Which Are Greatly in Need of Attention

By George M. Basford†

WHEN this club began (1901) the biggest locomotive in the world was, I believe, a Consolidation running here in Pittsburgh. For a long time after that locomotives ran to size and weight. It was easy to make them bigger and heavier. But a far greater and more difficult as well as more important problem faces us today. It is the problem of forcing every pound of weight to justify itself in terms of power to serve mankind. Who has a bigger, nobler opportunity and duty than this?

When our club began, officials wouldn't listen, as they do now, to consideration of improved efficiency. Superheaters, brick arches, combustion chambers and feed water heaters are old. Their real application to our great problem came but six years ago, and they are only now beginning to be really used in this problem. Today officials are reaching out for new things and old things in new application. They eagerly seek capacity increasing factors. Why? Because they are facing the question of increased weights in equipment and in operation. They need more power per unit, to do the world's business and do it economically.

Therefore young men never had the opportunity or the duty that they have facing them today. Do they realize it? To try to make some of them see it is the object of these paragraphs.

Let us make a little list of big possibilities in locomotive development to show what lies before young railroad men right now. The items are mentioned at random, not in order of importance.

Boiler Design as a Whole.—Size is only one part of this problem instead of being the chief feature as it has been considered in the past. It is now a question of balancing all factors to make and to absorb the maximum amount of heat per unit of weight. The day of ratios between grate area, heating surface and cylinder volumes has given place to a day of providing steam to produce definite amounts of cylinder horse power within defined limits of weight. This is revolutionary and the corralling of many a fractious heat unit must be made possible. This is your main line of activity in boilers.

Boiler Circulation.—Many a bright mind is engaged in improving the movement of the water in the boiler with the promise for the future. Very little positive information is available now upon this subject. Who will put us straight on the matter of boiler circulation?

Improved Grates.—Grate design is now being studied as it never has been before. Experimental developments in grates as to air openings and grate construction promise valuable improvements in the near future. Conditions requiring maximum power lead to the conclusion that air openings through the grates should be as large as the character of the coal used will permit. Thirty per cent is aimed at. Recognition is waiting for a thoroughbred grate expert. The largest Pacific type passenger locomotive has 47,500 lb. tractive effort and the same grate area that was used in the same service six years ago when the tractive effort was but 32,900 lb. This problem is a worthy one for that expert. What is he going to do about it?

Ash Pan Design.—This is a vital factor in the production of heat. To provide air sufficient for intense combustion is the object of experiments now being conducted which promise a simple solution of this problem. To provide air enough for a big firebox and put the air where it is wanted is no child's play. The speed of gases at a certain point in a big firebox, working hard, is 200 miles per hour. Who is the expert who will point the way to the ash pan design to supply air enough and how will he provide air openings in the ash pan sufficient to maintain atmospheric pressure in the ash pan at maximum rate of power development?

Combustion Engineering Applied to Firebox Design.—The purpose is to attain, with all fuels, the highest degree of heat intensity per unit of firebox volume. Here is where the energy is developed. This is the heat factory. It is worthy of a life time study. Important developments are nearly ready to be announced. Your field is nearly 70,000 fireboxes.

To burn the gases completely before they reach the flues and to accomplish this in the big firebox is another big problem. This involves grates, arches, air admission below and directly into the fire and mixing of the burning gases by division into small streams. It also involves the shape and size of the firebox and combustion chamber. All this is now being worked out on paper and in practice. Recent studies in firebox design recognizing the great importance of heat radiation and the relatively small importance of transfer of heat by convection have revealed the firebox problem in a new light. This will result in larger fireboxes, larger grates, larger combustion chambers and in new developments in the mixing of the burning gases by improvements in brick arches. Improvements already tried experimentally promise remarkable results. With all this to do, the field for combustion experts is very far from being over crowded. Before long 100,000 fireboxes will be in service to keep this country going. A little improvement applied to each of these will save a mountain of money.

It is known that a certain sacrifice of tube heating surface for the benefit of increased firebox volume in the form of a combustion chamber is justified but how far should this be carried? This should be investigated. Then there is the question of tube length.

Front End Draft Appliances.—Here is another field of promise. To produce the pump action necessary for draft with minimum back pressure load on the cylinders will bring great credit to the one who is successful in working it out. Why should front end construction that itself consumes 33 per cent of the draft produced be perpetuated?

Detail Design.—Developments in details to enable locomotives to run between shoppings with minimum running repairs present interesting possibilities. Shoes and wedges, journal boxes, hub liners, long driving boxes, improved throttles, lubrication, engine truck, trailing truck, tender truck design, also improved couplings of locomotives to tenders and radial motion for front and rear driving axles of long wheel base locomotives all have a bearing on this question.

Tender Design.—Tenders may be said to have been somewhat overlooked in the speed of going to heavier and more powerful locomotives.

Labor Saving Devices.—Here is a definite line for development which is well started in power reverse gear, power operated firedoors and grate shakers and coal pushers, also the greatest of all these devices, the mechanical stoker. All

*From a paper on Railway Clubs and Young Men, presented at a meeting of the Railway Club of Pittsburgh, Friday evening, September 22, 1916.

†President, Locomotive Feed Water Heater Company, New York.

these factors are needed because of the increased size of the locomotive. This renders it necessary to provide power auxiliaries to take the place of physical strength and endurance. Then locomotive operation becomes a matter of brain work rather than brute force.

Improved Valve Motion.—Great strides in this direction in ten years give encouragement to the hope that there is more improvement to come. How crude the valve gear of the past would look on a big modern locomotive from the standpoint of convenience, let alone the question of economy in performance and the possibility of standardizing construction! Imagine yourself crawling under the wheels of a big modern locomotive to get at the eccentrics on the main axle!

Superheating.—This improvement is by no means finished. Those who are living with this problem are in position to lead still further in their influence on cylinder performance and in the effective use of the heat from the firebox. Superheating engineers are ready to give higher superheat when railroads are prepared to use it by improvements in operation and maintenance. Great economies are available in higher superheat through increase in volume of the steam. These engineers are also ready to put to good use any increase of firebox temperature the combustion engineers can give them. Superheating, the greatest improvement the locomotive has ever seen, is not finished. It offers still greater possibilities when you are ready for them.

Feed Water Heating.—This is now a factor in locomotive engineering and operation. It promises to take a place next to superheating in improving economy and increasing capacity with the incidental advantage of prolonging boiler and firebox life and reducing cost of boiler maintenance. Successful feed water heating means increased boiler power. It will permit of modernizing existing boilers of outclassed locomotives to render them available again in many cases for service which has outgrown them. Feed water heaters may be applied to existing locomotives under a charge to capital account and for a number of years will defer charges to operating account for replacing those locomotives by new ones. Feed water heaters will increase evaporation per pound of coal and provide economy not available in any other way because the improvement is made from otherwise wasted heat. Locomotive boilers should be relieved of the duty of heating water. It should come to them hot, leaving only the evaporation to be effected in the boiler. Feed water heating is not new but successful locomotive feed water heating in this country has but just now been accomplished. A little later there will be more to be said on this subject. This development has been waiting for the successful heater.

Compounding.—This principle is coming to its own. No locomotive improvement fills its natural field so well as when it is properly fitted into the general scheme of locomotive design as the compound feature is fitted into the Mallet.

Water Purification.—This becomes more important every day. Before long people whose lives have been made miserable by water unfit to use in boilers of any kind will wonder why they ever used it in the most rigorous boiler service in the world. They will wonder why they ever paid the boiler repair bills of the past when the remedy is so easy and the returns so great. Let some of the young men tackle the problem of improving means and methods of water purification.

Brake Shoes.—Do you remember any illuminating paper on the subject of brake shoes within a year or two before any of the clubs? Here is an inspiring, live, subject—this and the clasp brake. It would be specially appropriate for this club to record brake and braking progress as a whole in a fitting manner and tell the railroad world what it is missing and what it ought to do.

Air Brakes.—So great have been the improvements in means of stopping trains that the authorities of a few years ago have now new subjects to study if they would keep abreast of progress. The electric control and the automatic adjustment of braking power to load in addition to other improvements are distinctly revolutionary in their effect on the capacity of railroads as well as on the safety of travel. The capacity of some very important railroads is specifically a question of brakes. Do the railroads know what they ought to do next in air brakes?

Powdered Fuel.—Herein lies a possibility of the use of heretofore impossible fuels with a $250,000,000 annual steam locomotive fuel bill to work on, also the possibility of increased steam making capacity and perfection of firebox operation that until recently were not hoped for. Increased hauling capacity and continuity of locomotive operation and eliminating of ash pit delay offer great promise for the future. Increased boiler capacity is a question of producing maximum calorific intensity per cubic foot of firebox volume. This is the raw material for the heating surface and superheater to work with. Speaking in general terms pulverized fuel will transform an 80 per cent boiler into a 100 per cent boiler. Consider what this would mean to say 30,000 locomotives in this country that are deficient in boiler capacity. Here again a capital charge will put from five to ten years of new life coupled with increased capacity into a lot of old power. It will put many an outclassed locomotive back on the main line. The chief reason for buying new locomotives is to get boilers that are big enough to haul maximum tonnage over ruling grades. Increased boiler capacity resulting from fuel efficiency is the question answered by pulverized fuel. It has already shown a boiler efficiency of 77 per cent with pulverized Kentucky unwashed screenings, as compared with 61.1 per cent with lump coal from the same mine hand fired in the same locomotive.

Alloy Steels.—If you could see confidential figures now in the desk of your speaker some of you would jump to the task of improving locomotive design with respect to lightening reciprocating and revolving parts of locomotives. This means making every pound of weight work for you. It includes possibilities in locomotives and tender designs as well as parts of running gear. It is difficult to understand how the possibilities of improved use of a pound of weight rendered possible by improved detail design of running gear could have been overlooked so long. Your speaker has recently given three years to this study and is in position to state that there is an insistent need of brain work followed by action in this field. There is not a minute to lose in taking up the light part and counterbalance questions and the reduction of dynamic augment by improved designs and alloy heat treated steels.

Signaling.—This has become a matter of speed control and increased capacity of track as well as a safety provision. Wonderful strides are being made in this field that are not widely known or well understood. Signaling is seldom mentioned before the various railroad clubs. It will have an important effect upon the operation of locomotives in the near future.

Do you want more things to do? Then get into locomotive operation. Work out plans for keeping expensive locomotives in service a larger portion of the day. An average figure representing present practice is 4 hr. 19 min. actual service out of a 24-hour day. Get into questions of organization, selecting, training and promotion of men. Who will wake up the railroads to the suicidal policy of neglect of the selection of recruits and of training these recruits in all departments? Take up the question of railroading as a business with real cooperation of all departments. Study suitability of locomotives to their working conditions. Who will show railroad managers how much money may be made in suitable roundhouses and in shops and shop equipment for maintaining big engines? No specific mention of the details of the car problems can be made on this occasion but

the car offers opportunities that are little less important than those of the locomotive.

Best locomotive records, reflecting up to date developments show a water rate of 14.6 lb. per indicated horse power hour. What may be termed unimproved locomotives produce this unit on about 24 to 30 lb. Between these figures lie great possibilities. Between them lies your opportunity. The majority of locomotives are in or near the 24 lb. class

REAL LIFE IN THE DESPATCHER'S OFFICE

By J. L. Coss

Our telegraph operators are gradually receiving more concessions from the railroads in the way of additional pay and shorter hours; and the less work the more negligence. On some lines eight hours is now a day's work in relay offices, nine hours at terminals and two-man offices and eleven hours at one-man stations, with three hours at one-man stations on Sunday.

In fact, the business on Sunday is pretty nearly tied up, so far as the telegraph end of it is concerned. But the trains must be run on Sunday the same as on other days, and their movement, as a matter of fact, is handicapped by the scarcity of operators. The despatcher is compelled to scheme and figure far ahead to handle his Sunday work. If he gets caught in a tight place and is forced to call an operator for five or ten minutes' work, he is obliged the next day to O. K. an overtime slip for an hour, and then explain why it was necessary to do it. Very likely this same operator had been absent from his office a half day in the week before on a fishing trip; and this through the kindness of the despatcher. He was not docked on that account.

But the operators do not seem as anxious to render first class service as they were 20 years ago. At that time they worked 12 hours a day, did more work than they do today and did it better; and the despatcher did not have to call an operator then as much as now though he now has a bell to do the calling. It is seldom now that a despatcher can line up five or six offices within a reasonable length of time, and likely three out of five will delay the move by having to adjust his blanks or instruments, or something. Again, they do not seem to take the interest in keeping the despatcher advised as to the conditions existing at and near their offices. They do not OS trains promptly. After they clear a train they do not think it necessary to advise the despatcher if the train does not move promptly. Many other things, too numerous to mention, show that they are unwilling or lack the intelligence to advance the interest of the corporation from which they draw their money. This is not intended to apply to each individual operator, because there are some good ones; but there are many who are guilty of these faults.

Not so long ago, an agent-operator at a very small station called up one morning about 8:30 and asked if he could be absent that day, saying that his wife would be on hand to sell tickets if we could do without the telegraph service. He was told that we could get along without him. The next morning the request was repeated and he was given permission to be absent that day, the despatcher telling him that, though the accommodation was cheerfully granted, it was objectionable to close the office so often. About a week later, one Sunday, about fifteen minutes before this man's time was up, an engine ran short of water and the despatcher was forced to hold the operator on duty about 40 minutes to deliver an order. The next morning an overtime slip was sent in. He has been off several times since for a half day at a time. It is safe to say that if he should call up today and want to be off a few hours and were refused, he would think that he was being misused.

A westbound red ball freight train had been seriously delayed on an adjoining division and we were asked to hurry it along as much as possible in order to recover some of the lost time. The train proceeded nicely up to the last 20 miles —the last telegraph office before reaching the terminal. At this station there was a water tank where most of the trains took water and where there were nearly always orders out. At this time the red ball was only a short distance ahead of a passenger train and there were two eastbound freight trains to be run in this territory against the red ball and the passenger train. When the red ball started the operator was told to ask the conductor if everything was running smoothly and if he would go in ahead of the passenger train. The conductor said everything O. K. and he should go in ahead. I cautioned the operator not to OS him until he had gone, because I had to put a call on the connection west and wanted to be reasonably sure about the train before calling the west connection. In about ten minutes after this conversation with the operator he reported the train out and the call was placed. In thirty minutes from the time the operator had reported the train out he reported that it had not gone, but was in the west end of the yard, on the siding. Asked what he had been doing he replied that he had been selling tickets for a passenger train. On an investigation as to how busy he had been it appeared that he sold five card tickets, which would consume about three minutes; and all the time the caboose of the train was but a quarter mile away and could have been plainly seen at any time from the office window. This delay knocked out the freight and resulted in an hour's terminal overtime for the crew west and caused the two eastbound freight trains to make two hours' road overtime each because of the delay to the red ball freight, which had been delayed by track repairers.

A peculiar circumstance happened sometime ago at a terminal where three operators are worked, a continuous office. Sometime after midnight the third trick operator's wife took sick and he went out to see her, first advising the despatcher. When he reached the house he found her in such condition that he could not leave; but he called the second trick operator and told him to go to the office and advise the despatcher the conditions. The latter did so, and the despatcher told him to go home, as he could not work without violating the law; told him to leave the key to the office with the yardmaster so that the conductor of an extra, which had been called, could get his orders. The despatcher thought that by this course he was doing the third trick operator a favor. However, the O. R. T. committee has taken the matter up because their contract was violated by allowing a conductor to take the order at a station where there is an operator. What do you think of such a committee?

A message was received lately at the despatcher's office from a section foreman, advising that a frog and a switch were being exchanged in the yard at a certain place. The telegraph office was situated west of where this was being done and the freight house east. There were a couple of freight trains approaching this point when the word was received and the operator at the telegraph office was instructed to telephone the freight house to advise these two freights to look out for the change of frogs. The O. R. T. chairman in some way got hold of this case, and made a grievance out of it, on the ground that the freight house man should not have been used to handle messages, as he was not an operator. This chairman would rather these trains should be derailed, with possible bodily injuries, rather than that word be sent to them in an irregular way.

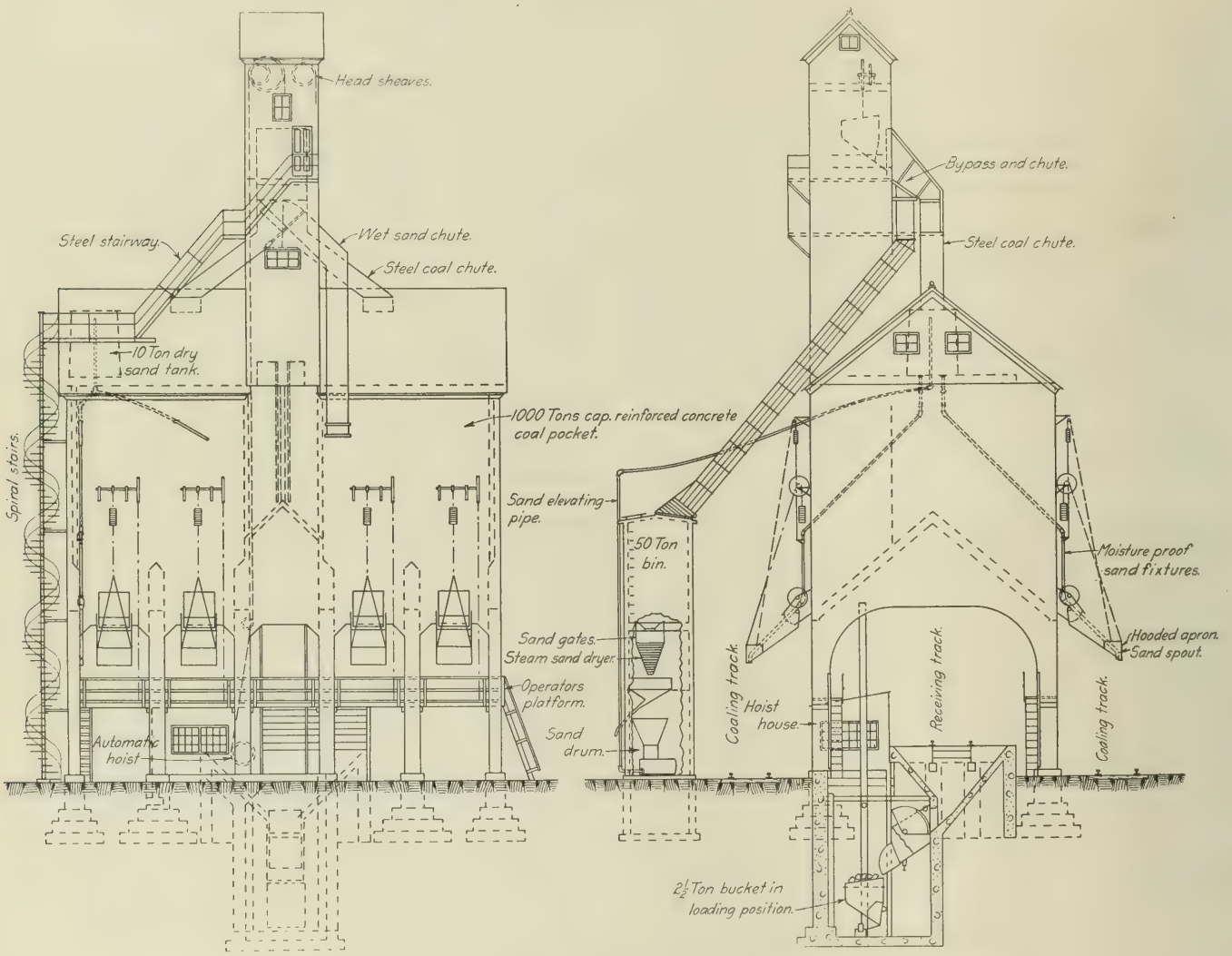
Imports of Iron Ore.—The imports of iron ore into the United States for the year ended June, 1916, were 1,059,756 tons, as compared with 1,341,281 tons in 1914-15. Of the iron ore received from abroad in the 10 months ended April, 1916, 63,610 tons came from Spain, 181,531 tons from Sweden, 84,343 tons from Cuba and 128,073 tons from other sources.

A Large Reinforced Concrete Coaling Plant

New Station for the Duluth, Missabe & Northern at Proctor, Minn., Is Equipped with Modern Machinery

A REINFORCED concrete coaling station having a storage capacity of 1,000 tons of coal has been built for the Duluth, Missabe & Northern at Proctor, Minn., and aside from the interesting details embodied in the design and construction of a station of this size in reinforced concrete, the project merits notice as an example of recent development in equipment for handling coal and sand.

The coaling plant consists of a coal bin structure 56 ft. long, 32 ft. wide and 51 ft. 6 in. high, surmounted by a roof and a headhouse of structural steel covered with corrugated iron, which includes a bucket tower extending 48 ft. 6 in. above the top of the bin, or a total of 100 ft. above the track level. The station serves two tracks, one on either side, and receives coal from a track between the two coaling tracks which passes through or under the station. The sand facilities occupy a separate reinforced concrete structure 12 ft. by 9 ft. and 33 ft. high located just outside of one of the coaling tracks and opposite the center of the station. The wet sand is elevated by the coal conveying machinery to the top of the tower where a spout is provided to chute the sand into the building, in which it is dried and returned to a bin in the top of the coaling station by means of compressed air.

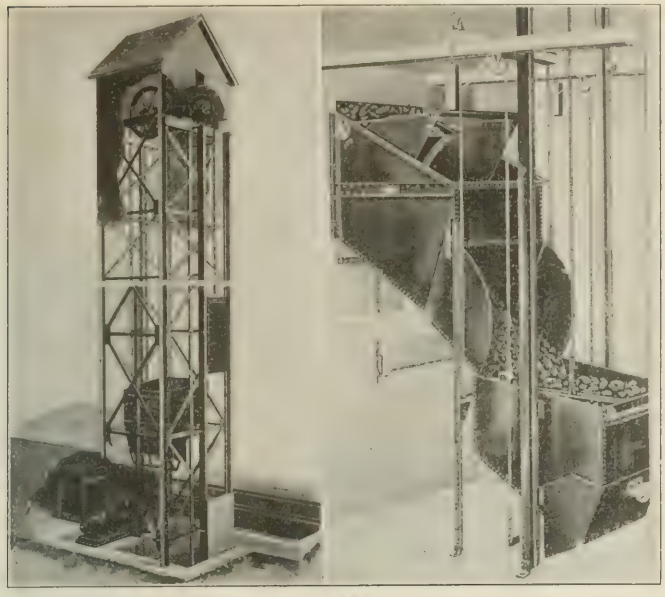


Side and End Elevations of the Plant.

Structural Details

The design of the superstructure of the station structure is simple. The bins are supported on two rows of concrete columns along the two sides of the building, there being six 2-ft. by 2-ft. 6-in. columns in each row. Transverse girders of the same width as the columns span between opposite sides of the building over each pair of columns and support the floor of the bin, which is 14 in. thick and slopes downward each way from the longitudinal center line of the structure. This slope has a pitch of 40 deg. from the horizontal so that the transverse girders have a maximum depth of 12 ft. 4 in. at mid-span. Fillets on a curve of 8-ft. radius join the girders to the columns and brace the structure against wind action, at the same time giving a pleasing appearance. The sides of the bins are 7 in. thick and span horizontally between pilasters which are 18 in. wide and project 11 in. into the bin. These pilasters are located directly over each column along the two sides of the building

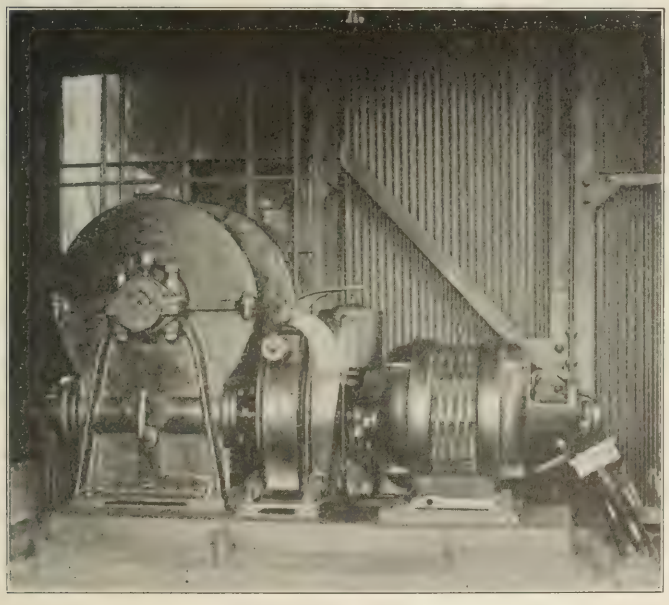
and at a spacing of about 10 ft. center to center at the two ends. They distribute the lateral pressure of the coal to the top and bottom of the bin, being absorbed at the bottom by the floor system and at the top by a horizontal girder, continuous on all four sides which is braced at each corner



Arrangement of Cables for Hoisting and the Bucket in Position Under the Measuring Feeder

by a diagonal tie or horizontal knee-brace which connects the nearest pilasters in adjoining walls.

The bin is divided on the transverse center line into two compartments by an interior wall which is of similar construction to the outside walls. Besides this subdivision a shaft, 9 ft. by 9 ft. 8 in., is cut out of the bin in the middle



The Traction Hoist in the Hoist House

of one side to provide for the passage of the elevator bucket through the bin structure. Four openings are provided on each side of the bin at the bottom for the discharge of coal. The bin bottom between these openings is filleted with cinder concrete to insure a flow of coal to all of the outlets so that the bin can be completely emptied whenever necessary.

The space between the supporting columns and under the girders is ample to admit the coal cars on the receiving track which is elevated four feet above the coaling track level. The track hopper is 20 ft. long and 15 ft. wide, leaving ample room on one side for the elevator tower and hoist house and space for an operating platform on the opposite side. The receiving track is supported on the track hopper by 24-in. 80-lb. I-beams. The track hopper and the bucket pit which extends 21 ft. below the track level are built of monolithic concrete, special care being taken to insure water tight construction. The foundation material encountered at a depth of 8 ft. below the ground level was found to be excellent and no difficulties were encountered in the foundation work. The sides of the track hopper except over the bucket pit are of plain concrete bedded on the excavation or on thoroughly compacted filling.

Coal Handling Machinery

The coal delivered to the track hopper in bottom dump cars is fed by a Schraeder measuring feeder into the elevator



The Elevating Bucket in the Shaft

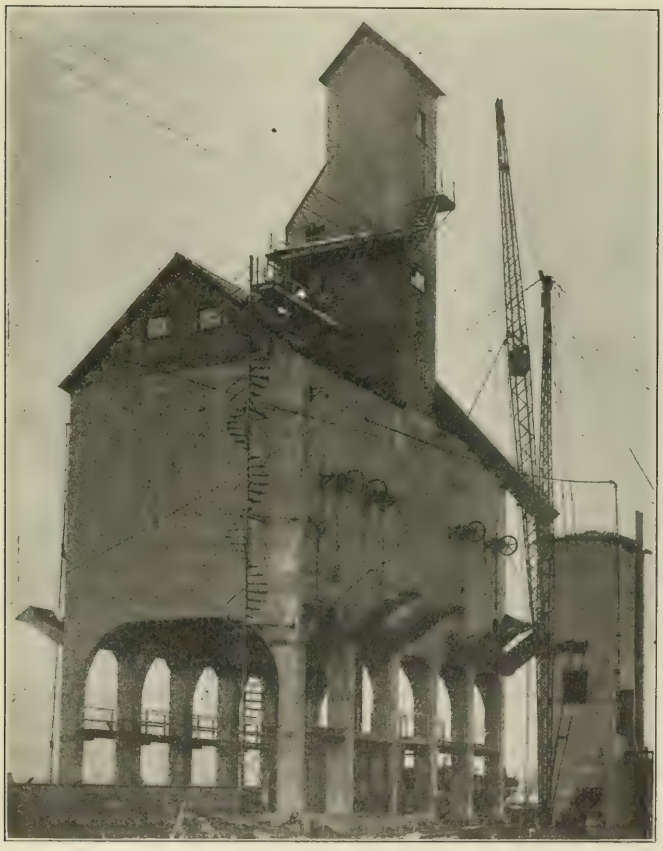
bucket. This feeder which has a capacity of 2½ tons, is actuated by the ascent and descent of the elevating bucket, being arranged in such a manner that 2½ tons of coal are discharged into the bucket each time that the latter passes by the feeder in its descent.

The elevating bucket which has the same capacity as the feeder, ascends and descends in the elevator shaft, in which it is secured by 30-lb. rail guides anchored to the structural members of the shaft. As shown in one of the accompanying photographs the coal is retained in the bucket by means of an apron at the bottom which is equipped with a 6-in. roller that travels on a continuous steel guide from the bottom of the pit to the bucket discharge point. This insures the retention of the coal except when the roller guide permits the apron to open up at the top of the tower to discharge the coal into the bin.

The bucket is carried by two cables to which it is connected by means of an equalizer. In case one cable becomes worn and breaks, the bucket cannot drop because of the second cable. As shown in the accompanying drawing the bucket is balanced by a counterweight. The two cables

attached to the bucket pass over 48-in. turning sheaves at the top of the tower, down around the grooves of the drum on the traction hoist, up over the turning sheave and then down to the counterweight to which they are secured. The arrangement is such that the bucket cannot be hoisted above the discharge point even though the automatic feature of the operating machinery should fail, because should an over-wind occur, either the bucket or the counterweight will come in contact with the bottom of the pit and thus throw slack into the cables, causing them to slip on the traction hoist drum.

One of the photographs shows the traction hoist installed in the hoist house. The hoist is operated by a 20-hp. electric motor connected through a set of cut bronze and steel gears in a cast iron housing and operating in an oil bath. The operating machinery is controlled by a Cutler-Hammer automatic controller, which stops the motor when the bucket reaches either end of the shaft and then starts it in the opposite direction after the passage of a sufficient interval of time to permit the complete filling or emptying of the bucket. Substantial hatch limit switches are installed at the top and bottom of the shaft, bringing the bucket to a standstill, at which time a solenoid brake on the hoist sets



The Completed Plant

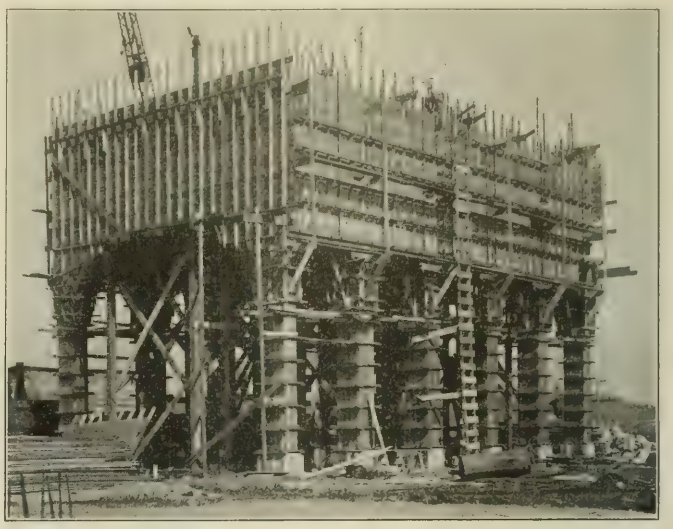
fast, holding the load until the current is applied, reversing the operation.

The operation of the bucket when handling sand is exactly the same. The sides of the track hopper were given a slope of 50 deg. to insure the ready flow of the wet sand and the necessary deflectors are provided in the chute at the top of the shaft to deflect the sand into the sand chute, as well as to control the flow of coal into either one of the bins.

The outlets from the coal bins are equipped with manually operated under-cut gates provided with hooded aprons to deflect the coal directly into the tenders. The station is equipped with a coaling platform along each side just under the coaling gates so that the fireman or station operator does not need to stand on the tender when taking coal. The coal gates are arranged for positive operation in opening and closing, so that there is no danger of burying an engine with a bin full of coal.

The Sand Drying Plant

The sand building contains a Rands gravity sand plant. The top of this structure contains a bin having a capacity of 50 tons of wet sand. The space below this bin contains the apparatus for drying and screening the sand and for returning it to the storage bin in the top of the coaling sta-



Formwork for Columns and Bin

tion. At the bottom of the storage bin a gate is provided to control the flow of the green sand into a Beamer steam sand drier. This is so designed that the steam pipes themselves act as retaining walls for the green sand, permitting the moisture to escape immediately into the atmosphere. The spaces between the coils are such that they readily hold the green sand, but permit dry sand to slip through and fall onto a gravity sand screen which removes all foreign matter and particles of sand which are of too large a size. From the screen the sand passes into a hopper of an automatic air drum, from which it is blown by compressed air into the dry sand storage pocket referred to previously. A 2½-in. pipe is used for this purpose equipped with special Pittsburgh chilled iron long-radius elbows. The air is used at a pressure of 110 lb. per sq. in., being supplied from the compressed air plant of the railway's engine terminal.

This coaling and sand plant was designed and erected under the direction of H. L. Dresser, chief engineer of the Duluth, Missabe & Northern, by Roberts & Schaefer Company, Chicago, who furnished and installed all of the operating machinery.

BLIGHT-KILLED CHESTNUT USEFUL

The Department of Agriculture has issued a circular to the effect that experiments conducted by the Forest Service of the Department, to determine the value of chestnut wood that has been blight-killed, show that it is just as durable as healthy timber. Posts, poles and ties made from infected timber show that, after three years' use, they are as sound as timber not infected. Blight-killed timber, which had seasoned on the stump for several years and which had lost its bark, resists decay better than healthy wood from which the bark was not removed.

RAILWAY REAL ESTATE ASSOCIATION

The second annual meeting of the Railway Real Estate Association will be held at the Hotel Sherman, Chicago, on October 11, 12 and 13. The program for the meeting is divided into three parts and will include the reading and discussion of papers on the first day on subjects pertaining to real estate and right of way work, on the second day on subjects pertaining to taxes and on the third day on development and valuation work. The association's committee on revision of the constitution will report favorably upon an amendment to provide for two divisions of the association, to be devoted particularly to tax and valuation work, one day of each meeting to be devoted to special sessions of these divisions. Later it is hoped to establish other special divisions, such as industrial, agricultural and insurance.

Among the speakers scheduled for Wednesday are Peter McPherson, Canadian Pacific, and W. L. Lawrence, Delaware & Hudson. For Thursday, F. A. Waters, Los Angeles & Salt Lake; A. J. Rooney, Chesapeake & Ohio; S. G. Cramp, Pennsylvania Lines; W. K. McElroy, Pennsylvania Railroad, and E. H. Earp, Seaboard Air Line. For Friday, M. V. Richards, Southern Railway; H. A. Howarth; Long Island, and James P. Nelson, Chesapeake & Ohio.

PREVENTION OF RAILROAD STRIKES

The Committee on Public Utilities and Law of the Merchants' Association of New York has prepared a report on the Prevention of Railroad Strikes, which has received the unanimous approval of the board of directors of that association. An important part of the report is a plan proposed by Henry R. Towne, a former president of the association, based upon the principle of a contractual relationship, which it is believed will guarantee the uninterrupted operation of public utilities.

The resolution which the Merchants' Association asks the Chamber of Commerce of the United States to submit to referendum vote contains the following paragraph:

"*Resolved,* That the tenure of service of employees of public service corporations, particularly of transportation corporations, should be regulated by law in such manner that each person who voluntarily elects to enter such employment shall, as a condition of such employment, be legally obligated by contract to continue therein for a specified term, during which term he may not lawfully quit that employment nor the corporation lawfully discharge him from its service, except as provided by such contract; and that such contract should provide adequate penalties for violation of its terms by either party."

Mr. Towne's Plan

In presenting his plan Mr. Towne said in part:

"The events of August, 1916, have focussed public attention upon a national problem which imperatively calls for solution. They have shown the existence of a self-constituted power exercised as though co-ordinate with that of the Federal government, an *imperium in imperio,* which the President has felt constrained to negotiate with, which has notified him of its terms, and whose terms he has deemed it expedient to accept and to urge upon Congress, as a basis for hasty legislation, in order thus to save the people from threatened calamity deliberately plotted. Until Congress acted the threat remained effective and the country in painful suspense. The situation is intolerable, and the public demands that a remedy be found.

"That such a situation could develop is due chiefly to two causes, namely, (1) the vast growth in number, size and importance to the community of public utility corporations, and (2) the coincident and almost equal growth in numbers, power, and influence, both for good and for evil, of organized labor.

"But when we consider a case involving both groups, that is, a public utility corporation and some or all of its employees, we find that there are three parties directly concerned, the third party, and the one having the chief interest, being the public, the people, by whom the franchise was granted under which the corporation exists and acts, and by virtue of which the employees have been enabled to find employment in its service. To this third party, the people, it is a matter of vital concern that the service, to obtain which the franchise was granted, shall not be interrupted, least of all by either one or the other of the parties who are the beneficiaries of the franchise, one of whom thus finds employment for its capital and the other for its labor. Just as the former, the public utility corporation, is required under its franchise to perform the stipulated service for the public convenience, so also should the latter, the body of its employees, be required, as a condition of entering its employ, to abstain from any act, of commission or omission, tending to interrupt the service or designed to have that effect. The act of entering the employ of a public utility corporation is voluntary. Each individual who enters it does so of his own free will. He knows, or should know, that the corporation operates a public utility, for the benefit and convenience of the people, and it should be required of him, by law, that, as a condition of employment under such a corporation, he shall agree in advance not to do anything knowingly, alone or in combination with others, designed or tending to interrupt the service to the people for which the corporation was chartered by them. In so doing he would surrender no right to liberty of action except the right to inflict injury on the public in the pursuit of selfish ends, and this right is one which the people may justly require to be surrendered by those who voluntarily seek employment in a service created by act of the people for the benefit of all the people, including organized labor itself.

"For the members of any group to claim or seek the right to inflict vital injury upon all the rest of the community would in effect be tantamount to a declaration that such members were not loyal citizens of the state but public enemies.

The essential features of the contractual relationship plan proposed by Mr. Towne are as follows:

1. An enlistment or enrollment contract for a stated term. After a probationary period, in the case of a new employee; removable by mutual agreement, at the end of term, in the case of an old employee.

2. A "service record" of each employee, to be kept.

3. Preference in promotions, and in retention in the service, to be based on such records.

4. Penalties for violation of the contract by either party, to consist of cash fines.

5. Fines against company to be collectible from a fund created by the company and vested in a trustee.

6. Fines against an employee to be collectible from a fund created by the company's retaining, say 20 per cent of his wages until the fund equals two weeks' wages (would require 10 weeks). The company to pay interest at 5 per cent on this fund, and to repay it when the employee leaves the service as prescribed in the contract, or dies. The fund to be in the custody of a trustee.

7. Schedule of fines to be fixed by law and stated in the contract.

8. Assessment of fines to be determinable. (*a*) By mutual consent, duly recorded. (*b*) By joint Board of Award, duly appointed. (*c*) By Public Service Commission on appeal. (*d*) By legal process.

9. The company to have the right to terminate the contract. (a) Because of misconduct by the employee. "Misconduct" to be defined by law and in the contract, and also the fines attaching thereto. (*b*) Because of slack business or excess of help. In this case the employee to receive either 30 days' notice, or two weeks' pay and immediate release.

(*c*) Because of disability or superannuation of employee, on stated notice, subject to such pension provisions, if any, as may exist.

10. The employee to have the right to terminate the contract, (*a*) Because of valid family or personal necessity. In which case, honorable discharge, without penalty. (*b*) Because of sickness or of unfavorable effect on health. (*c*) For cause not stated, upon fair notice, say 30 days, without penalty if with the company's consent; otherwise subject to fine, as provided by law and stated in the contract.

11. Violation of the contract by the company, if duly established, to subject it to stated fines, payable to the employee, from the fund vested in a trustee.

12. Violation by the employee, if duly established, to subject him to fines collectible by the company from the fund held for that purpose by a trustee; and also, under specified conditions, to forfeiture of wages earned but not yet paid.

13. The company to recognize the right of the employee to membership in any lawful organization, and not to discriminate against him on such account.

14. The employee to respect the right of the public to uninterrupted service, and not to combine with others to cause its interruption.

15. The employee to have the right, alone or in combination with others, to request concessions, in wages, hours of work, or conditions of service, from the company, and the company to give prompt and fair consideration to all such requests when properly presented, and not to discriminate against any employee because of participation therein.

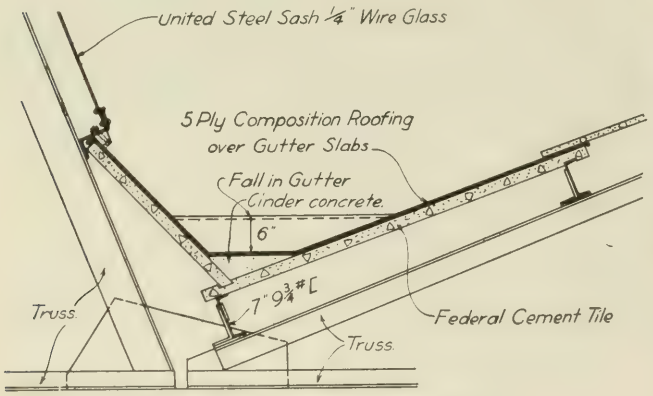
16. The employee to have the right of appeal, from acts or decisions of the company, to a "Joint Board of Award," constituted under the law by joint action of the company and its employees, as a Board of Arbitration.

17. Both the company and its employees to have the right of appeal from the rulings of the "Joint Board" to an appropriate federal or state commission, whose decisions shall be conclusive and binding, unless and until reversed by a court decision.

18. During the term of any contract between the company and an employee the discharge of the employee by the company (except as provided in No. 9 above), or the cessation of service by the employee (except as provided in No. 10 above), to be constituted an offence at law, and to be punishable as the law may prescribe.

AN INTERESTING CAR REPAIR SHED AT MEMPHIS, TENN.

The Illinois Central has recently completed a car repair shed at Memphis, Tenn., of sufficient size to house all car repair work done at that point other than light repairs



Details of Gutter Construction

requiring one day or less to the car. This structure covers more than 4½ acres and is composed entirely of noncombustible materials. It was built over the existing car repair yard with practically no interference with the work on the cars.

The car repair yard is located adjacent to the mechanical terminal and shops in the Nonconnah yard of the Illinois Central located about four miles south of Memphis. The building is 1,140 ft. long by 176 ft. wide and covers all of the old car repair yard, comprising five repair tracks and three additional tracks or a total of eight tracks placed 22 ft. center to center. The track space under the shed has a capacity of 152 cars, based on 19 cars per track, with 60 ft. for each car. The building consists of a series of columns supporting a saw-tooth roof, the teeth running transverse



The Saw-Tooth Roof

to the structure in rows 30 ft. apart. The sides of the building are open to a height of 14 ft. and the ends to a height of 22 ft. except where knee-braces are provided at the columns, these braces conforming to the standard clearance diagram of the Illinois Central.

The frame of the building is structural steel, with a transverse row of columns every 30 ft. longitudinally and directly under the gutters of the saw-tooth roof. There are five columns in each row placed 44 ft. center to center, the tracks being arranged in pairs between each pair of columns. The roof framing consists of triangular shaped trusses con-

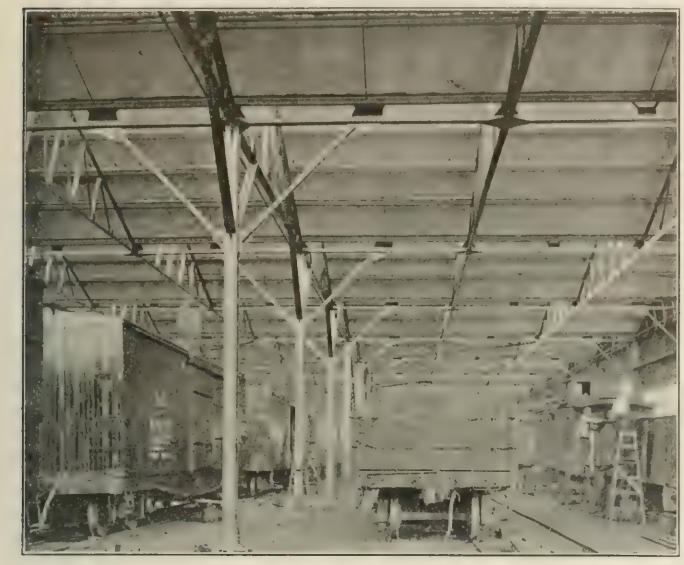


Erecting the Steel Frame

forming to the outline of the saw-teeth, spanning longitudinally between the columns with two intermediate rows of trusses in each 44-ft. transverse space, these intermediate longitudinal trusses being supported by transverse trusses placed in the plane of the steep sides of the saw-teeth. Knee-braces are provided for all transverse trusses and for all inside longitudinal trusses in the planes of the columns. Structural steel girts are provided below the trusses on the

two longitudinal outside rows of columns for the support of the siding above a height of 14 ft. above the track. Expansion joints are provided in the frame at three different points in the length of the building.

The roof is covered with Federal cement tile which is supported on steel purlins spanning between the longitudinal trusses in rows 4 ft. center to center. An accompanying drawing shows the detail of the gutters, which are given a



Interior View

pitch each way from the center line of the building to downspouts at each end. These gutters and the two rows of slabs of Federal cement tile involved in their construction are covered with a five-ply composition roofing.

The steep sides of the saw-teeth are 11 ft. 1 in. high. Seven feet of this space is occupied by United Steel sash, glazed with ¼-in. ribbed wire glass. The panes are 2 ft.



Side View of the Shed

wide and 7 ft. high, thus avoiding the use of any horizontal mullions. The ends and sides of the roof are finished with vitrified tile copings. The siding at the ends of the gables along the two sides of the building and for a limited area of each end of the building consists of No. 20 black corrugated iron. Thirty tons of this material was used.

The steel columns are supported on concrete pedestals 4½ and 5 ft. high, requiring a total of 478 cu. yd. of concrete and 900 cu. yd. of excavation. This excavation was made by hand and the concrete was placed by wheeling to the individual pedestals from a concrete plant located adjacent to the site of the building.

The ground space for the building, other than that formerly used for the car repair yards, required grading to the extent of 16,000 cu. yd., this being entirely excavation. The material was removed by an American ditcher, loading flat cars which were hauled 50 miles to improvement work being done on the lines of the Yazoo & Mississippi Valley.

The erection of the steel work was carried on without interference with the car repair work, by means of two platform derricks with 60-ft. booms mounted on timber dollies rolling on skidways placed 8 ft. center to center. These derricks were located, one each, in the lines of longitudinal columns 44 ft. each side of the center line of the building and started the erection at one end of the structure, backing away as the work progressed. With 60-ft. booms the necessary maximum reach of 44 ft. was easily accomplished. The car repair operations were interrupted only at the point in the length of the building where the erection was in progress as necessitated to afford clear space for the swing of the derrick booms. The transverse truss and the two intermediate longitudinal trusses of each bay were assembled on the ground and erected as a unit.

The erection of the tile, glass and roofing offered no interference whatever with the car repair work. Part of the additional space utilized for the car repair sheds was previously occupied by several old buildings which were removed just before the steel frame was erected.

The design and construction of these sheds was carried on under the general direction of A. S. Baldwin, chief engineer of the Illinois Central, with F. R. Judd, engineer of buildings, in direct charge of the design and W. I. Deadrick, Memphis, Tenn., in charge of construction. The structural steel frame work was fabricated by the American Bridge Company and was erected by the Kelly-Atkinson Company, Chicago. E. H. Walsh & Son, Memphis, Tenn., placed the foundations and sewers, and Nohsey & Schwab, Memphis, placed the composition roofing, sheet metal work and gutters and did the painting.

THE "EIGHT-HOUR" LAW

By H. F. Lane

WASHINGTON, D. C., September 26, 1916.

The Adamson "eight-hour" law has changed the entire aspect of the political campaign. Apparently many people who had been apathetic toward the "issues" with which they were being entertained, or who had been inclined to take it for granted that the present administration would be continued in office, are taking a new interest, and both sides are apparently finding the new theme afforded them by the new law a popular one. President Wilson made his promised reply to the vigorous attacks on the law made by Mr. Hughes in his speech before the Business Men's League at Shadow Lawn on Saturday. He did not return to the subject of his address before the National Grain Dealers' Association at Baltimore on Monday, although it was announced from his headquarters at Long Branch that the President has decided upon this as the keynote of the campaign, to be featured in most of his campaign speeches, and the western national Democratic headquarters at Chicago got into the game with "A Word About the So-Called Eight-Hour Law," by Senator Stone, of Missouri, which it issued for public consumption. Meanwhile, Mr. Hughes has continued his castigation of the surrender of the principle of arbitration in his series of western speeches.

While President Wilson defends his course by explaining

what he proposes to do to supplement the law after election, Mr. Hughes says: "It is idle to excuse the action taken by the Adamson bill by a request for additional legislation with respect to the future. That legislation was not obtained. We are dealing with what was demanded and actually enacted. We have an unjustifiable attempt to use public sentiment with respect to another eight-hour workday in order to justify a bill which does not provide an eight-hour workday, but relates solely to an increase in wages. We have seen the choice of what seemed to be the easier way, which escaped the necessity of a determined stand for principles. We have seen what has appeared to be the consideration of immediate political expediency at the expense of public welfare."

President Wilson discusses the law as if it provided for a real eight-hour workday, under which the train employees would work eight hours a day and no more. He says: "We believe in the eight-hour day because a man does better work within eight hours than he does within a more extended day —his efficiency is increased, his spirit in his work is improved and the whole moral and physical vigor of the man is added to." He says the railroad executives asked that the result of the eight-hour day be predicted in advance and the prediction be arbitrated, but that his plan will allow an impartial commission to observe and report upon the results in order that justice may be done the railroads in respect to the cost of the experiment. He does not show, however, how the efficiency of the trainmen will be increased merely by having their pay increased during the period of investigation or thereafter, nor does he say anything about the possibility of amending the law, when it is reconsidered after election, so as to make it provide for the kind of an eight-hour day he is talking about.

He also insists that the remainder of the program which he outlined to Congress "is going to be proceeded with," including the plan for compulsory investigation of labor disputes before a strike can legally be called. He says: "America is never going to say to any individual, 'You must work whether you want to or not,' but it is privileged to say to an organization of persons, 'You must not interrupt the national life without consulting us.'" Railroad officers could support such a plan enthusiastically, and there is much reason to believe that the public would have found itself in nearty accord if the President or Congress had made just that statement to an organization of persons on the occasion of the recent emergency, but the officers of the trainmen's brotherhoods vigorously opposed such a law and their opposition was allowed to prevail. Samuel Gompers said that a compulsory arbitration law would not prevent strikes, but that it would merely make strikers criminals. It is difficult to understand why the brotherhoods are supporting Mr. Wilson so enthusiastically because of what he has done if they are taking seriously what he says he proposes to do in the future.

The brotherhoods have had printed in the government printing office 400,000 copies of a special edition of the Congressional Record containing reprints of the speeches made in the Senate and in the House during the debate on the Adamson bill on September 1 and 2, together with 400,000 copies of the proceedings at the hearing before the Senate Committee on Interstate Commerce, at which the four officers of the brotherhoods and representatives of the railways and of the shippers expressed their views as to the proposed legislation. These will be distributed among their members, so that, as Warren S. Stone says, labor may "know who is friendly to its interests, and who is not."

An impression got into print last week that the railroad presidents were beginning to calculate more on what the administration could do for them in the future than on what it had done to them in the past. This was promptly refuted in a statement issued by Frank Trumbull, chairman of the Railway Executives' Advisory Committee, stating that there had been "no change of attitude on the part of the executives as a whole in this matter," but that they are proceeding in an orderly way to ascertain the effect of the law as a practical operating problem and its legal status.

Investigation of the operating aspect of the law is being carried on by the National Conference Committee of the Railways, that had charge of the negotiations with the brotherhoods, and the committee of executives, headed by President Holden, of the Burlington, that conducted the negotiations with the President still has under consideration the other aspects of the problem. Howard Elliott, president and chairman of the New Haven, in a letter to the New York Times, states that "as an individual and as an officer of a railroad company I feel it to be my duty to have that law tested, if possible. I feel it my duty, in a legal and orderly way, to have the law investigated and interpreted in order that the sober second thought of the American people can be brought into action before any further legislation of this character is passed."

Meanwhile the Switchmen's Union of North America, which presented to the railroads demands similar to those of the four brotherhoods, apparently intends to see what it can get by the process of arbitration, instead of depending entirely on the new law, which of course applies to its members just as it does to the trainmen in the other organizations. This organization, which contains less members than its rival, the Brotherhood of Railroad Trainmen, agreed to submit its demands, together with the contingent proposals of the railways, to arbitration under the Newlands law, after the brotherhoods had rejected a similar proposal. The United States Board of Mediation and Conciliation, through whose offices the arbitration agreement was brought about, has just been notified that the union has selected as its arbitrators J. B. Connors, assistant president, and W. A. Titus, vice-president, of the Switchmen's Union. The railroads are expected to name two arbitrators within a few days.

Laws Which Increase Railway Expenses

Although the sixty-fourth Congress at its session recently closed has passed comparatively few laws affecting railroads, the eight-hour law, which it is estimated will increase the wages of the train employees at the rate of about $60,000,000 a year, is not the only one which will greatly increase the expenses of the roads. Another, which has apparently attracted little attention, is the corporation tax law provision of the revenue law, which provides for a tax of two per cent annually, instead of one per cent as before, upon the total net income received in the preceding year from all sources "by every corporation, joint-stock company or association or insurance company." The Pomerene bill of lading law is also likely to be more or less expensive in increasing the liability of the roads under bills of lading. Congress also amended the hours of service law to provide for a minimum fine of $100 for violations, whereas the law formerly provided only a maximum of $500. The Decker clearance law, providing for greatly increased clearances between cars and locomotives and structures, which was reported to the House from the Committee on Interstate and Foreign Commerce, was not called up for passage during the session.

Undoubtedly the most important action affecting the railways, at least in its possibilities, was the creation of the Newlands committee to make a study of the entire subject of railway regulation. Probably for the reason that it was preferred to withhold action until this committee has made its report the bill providing for a reorganization and an increase in the membership of the Interstate Commerce Commission was not passed. Another law of great importance which was enacted was the rider to the postoffice appropriation bill directing the Interstate Commerce Commission to fix

and determine from time to time fair and reasonable rates for the transportation of mail matter by common carriers and to prescribe methods for ascertaining the compensation of the carriers for handling the mails. The Cummins amendment to the interstate commerce law relieves the railroads of the necessity of requiring declarations of the value of baggage.

STATIONARY BOILERS FIRED BY PULVERIZED COAL ON THE MISSOURI, KANSAS & TEXAS

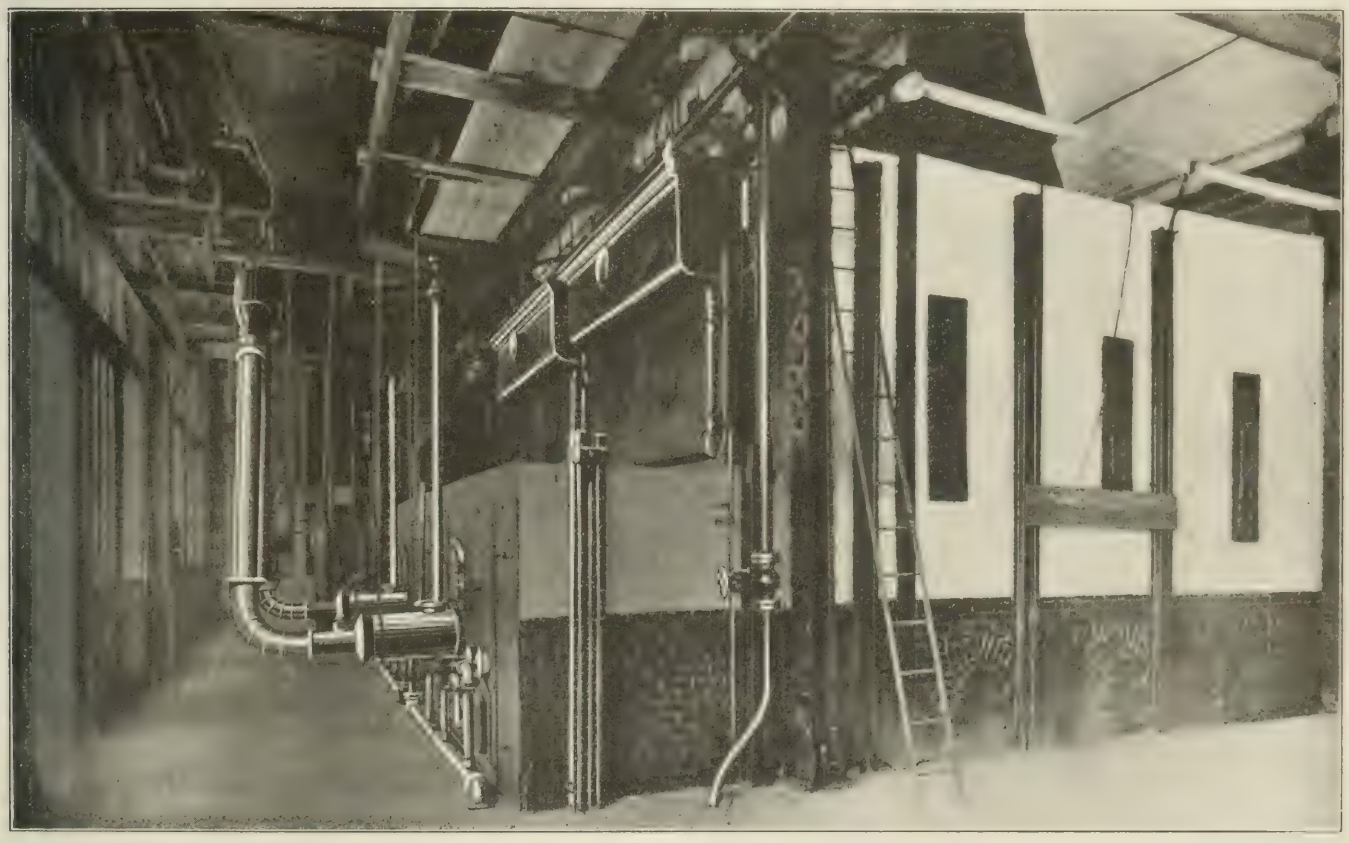
During the winter of 1912, when the natural gas supply was limited in quantity and fuel oil hard to obtain in Kansas, the officers of the Missouri, Kansas & Texas decided to investigate other methods for generating steam in the boilers at the powerhouse of the shops at Parsons, Kan. There were at this point, eight 250-hp. boilers of the Heine water tube type, equipped for using natural gas and oil as fuel. Some of the other fuels available in the district, which would be within an economical range as to cost delivered at the plant, were soft coals from the Mineral mine in Kansas, the McAlester and Lehigh mines in Oklahoma, and lignite from Texas, with the following analysis:

Kind of coal	Fixed carbon	Volatile	Ash	Moisture	B. t. u.
Mineral	45.22	26.39	20.38	8.01	10,640
McAlester	47.07	32.37	14.29	6.27	11,837
Lehigh	41.40	31.28	19.29	8.03	11,200
Lignite	25.50	33.95	7.58	32.97	7,548

The sulphur, separately determined, ranged from approximately 3 to 5 per cent in the various soft coals.

Owing to the ash and moisture content of these fuels, it was determined to investigate methods of using them in pulverized form, as it was known that pulverized bituminous coal has been in successful use in the cement industry, in a major portion of the plants throughout the country. This investigation resulted in the placing of a contract for the necessary equipment at the Parsons powerhouse with the Fuller Engineering Company, Allentown, Pa., and the material and machinery was delivered in the fall of 1913. Owing to financial conditions, it was thought unwise to make the change at that time, but in the early part of 1916, owing to the abnormal price of fuel oil, orders were given to proceed with the work, and the plant was placed in successful operation August 1, 1916.

The equipment for pulverizing and drying fuel is contained in a separate building, which is located near one end of the boiler house and the coal is dumped from the cars directly into a concrete track hopper of 50 tons capacity adjoining this building. The plant is designed to handle either mine run or slack coal and immediately below the track hopper is placed a set of Jeffrey double spike-tooth rolls, which will reduce lumps up to 12 in. by 18 in. to 5-in. cubes or less in one operation. As the coal passes through this crusher, it is discharged onto a 20-in. inclined belt conveyor, which discharges directly into a set of Lehigh corrugated rolls. The upper end of the belt conveyor passes over a Cutler-Hammer magnetic separator pulley, the function of which is to remove any pieces of iron or steel which may be in the coal and retain them on the belt until it passes off the underside of the pulley, the metal then dropping to the floor behind the crusher rolls. The coal from these rolls is reduced to pass through a ¾-in. mesh and discharges directly into a dust-tight elevator, from which it is distributed by a 12-in. screw conveyor into a storage bin over the coal dryer, of 50 tons capacity.



Heine Type Horizontal Tubular Boilers Burning Pulverized Fuel, at the Parsons, Kan., Shops of the Missouri, Kansas & Texas

The equipment throughout the pulverizer plant is operated by Westinghouse three phase, 60 cycle motors at 440 volts. The crusher below the receiving hopper is driven by a 10-hp. belt connected motor, while the inclined belt conveyor and the second crusher are operated by one 15-hp. belt connected motor. This arrangement of the drive obviates any possibility of choking the second crusher. The elevator and

screw conveyor, by means of which the coal is taken from the rolls and delivered to the storage bin, are operated by a 10-hp. back geared induction motor.

Coal may be drawn from any part of the storage bin and delivered by means of a screw conveyor to the Fuller Engineering Company's indirect fired dryer, a chute from the screw conveyor being provided for the delivery of coal to the floor to be used in firing the dryer furnace. The dryer is driven by a 10-hp. induction motor and will evaporate the moisture from coal containing 10 per cent moisture, to ½ per cent at the rate of eight tons per hour. In order that lignite, containing from 30 to 50 per cent moisture may be handled, the dryer is arranged so that the material may be passed through as many times as may be necessary to reduce the moisture to the desired amount before the coal is delivered to the pulverizer.

From the dryer the coal is discharged directly into a second dust-tight elevator, delivering to a 12-in. screw conveyor, both of which are driven by a 10-hp. induction motor. The conveyor discharges the fuel into two bins of 40 tons capacity each, which feed two 42-in. Fuller-Lehigh pulverizing mills. Each pulverizer is driven by a 60-hp. vertical motor and in one operation reduces the fuel so that 95 per cent will pass through a 100 mesh screen and 85 per cent through a 200 mesh screen, at the rate of four tons per hour. As the fuel leaves the pulverizer it is discharged into a third dust-tight elevator and delivered to a 12-in. screw conveyor, which carries it to the bins in front of the boilers. This elevator and screw are driven by a 15-hp. induction motor, the conveyor passing from the pulverizer building to the powerhouse through a steel bridge covered with corrugated sides and roof.

The capacity of the pulverizer plant is 180 tons per day of 24 hours and the requirements of the present boiler installation are about 96 tons in 24 hours. Arrangements are being made for the trial of pulverized coal in locomotive service, one engine now receiving the pulverized fuel burning equipment, and an outside storage bin will be added to the plant to take care of the locomotive fuel supply.

The boilers in the powerhouse are arranged in pairs and as equipped for burning gas and oil, the combustion takes place in the furnace directly under the heating surface of the boiler. For pulverized fuel, however, a Dutch oven furnace has been built on the front of the boiler setting, it having been found that the best results are obtained in this manner. The equipment for burning the fuel is simple. Each pair of boilers is provided with a blower, driven by a 10-hp. constant speed direct current motor, a blast pipe from this blower entering the rear end of an induction tube passing through the wall of each furnace. Each blast pipe is fitted with a gate for controlling the air jet to the combustion tube. The fuel from the bins passes through a 4-in. screw feeder, the speed of which accurately determines the rate at which the coal is delivered to the furnace. Each of these feeders is driven by a 2-hp. variable speed motor. The fuel from the feeders is led by gravity through a pipe entering the top of the induction tube near the front of the furnace. The action of the high velocity jet from the blast pipe induces a large volume of air at lower velocity through the induction tube; the fuel is caught by this current, with which it is thoroughly mixed, and enters the furnace at a low velocity,



Fuller-Lehigh 42-in. Pulverizer Mills at the Parsons Plant

burning with a lazy flame which practically fills the combustion chamber.

The fuel bins in front of the boilers have a capacity equivalent to 16 hours service at boiler rating. The bins and supports are of steel and the bins are closed with steel covers which are dust-tight. Each bin is hoppered and is equipped with a hand-operated agitator, the purpose of which is to prevent the bridging over of fuel in the hopper.

Considerable experimental work has been done in order to secure the best furnace arrangement and to provide an effective control of combustion to meet the requirements of varying loads on the boilers. As installed for the use of gas, the boilers were provided with three-pass horizontal baffles. In the pulverized fuel fired boilers these baffles are being replaced by a vertical three-pass arrangement from which excellent results have been obtained.

Various tests have been made with the different fuels mentioned and all of them were burned with entire success, an effective distribution of the heat throughout the heating surface of the boiler being obtained and the stack temperatures being low. No deposit of ash settled anywhere in the boiler that could not readily be dislodged with an ordinary air blast. With Texas lignite and a boiler output of 110 per cent of rated capacity, an equivalent evaporation of 8.81 lb. of water per pound of combustible was obtained. The coal as fired, had a heating value of 11,250 B. t. u. and contained 7 per cent moisture, the dryer not being arranged to handle this class of fuel regularly. At about 92 per cent of rated capacity an equivalent evaporation of 10.9 lb. of water per lb. of combustible was obtained with Mineral slack (Cherokee County, Kansas), the fuel as fired containing one per cent moisture. Including the cost of pulverizing, which was 35 cents per ton, the cost of this coal delivered to the bin was $1.795 per ton. The cost of evaporating 1,000 lb. of water was 11.6 cents while with natural gas, the heating value of which is about 940 B. t. u. per cubic foot, the cost of evaporating 1,000 lb. of water was 16 cents, the gas being purchased at 12.5 cents per 1,000 cu. ft.

The normal coal feed is arranged to develop about the rated capacity of the boiler. At maximum feed, however, the boilers may be forced to 142 per cent of rated capacity. No difficulty has been experienced from abnormal furnace temperatures which would tend to destroy the furnace walls. Even under forced conditions the furnace temperature does not exceed 2,350 deg. F., and under normal conditions it is about 2,100 deg. F.

THE ADVISORY COMMITTEE AND THE EIGHT-HOUR LAW

Frank Trumbull, chairman of the Railway Executives' Advisory Committee, has issued the following statement to refute inaccuracies which had appeared in newspaper accounts of the meeting of the Advisory Committee:

"An entirely erroneous impression concerning the attitude of the railway executives toward the Adamson eight-hour law has been given circulation through inaccurate reports of the proceedings of the meeting of the Railway Executives' Advisory Committee which was held at this office on Wednesday (September 20). There has been no change of attitude on the part of the executives as a whole on this matter, and in whatever deliberations they have pursued concerning it they have proceeded in an orderly way to ascertain, if possible, first, the effect of the law as a practical operating problem, and, second, its legal status.

"Investigation of the practical problem involved is being pursued by the managers of the roads through the National Conference Committee of the Railways, Elisha Lee, chairman, and a study of the legal questions has been referred to the counsel of the various railways for investigation and future consideration. The railway executives have, throughout this whole controversy, taken a position squarely in favor of investigation before action. In harmony with that policy, they are seeking by a study of every phase of the subject and a careful investigation into all of its bearings to prepare the way for the proper course to be pursued.

"There is today, as there was on the day of its passage, great dissatisfaction with the so-called eight-hour act, both in principle and the manner of its enactment. There has been no change of feeling on these points, nor, indeed, could there be, in the light of the facts.

"The committee of executives which conducted the negotiations for the railways at Washington, of which Hale Holden is chairman, is continued in its activities for the railroads in this matter, and has under consideration the problems to be met.

"There are various questions of policy, aside from those of an operating or legal nature, which must be decided. If the railway executives, on advice of counsel, should conclude that the law is invalid or even unfair, they must then consider what is to be their attitude to their shareholders in the matter of its enforcement. They must also consider their duty to the public in asking for an increase in railroad rates, as suggested by the administration. They must meet the question whether or not, under the eight-hour law, they must require men who now work less than eight hours to give a full eight hours of service. These and other questions of policy are all to be considered before decision or action.

"There was nothing in the deliberations of the executives on the day in question to warrant the reports which have been circulated."

Howard Elliott, president of the New York, New Haven & Hartford, sent a letter to the New York Times, dated September 22, referring to an editorial entitled "Second Thought," which was based on the above-mentioned misconception of the meeting of the Advisory Committee. In it he said:

"For your information, may I have the privilege of stating that I am a member of the Railway Executives' Advisory Committee and attended the meeting on Wednesday. No action was taken at that meeting that justified the statement appearing in this morning's editorial. The position of the owners and managers is the same today as it was in Washington when they urged the President and Congress not to take a 'leap in the dark' in this matter. They are, however, citizens and will obey the Adamson law if it goes into effect. As an individual and as an officer of a railroad company I feel it to be my duty to have that law tested, if possible—in the interest of 35,000 employees on the New Haven road who are not members of the so-called Big Four Brotherhoods, in the interest of about 45,000 holders of New Haven securities and in the interest of nearly 10,000,000 people living in New England and New York along the line of the road and who are more or less dependent upon its ability to add to its facilities. Therefore, I feel it to be my duty, in a legal and orderly way, to have the law investigated and interpreted in order that the sober second thought of the American people can be brought into action before any further legislation of this character is passed."

MANGANESE ORE AT ILSEDE.—Much of the manganese ore wanted for the German steel industry now comes from the Ilsederhütte, near Peine, east of Hanover. The occurrence of manganese ores was known, but the ores were practically inaccessible, lying immediately underneath the village of Ilsede. A large portion of this village had to be removed; this has been done since the war began, and the works are said to have paid 33 per cent in dividends last year. The district of Peine also produces petroleum, and there is a petroleum refinery at Peine.—*Engineering.*

TRAIN ACCIDENTS IN AUGUST[1]

The following is a list of the most notable train accidents that occurred on the railways of the United States in the month of August, 1916:

Collisions

Date	Road	Place	Kind of Accident	Kind of train	Kil'd	Inj'd
9.	Southern	Crosswell.	bc	P. & F.	1	3
10.	N. Y., Susq. & W.	Blairstown.	rc	P. & F.	0	3
11.	Texas & Pacific, Galveston H. & S. A.	El Paso.	xc	P. & F.	0	17
15.	Balt. & Ohio	Vance, Pa.	bc	F. & F.	3	3
16.	Wabash, Ill. Traction	Venice.	xc	F. & P.	0	4

Derailments

Date	Road	Place	Cause of Derailm't	Kind of train	Kil'd	Inj'd
1.	M., K. & Texas	Lancaster.	b. rail	P.	3	20
4.	Lake Erie & W.	South Bend.	boiler	P.	2	7
8.	Missouri Pacific	Elmo, Kan.	b. rail	P.	0	0
11.	Southern	Bellwood.	neg.	P.	0	2
11.	Great Northern	Boru, Mont.	ms	P.	1	25
11.	Penn.	Mt. Pleasant.	.....	F.	1	2
12.	Atchison, T. & S. F.	La Rose.	boiler	F.	2	1
12.	Erie	Youngstown.	acc. obst.	P.	0	2
19.	Atchison, T. & S. F.	Deming	washout	F.	1	2
19.	Cleve., C., C. & St. L.	Seneca.	unx	F.	0	0
24.	Lehigh & N. E.	Nazareth.	unx	F.	3	0
26.	Phila., Balt. & W.	Dover.	der. sw.	F.	1	2

The trains in collision on the Southern Railway, at Crosswell, S. C., on the 9th of August were a southbound passenger, No. 11, and a northbound freight. The passenger train was standing at the station when the freight approached on the main track, at uncontrollable speed, when it should have entered the side track before reaching the station. The engineman of the passenger train was killed and three trainmen were injured.

The trains in collision near Blairstown, N. J., on the 10th were an eastbound passenger and an eastbound freight. The passenger ran into the freight train and wrecked the caboose. Three trainmen were injured. The freight had encroached on the time of the passenger train without proper flag protection.

The trains in collision at El Paso, Tex., on the 12th were Texas & Pacific westbound passenger No. 5, and a switching engine of the Galveston, Harrisburg & San Antonio, the switching engine being on the main track without right. Seventeen passengers were injured, none seriously.

The trains in collision at Vance, Pa., on the 15th were through freights. Three trainmen were killed and eight were injured. The cause of the collision was the neglect of the men in charge of the inferior train, which had run past the appointed meeting station.

The trains in collision at Venice, Ill., on the 16th were a passenger train of the Wabash, and a train of the Illinois Traction Company consisting of a motor passenger car and an empty sleeping car. The steam engine ran into the side of the electric train, at the crossing of the two roads, and badly damaged one of the coaches. Four passengers were slightly injured. The movement of trains over this crossing is controlled by a flagman whose flag signal is said to have been misinterpreted.

The train derailed near Lancaster, Tex., on the 1st was a southbound passenger, known as the "Texas Special." The engine and four cars were ditched and the engineman, fireman and one passenger were killed. Twenty or more passengers were injured. The cause of the derailment was a broken rail.

The train derailed near South Bend, Ind., on the 4th was a northbound passenger. The boiler of the engine exploded and the first two cars were derailed. The engineman and fireman were killed by the explosion and one trainman and six passengers were slightly injured. The cause of the explosion was not determined.

The train derailed at Elmo, Kan., on the 8th was westbound passenger number 4. The train was running at moderate speed and no passengers were seriously injured. The derailment was caused by a broken rail.

The train derailed at Bellwood, Ga., on the 11th at about 12:15 a. m. was eastbound passenger No. 36, drawn by two locomotives. Both of the engines were overturned, and the engineman and fireman of the leading engine were scalded. The derailment occurred at a derailing switch, the signal of which appears to have been disregarded.

The train derailed on the Great Northern near Boru, Mont., on the 11th was eastbound passenger No. 44. Two engines and the first three cars were ditched. One engineman was killed and six passengers and nineteen employees were injured. The cause of the derailment was a misplaced switch, said to have been left in the wrong position by track repairers.

The train derailed near Mount Pleasant, Pa., the 11th was a northbound freight, and the engine was overturned. Seven cars were piled upon the overturned engine, and the fireman was killed. The engineman and one trainman were injured.

The train derailed near La Rose, Ill., on the 12th was an eastbound freight. The engineman and fireman were killed by the explosion of the boiler, and one brakeman was injured. The cause of the explosion was low water.

The train derailed near Youngstown, Ohio, on the 12th was eastbound passenger No. 620. Seven coaches left the rails, and two passengers were injured. The cause of the derailment was a stray piece of iron rod lying on or near the track.

The train derailed near Deming, N. M., on the 19th, was an eastbound freight. The engine and 5 cars were wrecked and piled up in a gully caused by a washout. The engineman, fireman and conductor were injured, the engineman fatally.

The train derailed near Seneca, Ill., on the 19th was a westbound mixed train. Four cars fell through the bridge over the Illinois river. The bridge appears to have been knocked down by a derailed car. The cause of the derailment was not determined.

The train derailed near Nazareth, Pa., on the 24th was a westbound freight. The derailment occurred within yard limits but it appears to have been due to excessive speed. The locomotive (at the head of the train) was running backwards. The leading wheels mounted the rail on a curve and the engine and five cars were piled up in a bad wreck. The engineman, fireman and one brakeman were killed. These were the only persons on the train, and the cause of the derailment has not been discovered. Both the engine and the track were nearly new, and in good condition.

The train derailed near Dover, Del., on the 26th, about 11 p. m., was an extra freight. The engine ran over a derailing device and was overturned. The engineman was killed and two other employees were injured.

Electric Car Accidents. Near Johnstown, Pa., on the 12th of August, a trolley car of the Southern Cambria Traction Company collided with a standing car at the foot of a hill, having become uncontrollable on the steep descending grade, and 25 persons, including the two motormen, were killed or fatally injured.

[1]Abbreviations and marks used in Accident List:

rc, Rear collision——bc, Butting collision——xc, Other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc. ——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

THREATENED RAILWAY STRIKE IN GREECE.—The employees on the Peloponnesus and Athens-Piræus railways, following the example of the tramway employees, threaten to strike if they are not granted an increase of pay.

A Catechism of the Adamson Pay Day Law

Questions and Answers Making Clear What It Is and What It Isn't—Merely an Act to Increase Wages

Q. What is the "Adamson law?"

A. It is a law designed to give certain railway employees a 21 per cent increase in wages, by insuring them the same pay for eight hours as they now get for 10 hours.

Q. Does the law make eight hours the maximum time these men may work in one day? In other words, does it aim to establish a real eight-hour work day?

A. It does not. They may work any number of hours up to 16 a day, provided they get a wage increase of 21 per cent over the present wages.

Q. Then, it is not a law for a bone fide work-day of eight hours at all?

A. In no sense is it such a law. It is a basic wage plan only, and hence totally different from all other so-called "eight-hour" laws.

Q. Does the law require the men to work a full eight hours to earn a full day's pay?

A. This was not the intent of those responsible for the passage of the law, but this may be held to be its meaning, and that possibility is greatly worrying the men whom the law was intended to specially favor.

Q. Who are those men?

A. The members of the railroad brotherhoods.

Q. What are they?

A. They are the four labor unions which are made up of the men employed in railway train service: (1) the locomotive engineers; (2) the firemen; (3) the conductors; (4) the brakemen, flagmen and yardmen, or switchmen.

Q. Do these men get good wages?

A. They get very high wages. On the western railroads in 1915 all the train service employees (including those who worked only a fraction of the years) earned these wages, on an average:

	Passenger	Freight	Yard
Engineers	$2,038	$1,737	$1,218
Conductors	1,772	1,624	1,292
Firemen	1,218	973	832
Brakemen	912	1,000	1,026

On all the railroads in 1915 three-quarters of the train employees earned these wages:

	Passenger		Freight		Yard	
	Range	Average	Range	Average	Range	Average
Engineers	$1,641 3,983	$2,067	$1,455 3,505	$1,892	$1,005 2,445	$1,526
Conductors	1,543 3,004	1,850	1,353 2,932	1,719	1,055 2,045	1,310
Firemen	943 2,078	1,203	648 2,059	1,117	406 1,633	924
Brakemen	854 1,736	1,095	755 1,961	1,013	753 1,821	1,076

These are the highest paid workers in railroad service and while these men constitute only 18 per cent of the employes, their share of the pay roll is 28 per cent.

Q. Do they work every day in the year to make these wages?

A. They do not. A record kept for a typical month (October, 1913) for engineers and firemen on western roads showed they worked only 23.4 days per month. So they have more days to rest than does other labor having steady jobs.

Q. How are their wages calculated?

A. For men in freight service, being those who are now complaining, they are calculated on the basis of a day of 10 hours or less, or 100 miles or less. If a man makes his run in 10 hours or less he gets pay for the full day, even though he works only six or seven hours. If his run takes over 10 hours, he gets pay pro rata for the time in excess of ten hours; that is, if his excess time is one hour, he gets one and one-tenth his day's pay and so on. If his run is over 100 miles, he gets pay pro rata for the mileage in excess of 100 miles, no matter how few hours it takes to make the run. If his run is over 100 miles and takes over 10 hours, he gets his extra pay either for the excess hours or for the excess mileage, whichever makes the higher amount of pay for him.

Q. How have these wages and conditions been arrived at?

A. They have been arrived at by negotiations from time to time during the past 30 years, originally with the individual roads and of recent years by general conferences of committees representing the brotherhoods and the railroads; and more recently by arbitration covering large parts of the country. There have been four important arbitrations:

1. Between eastern railroads and conductors and brakemen. Submitted to arbitration July 26, 1913. Arbitrators were: Seth Low, chairman; A. H. Smith, John H. Finley, L. E. Sheppard, W. W. Atterbury, D. L. Cease.

2. Between eastern railroads and locomotive engineers. Submitted to arbitration April 30, 1912. Arbitrators were: Charles R. Van Hise, chairman; Oscar S. Straus, Otto M. Eidlitz, P. H. Morrissey, Frederick N. Judson, Albert Shaw, Daniel Willard.

3. Between eastern railroads and firemen. Submitted to arbitration February 18, 1913. Arbitrators were: William L. Chambers, chairman; W. W. Atterbury, Albert Phillips.

4. Between western railroads and engineers and firemen. Submitted to arbitration August 3, 1914. Arbitrators were: J. C. Pritchard, chairman; Charles Nagel, H. E. Byram, W. L. Park, F. A. Burgess, Timothy Shea.

In each the men asked for much more than they expected to get and were given generous awards—probably all they hoped to get. In none of these cases was the railroads' request granted for arbitration of certain of their grievances; so that the railroads always lost without any compensating gains whatever.

Q. What was the recent demand of the brotherhoods?

A. It was that they should be paid for the first eight hours of their run the same amount which they now receive for the first 10 hours; and that for any time in excess of eight hours they should be paid 1½ times the hourly rate. For example, if a man's pay is now $4.00 for 10 hours, this demand meant that he should get $4.00 for the first eight hours and then should get 75 cents per hour for time in excess of eight hours, thus making for 10 hours' work $5.50 or an increase of 37½ per cent.

Q. Were they not trying to get their work cut down to eight hours a day?

A. They were not. They were and are glad to work the additional time so as to get additional money. They would oppose any effort to prohibit them from working only eight hours a day.

Q. Then they were trying to get more money instead of trying to get a shorter day?

A. That is exactly what they were trying to do.

Q. Would their demand have made any important increase in the expenses of the railroads?

A. The railroads estimated that it would cost them about $60,000,000 additional merely to grant this demand of the men for increased pay even if the excess time over eight hours was paid for only at the hourly rate instead of at 1½ times the hourly rate; and estimated it would have

cost an additional $50,000,000 if the excess time had been paid for at 1½ times the hourly rate.

Q. What answer did the railroad companies make to the demands?

A. The railroads said the trainmen were already paid very high wages and could not reasonably demand still further increases; that they already got wages which were relatively much higher than the other railroad employees got and that it was unjust to increase this disparity still further; that the railroads could not stand the additional cost unless the freight and passenger rates paid by the general public should be increased; but that the railroads were willing to submit the whole matter, including requests on their part for certain changes in some extra or so-called double pay schedules, to the Interstate Commerce Commission or to arbitrators selected according to the Act of Congress known as the Newlands act, or to arbitrators appointed by the President; that such arbitrators could examine all the facts and hear all the reasons for and against the claims of each side and then declare what they thought was reasonable and just, and that the railroads would abide by that decision.

Q. What did the brotherhoods say to the railroads' position?

A. They said they would not arbitrate and would not await any inquiry into the reasonableness or unreasonableness of their demands and would strike and tie up every railroad in the United States so that neither freight nor passengers could move unless their demands were granted.

Q. What happened then?

A. After various efforts at mediation by other federal officers, President Wilson summoned both sides to Washington and indicated that he had decided that the railroads ought to pay the men for the first eight hours of their work the full pay which the various conferences and arbitrators had fixed in the past as reasonable for 10 hours' work, and should pay for any time in excess of eight hours at the hourly rate. He suggested that the further demand of the men for the still higher pay of 1½ times the hourly rate for time in excess of eight hours and all other questions at issue should be held in abeyance and be the subject of consideration in the future. He said he would use his influence to get freight and passenger rates increased so as to put the burden on the general public of paying for the heavy increased pay (estimated by the railroads at $60,000,000 per year) which his view would give to the men.

Q. Does this mean that President Wilson proposed that the railroads should pay the men additional wages for the same service over and above the wages which had been fixed in the various conferences and arbitrations in the past?

A. It does.

Q. Had President Wilson, before deciding that this heavy increase in wages should be given to the trainmen, had a hearing of all parties concerned so as to get the facts as understood by both sides and so as to hear their arguments and so as to decide, on the basis of those facts and arguments, that his decision was just?

A. He had not. He made up his mind before summoning either side before him and without giving either side an opportunity to present its case or criticize the case which might be presented by the other side.

Q. Did President Wilson claim that these matters ought to be settled in this way by the President of the United States, himself, without a full hearing of both sides through the usual processes of arbitration?

A. No. He said his faith in arbitration was not shaken, but that the eight hour day was not arbitrable and that there was no way to compel arbitration of any of the questions and no way to prevent the brotherhoods from tying up all the railroads in the United States and hence that the men must be given what they demanded in order to keep them from stopping all the rail transportation in the country.

Q. Did President Wilson first urge the brotherhoods to agree to submit all their demands to arbitration and impress upon them that arbitration had the sanction of society and that public sentiment would not support a strike to enforce demands which the brotherhoods refused to arbitrate?

A. He did not. He started out by proposing that the brotherhoods be given without arbitration or investigation the principal increase in wages which they were demanding and that the remaining increase in wages be left open for future consideration.

Q. What was the position of the brotherhoods on this proposition?

A. They were tickled to death to accept it, although they made a show of reluctance. They knew they would get thereby far greater increases in wages than they could possibly hope for as the result of any impartial hearing and investigation.

Q. What was the position of the railroads?

A. The railroads claimed it was unjust to ask them, and through them the general public, thus to "stand and deliver" in answer to this hold-up by the brotherhoods without any opportunity for arbitration; that to yield to this hold-up would simply encourage other hold-ups and that the only proper course was for the railroads and the public to fight this thing out now, instead of whetting the appetites of the brotherhood leaders by tamely submitting to their present hold-up. The railroads also pointed out that the President could not guarantee increases in rates so as to put upon the general public the burden of the wage increase for the trainmen which he sought to bring about; that shippers and passengers would strongly oppose any such increase in their burdens and that no one could forecast what the Interstate Commerce Commission would do about granting any increases; and that it would be a betrayal of the public for the railroads to help create this additional burden, unless and until impartial arbitration had determined that it was a necessary burden.

Q. What happened then?

A. It developed that while these discussions were proceeding, the brotherhood leaders had already called a strike throughout the United States of all trainmen, both passenger and freight, to take effect at 7 a. m., September 4. The President therefore went personally to the Capitol and delivered an address to both Houses of Congress, in which he urged them to prevent the strike by passing a law giving the trainmen the price which they said they had to have to keep them from striking; that is, he asked Congress to pass immediately and without any opportunity for investigation an act requiring the railroads to pay the trainmen for the first eight hours of service the wages which had been fixed by various conferences and arbitrations as the reasonable wages for the first 10 hours of service, and to pay overtime at the hourly rate for the excess time over eight hours. The brotherhoods indicated that unless this bill was passed and signed by six o'clock Saturday evening, September 2, the rail facilities of the United States would be tied up by strike of all the trainmen, passenger and freight, at 7 o'clock on the next Monday morning.

Q. What did Congress do?

A. It did as it was requested. It hurriedly passed the bill which the brotherhood leaders said was the only thing which would prevent them from tying up the rail transportation of the United States.

Q. Was the bill passed and signed by 6 o'clock Saturday evening, September 2?

A. It was passed, but not signed. Instead the President of the United States made a pledge to the brotherhood chiefs that he would sign the bill on Sunday morning, September 3, and finally the brotherhood chiefs graciously agreed that in consideration of this pledge they would call off the strike

and would let the people of the United States continue to enjoy rail transportation.

Q. Did the President sign the bill so as to pay the price the brotherhood leaders demanded?

A. He did. He signed it with four pens and gave them to the four brotherhood chiefs as souvenirs of their conquest of the President and Congress.

Q. Did Congress have an opportunity to investigate the reasonableness of the increased wages which it voted to the trainmen?

A. It did not. It was admitted on the floor in both Houses that they did not know whether the demands were reasonable or not and that they had to pass the bill to keep the brotherhood chiefs from stopping rail transportation.

Q. Did the President recommend the passage of any other legislation?

A. Yes. He recommended the passage also of a bill prohibiting conspiracies to strike on the railroads except after there had been an impartial investigation and a decision and report as to the reasonableness of the demands.

Q. Would this prohibition of conspiracies to strike in advance of investigation have been sufficient to stop this strike?

A. It would. If this prohibition had been passed it would have prevented the strike and it would have been unnecessary for Congress to increase without investigation the wages of the trainmen and thereby put the Government in the humiliating position of submitting for the first time in the history of the country to an unqualified and unvarnished hold-up under a threat to tie up the business of the country.

Q. What did Congress do as to this additional recommendation?

A. It said there was not time to pass this prohibition which would have vindicated the dignity and power of the United States and that the matter could be considered at the next session.

Q. Would it have required any more time to pass this prohibition than it required to pass the act which yielded to the hold-up of the brotherhoods?

A. It would not. But Congress was willing to pass without the necessary time for investigation and consideration a bill which gave the brotherhoods the price they demanded; and was unwilling to pass, even with full time for investigation and consideration, the bill which would have vindicated the honor and power of the United States. The President and Congress knew for months in advance that the brotherhoods were threatening to strike and tie up all the railroads in the country unless their demands were granted without opportunity for arbitration. But neither the President nor Congress made any effort to provide legislation to prevent the carrying out of such a disastrous conspiracy and thereby vindicate the dignity and power of the country.

NEW RAIL MILL OF THE CARNEGIE STEEL COMPANY AT BESSEMER, PA.

The demand for open hearth rails and rails of larger area of cross section has caused the Carnegie Steel Company to construct an entirely new rail mill from the open hearth furnaces to the loading platform. Active work on the building of the Edgar Thomson Works dates back as far as 1872, the first steel rail having been rolled in 1875. The plant has been steadily enlarged in the 40 years since the first rail was rolled, and at the present time consists of 11 modern blast furnaces, a Bessemer department of four 15-ton converters, 14 open hearth furnaces, 4 rail mills, a splice bar shop, 3 foundries, a briquetting plant, auxiliary mills and a repair shop.

The limit of economic manufacture was reached on the old rail mill, known as No. 1, which produces rails up to 100 lb. per yard from an ingot 17½ in. by 19½ in. at its bottom, and 15 in. by 17 in. at its top. To produce a rail of heavier weight and greater height called for the construction of a heavier mill, which has recently been completed and is capable of rolling the heaviest rails that will be required for years to come. The heavier rails naturally required a larger ingot and larger soaking pits to accommodate them. The size of the new ingot is 23½ in. square, and is the largest ingot from which rails are produced in this country today.

The new rail mill, known as No. 2, consists of two stands of rolls in tandem, a blooming mill, a bloom shear, a reheating furnace and the finishing rolls, which consist of four stands of rolls set up in three trains, the first and second roughing rolls being in one train, and the first finishing rolls in another train, while the final finishing rolls are in a third train.

The ingot is cast at the open hearth furnace which has a capacity of 90 to 100 tons per heat. It is stripped of its mold, and placed in a soaking pit where it is left until it is ready to be rolled. It is delivered to the two stands of 48-in. rolls, where it is reduced in size, after passing through the two tandem rolls. It is then returned to its original starting point by means of two turn-tables and a return runway, and passes a second time through two different passes in the tandem rolls, which makes sufficient reduction to enable the 40-in. three-high blooming mill, to which it is delivered, to reduce it in size by seven passes, to a bloom about 10 in. square. This bloom then passes to a hydraulic shear, where the proper discard is made, and the bloom is cut to convenient lengths for further rolling. The bloom is then charged into a reheating furnace where it is reheated to the proper temperature, and delivered to the rail mill, where it is given 5 passes in the first roughing, 4 in the second roughing, 3 in the first finishing and 1 in the final finishing, after which it passes through the cambering roll, is sawed to length and delivered to the cooling beds. The total number of passes from the ingot to the finished rail amounts to 24.

Special design gag presses have been installed to take care of the heavier rails. Drill presses are so located as to permit of a limited quantity of long rails, about 65 ft. long, to be finished. The loading beds extend the entire length of the mill. After proper inspection the rails are lifted by means of electric magnets operated from traveling overhead cranes, and are placed on cars for shipment. Near the saws is located the drop testing machine, which was erected after the design adopted by the American Railway Engineering Association.

All the rolls are driven by five tandem compound steam engines. The first two sets of 48-in. tandem rolls are driven by a 5,000 hp. engine, the blooming mill by a 3,000 hp. engine, the first and second roughing rolls by a 4,000 hp. engine, and the first finishing stand by a 4,000 hp. engine. The cambering rolls, saws and second finishing stand are driven by a 2,000 hp. engine.

This new mill has been so designed as to make it more flexible than earlier designs of rail mills, in that it can produce other products when it is deemed necessary. The scheme of rolling has been changed in the design of this mill. In the first place, the larger ingot and the slow movement through the tandem 48-in. rolls and the larger fillets allowed, produce a better bloom, which is almost as smooth and free from cracks as a finished merchant bar. In the finishing end where the usual practice has been to keep the axis of the rail either in a horizontal or a vertical position, this mill holds the rail in an inclined position, thereby getting more work on the top of the rail than has heretofore been possible. A rolling recently completed of 130 lb. rails for the Pennsylvania Railroad shows very satisfactory results, and justifies the improved design of rolling.

There are many other features which make this mill inter-

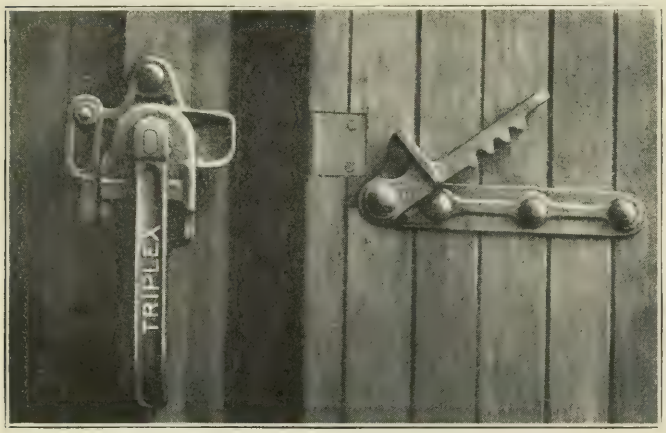
esting. Bridges with hand rails on both sides are provided where it is necessary to cross over any part of the machinery and tunnels and subways are provided to permit safe and easy passage under the mill. The tables on either side of the roll-stands are operated by electrical apparatus, located beneath the tables, and the cellars where these are located are kept clean and well lighted, so that there may be no chance for an accident.

In addition to the safety features around the mill proper, special attention has been given to the comfort and sanitary surroundings of the workmen. Fountains of clear, cool water are in evidence all around the plant; rest rooms with wash and toilet rooms, with modern equipment, for the welfare of the employees.

The entire layout of the plant was designed and erected by the engineers and superintendents of the Edgar Thomson plant, and the greater part of the equipment (except engines) was manufactured in the shops of the company. The rated capacity of this new mill is about 2,500 gross tons of rails per day of 24 hours.

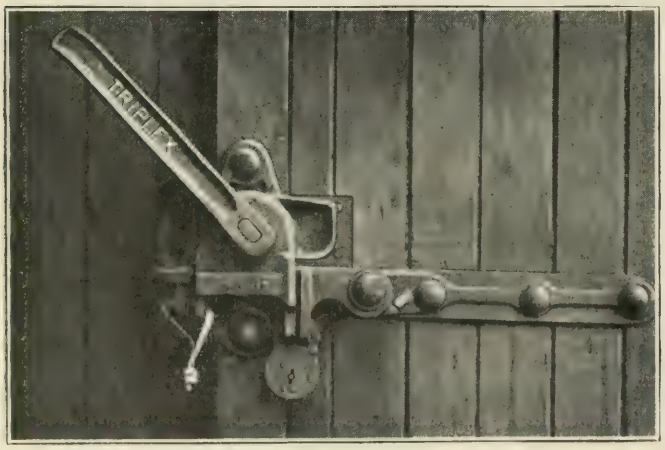
BOX CAR DOOR LOCK

The Triplex Lock Company, Michigan City, Ind., has placed on the market a new box car door lock, which provides a means for locking the door with a padlock in addi-



Triplex Lock with the Car Door Open

tion to the regular seal method. The lock is so constructed that additional power is obtained in closing and opening the door through a segmental gear and rack, as indicated



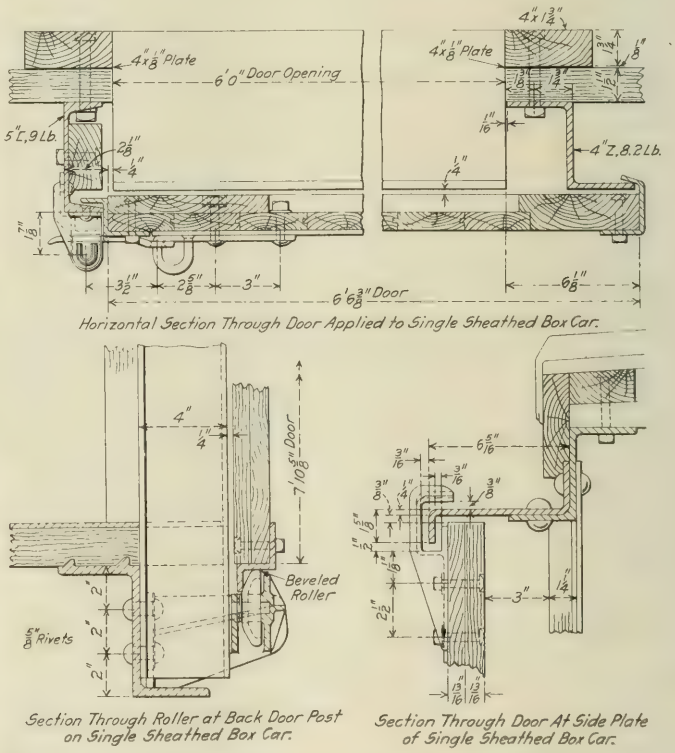
Triplex Lock with the Door Shut and Locked

in the illustrations. As the door approaches the closed position the rack, which is attached to the door, is thrown over and passes through a slot in the gear housing on the door post. This rack meshes with the gear, which in turn is operated by the handle shown. By twisting the handle the door is drawn to its shut position, a multiplication of power of 9 to 1 being obtained. A slotted lug on the rack abuts a corresponding lug on the gear housing through which the padlock is passed. The seal pin passes through a hole in the end of the rack and the seal is passed through the pin and a lug on the gear housing, as shown in the second illustration.

In opening the door this same increased power is available and eliminates the necessity of using crow bars and sledge hammers, which so often injure the car doors. The rack attachment also has the added advantage in that in case of a sagging door sufficient power may be exerted to bring the door up tight against the stop, permitting it to be locked, as above described. It will also be noted that a bracket on the gear housing forces the door up tight against the door post as the door is drawn to the closed position; this permits the lock to operate freely. With this lock the door may be securely fastened, thus eliminating a cause of defective doors.

NATIONAL CAR DOOR

The National door is a car door without a track. It is supported by strong brackets secured to the side sill, its weight and all stresses produced by it being transmitted direct to the underframe. No load is imposed on the superstructure or roof structure and the danger of binding, as in the case of a door hung on a track at or near the eaves of the roof, is obviated. The brackets, usually four at the door opening



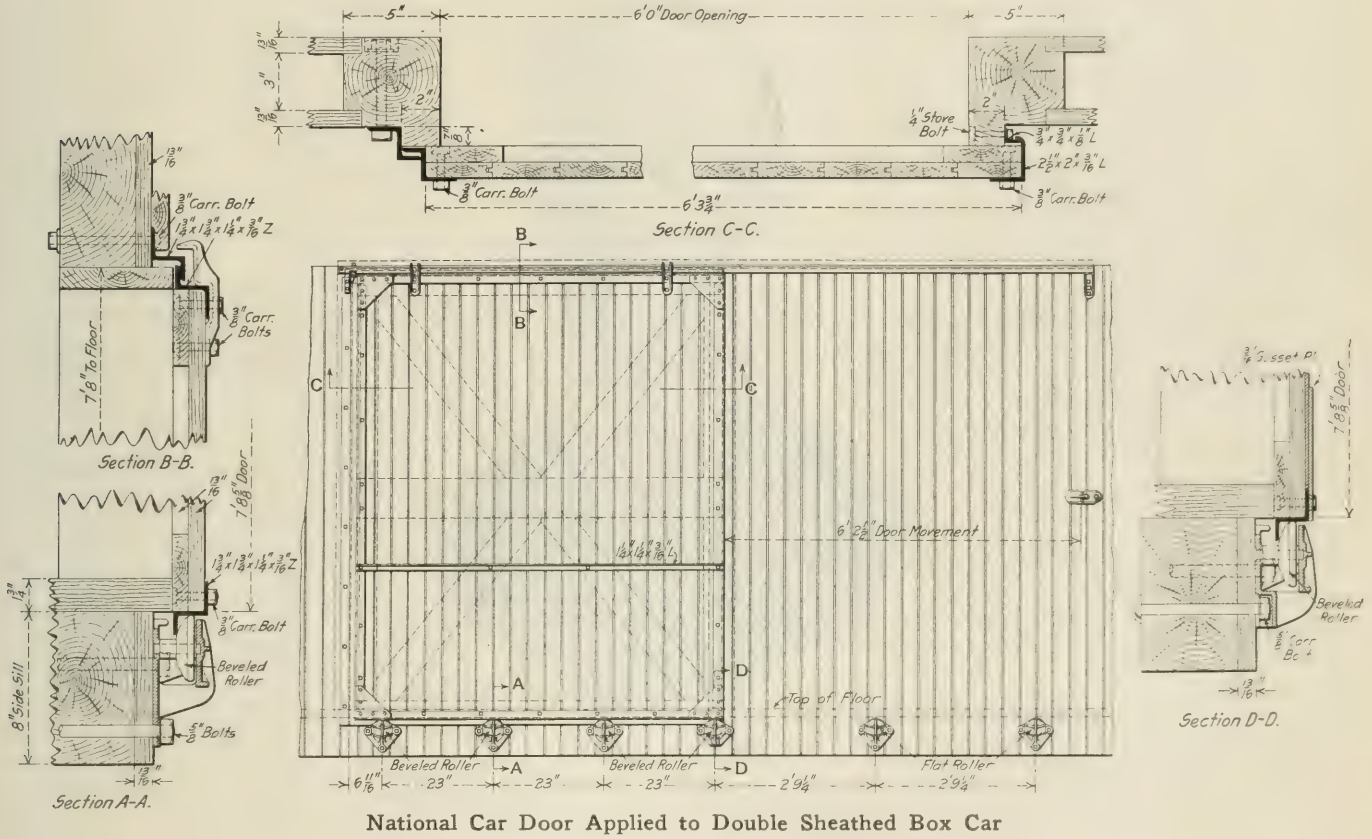
Sections Through National Car Door Applied to a Single Sheathed Box Car

and two at the back of the door opening, are fitted with rollers 3½ in. in diameter, the door traveling freely on these rollers. To insure a close fit when the door is closed the rollers at the door opening have a beveled face so that the door is moved inwardly as they rotate. The rollers back of the door opening are flat faced, being inserted in brackets with guide lugs to prevent the door marring the sheathing,

but still allowing ample freedom of movement. On steel frame single sheathed box cars the roller brackets are secured with rivets and on double sheathed box cars the roller bracket at the back of the door is so arranged that one of the bolts is concealed, thereby making it inaccessible and thus preventing burglarizing.

The door has a steel frame with gusset plates at the corners and a steel brace extending from the front strip to the back strip. This provides a rigid construction which will keep in alinement and protect the wood, and to which new boards can be applied at any time. The corner gussets prevent the frame strips from loosening or turning out in case the wood deteriorates. The door posts in the case of double sheathed cars project about an inch outside of the sheathing and the flooring at the doorway is carried out flush with the face of the post, the door being made wide enough to lap over the back post. The top and front frame strips are made of Z-bars, having one leg bolted to the door and the other leg extending out from the door and interlocking with Z-bars or other suitable members on the car. The bottom frame strip is also of Z-bar section, one leg being bolted to the door and the other extending down and behind the rollers described above. The back frame strip is an angle with one leg bolted to the door and the other, slightly longer than the thickness of the door, bent inward to close over the leg of a small angle secured to the back door post. This construction makes the door weather proof and spark proof. The interlocking of the door at all sides also prevents it from being sprung open by thieves when once it is closed.

Safety hangers are provided to carry the door on the door hood in the event the car to which it is applied is side-wiped and the bottom roller brackets knocked off. In such a case the door would still be operative. Safety door stops are also provided in case the ordinary back stop is knocked off. These are extra precautions taken to prevent the loss of the door from the car. From reports of 1,000 cars, on which these doors have been in service for one year, the maintenance expense has been practically negligible and not a door has been reported lost from a car. The illustrations show clearly the construction of this door. It is made by the Union Metal Products Company, Chicago, Ill.



National Car Door Applied to Double Sheathed Box Car

RAILWAY DEVELOPMENT IN VENEZUELA.—According to consular reports, the total railway mileage of Venezuela is 539 miles, including the 5 miles of the Macuto & Coast Line Railway, which is really an electric tramway. The present termini of the Central Railway of Venezuela are Caracas and Yare, the extension of about 5 miles, from Santa Teresa to Yare, having been opened to traffic. The Bolivar Railway worked with regularity during 1915, and the new branch line to San Felipe has been opened to traffic as far as Marin, close to San Felipe. In the Maracaibo district three railways are operating, viz.: The Gran Ferrocarril de Tachira, about 72 miles in length, which runs from Encontrados on the river Catatumbo to Tachira, and from that town there is a good road to San Cristobal; the Gran Ferrocarril de La Ceiba, which starts from La Ceiba and runs for some 58 miles into the interior of the State of Trujillo; and the Santa Barbara Railway, which starts from Santa Barbara on the river Escalante, and runs about 50 miles into the state of Merida.

SERBIANS ON FRENCH RAILWAYS.—A number of Serbian railway men are now working at various railway centers in France. Altogether, the Paris-Orleans and the Paris, Lyons and Mediterranean companies have 500 of these men.

NEW RUSSIAN RAILWAY.—The Russian Government has decided to begin in January, 1917, the construction of a railway from Alexandrovgai—the terminus of a branch line of the Rjasan-Urask Railway to Tchardchui, a distance of approximately 1,100 miles, on the Merv-Buchara line, in Buchara. Thence the railway will be continued to Kerki, on the frontier of Afghanistan, and also to Kungari.

WILLIAM J. CUNNINGHAM

W. J. Cunningham, president's assistant of the Boston & Maine, has been appointed to the James J. Hill Professorship of Transportation of Harvard University. This professorship was established to commemorate the work of the late James J. Hill. Howard Elliott, president of the New York, New Haven & Hartford, and Thomas W. Lamont, perhaps, did more to secure the establishment of the James J. Hill professorship than any others, but the list of donors to the gift of $125,000 which establishes the professorship is a long one.

The appointment of William J. Cunningham shows a recognition of the really great possibilities that are in the professorship. There are very few men in the United States who combine a thorough practical knowledge of railroad operation with the scholarly qualities necessary to make a professorship at Harvard University of as far reaching influence and importance as it can be made. Mr. Cunningham is one of these few men. Railroad operation and management have many points in common with a profession, yet insofar as the opportunities of learning the business are concerned, it is more in the nature of a trade or business. Experience has been almost the only school open to the student. There have been exceptions, of course. The work done by men like Professor Ripley of Harvard and Professor Adams of Michigan has been of great usefulness. To a certain extent, however, there has been lacking on the part of those who are engaged as student teachers of railroad management, a thorough first-hand knowledge of the problems of railroad operation. It is in the operating department that the young man entering railroad service has had to feel his way by experience. It is by the results of operation of railroads that the public knows them, but of the operations themselves the public knows nothing. It is of the utmost importance therefore that so important and influential a position as the James J. Hill Professorship of Transportation should be filled by a man who understands the actual practical problems involved in railroad operation and management and who at the same time has that broader scholarship which is essential in such a position.



W. J. Cunningham

William J. Cunningham was born April 29, 1875, at St. John, N. B. He began railway work in 1892 with the Canadian Pacific as stenographer and ticket clerk in the passenger department at St. John, N. B., and Boston, Mass. In 1896 he went to the Boston & Albany as clerk in the superintendent's office at Boston, and three years later became statistical clerk to the general manager of the New York, New Haven & Hartford. From 1901 to 1907 he was employed in various capacities by the Delaware, Lackawanna & Western, his last position being assistant chief clerk to the general superintendent. In November, 1907, he became associated with J. H. Hustis (then assistant general manager of the Boston & Albany) as statistician. When the Harvard Business School was established in 1908, Mr. Cunningham was engaged for two years as lecturer on railroad operation. In September, 1910, he was appointed assistant professor of transportation, but continued to act on Mr. Hustis' staff as consulting statistician. Coincident with the election of Mr. Hustis as vice-president of the New York, New Haven & Hartford, Prof. Cunningham was appointed vice-president's assistant, with headquarters at New Haven, Conn. To permit of the acceptance of this appointment for two years Harvard University granted partial leave of absence for that time, and Prof. Cunningham continued to lecture at Harvard on one day a week.

During the summer of 1910 Prof. Cunningham made a special study of British railways, and the following summer did work of a similar nature on the Harriman Lines with special reference to the unit system, and also on the Santa Fe and the Frisco lines. In the summer of 1912 he made a study of the Prussian-Hessian railways, and during the summer of 1913 he was engaged on special work for Vice-President Seger of the Union Pacific system. Shortly after Mr. Hustis had been elected president of the Boston & Maine, Mr. Cunningham was appointed president's assistant.

STEEL RAILS IN GERMANY.—The Prussian State Railway Department recently revised its contract with the Steel Union in regard to the state requirements of rails, ties and accessories. The former arrangement, which held good for another year, has been superseded by a new agreement for three years, the price for rails having been raised 15 marks per ton and is now standing at 129 marks per ton. This increase in the price is considered moderate, since the price for other products of the Steel Union has been raised as much as 50 per cent. At the same time it means an extra 15 per cent to the Steel Union on the deliveries during the first year, but the railway department is probably of opinion that the present time is more favorable for making a forward contract than will be the earlier portion of 1917, when a fresh agreement in any case would have to be entered upon. If the war were still going on at that time, an advance of 15 marks would in all probability be declined as insufficient by the Steel Union, and even if, in the meantime, peace had been concluded, it is doubtful whether the quotations for steel and iron products would all at once descend to normal figures. A too sudden fall in the general level of industrial quotations is likely to be averted by the amount of repair work which will have to be taken in hand. The state railways are holding back all work that is not particularly urgent, and the steel and iron works are by no means keen about the manufacture of rails at a nominal profit, when it pays them much better to push the manufacture of half-finished products. This is evidenced by the aggregate of railway materials (rails, etc.), which in the year 1914-15 only amounted to 1,759,115 tons, as compared with a total of 2,748,728 tons during the preceding year.—*Engineering, London.*

General News Department

The Transportation Club of Ft. Worth, Tex., has been organized and temporary officers have been chosen.

A fire in the yards of the Pere Marquette, at Detroit, Mich., September 21, destroyed 52 loaded freight cars. In a fire on the 20th at Wellsboro, Ind., 32 carloads of wheat were destroyed.

On the Panama Railroad, according to an order which went into effect September 1, the working day for trainmen and for the crews of switching engines is eight hours, except in cases of emergency.

Near Baltimore, Md., about 400 Mexicans are at work as track laborers on the Pennsylvania; and from Laredo, Tex., it is reported that the Pennsylvania is hiring Mexicans, as fast as it can, at the rate of $1.80 a day with transportation to the places where they are to be put to work. Many of these men have families, which, it is said, they are taking with them.

Eastbound passenger train No. 14 of the Michigan Central, known as the New York Express, was stopped by robbers near Dearborn, ten miles west of Detroit on the night of September 27, and the mail was robbed. After stopping the train by disarranging the block system, the men uncoupled the mail and baggage cars from the rest of the train and moved them forward two miles. There they ransacked both cars and escaped after extinguishing the fire in the locomotive.

It is reported on good authority that the shopmen on eighteen western railways have voted to strike if not granted an increase of pay of three cents an hour and an eight-hour day. The vote, however, must be submitted to the executive boards of five international unions for approval. The trades involved are the machinists, boilermakers, blacksmiths, sheetmetal workers and "car men." The demands of 1,000 members of the Switchmen's Union of America for an eight-hour day, with an increase from forty-seven cents to fifty cents an hour, and time and one-half for overtime, will go to arbitration, according to an agreement entered into at New York, September 26.

No new developments have taken place in the negotiations between the shopmen and the western railways, except on the Texas & Pacific, where the company's offer of increases in wages ranging from 1½ cents to 2½ cents an hour with a nine-hour day has been accepted by all the crafts except the carmen. The carmen have withdrawn their demands for an eight-hour day, and are expected to make a contract on the same basis. The original request of the men of this road was for an increase of 3 cents an hour in pay and an eight-hour day.

The Lehigh Valley road, inconvenienced by the scarcity of vessels available for the transportation of ties from the South, and the high rates charged, lately used in that traffic its own seagoing tug "Perth Amboy," which ordinarily takes coal to New England. The tug was sent south with three steel barges used for carrying coal. These barges were placed at Brunswick, Ga., and Jacksonville, Fla., where the ties are easily concentrated; and a load of 50,000 ties was quickly obtained. The tug experienced no difficulty in bringing the tow back to Perth Amboy (New York harbor). The experiment is regarded as a complete success. Not only was the company able to bring a large quantity of ties to its line promptly, but there was also a large saving in cost.

A New Kind of Train Robbery

A single-handed, gunless, mid-day train robbery, that netted $148 from two passengers and no telling how much more from five other victims was executed on the Canadian Pacific train from Toronto at the Black Rock end of the International bridge at 12:20 o'clock yesterday afternoon. The weapons of the bold hold-up man were a harmless pad and pencil, rapid action, a little impersonation work, and the war in Europe.

When the train was stopped at this end of the International bridge for the customs officers to pass through it, a broad-shouldered man in a dirty gray suit, whose eyes were a bit bloodshot and who appeared to be about thirty years old, entered one of the coaches. Stopping before Mrs. Jessie M. Ardill, he asked in a gruff voice where she was going, to see her ticket and after examining it, wanted to know how much money she had.

Mrs. Ardill took a roll of bills from her bag and handed it to the man. He counted the money, took $110 and returned $65 to her, adding that he would have to take the money as a deposit. He gave her a left-handed receipt showing that her $110 had been paid over to "the United States Customs at Buffalo." Mrs. Ardill thanked the man and placed the receipt in her pocketbook.

The next victim, further down the aisle was Edward Crockett of Brantford, Ont. "How much money have you to get into this country?" Crockett was asked. He obliged the man by handing over his wallet. The artist in crime counted $50 took $38 and gave Crockett a receipt.

At this juncture Mrs. Ardill looked questioningly towards the man who returned to her. She said, "I'm going to New York. Do I stay in this coach?" He blandly replied, "When we get through the customs here, you move into the coach ahead. There's plenty of time."

The man in the dirty gray suit leisurely walked into the next coach in the rear and by working rapidly wrote out five more receipts.

After the train had left the bridge and had proceeded as far as Forest avenue Conductor Ferguson met Mrs. Ardill hurrying towards the coach ahead. "Stay in this coach," said the conductor; and then revelations and explanations followed.

The train was stopped and the police notified. The names and the amounts taken from the five victims in the second coach were not obtained. The man with the pad and the pencil failed to leave a note showing where he left the train and where he was going. An extra guard has been stationed at the bridge.—*Buffalo Commercial,* Sept. 13.

Railway Men's Pay in England

According to press dispatches, the general demand of the employees of the railways of Great Britain for an increase in pay has been compromised by the granting of a war bonus twice as great as that heretofore allowed; which is equivalent to giving the men half of the ten shillings a week which they had asked for.

Russian Railway Concessions

According to a recent announcement from Petrograd, the Russian Minister of Ways and Communications has decided on the creation of a new type of railway company. Henceforth, the Government will only accord concessions for new lines to companies whose shareholders are interested in the development of the districts to be traversed. In other words, the shareholders must be business men, industrialists or agriculturists in direct local interests. The Zemstvos, or district councils, will be empowered to make long-term loans to the companies, and the Government, in certain cases, will also accord subsidies. The Finance Minister has agreed to establish a special fund for the purpose, so that the local authorities referred to will be enabled to borrow money on easy terms in order to participate in the construction of new railways. The object of this scheme is to insure that no new lines shall be built save under conditions that will alike serve the interests of the localities concerned and of the Government. It will also prevent "peaceful penetration" in the shape of control or ownership of Russian railways by German shareholders or financial concerns.—*Railway Gazette.*

TWINE FOR THE POSTAL SERVICE.—Twine enough to encircle the earth twenty-seven times, or 680,000 miles of cord weighing 2,000,000 pounds, will be used by the United States postal service next year in tying up mail matter.

Chief Interchange Car Inspectors' and Car Foremen's Association

The Chief Interchange Car Inspectors' and Car Foremen's Association will hold its annual convention at Indianapolis, Ind., October 3, 4 and 5, 1916. In addition to a very thorough discussion of the Master Car Builders' Rules and the changes made therein at the June convention for the purpose of arriving at a uniform interpretation and thereby accelerating the movement of cars through the various interchange points throughout the country, it is anticipated that papers will be read dealing with a number of car department subjects. At this convention will also be decided the winners of the $25, $15 and $10 prizes offered for the three best papers on Car Department Apprenticeship. Committees have been appointed to report on Freight Car Maintenance and Advanced Methods of Freight Car Repair Billing, and several papers on these subjects will be read. Papers will also be read on the subjects of Interchange Inspection and Passenger Car Cleaning and Sanitation.

The association now has a membership of about 500 general foremen, car foremen and interchange inspectors throughout the country and it is anticipated that the constitution and by-laws will be amended so as to admit to membership car inspectors, M. C. B. bill clerks, or anyone actively engaged in the work of the car department.

American Electric Railway Association

The annual convention of the American Electric Railway Association will be held at Young's Million Dollar Pier, Atlantic City, N. J., beginning Monday, October 9, and continuing through Friday, October 13. Among the reports to be presented which are of interest to the readers of the *Railway Age Gazette,* are the following: From the committee on heavy electric traction, E. R. Hill, chairman; committee on power distribution, C. L. Cable, chairman; committee on roadway, C. H. Clark, chairman; and committee on equipment, W. G. Gove, chairman.

On the opening day there will be an address on electric railways and preparedness by Major General Leonard Wood. One of the speakers scheduled for Wednesday is Ivy L. Lee, who will speak on publicity. Other speakers named in the five-days program are: W. J. Harvie, overhead and underground line construction; J. N. Shannahan, valuation; A. W. Brady, federal relations; H. S. Lyons, payment for carrying mails; Calvert Townley, electrolysis; C. L. Allen, public relations; B. I. Budd, operation of motor vehicles.

Track Supply Exhibit

In addition to the firms mentioned in the issue of last week as exhibiting at the convention of the Roadmasters and Maintenance of Way Association in New York on September 19-22, the following firms retained membership in the Track Supply Association but did not present exhibits:

Ajax Forge Co., Chicago, Ill.
Elliot Frog & Switch Co., East St. Louis, Ill.
Morden Frog & Crossing Works, Chicago, Ill.
Cleveland Frog & Crossing Co., Cleveland, Ohio.
L. S. Brach Supply Co., Newark, N. J.
H. M. Brown.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, New Orleans, La.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.

American Electric Railway Association.—F. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.

American Electric Railway Manufacturers' Association.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Railway Association.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Denver, Colo.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, Gruenwald Hotel, New Orleans, La.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

Association of Manufacturers of Chilled Car Wheels.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

Association of Transportation and Car Accounting Officers.—G. F. Conrad, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

Bridge and Building Supply Men's Association.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Chief Interchange Car Inspectors' and Car Foremen's Association.—W. R. McMunn, New York Central, Albany, N. Y. Annual convention, October 3-5, Indianapolis, Ind.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

Maintenance of Way and Master Painters' Association of the United States and Canada.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

Railway Development Association.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next meeting, November 9-10, La Salle Hotel, Chicago.

Railway Fire Protection Association.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Annual meeting, October 3-5, Hotel Astor, New York.

Railway Real Estate Association.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 11-13, Hotel Sherman, Chicago.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

Roadmasters' and Maintenance of Way Association.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, Hotel McAlpin, New York.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Society of Railway Financial Officers.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Hotel Raleigh, Washington, D. C.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Annual convention, October 24-27, Hotel Sherman, Chicago.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Association of Short Line Railroads.—Clarence M. Oddie, Mills Bldg., San Francisco. Annual meeting, November 15, Brown Palace Hotel, Denver, Colo.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

REVENUES AND EXPENSES OF RAILWAYS

Month of June, 1916

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Chicago, Burlington & Quincy	9,369	$5,532,318	$1,896,518	$8,283,114	$1,366,041	$1,528,392	$205,155	$2,448,938	$74,912	$184,303	$5,401,897	$2,881,218	$426,305	$2,445,365	$746,558
Chicago, Indianapolis & Louisville	622	454,840	163,015	669,609	75,434	133,796	20,835	189,110	1,028	19,476	438,880	230,730	36,613	194,088	40,929
Chicago, Terre Haute & Southeastern	373	182,324	14,688	202,321	23,411	14,298	3,844	57,059	948	10,023	109,569	92,752	13,383	79,365	13,333
Cripple Creek & Colorado Springs	87	102,223	14,912	119,934	4,946	18,515	2,898	22,027	.....	3,211	51,596	68,338	7,603	60,736	10,771
Philadelphia & Reading	1,127	3,922,065	636,538	4,844,151	356,334	683,646	57,834	1,579,205	12,034	87,776	2,773,551	2,070,601	299,151	1,770,712	322,159

Twelve Months of Fiscal Year, 1916

Chicago, Burlington & Quincy	9,368	$71,592,578	$21,168,052	$102,358,893	$12,014,208	$15,592,110	$1,610,627	$29,956,781	$927,593	$2,017,687	$61,713,161	$40,645,732	$4,449,291	$36,186,894	$9,608,865
Chicago, Indianapolis & Louisville	622	5,345,941	1,854,184	7,694,734	838,061	1,279,091	239,099	2,538,474	4,463	218,061	5,111,039	2,583,694	364,214	2,217,286	654,653
Chicago, Terre Haute & Southeastern	373	2,270,165	193,825	2,528,047	357,695	545,327	47,569	746,851	12,080	103,465	1,812,787	715,260	133,900	581,074	142,129
Cripple Creek & Colorado Springs	87	1,155,323	233,061	1,412,536	154,740	163,083	41,368	332,361	.....	40,703	732,255	680,282	69,289	610,992	.....
Philadelphia & Reading	1,127	47,581,867	6,793,606	57,298,393	4,019,699	8,829,256	574,003	18,898,268	152,901	938,051	33,389,659	23,908,734	1,402,177	22,499,699	8,082,851

Month of July, 1916

Alabama & Vicksburg	143	$86,134	$38,290	$140,825	$16,555	$32,714	$3,996	$48,040	$2,225	$6,130	$109,661	$31,164	$8,600	$22,564	$11,543
Alabama Great Southern	399	282,534	124,786	448,070	48,144	105,602	13,531	136,115	2,928	11,740	318,060	130,010	17,064	112,900	4,321
Ann Arbor	294	168,888	55,296	238,380	21,068	34,477	4,980	91,247	888	8,561	161,221	77,158	13,400	63,760	23,378
Arizona Eastern	378	300,125	43,275	362,344	36,619	32,872	2,287	68,340	2,063	12,152	154,101	208,243	16,200	192,042	74,867
Atchison, Topeka & Santa Fe	8,648	6,668,065	2,602,905	10,015,642	1,253,245	1,549,064	186,662	2,662,661	752	193,608	5,831,658	4,183,984	443,023	3,739,446	742,327
Atlanta & West Point	93	50,287	42,144	105,741	12,874	20,097	6,391	30,894	1,848	4,832	76,935	28,806	6,564	22,228	10,574
Atlanta, Birmingham & Atlantic	640	179,762	52,523	252,977	40,598	48,688	14,121	94,458	26	8,973	206,864	46,114	13,100	32,997	.....
Atlantic & St. Lawrence	167	120,005	34,021	164,450	28,746	37,676	4,339	93,001	.....	5,165	168,928	—4,478	9,895	—14,373	—13,718
Atlantic Coast Line	4,735	1,751,754	666,173	2,607,180	380,287	504,582	57,676	956,482	9,013	81,278	1,987,397	619,784	160,000	457,236	222,718
Baltimore & Ohio	4,539	7,663,003	1,642,603	10,153,913	1,239,921	1,990,611	195,842	3,347,023	92,817	200,810	7,066,864	3,087,049	338,296	2,744,423	—41,115
Baltimore & Ohio Chicago Terminal	79	.....	567	147,767	17,606	22,259	933	69,907	2,370	5,181	116,838	30,930	22,689	8,242	—7,744
Baltimore, Chesapeake & Atlantic	88	100,681	52,171	159,597	11,440	28,689	2,849	71,680	.....	2,594	117,209	42,388	2,300	40,080	6,287
Bangor & Aroostook	632	140,652	52,381	211,051	47,191	51,262	3,952	69,157	3,229	13,117	187,908	23,143	12,500	10,643	17,073
Belt Ry. Co. of Chicago	31	.....	.....	241,798	13,714	31,207	1,613	96,131	.....	5,743	148,408	93,390	13,121	80,269	—2,699
Bessemer & Lake Erie	205	1,235,426	39,889	1,292,958	85,302	173,584	12,013	283,403	.....	13,108	547,903	745,055	22,010	723,035	—40,327
Bingham & Garfield	36	277,575	2,942	282,879	17,890	23,935	851	31,856	59	3,061	77,650	205,229	9,961	195,268	90,294
Boston & Maine	2,298	2,600,016	1,613,438	4,719,795	545,981	568,953	36,715	1,851,001	24,493	97,843	3,124,985	1,594,810	172,252	1,422,558	342,125
Buffalo & Susquehanna R. R. Corp.	253	133,572	6,323	142,288	20,925	32,138	1,283	38,774	.....	5,394	98,513	43,775	2,600	41,174	22,407
Canadian Pacific Lines in Maine	234	52,655	16,847	79,637	23,708	12,698	5,646	32,792	.....	4,028	78,872	765	9,100	—8,335	9,702
Carolina, Clinchfield & Ohio	283	149,969	21,409	180,668	17,524	29,321	14,459	41,155	.....	11,295	113,431	67,237	14,250	52,987	—31,891
Carolina, Clinchfield & Ohio of S. C.	18	5,999	876	7,252	351	92	1,963	2,228	.....	579	5,208	2,043	750	1,276	—1,036
Central of Georgia	1,924	704,927	307,825	1,119,170	175,308	198,593	42,652	349,027	898	41,106	805,526	313,644	54,558	258,580	60,333
Central of New Jersey	684	1,972,017	773,142	2,962,757	236,073	456,831	34,554	995,681	15,476	82,906	1,821,509	1,141,248	139,914	1,001,326	280,612
Central New England	301	411,998	51,151	486,046	42,315	51,365	992	121,581	.....	5,486	221,736	264,310	15,000	249,310	81,513
Central Vermont	411	229,559	94,014	361,552	42,760	58,908	9,268	163,714	2,692	9,132	286,474	75,078	15,565	59,504	1,543
Charleston & Western Carolina	343	88,991	29,017	128,169	28,584	25,847	4,397	45,157	.....	4,061	107,880	20,289	5,000	15,289	6,267
Chesapeake & Ohio Lines	2,386	3,060,562	624,982	3,972,154	465,405	759,933	54,629	1,096,782	30,761	84,207	2,489,347	1,482,806	127,420	1,355,359	213,255
Chicago & Alton	1,053	970,105	405,886	1,485,433	162,890	301,766	36,936	469,496	10,997	32,498	1,014,553	470,880	46,112	424,435	218,371
Chicago & Eastern Illinois	1,136	897,790	284,477	1,292,036	235,111	294,061	24,963	449,625	7,607	40,201	1,048,212	243,824	62,400	181,360	50,040
Chicago & Erie	270	532,674	81,537	668,387	70,118	70,022	18,778	249,556	1,887	15,874	423,269	245,118	22,230	222,888	79,925
Chicago & North Western	8,108	4,973,604	2,177,458	8,085,920	1,147,240	1,193,998	121,481	2,731,824	61,081	164,198	5,365,838	2,720,082	410,000	2,309,791	822,968
Chicago, Burlington & Quincy	9,369	5,370,972	2,124,801	8,278,336	1,086,494	1,454,377	151,758	2,400,525	81,334	198,514	5,373,002	2,905,334	381,036	2,524,298	564,027
Chicago, Detroit & Can. Grand Trk Jctn.	60	55,483	18,122	89,985	10,933	8,350	1,399	38,558	.....	1,556	60,796	29,189	3,487	25,701	—167
Chicago Great Western	1,496	820,231	338,467	1,276,642	204,717	199,266	47,078	416,453	9,280	37,790	912,966	363,676	45,744	317,075	122,961
Chicago, Indianapolis & Louisville	622	462,958	166,300	680,553	71,057	111,210	19,540	220,370	455	16,262	436,546	244,007	29,438	214,559	71,820
Chicago Junction	13	.....	.....	194,490	20,443	21,018	1,160	108,309	.....	5,085	156,015	38,475	4,941	33,534	3,033
Chicago, Milwaukee & St. Paul	10,208	6,240,022	2,003,608	9,236,387	1,063,615	1,205,357	175,150	3,015,247	73,071	161,501	5,566,884	3,669,504	480,190	3,188,436	377,897
Chicago, Peoria & St. Louis	255	111,002	29,078	148,595	19,613	36,308	5,450	57,764	.....	6,030	125,165	23,430	6,000	17,430	15,210
Chicago, Rock Island & Gulf	477	192,074	62,086	272,595	48,004	33,242	9,721	89,540	1,660	8,909	190,477	82,119	10,000	72,048	47,902
Chicago, Rock Island & Pacific	7,548	3,911,119	1,986,945	6,381,385	918,235	1,098,068	139,169	2,158,899	48,553	155,335	4,506,248	1,875,137	292,040	1,582,279	948,157
Chicago, St. Paul, Minn. & Omaha	1,753	944,049	516,206	1,596,854	192,281	228,458	32,417	543,915	16,636	42,801	1,054,340	542,515	85,744	456,351	133,335
Chicago, Terre Haute & Southeastern	373	189,057	16,347	210,920	29,803	50,965	3,753	60,448	1,002	8,449	154,420	56,500	10,883	45,616	20,328
Cincinnati, Hamilton & Dayton	622	704,832	121,326	933,891	149,669	118,961	14,747	315,156	3,334	18,170	618,964	314,927	28,280	286,634	67,038
Cincinnati, Indianapolis & Western	322	137,751	48,121	202,529	31,233	27,711	7,759	75,664	440	6,611	148,604	53,925	9,441	44,484	.....
Cincinnati, New Orleans & Texas Pacific	337	670,574	177,171	906,470	73,906	212,282	27,688	252,359	6,270	19,051	591,556	314,914	32,000	282,845	66,762
Cincinnati Northern	246	134,606	20,642	161,749	26,248	27,264	3,315	48,909	.....	2,722	108,458	53,491	6,000	47,290	18,197
Cleveland, Cincinnati, Chic. & St. Louis	2,384	2,516,123	997,673	3,841,219	445,808	741,451	93,477	1,228,029	26,406	74,778	2,602,325	1,238,893	149,000	1,089,219	339,193
Coal & Coke	197	74,569	18,299	96,369	19,948	23,349	999	26,990	.....	3,074	74,360	22,009	5,000	17,009	3,941

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY, 1916—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Colorado Midland	338	$89,180	$26,718	$127,642	$32,260	$27,715	$7,615	$53,672	$1,874	$5,382	$128,519	—$876	$9,000	—$9,876	$8,344
Colorado & Southern	1,192	474,294	175,638	701,431	98,008	137,601	11,071	196,721	4,765	20,612	468,777	232,653	38,500	193,815	81,853
Cripple Creek & Colorado Springs	87	86,437	22,199	111,218	9,261	12,064	2,958	26,079	.....	2,973	53,334	57,883	7,603	50,281	—8,468
Cumberland Valley	164	195,968	55,804	267,645	23,965	32,563	4,960	83,504	710	8,217	153,049	114,596	5,960	108,634	27,377
Delaware & Hudson Co.—R. R. Dept.	886	1,829,477	308,910	2,287,311	190,410	462,808	38,232	781,156	22,090	78,776	1,573,471	713,840	58,650	655,190	120,932
Delaware, Lackawanna & Western	955	3,195,815	860,408	4,507,804	525,229	611,842	80,046	1,355,914	39,452	85,830	2,694,401	1,813,403	202,500	1,610,695	703,139
Denver & Rio Grande	2,577	1,541,724	404,133	2,096,617	278,928	337,598	42,453	504,135	33,972	51,567	1,248,651	847,966	92,000	755,567	226,485
Denver & Salt Lake	255	118,140	51,375	178,223	33,054	32,276	3,008	51,010	.....	5,158	124,507	53,716	9,021	44,695	—4,200
Detroit & Mackinac	383	63,796	33,387	105,585	13,653	16,699	2,246	34,289	293	2,523	69,702	35,883	8,126	27,757	5,211
Detroit & Toledo Shore Line	81	117,090	.....	117,445	9,242	7,302	1,491	32,946	.....	2,934	53,916	63,529	6,800	56,729	12,937
Detroit, Grand Haven & Milwaukee	191	174,000	68,000	289,119	31,533	34,171	4,812	132,195	1,131	4,868	208,710	80,409	3,963	76,154	—9,348
Detroit, Toledo & Ironton	441	153,161	18,264	186,205	20,411	28,023	3,968	80,495	.....	5,693	138,589	47,616	6,000	41,558	21,570
Duluth & Iron Range	277	973,320	22,470	1,035,129	76,300	75,637	1,472	196,499	2,225	11,496	360,679	674,451	56,146	618,305	112,225
Duluth, Missabe & Northern	411	1,753,202	34,846	1,898,170	133,279	101,547	2,823	278,840	1,186	11,474	529,149	1,369,021	101,347	1,267,674	315,975
Duluth, South Shore & Atlantic	601	207,562	104,034	345,608	60,298	34,651	7,277	108,813	4,531	9,251	224,821	120,786	19,000	101,784	23,919
El Paso & Southwestern Co.	1,028	770,905	217,623	1,040,083	110,361	116,718	17,841	237,286	6,668	25,414	514,288	525,795	39,529	486,258	235,315
Elgin, Joliet & Eastern	798	1,045,774	20	1,113,066	98,438	271,540	6,119	309,749	.....	22,784	708,294	404,772	36,517	368,255	13,821
Erie	1,989	4,027,461	1,024,124	5,637,827	529,360	1,119,094	92,607	2,012,924	42,194	135,547	3,929,372	1,708,455	194,147	1,513,823	—301,955
Florida East Coast	745	349,921	110,753	506,905	55,891	77,985	7,705	159,984	2,971	15,376	318,242	188,663	26,032	162,584	110,880
Fort Worth & Denver City	454	305,497	137,188	467,489	59,090	88,826	9,443	126,132	2,787	18,979	305,258	162,231	15,500	146,731	65,917
Galveston, Harrisburg & San Antonio	1,361	315,395	315,292	1,187,230	161,404	163,347	30,357	397,104	9,558	38,815	795,288	391,942	48,502	342,931	178,457
Galveston Wharf	14	.....	.....	70,017	1,249	2,325	585	23,754	17,565	368	45,846	24,171	10,300	13,871	—19,675
Georgia	307	191,717	69,616	280,989	22,218	41,237	14,353	97,513	142	8,758	184,221	96,767	4,865	91,899	53,239
Georgia, Southern & Florida	395	105,712	60,288	187,909	25,035	40,008	7,796	71,060	.....	8,685	152,576	35,333	11,115	24,077	—8,735
Grand Canyon	64	1,446	27,388	34,785	9,455	974	53	10,644	.....	169	21,295	13,490	1,506	11,984	—116,582
Grand Rapids & Indiana	575	269,419	182,559	500,534	61,059	80,285	10,924	198,932	3,397	17,051	371,648	128,886	24,081	104,797	—1,162
Grand Trunk Western	347	624,000	168,000	831,260	63,489	136,033	15,141	244,207	7,648	13,616	480,134	351,126	36,637	313,985	146,319
Great Northern	8,051	5,321,739	1,569,942	7,619,246	1,024,277	851,403	105,903	1,943,655	89,640	115,788	4,065,876	3,553,370	464,973	3,087,988	721,875
Gulf & Ship Island	308	116,643	30,784	156,178	16,409	28,078	4,145	52,924	271	7,217	109,044	47,134	7,340	39,778	—3,219
Gulf, Colorado & Santa Fe	1,938	855,050	287,882	1,216,121	256,232	192,799	28,783	462,735	.....	45,356	985,512	230,609	59,287	170,966	—100,710
Hocking Valley	350	625,823	89,927	780,565	77,130	176,065	7,921	209,018	.....	13,739	483,873	296,692	41,350	255,335	67,670
Houston, East & West Texas	191	83,332	31,837	123,534	24,092	18,565	2,296	39,357	864	3,242	88,299	35,235	5,360	29,757	10,385
Houston & Texas Central	895	412,976	180,129	632,786	85,176	91,497	15,829	196,728	4,570	17,842	410,792	221,994	30,665	191,131	73,518
Illinois Central	4,767	3,998,556	1,272,036	5,842,492	901,245	1,560,411	109,904	1,746,937	34,136	160,142	4,500,579	1,341,913	318,000	1,022,661	491,364
Indiana Harbor Belt	109	.....	.....	360,376	51,670	40,592	2,881	127,865	.....	7,763	230,770	129,606	6,453	123,093	48,947
International & Great Northern	1,160	529,521	255,196	854,971	126,501	160,929	21,902	299,825	5,229	28,298	629,747	225,224	30,000	195,169	172,073
Kanawha & Michigan	177	239,394	35,950	283,641	44,581	72,839	3,580	73,848	4	6,367	201,219	82,423	14,000	68,422	—22,367
Kansas City, Mexico & Orient	272	86,505	15,892	107,845	21,248	20,905	5,578	35,831	.....	5,923	89,484	18,361	6,000	12,328	10,446
Kansas City Southern	837	699,389	165,307	947,581	84,855	122,301	25,847	268,677	.....	34,859	534,096	413,485	48,083	364,793	44,215
Lake Erie & Western	900	527,617	76,614	644,407	61,660	95,572	12,457	188,815	.....	12,005	370,508	273,898	27,000	246,780	157,127
Lehigh & Hudson River	97	170,575	13,531	201,944	22,591	34,080	1,533	63,674	.....	4,195	126,074	75,870	5,000	70,825	20,697
Lehigh & New England	296	201,957	1,352	217,775	39,282	36,823	1,805	61,302	.....	5,679	144,754	73,020	8,820	64,178	—103,510
Lehigh Valley	1,444	3,482,311	525,345	4,307,498	556,195	681,142	84,068	1,512,320	16,611	87,372	2,936,450	1,371,047	148,500	1,222,323	193,779
Long Island	397	335,837	1,137,365	1,680,637	152,627	138,529	20,950	516,822	6,377	32,922	866,849	813,788	71,905	741,735	74,320
Louisiana & Arkansas	279	109,495	19,000	132,904	24,435	17,921	3,503	34,853	.....	4,285	84,997	47,907	7,920	39,971	6,620
Louisiana Ry. & Navigation Co.	351	126,548	26,615	163,644	28,480	19,762	6,686	52,989	.....	6,397	114,314	49,330	11,000	38,325	2,627
Louisiana Western	208	114,583	60,432	187,881	23,761	28,718	7,181	47,154	1,703	6,648	115,162	72,719	10,250	62,424	18,491
Louisville & Nashville	5,071	3,646,333	1,120,138	5,102,605	738,390	959,041	118,935	1,530,860	18,827	114,505	3,470,745	1,631,860	198,639	1,432,362	249,911
Louisville, Henderson & St. Louis	200	87,643	40,856	136,383	23,314	15,861	5,194	40,328	.....	2,843	87,541	48,843	3,800	45,044	37,879
Maine Central	1,221	608,895	387,537	1,084,537	144,594	134,736	17,171	394,701	10,894	28,611	730,587	353,950	49,602	304,310	58,504
Michigan Central	1,803	2,232,871	1,180,590	3,857,971	518,397	536,856	69,096	1,269,164	55,462	70,976	2,519,951	1,338,020	140,000	1,196,343	310,440
Midland Valley	385	130,419	44,296	180,635	36,736	32,579	2,677	46,262	.....	7,229	125,346	55,289	5,934	49,309	19,723
Mineral Range	120	86,707	3,537	93,107	13,240	14,949	394	36,392	.....	1,330	66,304	26,804	3,300	23,504	871
Minn., St. Paul & Sault Ste. Marie	4,228	2,277,075	683,146	3,201,682	308,484	344,947	47,875	805,211	18,865	64,600	1,585,236	1,616,446	148,450	1,467,996	662,842
Missouri & North Arkansas	365	53,081	40,052	100,781	15,121	10,166	3,303	34,899	.....	4,834	68,323	32,458	4,800	27,645	25,222
Missouri, Kansas & Texas System	3,865	1,988,363	921,276	3,127,313	562,996	615,889	61,069	1,020,299	24,125	100,458	2,384,784	742,530	125,108	616,569	145,086
Missouri, Oklahoma & Gulf	334	90,636	28,695	124,671	21,192	24,277	3,964	52,013	110	8,511	110,067	14,604	8,272	6,332	29,597
Missouri, Oklahoma & Gulf Ry. of Texas	134	20,482	498	21,156	2,948	2,826	1,694	9,305	.....	1,509	18,282	2,874	188	2,686	3,490
Missouri Pacific	3,931	1,977,174	517,549	2,716,151	464,021	616,950	81,075	932,732	9,237	61,985	2,157,997	558,154	109,000	446,906	60,355
Mobile & Ohio	1,160	743,819	128,068	923,713	135,985	191,383	35,530	332,159	2,573	30,535	728,165	195,548	35,902	159,515	—12,915
Monongahela	108	152,515	10,659	166,070	23,940	13,199	739	34,915	.....	4,073	76,865	89,205	4,000	85,205	11,592
Monongahela Connecting	6	.....	.....	112,748	15,368	15,312	300	58,878	.....	2,969	92,827	19,921	1,590	18,332	2,469
Morgan's La. & Texas R. R. & S. S. Co.	401	218,641	92,677	338,090	60,509	69,899	11,200	131,126	2,185	11,907	285,850	52,239	22,667	29,542	—1,384
Nashville, Chattanooga & St. Louis	1,237	720,252	259,118	1,054,267	129,308	206,835	52,579	360,594	8,509	34,463	791,803	262,464	28,500	233,798	34,433
Nevada Northern	165	168,034	12,760	185,689	20,929	13,779	819	29,991	92	4,758	70,368	115,321	6,185	109,136	31,382

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY, 1916—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
New Orleans & North Eastern	204	$215,552	$60,383	$308,962	$34,314	$56,342	$10,148	$94,889	$7,060	$11,978	$214,732	$94,229	$15,700	$78,529	$5,925
New Orleans, Mobile & Chicago	402	110,734	26,716	145,704	27,132	20,591	4,227	51,533	2	6,758	110,242	35,462	6,491	28,967	—14
New Orleans Great Northern	285	113,014	30,828	150,831	15,980	20,313	2,807	43,022	226	6,675	88,023	62,808	4,485	58,289	11,621
New Orleans, Texas & Mexico	192	59,810	18,236	81,913	16,125	15,218	5,098	22,398	.....	7,329	66,170	15,744	1,347	14,397	—19,196
New York Central Railroad	6,093	11,080,667	5,227,526	18,961,829	1,976,402	3,080,741	346,503	5,840,261	251,775	397,434	11,893,116	7,068,714	768,378	6,299,332	1,439,816
New York, Chicago & St. Louis	570	1,038,994	190,425	1,283,928	119,847	178,471	45,732	461,251	5,668	24,585	835,217	448,712	42,000	406,710	212,260
New York, New Haven & Hartford	2,005	3,223,716	2,869,266	6,967,345	749,650	856,220	37,779	2,445,464	81,671	164,141	4,334,011	2,633,333	256,000	2,377,194	202,433
New York, Ontario & Western	568	445,961	398,184	987,743	102,721	127,954	7,465	303,128	.....	18,351	558,920	428,822	23,000	405,822	23,568
New York, Philadelphia & Norfolk	112	474,685	49,854	561,975	44,588	97,789	4,780	179,237	5,034	11,441	342,638	219,337	13,000	206,264	42,617
New York, Susquehanna & Western	140	173,129	53,881	259,064	24,203	33,002	2,017	121,161	.....	9,466	189,849	69,215	14,100	55,113	—39,654
Norfolk & Western	2,086	4,070,215	545,507	4,845,121	663,100	850,877	58,922	1,177,656	9,743	85,107	2,823,887	2,021,234	205,000	1,816,107	128,281
Norfolk Southern	908	240,772	124,675	396,045	62,715	62,331	7,497	128,469	146	18,656	279,814	116,231	12,501	103,664	18,716
Northern Pacific	6,505	4,610,096	1,489,146	6,732,286	1,057,156	844,184	115,232	1,744,071	102,101	104,444	3,924,943	2,807,343	417,759	2,388,736	970,913
Northwestern Pacific	507	205,852	262,018	527,192	56,629	42,512	6,014	140,473	1,104	9,256	255,184	272,008	18,155	253,853	43,178
Oregon Short Line	2,247	1,502,326	478,443	2,149,284	307,862	227,897	34,990	449,086	34,569	57,173	1,111,297	1,037,987	123,600	914,249	175,527
Panhandle & Santa Fe	670	341,296	81,989	443,444	78,865	70,718	4,245	114,159	.....	11,485	279,413	164,031	11,834	152,197	75,871
Pennsylvania Company	1,755	4,974,341	1,157,412	6,860,076	794,191	1,052,145	96,734	2,104,292	37,691	145,852	4,216,225	2,643,850	292,745	2,350,421	391,518
Pennsylvania Railroad	4,534	13,662,299	4,244,646	19,639,800	2,439,420	3,768,393	214,320	6,619,968	263,908	479,843	13,781,961	5,857,839	683,441	5,172,894	442,602
Peoria & Pekin Union	19	10,574	4,284	83,606	6,433	12,764	135	41,876	.....	2,792	63,999	19,607	6,500	13,107	9,241
Pere Marquette	2,249	1,140,279	466,525	1,804,288	180,622	323,054	34,847	590,256	5,724	40,648	1,174,892	629,396	51,041	577,972	199,045
Philadelphia, Baltimore & Washington	717	1,255,713	821,238	2,282,598	278,897	434,282	28,512	854,600	83	54,178	1,649,509	633,089	60,060	572,991	126,998
Pittsburgh & Lake Erie	225	1,733,676	199,568	2,064,955	165,519	308,490	13,436	450,142	4,087	32,349	974,023	1,090,933	67,900	1,023,033	181,838
Pittsburgh, Cincinnati, Chic. & St. Louis	1,489	2,841,906	885,212	4,239,755	569,843	819,473	76,739	1,327,547	27,336	102,133	2,922,332	1,317,423	173,354	1,143,804	342,506
Pittsburgh, Shawmut & Northern	294	172,434	9,909	184,926	34,723	61,580	1,582	61,382	.....	3,939	163,205	21,721	2,134	19,588	—26,835
Richmond, Fredericksburg & Potomac	88	207,935	84,516	325,823	18,760	34,706	3,849	94,728	1,932	7,869	161,845	163,978	10,532	153,433	54,678
Rutland	468	173,445	118,825	340,335	41,419	55,436	11,371	112,715	1,109	6,531	228,583	111,752	17,203	94,550	17,151
St. Joseph & Grand Island	258	137,457	27,475	177,760	26,706	22,400	4,397	51,047	402	5,072	110,025	67,735	7,955	59,743	53,849
St. Louis & San Francisco	4,752	2,770,521	1,213,549	4,243,240	603,207	1,109,453	72,637	1,279,604	.....	116,477	3,147,423	1,095,817	173,656	920,893	27,039
St. Louis, Brownsville & Mexico	548	216,490	260,636	493,226	65,295	47,496	9,379	131,548	.....	10,219	263,025	230,202	8,000	221,775	179,305
St. Louis, Iron Mountain & Southern	3,555	2,039,923	618,494	2,854,523	590,943	525,460	76,535	802,381	6,894	62,760	2,048,532	805,991	131,600	673,584	113,406
St. Louis Merchants' Bridge Terminal	9	.....	330	186,849	32,130	12,304	828	83,630	.....	6,821	135,713	51,136	7,600	43,535	13,055
St. Louis, San Francisco & Texas	235	67,897	34,055	106,667	13,669	17,588	2,435	44,475	.....	4,702	82,868	23,799	1,565	22,234	4,296
St. Louis Southwestern	943	483,086	162,707	686,130	54,291	119,236	30,781	171,755	3,169	24,649	403,759	282,371	32,166	250,038	75,336
St. Louis Southwestern of Texas	811	270,153	109,473	407,468	57,569	92,235	18,340	149,212	1,589	18,346	336,500	70,968	16,767	54,104	—12,904
San Antonio & Aransas Pass	726	171,832	124,167	317,352	55,271	44,574	8,090	143,515	.....	12,089	263,185	54,166	20,000	34,166	38,902
San Pedro, Los Angeles & Salt Lake	1,154	631,919	304,970	1,024,318	85,890	133,311	31,763	263,381	20,412	19,290	547,357	476,961	50,174	426,726	28,617
Seaboard	3,449	1,094,663	421,733	1,691,605	258,956	331,229	71,466	640,319	10,933	60,132	1,373,035	318,570	105,002	212,867	.....
Southern	6,983	3,498,985	1,444,612	5,481,475	699,192	965,293	160,393	1,946,165	42,266	177,197	3,945,151	1,536,324	253,489	1,281,827	83,029
Southern in Mississippi	281	49,052	24,388	80,870	22,675	8,567	2,501	34,873	.....	3,473	72,089	8,781	8,350	365	14,490
Southern Pacific	6,950	7,254,919	2,816,513	10,966,857	994,748	1,560,714	173,963	3,315,240	160,156	237,847	6,428,174	4,538,683	440,112	4,096,606	72,770
Spokane, Portland & Seattle	555	258,787	177,642	480,589	59,434	40,598	8,717	95,899	5,077	15,027	223,987	256,602	57,445	199,026	30,485
Tennessee Central	295	97,054	40,666	145,046	22,462	19,470	5,429	48,291	.....	6,649	102,300	42,746	4,566	38,173	16,751
Terminal R. R. Ass'n of St. Louis	37	.....	225	232,403	23,245	16,638	913	68,334	.....	3,281	112,410	119,993	27,485	92,145	17,362
Texas & New Orleans	468	243,817	96,212	376,299	47,670	90,722	7,853	114,973	14,196	10,453	285,682	90,618	19,816	70,439	9,442
Texas & Pacific	1,944	999,949	501,393	1,607,780	176,892	205,637	41,501	577,483	11,371	60,062	1,070,596	537,184	75,000	461,790	137,316
Toledo & Ohio Central	436	485,685	63,789	592,757	71,606	137,491	7,247	184,908	1,916	10,440	413,608	179,149	23,501	155,513	61,534
Toledo, Peoria & Western	248	52,919	35,485	96,568	15,466	30,620	2,096	35,553	.....	3,977	87,712	8,856	6,500	2,356	11,312
Toledo, St. Louis & Western	451	388,894	67,552	483,991	68,385	71,739	16,785	152,329	.....	8,842	317,060	166,931	17,500	149,431	50,920
Ulster & Delaware	129	40,166	76,626	138,011	11,901	12,253	2,995	47,242	286	3,337	78,014	59,997	4,000	56,004	5,916
Union Pacific	3,622	3,812,683	1,045,544	5,390,234	890,197	639,661	104,331	1,254,630	96,475	131,053	3,088,659	2,301,574	204,400	2,096,887	459,911
Union R. R. of Baltimore	8	139,618	24,658	166,223	12,631	.....	.....	6,343	.....	2,388	21,362	144,860	5,932	138,929	56,192
Union R. R. of Pennsylvania	32	.....	.....	570,476	29,987	92,647	108	219,221	.....	4,041	345,166	225,310	8,500	216,810	2,509
Vandalia	917	705,045	226,864	1,064,764	166,681	208,476	27,376	360,375	10,748	27,618	800,512	264,252	40,174	223,868	26,156
Vicksburg, Shreveport & Pacific	171	68,940	41,590	128,107	17,362	26,873	3,634	44,137	2,086	5,013	99,103	29,004	9,180	19,824	8,583
Virginian	510	567,340	45,054	656,591	76,427	105,152	5,634	133,354	15,888	15,520	351,659	304,933	30,000	274,933	33,729
Wabash	2,519	2,009,178	747,166	3,024,920	293,382	467,475	92,762	1,070,671	20,204	69,828	2,008,578	1,016,342	98,844	917,329	496,239
Wabash-Pittsburgh Terminal	63	106,025	9,457	123,629	19,521	15,636	1,969	31,071	1,583	1,584	74,366	49,263	7,500	41,763	39,598
Washington Southern	36	68,199	47,234	149,396	10,998	16,654	1,444	45,629	859	3,443	79,026	70,370	4,193	66,175	29,190
West Jersey & Seashore	359	190,346	732,612	985,206	126,042	97,164	12,391	296,799	3,166	17,807	553,267	431,940	37,035	394,890	24,266
Western Maryland	689	784,555	112,197	969,209	116,303	138,733	23,441	279,729	12,109	21,088	590,688	378,521	31,500	347,021	91,821
Western Pacific	941	607,323	122,691	773,102	115,919	66,948	19,313	200,418	10,838	17,860	431,294	341,808	32,761	309,028	59,229
Western Ry. of Alabama	133	50,943	34,252	96,626	14,646	22,092	6,493	26,946	1,675	4,254	76,106	20,520	5,341	15,149	7,513
Wheeling & Lake Erie	512	802,326	69,425	938,924	142,519	137,551	10,455	264,665	1,542	15,696	572,401	366,523	40,649	325,798	184,355
Wichita Valley	257	51,324	21,365	76,230	13,584	7,225	61	19,774	.....	1,355	41,998	34,232	3,750	30,482	11,074
Yazoo & Mississippi Valley	1,382	785,156	212,784	1,058,683	205,570	179,425	21,306	338,297	1,757	33,535	772,952	285,731	57,000	228,601	82,999

Traffic News

The executive committee of the American National Live Stock Association, at its recent meeting in Denver, adopted resolutions asking Congress to define the authority of the Interstate Commerce Commission as to freight rates on intrastate traffic.

Traffic through the Panama Canal was suspended from August 30 to September 7, inclusive, for ships drawing over 17 ft. of water by a sudden forward movement of the large rock at the base of Cucaracha slide. On September 8 the movement of ships was resumed and on the 9th the last of the waiting vessels passed through the cut.

Beginning with the sailing of the steamship Advance on September 20, the ships of the Panama Railroad Line are now leaving Cristobal, Panama, for New York on Wednesday instead of Thursday. Arrival in New York will be on Tuesday for the Panama, Allianca, and Colon, and on Wednesday for the Advance. Sailings from New York will continue to be on Thursday.

It was announced on September 27 that the Pacific Coast Steamship Company, owned in New York, and the Pacific-Alaska Navigation Company had been consolidated into a new corporation to be known as the Pacific Steamship Company. The merger, affecting thirteen large passenger and freight steamships of the Pacific Coast Steamship Company and nine vessels of the Pacific-Alaska, will go into effect November 1. The vessels involved are said to be valued at about $12,000,000.

Following the conference of grain dealers and carriers called by the State Public Utilities Commission of Illinois last week, that body has issued an order providing for the equitable distribution of freight cars for the shipment of grain. The railroads of the state are asked to compile data from all stations and elevators along the line to show the amount of business done by the individual elevators during the last four years. The cars will then be distributed pro rata, each station and elevator receiving cars according to the amount of business done. The data must be filed with the commission by December 1.

The Delaware & Hudson, in its studies of automobile travel and the influence of such travel on railroad business, has counted the attendance at fairs held recently at Altamont, N. Y., Hudson Falls, N. Y., and Rutland, Vt.; and finds that large percentages of the persons attending these fairs were carried in their own cars. Two days' count at Altamont showed the number of paid admissions to be 5,820, and the number of persons coming by automobile, 2,026. At Hudson Falls, in four days the attendance was 13,578; and of this number of persons 3,195 traveled in automobiles. At Rutland, out of 13,000 paid admissions, it was found that 3,115 persons had traveled in automobiles.

J. M. Roberts, superintendent of freight transportation of the Pennsylvania Lines West, has addressed a letter to the general superintendents of the company pointing to the serious shortage of open flat cars and urging that every effort be made to keep this class of cars from leaving the company's lines. On September 1 there were located on foreign lines 55,361 of the 162,466 open cars owned by the Pennsylvania System Lines. The letter states that the loss of these cars is due particularly to the practice of shippers in disposing of the products of their plants and factories on a basis of attractive prices, irrespective of the destinations of the shipments. It further points out that the financial advantages to be gained by the shippers by shipping off the System is likely to be overcome in the majority of cases by losses to the shippers through their inability to obtain cars.

Traffic League Takes Up Federal Investigation

Under date of September 20 the National Industrial Traffic League issued to its members a circular letter calling attention to the report of its legislative committee on Senate Joint Resolution No. 60, providing for a general investigation of railway regulation. The report pointed out that there is involved in this investigation the question whether the present public policy of a dual system of regulation, state and federal, shall be changed to a policy of exclusive federal control. Members of the league are also enjoined to give consideration to the related matters of taxation, physical operation, train service, hours of service, police power, etc.

For the purpose of crystallizing the sentiment of the membership of the league, the circular presents a series of questions which members are requested to answer specifically, after taking them up with the commercial organization or individual concern the members respectively represent, the answers to be laid before the league at its annual meeting or at a special meeting which may be called prior to the beginning of hearings before the Newlands committee on or about November 20. The questions follow:

1. Shall the League favor exclusive federal control or regulation as opposed to the present dual system?
2. Shall the League favor exclusive federal incorporation of all common carriers and federal regulation of the issuance of securities?
3. If there is to be exclusive federal incorporation and regulation, what shall be done about taxation? Shall the state continue to tax, or shall the tax be fixed and controlled by the federal government, and then apportioned among the states traversed by the respective railroads?
4. If exclusive federal control is to be the policy, what shall be done about the police power of the state, the right to regulate hours of service, operation of trains on Sundays and legal holidays, speed limits, fencing, track elevation, etc.?
5. What changes are necessary in the present Act to Regulate Commerce? Why?
6. If you favor exclusive federal control: A—Shall such an act be administered by one commission? B—How many members? How selected? C—How should such a body be organized? D—If regional, how should the regions be determined? Why? E—Should the power of the regional commissioners be final or subject to some central body?
7. If you favor the present system: A—Shall the Interstate Commerce Commission be reorganized? Why? B—If so, how? Merely by increasing its members with authority to subdivide itself in divisions for separate parts of its work, or should it be largely increased with units sitting permanently in different parts of the country? Why?
8. The League desires its members also to discuss and offer suggestions or recommendations upon any phase of this general subject that may be of interest to the member responding.

The officers of the league express the view that this is the most important subject that has ever come before the organization and that members should consider it from the broad viewpoint of the public interest.

Turkey Cancels Railroad Grants.—The Turkish government has canceled the French concession for the building of a railroad from Smyrna to Kassaba, a town of Asia Minor, 54 miles southeast of Konieh. The government also has annulled the Franco-Belgian concession for the construction of a railroad from Mudania, an Asia Minor town on the Sea of Marmora, to Brusa, about 100 miles further southeast. These enterprises, it is said, will be bought back by the Turkish government.

Change of Gage on Japanese Railways.—The Japanese Diet has appointed another committee to investigate the question of substituting broad gage for the present narrow gage on the government railways. It is expected that recommendations in favor of the work will be adopted in the next fiscal year's budget. The work of reconstruction would be started on the trunk line on the main island, with treasury funds amounting to nearly $10,000,000, the deficit to be covered from the railway funds.

Cement for Steam Pipes.—Cement of specially valuable properties for steam pipes and for filling up small leaks such as blow-holes in a casting, without the necessity of removing the injured pieces, is composed of 5 parts by weight of paris white, 5 of yellow ocher, 10 of litharge, 5 of red lead and 4 of black oxide manganese, these various materials being mixed with great thoroughness, a small quantity of asbestos and boiled oil being afterward added. The composition, as thus prepared, will set hard in from two to five hours, and possesses the advantage of not being subject to expansion and contraction to such an extent as to cause leakage afterward, and its efficiency in places difficult of access is important.—*Power.*

Female Labor in German Mines.—From the very beginning of the war the German mining industry has been very seriously handicapped by shortage of labor, and female labor is being exploited on an increasing scale. It is now said that the number of female hands employed in the mining industry of Germany amounts to 45,500, against 5,500 at the beginning of the war.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

W. M. Daniels, commissioner, opened hearings at Chicago last week on the proposed readjustment of rates on cement in Western Trunk Line territory.

The commission has suspended until January 25, 1917, the operation of a tariff filed by the Toledo, St. Louis & Western providing for the cancellation of commodity rates on straw in carloads from various points in Indiana to Coshocton, Ohio, and for the future application of class rates thereon.

The commission has suspended from September 22 to January 20, 1917, the operation of certain schedules in tariffs filed by southwestern roads providing for a charge of $1 and $2 for bedding single deck and double deck stock cars in connection with traffic originating in southwestern territory.

Eugene Morris, chairman of the Central Freight Association, has filed with the commission, freight tariffs, effective December 1, establishing a new scale of class rates in C. F. A. territory. They contain many advances over the present local tariffs. These advances are in addition to those allowed by the commission in its decision in the five-per cent case. The tariffs have been under preparation for some time. The commission indicated, in the five-per cent decision, that the railroad companies in this territory needed a larger increase in revenues than did the trunk lines.

The Cadillac (Mich.) Chamber of Commerce and the Cadillac Lumber Exchange have filed a complaint with the Interstate Commerce Commission against the present relation of rates between Cadillac and points in trunk line territory and the Chicago-New York scale. Class rates between Cadillac and New York are now 110 per cent of the Chicago-New York scale and commodity rates between Cadillac and points in trunk line territory have a varying relation to that scale, the rates on lumber and lumber products being 100 per cent. It is alleged that lower rates are applicable to points on or adjacent to the west bank of Lake Michigan as to which Cadillac is an intermediate point and the petition asks that rates between Cadillac and New York should not exceed 100 per cent and that lumber rates should not exceed 90 per cent of the scale.

The Interstate Commerce Commission has issued a supplemental order in the transcontinental rate case suspending until December 30 a proposed increase in rates on barley which was to become effective on September 25. The commission has also suspended from September 25 to January 23, 1917, the operation of tariffs providing for increased rates on lumber and other forest products originating in Pacific coast territory via the Northern Pacific and Great Northern to stations in Michigan on the Copper Range. The proposed increase is to a combination basis of rates which would result in advances ranging from 2½ to 9 cents per 100 lb. The commission has also amended its order of June 25, which rescinded its relief under the fourth section on rates to the Pacific coast, to become effective on December 30 instead of September 1. Tariffs filed by the carriers which were to become effective on September 1 were suspended by the commission on August 29 and the effect was to continue in force rates established by authority of the previous fourth section orders during the life of the suspension order.

Advances on Coal in Chicago Switching District

Opinion by Commissioner Clements:

In the original report in this proceeding it was held that the respondents had not justified proposed increased rates on coal and coke from mines in various states to points on the line of the Chicago, Milwaukee & St. Paul in Chicago, 27 I. C. C., 71. The carrier named performs only a terminal service in Chicago on this traffic. It now asks that the commission fix the division which it may receive out of the through rate; *Held,* That upon the whole situation the commission does not feel justified in ordering a basis of divisions different from that now existing. (41 I. C. C., 302.)

STATE COMMISSIONS

New Fiscal Year in Pennsylvania

The Public Service Commission of Pennsylvania has adopted a resolution fixing the fiscal year for reports made to the Commission to end December 31. All companies are notified, however, to file the usual annual report for the fiscal year ending June 30, 1916.

COURT NEWS

The hearing in the injunction suit of the Texas railroads to restrain the operation of an order of the Texas Railroad Commission cancelling its previous orders allowing an increase in intrastate freight rates, which had been set for September 28 at Atlanta, Ga., was expected to be postponed until the November term of the federal circuit court, and to be held at Ft. Worth, Tex.

The attorney general of the United States has filed a brief in the Supreme Court in the appeal from the federal district court for the eastern district of Pennsylvania in the case against the Lehigh Valley and its subsidiary companies for alleged violations of the Sherman anti-trust law. The contention of the government is that the railroad and its subsidiary companies have created a monopoly in the mining and moving to market of anthracite coal.

Upon application of the governor, the attorney-general and the state railway commission, the Supreme Court of Nebraska, on September 22, issued an order restraining the railroads doing business in the state from putting into effect the new freight tariffs which were prepared following the order of the Interstate Commerce Commission in the Missouri-Nebraska cases. The new tariffs, increasing the class rates, were intended to replace those prescribed in order No. 19, which has been in effect in Nebraska for two years.

The attorney general of the United States has filed with the Supreme Court his brief in the oil-tank car cases asking the court to reverse the Pennsylvania district court which enjoined the Interstate Commerce Commission from compelling the Pennsylvania Railroad to furnish oil-tank cars to shippers. A statement issued by the department of justice says that these cases are among the most important which have arisen under the interstate commerce law in recent years, and that they "present for decision for the first time whether violation of the established duty of a common carrier to provide and furnish cars may be remedied by the commission's order or solely by suit in the courts."

The Union Pacific has filed a suit in the United States District Court at Kansas City, Mo., to enjoin the members of the Public Service Commission of Missouri from interfering with the issuance of $2,000,000 in bonds and from attempting to impose any penalties for not submitting the bond issue to that body for approval. The state of Missouri has a law which requires all railroad companies to obtain a certificate before issuing stocks and bonds and it provides for heavy fines against the corporation and imprisonment for its officers if bonds are issued without obtaining such a certificate. The law also provides for the payment of a fee graduated according to the amount of the bonds, with a minimum fee of $250. In 1914 the Union Pacific applied to the Public Service Commission of Missouri for authority to issue about $31,000,000 in new bonds. Authority was given and a fee of $10,962.25 was imposed. An appeal was taken from the order of the commission to the Circuit Court of Cole county, Missouri, where the order was reversed and judgment rendered fixing the amount of the fee at $250. The commission carried the case to the Supreme Court, where the judgment was reversed on a technicality, nothing being said as to the validity of the law or its application to foreign corporations. That case will be appealed to the Supreme Court of the United States. The Union Pacific now wishes to issue about $2,000,000 in bonds and has asked for an injunction to prevent interference with its purpose. The Union Pacific owns but a half mile of track in Missouri, and is a Utah corporation engaged (in Missouri) exclusively in interstate commerce. The question is squarely presented whether a state can impose any conditions upon a foreign

corporation which happens to be doing nothing but interstate commerce within its borders.

Taxation

An appeal from an assessment of a state tax on the property of the Illinois Central, the Illinois Supreme Court holds that the tax was based upon a contract, and was not an ordinary tax, and was not to be fixed by the judgment of the state auditor, but according to the Illinois general revenue law, and by the same rules as used by other officers in listing and assessing state taxes.—People v. Illinois Central (Ill.), 112 N. E., 701.

Violation of Yard Speed Rule

In an action for personal injuries to an engineman, brought under the federal employers' liability act, the Arkansas Supreme Court holds that an instruction that the plaintiff could not recover if he violated the rule requiring his train not to exceed 10 miles an hour through yard limits, was improperly refused. —St. Louis, I. M. & S. (Ark), 187 S. W., 920.

Other Railroads' Customs Admissible in Evidence

In a fireman's action for injury when his shovel struck the edge of a hole in the metal sheet constituting the floor of the tender (used to allow the coupling pin of the draw bar to pass through) so that he was thrown down and his wrist broken, the issue was whether the railroad was negligent in making the hole too large. The Arkansas Supreme Court held that evidence for the railroad that it was about the customary size of that on other railroads was admissible as evidence of what a reasonably prudent employer would ordinarily do, but not conclusive evidence thereof; and the exclusion of such evidence was reversible error.—St. Louis & San Francisco (Ark.), 187 S. W., 319.

Right to Refuse Live Stock

Under the interstate commerce act, a connecting carrier would ordinarily be required to take an interstate shipment; but if one of its bridges was down so that it would be impossible to move the freight (in this case a car of hogs) within a reasonable time, the carrier has a right to refuse the shipment unless the shipper will agree to make it subject to delay on account of the bridge. This is the decision of the Kansas City (Mo.) Court of Appeals. The carrier has a right to demand that such a provision be inserted for its protection in the shipping contract, provided it notifies the shipper and gets his consent thereto before accepting the shipment. This right exists and is the same whether the shipment is interstate or intrastate.—Bowles v. Quincy, Omaha & Kansas City (Mo.), 187 S. W., 151.

Libel of Common Carrier

A Washington statute of 1911 prohibits discrimination by common carriers, in favor of either persons or localities, while section 94 makes a violation of the act an offense. A navigation company sued for libel a person who caused to be published in a local newspaper an article (signed) "urging the public to patronize a competitor of the plaintiff." One of the statements alleged to be libelous was that he believed the county to be fully 10 years behind what it should be because of unjust discrimination in the freight and passenger rates charged by the navigation company. The Federal District Court, western district of Washington, held that this statement was not libelous, as charging the navigation company with an offense under the laws, but should be treated merely as a severe criticism of the company's methods.

Another statement was that the company had driven competitors from the field, and had robbed the people of the locality for years, but now protested when they sought to dictate rates. It was held that, as words not actionable may become so if they contain a covert and hidden meaning, this publication was libelous. It tended to injure the navigation company in its business. The innuendo as to robbery meant, not a technical robbery, but the imposition of rates which were so exorbitant that they deprived patrons of the navigation company of their money without just return. Puget Sound Nav. Co. v. Carter, 233 Fed. 832.

Railway Officers

Executive, Financial, Legal and Accounting

B. F. LaRue, assistant general solicitor of the Lehigh Valley at New York, having resigned to enter the general practice of law in New York City, W. F. Gleeson, claims adjuster at New York, has been appointed chief claim agent. Mr. Gleeson will have charge of the investigation of accidents to persons and damage to property (other than property in transit) and the settlement of claims.

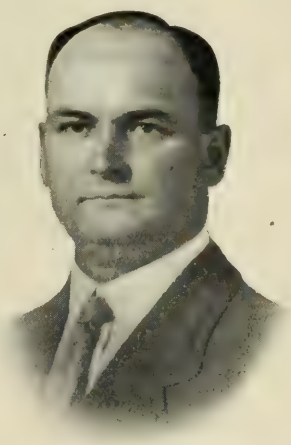
William D. Fenton, who recently retired as general counsel of the Southern Pacific Lines in Oregon, with office at Portland, Ore., was born June 29, 1853, in Scotland County, Mo. He received his early education in the public schools of Missouri and Oregon, later entering Chusteau College at Monmouth, Ore., from which latter institution he graduated in 1872. After some years of general legal practice he was appointed counsel of the Southern Pacific with headquarters at Portland, Ore., having jurisdiction over this company's lines in Oregon. He has been in active railway service for nearly 25 years and now retires to private practice.

Ben C. Dey, whose appointment as general counsel of the Southern Pacific Lines in Oregon, with office at Portland, Ore., has just been announced, was born December 29, 1879, at Oregon City, Ore. He attended the public schools of his native city and later graduated from the Portland High School in 1900, shortly thereafter he matriculated at Stanford University and took a complete full four years' course at this latter institution. He entered railway service on January 1, 1906, in the legal department of the Southern Pacific and has just succeeded William D. Fenton, resigned, as general counsel of the Southern Pacific, having jurisdiction over the company's lines in the state of Oregon.

Operating

W. J. Pickrell has been appointed assistant superintendent, District No. 1, of the Canadian Pacific, with office at Farnham, Que.

George G. Derby, the announcement of whose promotion from roadmaster of the Atchison, Topeka & Santa Fe at Newton, Kans., to be superintendent of the Oklahoma division with office at Arkansas City, Kans., was recently made, was born in Pennsylvania. He received his early education at the high school in Meadville, Pa., and later on entered Allegheny college. His leaning toward railway service began when he was very young, causing him to seek employment during his annual school vacations. After leaving college he abandoned the study of law, which profession he had taken up in the meantime, to accept service with the Erie Railroad. After working in various capacities in stations, yards and in the transportation department, he was appointed yardmaster at Jamestown, N. Y. He was holding this position when he decided to go west, shortly thereafter entering the employ of the Atchison, Topeka & Santa Fe. With this latter company he has been located at several points along the Arkansas River, Rio Grande & Middle divisions. About six years ago he was appointed trainmaster with office at Newton, Kans. His present appointment as superintendent became effective September 15.



G. G. Derby

R. J. Harlan, superintendent of the Southwestern division of the Central of Georgia at Macon, Ga., has been appointed general manager of the Wadley Southern Railway, with headquarters at Wadley, Ga., vice T. T. Hollomon, general superintendent, resigned.

Henry Baldwin, superintendent of the Columbus division, of the Central of Georgia at Columbus, Ga., has been appointed superintendent of the Southwestern division, succeeding R. J. Harlan, resigned to go to another company. E. P. McLain, transportation inspector at Savannah, has been appointed superintendent of the Columbus division, succeeding Mr. Baldwin, and C. E. Scarborough, trainmaster at Savannah, has been appointed transportation inspector succeeding Mr. McLain.

F. D. Kelsey has been appointed general superintendent of the Central division of the Great Northern, with headquarters at Great Falls, Mont., succeeding C. E. Leverich, resigned. W. R. Smith, division superintendent at Everett, Wash., has been appointed assistant general superintendent of the Central district, with office at Great Falls, succeeding Mr. Kelsey. J. M. Doyle has been appointed superintendent of the Cascade division, with office at Everett, Wash., succeeding Mr. Smith. A. K. Stone has been appointed superintendent of the Montana division, with office at Havre, Mont., succeeding Mr. Doyle, and H. W. Sheridan has been appointed superintendent of the Kalispell division, with headquarters at Whitefish, Mont., succeeding J. J. Darling, transferred.

Rolla Jabish Parker, whose appointment as general manager, Western lines, Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Tex., has just been announced, was born June 27, 1857, at Roscoe, Minn. He received his early education at the Shattuck School, Faribault, Minn., and entered railway service in 1872 as a brakeman on the Chicago, Milwaukee & St. Paul. In 1877 he was promoted to be a conductor, and held this position until 1881. From 1881 to 1884 he was conductor of a construction train on the Northern Pacific and from 1884 to 1887 held the same position with the Atchison, Topeka & Santa Fe. From this time on he has been continuously in the employ of the Santa Fe, having passed consecutively through the following grades: May, 1887, to December, 1892, division roadmaster; December, 1892, to January, 1897, general roadmaster at Topeka, Kan.; January, 1897, to February, 1900, superintendent of Middle division at Newton, Kan.; February, 1900, to January, 1901, superintendent of the Western division at Pueblo, Colo.; from January, 1901, to April, 1903, he was superintendent of the Colorado division with same headquarters; April, 1903, to June, 1905, he was superintendent of the Missouri division at Marceline, Mo.; June, 1905, to August, 1907, he was general superintendent of the Western Grand division at La Junta, Colo.; August, 1907, to April, 1909, he was general superintendent of the Central Grand division at Newton, Kans.; from April, 1909, to October, 1910, he was general superintendent at La Junta, Colo.; October, 1910, to his present appointment, which became effective September 7, he was general superintendent, Eastern lines, with headquarters at Topeka, Kans.



R. J. Parker

Traffic

H. A. Jordan, general freight and passenger agent of the Wadley Southern at Swainsboro, Ga., has resigned, and that office has been abolished. Effective October 1. All matters pertaining to operation and traffic will in future be handled by the general manager.

Engineering and Rolling Stock

H. A. Lane, assistant engineer of surveys of the Baltimore & Ohio at Baltimore, Md., has been promoted to assistant to the chief engineer of the Baltimore & Ohio system.

H. A. Macbeth, superintendent of motive power of the New York, Chicago & St. Louis at Cleveland, Ohio, has been appointed assistant to superintendent of motive power.

George Durham, master mechanic of the Delaware, Lackawanna & Western at Scranton, Pa., has been appointed superintendent of motive power and cars of the Wheeling & Lake Erie with office at Brewster, Ohio. Mr. Durham was born on October 10, 1875 at Pineville, Ky., and was educated in the common schools of his native town and later at Kentucky University, Lexington, Ky. He then entered the service of the Louisville & Nashville as a special apprentice and later served consecutively as a machinist, locomotive fireman, engineman, traveling engineer and general foreman until February 1, 1907. He was then appointed master mechanic of the Knoxville & Atlanta division with headquarters at Etowah, Tenn., remaining in that position until October 1, 1908, when he was made master mechanic of the same road at South Louisville, Ky. On April, 1911, he left that position and was appointed master mechanic of the Scranton, Bangor & Portland and Syracuse & Utica divisions of the Delaware, Lackawanna & Western, which position he held until his appointment on Septembr 15, 1916, as superintendent of motive power and cars of the Wheeling & Lake Erie, as above noted.



G. Durham

A. R. Ayers, principal assistant engineer, equipment department, of the New York Central lines east of Buffalo, with office at New York, has been appointed superintendent of motive power of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio. Mr. Ayers was born on October 26, 1878, at Toledo, Ohio, and graduated from Cornell University in 1900 as a mechanical engineer. He began railway work with the Lake Shore & Michigan Southern as a special apprentice in the same year. He was special inspector from 1903 to 1905, and in the latter year was made night engine house foreman at Elkhart, Ind. The next year he was made assistant general foreman of the Collinwood shops, and in 1907 was promoted to superintendent of shops at Elkhart. From January 1, 1908, to November 1 of the same year he was assistant superintendent of shops at Collinwood, and on the latter date was appointed assistant master mechanic, with office at Elkhart on the same road. He was appointed mechanical engineer of the Lake Shore, the Chicago, Indiana & Southern and the Indiana Harbor Belt, with office at Cleveland in 1910, and in March, 1912, was appointed general mechanical engineer



A. R. Ayers

of all the New York Central lines west of Buffalo, with office at Chicago. In February, 1915, he was appointed principal assistant engineer, equipment department of the New York Central lines east of Buffalo, with office at New York, and on October 1 leaves that road to become superintendent of motive power of the New York, Chicago & St. Louis, with headquarters at Cleveland, as above noted.

H. E. Stevens, engineer of bridges, Northern Pacific, with office at St. Paul, Minn., has been appointed chief engineer, succeeding W. L. Darling, resigned. Mr. Darling's resignation became effective on September 21.

Purchasing

Glenn G. Conklin, stationer of the Buffalo, Rochester & Pittsburgh at Rochester, N. Y., has resigned. Effective September 27.

J. F. Pratt has been appointed general storekeeper of the Great Northern, with office at St. Paul, Minn., succeeding John Opheim, transferred.

Francis J. O'Connor, who has just been appointed general storekeeper of the Chicago, Milwaukee & St. Paul, with office at Milwaukee, Wis., was born August 18, 1874, at El Paso, Ill. After an elementary education he took a course at Green Bay Business College, leaving there early in 1891. In May of this same year he obtained employment with the Chicago, Milwaukee & St. Paul as stenographer and clerk in the store department at Green Bay, Wis., which position he held until November, 1894. From November, 1894, to July, 1895, he was storekeeper with headquarters at this same place, being then appointed clerk and foreman in the general store department at Milwaukee, Wis. From February, 1901, to November, 1902, he was chief clerk to the master mechanic of the Milwaukee shops and from November, 1902, to May, 1904, he was signal inspector and assistant signal engineer. In May, 1904, he was appointed chief clerk to the superintendent of motive power and held this position until assigned to the office of general storekeeper September, 15.



F. J. O'Connor

OBITUARY

W. A. Thomas, master mechanic of the Virginian Railway, was killed in a derailment on the Virginian Railway near Alberta, Va., on September 20.

Allen J. Sovereign, formerly division superintendent of the Northern Pacific, with office at Staples, Minn., and who was granted an indefinite leave of absence in January, 1914, while holding this position, died at his home in St. Paul, Minn., September 19.

Railroad Building in Southern Manchuria.—Steps are being taken by the South Manchuria Railway Company to commence work on the Ssupingkai-Chengchiatun section of the Ssupingkai-Taonanfu Railway, a preliminary agreement for which was concluded by China and Japan in 1913. The detailed loan agreement for the construction of this section, 65 miles in length, was negotiated during the year. The whole line, which will be 165 miles in length, is expected to prove a profitable feeder to the South Manchuria Railway. The total cost of the first section is estimated at $1,500,000. The only work in this section attended with engineering difficulty is the bridge over the Liao river. There is a danger that the river traffic on the Liao above Chengchiatun may be seriously hampered by the construction of this bridge in the vicinity of the latter town.

Equipment and Supplies

LOCOMOTIVES

The Minnesota Steel Company is in the market for a number of locomotives.

The Missouri Pacific is reported to be inquiring for a number of locomotives.

The Union Pacific is contemplating the purchase of 10 Santa Fe type locomotives.

The Norfolk & Western is inquiring for a number of Mountain type locomotives.

The Buffalo & Susquehanna has ordered one locomotive from the Baldwin Locomotive Works.

The Canton Railroad has ordered one switching locomotive from the Baldwin Locomotive Works.

The United Railroads of Yucatan have ordered 2 10-wheel locomotives from the Baldwin Locomotive Works.

The Wilwin Company, Ltd., Mackinaw, Mich., has ordered one 2-4-2 type locomotive from the Baldwin Locomotive Works.

The Nashville, Chattanooga & St. Louis is inquiring for four Mountain type (4-8-2) and for six Mikado type locomotives.

Laurence Marques has ordered 3 Santa Fe type locomotives for Portuguese East Africa from the Baldwin Locomotive Works.

The Philadelphia Electric Company, Philadelphia, Pa., has ordered one 0-4-0 type locomotive from the Baldwin Locomotive Works.

The Bingham & Garfield has ordered one superheater 0-8-8-0 Mallet type locomotive from the American Locomotive Company. This locomotive will have 26 and 41 by 28-in. cylinders, 51-in. driving wheels and a total weight in working order of 461,000 lb.

The Guanica Centrale Railway (Porto Rico) has ordered one six-wheel switching locomotive from the American Locomotive Company. This locomotive will have 14 by 20-in. cylinders, 38-in. driving wheels and a total weight in working order of 64,000 lb.

The New York Central was reported in last week's issue as having ordered 115 locomotives from the American Locomotive Company. The order consists of 10 Pacific type, 5 Mallets, 55 Mohawk type, and 45 eight-wheel switchers. The Pacific type locomotives will have 23½ by 26 in. cylinders, 79-in. driving wheels and a total weight in working order of 273,000 lb. The Mallets will have 21½ and 34 by 32-in. cylinders, 57-in. driving wheels and a total weight in working order of 354,000 lb. The Mohawk type will have 28 by 28-in. cylinders, 69-in. driving wheels and a total weight in working order of 343,000 lb. The eight-wheel switchers will have 23½ by 30-in. cylinders, 57-in. driving wheels and a total weight in working order of 213,000 lb All these locomotives will be equipped with superheaters.

FREIGHT CARS

The Utah Copper Company is inquiring for 150 ore cars.

The Elgin, Joilet & Eastern is inquiring for 300 hopper cars.

The St. Louis Southwestern is repairing 500 cars in its own shops.

The Missouri, Kansas & Texas is reported in the market for 2,000 box cars.

The Chesapeake & Ohio has ordered 1,000 70-ton steel hopper cars from the Pressed Steel Car Company.

The Missouri Pacific is reported to have ordered 1,000 box cars from the American Car & Foundry Company.

The National Refining Company has ordered 60 40-ton 8,000-gal. tank cars from the American Car & Foundry Company.

The New York, Chicago & St. Louis has ordered 500 40-ton automobile cars from the Western Steel Car & Foundry Company.

The Indiahoma Refining Company, St. Louis, Mo., has bought 150 tank cars from the Standard Car Constructing Company.

The Cincinnati, New Orleans & Texas Pacific has ordered 50 center constructions from the Mount Vernon Car Manufacturing Company.

The Illinois Traction Company has ordered 60 50-ton hopper cars and 40 40-ton gondola cars from the American Car & Foundry Company.

The Kansas City Refining Company has bought 26 40-ton, 8,000-gal. and 24 50-ton 10,000-gal. steel tank cars from the American Car & Foundry Company.

PASSENGER CARS

The Arizona Copper Company has ordered three narrow gage passenger cars from the American Car & Foundry Company.

IRON AND STEEL

The Fort Dodge, Des Moines & Southern has ordered 175 tons of steel for a railroad bridge.

The Denver Union Stock Yards have ordered 181 tons of steel from the Hansell Elcock Company for an office building.

The Vandalia has ordered 778 tons of steel, for three riveted truss spans and one plate girder span for Indianapolis and Frankfort.

The Yazoo & Mississippi Valley has ordered 167 tons of steel from the Virginia Bridge & Iron Company for transfer belt gallery at New Orleans, La.

The Minneapolis, St. Paul & Sault Ste. Marie has ordered 478 tons of steel from the American Bridge Company for use in building extension to ore docks at Superior, Wis.

Italy Raises Railroad Rates.—Railroad freight rates in Italy have beeen raised 10 per cent. It is estimated that by this action the government railroad revenues will be increased $3,000,000 annually. The object in raising the rates was to secure money to pay extra wages of the railway employees totaling $4,000,000, which were granted recently following complaints by the men of the high cost of living and the extra work entailed by reason of the war.

Coal Car Distribution in Spain.—It appears that at Barcelona there are large numbers of cars loaded with coal which have been refused acceptance by the consignees owing to the poor quality of the coal. This practically immobilizes cars absolutely necessary in moving coal from the mines to industrial centers of the country. Accordingly, the railroads transporting the coal will be obliged to demand a certificate from the mine whence the coal proceeds showing quantity, to whom consigned, and by whom, so that in case it is not of the grade ordered the consignee may take up the case with the shipper. If the coal is not discharged by the consignee within 12 hours the railroad company will proceed to unload it at the expense of the consignee, without responsibility for loss or damage, unless this can be attributed to bad faith or negligence of employees. Each individual shipment must be kept separate, in order to permit the consignee to claim indemnification from the shipper. If the docks and freight yards of the transporting company are not large enough to permit of separately storing these shipments, more space may be rented at the expense of the consignee. Each coal transporting company must reserve a certain number of trains for coal, which they shall load to the maximum, and they shall inform the Ministry of Public Works within 15 days as to the number of cars needed by them for this purpose. In this way it may be arranged, if necessary, for one company to lease cars from another that has no immediate use for them.

Supply Trade News

The Railway Specialties Corporation, 29 Broadway, New York City, has been appointed eastern sales representative of the Denver Brass Works, Denver, Colo. Among the products manufactured by the Denver Brass Works are, injector repair parts, hose couplings, M. C. B. car journals and bearings, and the Swanson automatic flange lubricator.

Customers of the Carnegie Steel Company and other large steel companies in the Pittsburgh district have been notified regarding their early orders for steel delivery in 1917 that in the event the United States Government needs steel for the carrying out of its naval programs as an aid to preparedness, the government will be given reasonable first choice, and especially in delivery of steel plates and shapes for new naval vessels.

George W. Daves has been appointed a representative of the signal department of the Railroad Supply Company, with offices at 30 Church street, New York. Mr. Daves was for a number of years signal engineer of the Chicago & Alton, after which he went to the sales department of the Railroad Supply Company, later leaving that company to join the sales department of the Edison Storage Battery Company. He now returns to the signal department of the Railroad Supply Company, as noted.

Edward Cumberland Fisher, formerly assistant manager of the Cooke and Rogers works of the American Locomotive Company, has been appointed manager of the Cooke works of that company at Paterson, N. J. He was born May 2, 1875, on a farm in Virginia. At the age of sixteen he entered the Virginia Mechanics' Institute, a night school of technology in Richmond, and at the same time entered the shops of the Tidewater & Western Railroad at Chester, Pa., as a machinist apprentice. Shortly after completing his apprenticeship he accepted the position of general foreman of the Petersburg Iron Works. When that firm failed about a year later he entered the employ of the Southern Railway in its shops at Spencer, N. C., where he was soon made gang foreman. The following year he returned to Richmond as foreman of outside construction for the Richmond Iron Works, and shortly after was appointed instructor of mechanical drawing for the Chesapeake & Ohio in its apprentice school at Huntington, W. Va. This position he held until November 1, 1899, at which time he returned to Richmond as foreman for the Richmond Locomotive Works. After serving in various capacities, both in the drawing office and shops, he was transferred June 15, 1910, to Paterson, N. J., as superintendent of the Rogers works of the American Locomotive Company. In June, 1913, he was appointed assistant manager of the Cooke and Rogers works, and has now been appointed manager of the Cooke Works, as above noted.



Edward C. Fisher

The McKeen Motor Car Company, Omaha, Neb., has recently delivered to the Ferrocarriles del Norte de Cuba a motor car of 200 h.p., equipped with the Type C engine. This is the one hundred and forty-eighth car sent out by this company. These are in service on 69 railroads, including roads in the United States, Mexico, Canada, Australia and Cuba. This car is being sent to Florida under its own power and will be used between Jucara and Moron. A short time ago a 300 h.p. car was delivered to the Southern Utah Railroad, which will operate on grades 8 miles long having 2½ to 3 per cent gradient, and over a

maximum grade of 4.92 per cent for two miles. The car is equipped with a six-wheel motor truck, the two leading driving axles being connected by side rods. It will operate at three speeds.

Louis Sears has been appointed manager of railway sales of the Willard Storage Battery Company, Cleveland, Ohio, succeeding the late W. E. Ballantine, whose death was announced in the *Railway Age Gazette* of January 21, 1916. Mr. Sears has been with the Willard Storage Battery Company since April, 1908, remaining at the factory until January, 1910, at which time he went to the Chicago office where he remained until October, 1913. He was in the Cleveland office October, 1913, to March, 1915, and from March, 1915, to August, 1916, he was located in the New York office. Mr. Sears was transferred to the Cleveland office and appointed manager of railway sales on August 1, 1916.

The Baldwin Locomotive Works have taken over a $40,000,000 shrapnel contract made by the Eddystone Munitions Company with the Russian Government, and guaranteed by the British Covernment. Alba B. Johnson, president of the Baldwin Locomotive Works, in explanation of this deal has made the following statement: "The stock of the Eddystone Ammunition Corporation has been acquired by the Anglo-Russian Commission which will designate the board of directors. The corporation itself continues its corporate existence and its lesseeship of the building constructed for its use and is to continue to perform its contracts. The relationship of the Baldwin Locomotive Works in the matter of undertaking to carry on the business is in no wise altered. It has undertaken to render some services for the benefit of the Ammunition corporation for which it will be compensated in addition to a rental. The Baldwin Locomotive Works assumes no financial responsibility whatever."

The Texas Company

The Texas Company directors have voted 25 per cent increase in capital stock, subscription rights to which will be offered at par, $100, to stockholders of record November 30; payments to be made in two instalments of 50 per cent each, due on or before January 5, and April 5, 1917, respectively. New stock will share in earnings from April 1, 1917. Interest at rate of 6 per cent per annum will apply on installments paid from January 5 to April 5. Stockholders will be asked to ratify these recommendations at the annual meeting at Houston, Texas, on November 14. The increase will amount to $11,500,000 and will bring total outstanding capital of the Texas Company up to $55,500,000. Present outstanding capital is $37,000,000, but this will become $44,400,000 October 5, next, with payment of final installment of $7,400,000 new stock offered to shareholders last March. That increase involved the offering of rights to stockholders to subscribe to 20 per cent of their holdings at par. These rights last year sold as high as $20 each on a when-issued basis. Proceeds of sale of new stock as heretofore are to be applied solely to extension of plants and other facilities to take care of the continued and rapid growth of business.

TRADE PUBLICATIONS

Drills and Reamers.—Catalogue No. 15, issued by the Celfor Tool Company, Buchanan, Mich., is a 90-page book in which is listed the complete line of standard drills and reamers manufactured by this company. The catalogue also contains a list of drill chucks, drill sockets, lathe tool holders, tool bits, flue cutters and drill gages.

Universal Electric Hammer Drill.—Bulletin E-43 has just been issued by the Chicago Pneumatic Tool Company, describing the Duntley universal electric hammer drill. This tool is designed for use in drilling stone or concrete, as well as for light chipping and is equipped with a motor that will operate interchangeably on direct or alternating current.

Bulb Sections.—Under date of September 1, the Carnegie Steel Company, Pittsburgh, Pa., has issued a third edition of "Bulb Sections," a 17-page pamphlet, in which are catalogued the bulb angle and beam section, limited quantities of which are used in the car and ship building trades. These sections are not carried in stock, but are furnished on order. The usual data concerning the dimensions and properties of the sections are given.

Railway Construction

Anthony & Northern.—This company has finished work on an extension from Gibson, Kan., west to Kinsley, 8 miles. (July 14, p. 39.)

This company has awarded contracts for the grading of its new line from Larned, Kan., to Hays City. The track laying and bridge building will be done by the company's own forces. There will be approximately 8,000 cu. yd. of excavation per mile; the maximum grade is 1 per cent, and the maximum curve about 3 deg. J. E. Waite, Hutchinson, Kan., is in active supervision of the undertaking.

Carolina Southern.—Incorporated in South Carolina with $30,000 capital to build a railway from Orangeburg, S. C. south to Estill or to a point near Estill, in Hampton county about 60 miles. The headquarters of the company are at Orangeburg, and the incorporators include E. N. Mittle, Bowman; J. Leroy Dukes, Orangeburg, and W. C. Martin, Branchville.

Chicago, Milwaukee & St. Paul.—The report of this company for the year ended June 30, 1916, shows that the eastern extension of the Seattle, Port Angeles & Western was completed and placed in operation in May, 1916, and an extension from Majestic, Wash., west about six miles is about 25 per cent completed. An extension of the Big Blackfoot Railway from McNamara Junction to Clear Water, Mont., 20 miles, is under way, and is about 5 per cent completed. Work on a branch line from a point on the main line of the Bellingham & Northern, near Goshen, Wash., to Welcome, 11.3 miles, was started early in 1915, and the work is about 95 per cent completed. The construction of the Choteau line from Great Falls, Mont., northwest to Agawam, 70 miles is nearing completion, track laying is now in progress and it is expected that the line will be placed in operation during 1916. The work of depressing the tracks of the Hastings and Dakota division from Hiawatha avenue to Hennepin avenue, in the city of Minneapolis, 3 miles, is about 88 per cent completed and all the grade crossings have been eliminated and work on the remaining seven overhead viaducts is under way. A new viaduct carrying Lake street over the tracks of the Hastings & Dakota division in Minneapolis is now under construction, and it is expected will be completed this coming winter. The elevation of tracks on the Chicago & Evanston division from Montrose avenue to Howard avenue, Chicago, Ill., 4.4 miles, is under construction and about 45 per cent of the work is completed. The elevation of tracks in the city of Milwaukee, Wis., is about 85 per cent completed.

Fort Dodge, Des Moines & Southern (Electric).—This company is building an extension of its line from Gypsum, Iowa, to Brushy, Iowa, a distance of 7½ miles. Contracts for the grading have been let to Donald Jeffery, Delmar, Iowa, and Duggan & Naylor, Omaha, Neb. The bridges, of which there will be three—two concrete box culverts and one 50-ft. deck girder span on concrete abutments—will be built by A. H. Neumann & Company, Des Moines, Iowa. About 16 tons of steel and 1,200 cu. yd. of concrete will be needed for this latter undertaking. The excavation will average 13,000 cu. yd. per mile, with an eight-tenths per cent maximum grade, and a 3 deg. maximum curve. A sub-station will be built at Brushy, Iowa. The work is progressing rapidly, about 25 per cent of the grading, 40 per cent of the bridging and 15 per cent of the overhead line already has been completed. R. L. Cooper, chief engineer, Boone, Iowa, has active supervision of the work.

Gulf, Plainville & Northern.—The Imperial Promotion & Construction Company, of which Hal W. Neiswanger, Osborne, Kan., is president, has purchased the above road with all of its rights of way and 17 miles of railway grade. This road was begun some years ago, but owing to the failure of the construction company backing it at that time, just after it had the grade completed and was ready to lay the rails, the proposition was abandoned. However, other interested parties kept the enterprise alive by paying the taxes, hoping that some other promoters would take hold and put the road through. This is now about to be accomplished by the above-mentioned concern.

Actual track-laying will commence about November 1, and will be carried on to completion without further interruption. This road will run from Holyrood, Kan., down through Ellsworth county, north and west through Barton, Kan., thence north and west to Hays, Kan., so that connection with other and more important lines will be immediate. It is expected that the road will be ready for operation by April 1, 1917, at which time rolling stock and other equipment will be purchased. E. A. McFarland, Lincoln, Kan., has been elected president.

Gulf & Ship Island.—Surveys for a proposed branch are to be made, it is said, from a point near Gulfport, Miss., west to Kiln, about 20 miles.

Marengo, Lake Geneva & Northern.—The Cortlandt Engineering Company of New York has been awarded a contract by the above road for the completion of its line from Marengo, Wis., to Delavan, Wis. A $700,000 bond issue has been taken by the contractors.

Mobile & Baldwin County.—See Mobile, Volanta & Pensacola.

Mobile, Volanta & Pensacola (Electric).—This company, formerly the Mobile & Baldwin County, which now operates an electric line from Volanta, Ala., south to Euclid, about four miles, proposes to build an extension east to Pensacola, Fla., about 40 miles. The company plans to issue $100,000 bonds, it is said, to secure funds for carrying out the work.

Montgomery Light & Traction Company.—This company will build an electric line from Montgomery, Ala., to Wetumpka, about 15 miles, it is said, if a bridge is built across the Tallapoosa river near Hughes' Ferry and permission is granted to operate electric cars over the bridge. The proposed line would cost about $100,000.

New York Subways.—The New York Public Service Commission, First district, has given a contract to Kaufman & Garcey, New York, at $103,680 for the installation of tracks on the main portion of the Culver Rapid Transit Railroad in the borough of Brooklyn.

The commission has approved the award by the Interborough Rapid Transit Company to the Thomas Crimmins Contracting Company, New York City, of the contract for the installation of the third-rail on the Queens rapid transit lines. The cost of the work will be about $22,300.

The commission has approved the award of the contract for the installation of the tracks on the Seventh avenue branch of the Lexington avenue line to Engel & Hevenor, New York, at $229,440. This contract covers track laying from the junction of the Seventh avenue line with the first subway at Times Square, and south to a connection with the present subway at the Battery, and also in the Brooklyn extension of the Seventh avenue line to a connection with the first subway near Joralemon street.

The commission has awarded a contract to the Degnon Contracting Company, at $810,265, for the construction of section 1-B of route 12. This is part of the connection between the Brighton Beach line and the Fourth avenue subway. This section extends from Atlantic avenue under the Flatbush avenue station of the Long Island Railroad to Hanson Place and St. Felix street in the borough of Brooklyn.

Pennsylvania Lines West.—This company's construction forces are rebuilding two miles of the Wellsburg & State Line Railroad. The work includes some grading, new ties and 307 lineal feet of bridge superstructure.

Southern Pacific.—The report of this company for the year ended June 30, 1916, shows that on the Colusa & Hamilton, building from Hamilton, Cal. to Harrington, 61.23 miles, track laying has been completed on 46.66 miles, grading has been completed on 12 miles and is now under way on 2.56 miles. The Southern Pacific line, building from Eugene, Ore., to Marshfield, 120.50 miles, has 6.37 miles in operation, and track laying has been completed on 113.81 miles.

Sudbury Copper Cliff Electric Railway.—Plans for building an extension from Sudbury, Ont., to Murray nickel mine, about 4 miles, also a line from Sudbury to Coniston, about 19 miles are said to be under consideration. J. H. Mackey, president, Sudbury.

Sugar Land Railway.—An extension of this road from Otey, Tex., south to Anchor, is reported open for business. (April 7, p. 818.)

Wayne-Hardin.—Surveys are now being made, and as soon as these are completed bids will be asked for building from Waynesboro, Tenn., south to Collinwood, where connection is to be made with the Tennessee Western, thence west to Savannah; in all about 45 miles. There will be one short steel bridge on the line. The promoters expect to develop a traffic in lumber, iron ore and agricultural products. E. H. Steinman, president, Collinwood. (February 25, p. 377.)

West Virginia Roads.—According to press reports from Clay, W. Va., the Hartland Colliery Company will build a 22-mile railway to develop coal lands in West Virginia. The line will connect with both the Chesapeake & Ohio and the Coal & Coke. John B. Hart, Clarksburg, president, W. Va., and M. McD. Price, general manager, Johnstown, Pa.

According to press reports from Omar, W. Va., the Main Island Coal Company is receiving bids for the construction of a three-mile railroad to be built to new mines.

RAILWAY STRUCTURES

Ashland, Wis.—The Chicago & North Western has let contracts to the Grant Smith Company of St. Paul, Minn., for the erection here of ore dock No. 3. This third dock will have 200 pockets, will be of 50,000 tons capacity and cost approximately $1,500,000.

Bon Air, Va.—The Southern Railway will build a new passenger station at Bon Air. The building will be of frame construction, 26 ft. by 70 ft. with white and colored waiting rooms, office and baggage rooms, ladies' parlor, and will be equipped with modern conveniences. The improvements also include the rearrangement of the main line and side tracks, a short platform with concrete curb, a concrete wall supporting a driveway, steps and railing.

Buffalo, N. Y.—The Pennsylvania Railroad will build a new outbound freight house at Buffalo. It will have standing room for 120 cars, and will be so constructed that, if necessary, it can be enlarged at some future time. Contracts for the work have not yet been let. The company will use the present freight station at Louisiana street for the inbound freight house.

Butte, Mont.—The report of the Chicago, Milwaukee & St. Paul for the year ended June 30, 1916, shows that the new passenger station under construction at Butte is about 50 per cent completed. The cost of this improvement will be about $150,000. A new engine terminal with a 22 stall roundhouse to be built at North McGregor, Iowa, has been authorized. Land is being secured for new engine terminals at Sioux City, Iowa, also at Atkins. Work is under way on the new engine terminal with a 4 stall roundhouse at Beloit, Wis., and the enlargement of the roundhouse machine shop at Deer Lodge, Mont., in connection with the operation of electric locomotives is under construction at a cost of about $21,000. The construction of 21 grain tanks of a total capacity of 625,000 bu. in connection with the company's elevator E at Milwaukee, Wis., has been authorized. An extension of the yard track facilities at Cedar Rapids, Iowa, is under construction at a cost of $60,000 and is expected to be finished during 1916. Plans are under consideration for a proposed new passenger station and a duplication of the present ocean dock and warehouse at Tacoma, Wash.; automatic fire sprinkler and certain devices are being installed in the present dock and warehouse at a cost of $25,000 and dredging work near the present dock and warehouse has been authorized at a cost of $23,400.

Dubuque, Iowa.—The Illinois Central is remodeling and adding another story to its freight house at this point at an approximate cost of about $20,000.

East St. Louis, Ill.—The Illinois Central is erecting a new freight house here. The building will be of timber construction, 1,050 ft. long, 32 ft. wide and one story high. About 486 ft. will be two stories high to provide for additional office space. There will be a transfer platform 12 ft. wide and running the

entire length of the shed; also a heavy freight platform 170 ft. long and 27 ft. wide. The approximate cost of this undertaking is $150,000.

Freeport, Ill.—The Illinois Central is putting on an additional story to its division office building here at a cost of $20,000. Work has just begun.

Louisville, Ky.—Contracts have been awarded by the Illinois Central for a roundhouse and machine shop to cost approximately $80,000.

New York.—The Pennsylvania Railroad is carrying out work at the Pennsylvania Terminal to provide facilities for connecting with the Seventh avenue subway.

The New York Public Service Commission, First district, will receive bids on October 6 for the construction of station finish for six stations in the borough of Manhattan on the rapid transit railroads now being constructed under the dual contracts, as follows: On the Lexington avenue line underneath Forty-second street beneath Park and Lexington avenues; on the upper portion of the Seventh avenue line at Forty-second street and Times Square, at Pennsylvania station (Thirty-third street), at Twenty-eighth street and at Eighteenth street.

A contract has been awarded by the commission to the Serber-Stander Company, New York, at $149,324, for station finish work on the Canal, Twenty-third and Twenty-eighth street stations of the Broadway-Fourth avenue subway, in the borough of Manhattan.

Parkersburg, W. Va.—The Baltimore & Ohio has given a contract to J. J. Walsh & Sons, Baltimore, Md., at $300,000, for the new freight facilities to be built at Parkersburg. (June 16, p. 1354.)

Pine Bluff, Ark.—The St. Louis Southwestern has started work here on a new 15-stall roundhouse. The approximate cost will be close to $30,000. All the work will be done by the company's own forces. J. S. Berry, superintendent of bridges and buildings, has direct supervision of the undertaking.

Spencer, N. C.—Enlarged facilities for repairing cars at Spencer will be constructed at once by the Southern Railway to consist of a new all steel car shed 109 ft. by 600 ft. with a shop adjoining 50 ft. by 100 ft. Bids are now being asked for the foundation work. The shed will be equipped with overhead cranes for handling car bodies and materials. Additional track room will be provided for handling the increased number of cars to be repaired.

Tecumseh, Nebr.—The Chicago, Burlington & Quincy will soon erect a new passenger station at this point. The building will be one story in height, of brick veneer material and cost close to $25,000.

Waterloo, Iowa.—The Waterloo, Cedar Falls & Northern has started excavation here for a structure to be used as general offices and interurban railway waiting-room. The building will be 85 ft. long, 80 ft. wide and three stories high. It will be of brick construction with wood floors. The approximate cost is $75,000; H. A. Maine & Company of Waterloo, Iowa, being the successful bidders.

West Duluth, Minn.—The company forces of the Northern Pacific are constructing an eight-stall roundhouse at this point on its property just west of Sixty-fifth avenue west. The building will be used for the present, at least, exclusively for housing switch engines used in this end of the city. It is expected that the new structure will be ready for occupancy by November 1, 1916. The building will be erected of timber, and be spacious enough to easily house the largest type of switch engines on the company's transfer lines.

Irish Railway Traffic Receipts.—The Irish Department of Agriculture has issued its report for the year 1915. It states that the gross traffic receipts of Irish railways amounted to $23,510,063 in 1915, as compared with $22,682,757 in 1914, $22,551,361 in 1913, $21,193,608 in 1912, and $21,183,875 in 1911. In each of the first 25 weeks of 1915—that is, up to June 25—the gross receipts were greater than in 1914, but in 13 of the last 27 weeks of the year the receipts were less than in the corresponding weeks of 1914, due chiefly to the very large exports of live stock in the second half of 1914.

Railway Financial News

Boston & Maine.—At the annual meeting of the stockholders of the Connecticut River Railroad, held at Springfield, Mass., September 21, the directors elected were those on the ticket headed by Richard Billings, and it is believed that the new board will be favorable to the plan of reorganization of the Boston & Maine, under which the Connecticut River would become an integral part of the Boston & Maine. Mr. Billings cast 19,000 of the 24,000 votes. The new directors are: J. H. Williams, Walpole, N. H.; Henry P. Binney, Boston; Francis R. Hart, Boston; William H. Brooks, Holyoke. The directors who retire are H. W. Keyes, E. P. Kendrick, Richard Olney and Charles E. Gross. The remaining members, including the president, William H. McClintock, were re-elected without opposition.

Chicago & Eastern Illinois.—William J. Jackson, receiver, has reported to the court that surplus funds available on September 1, amounted to $1,476,960, against which there were liabilities of $350,000; and on this report the court has authorized the payment of interest on bonds which has remained unpaid since March 25, 1915; a total amount of about $630,000.

Chicago, Indianapolis & Louisville.—At the annual meeting of the stockholders in Indianapolis, September 20, the Chicago & Wabash Valley, the Indiana Stone, and the Indianapolis & Louisville railroads were discontinued as separate corporations, all of the stock being owned by the Chicago, Indianapolis & Louisville.

Colorado & Southern.—The directors, at a meeting held on September 22, declared a dividend of 2 per cent on the first preferred stock, the first dividend on this stock since October, 1913.

Grand Trunk.—The directors, at a meeting in London, September 22, declared a dividend of 2½ per cent on the first preferred five per cent stock. This is for the last half year. The last preceding dividend on these shares was paid in April, 1914.

Wheeling & Lake Erie.—The property of this road is advertised to be sold at foreclosure sale, October 30; and the upset price has been reduced to $12,000,000. Kuhn, Loeb & Company and Blair & Company, reorganization managers, have announced a plan of reorganization which provides for a total capital of $72,370,858; and for an assessment of $27 a share on all classes of the present stock. The assessment is calculated to raise about ten millions, which will pay off $6,673,000 in receivers' certificates, pay the cost of reorganization, and provide some working capital. According to the plan the annual interest charges will be reduced from $1,744,950 to $768,515. There will be a refunding mortgage under which $50,000,000 in bonds will be authorized. Of these bonds, $11,697,000 will be exchanged for the present first consolidated 4 per cent bonds. There will be $11,882,600 7 per cent prior lien stock, which will be exchanged for the same par value of three-year notes now outstanding. Upon payment of the assessment, holders of the $4,989,000 first preferred stock will get 100 per cent of new common and 27 per cent of new 6 per cent preferred. Owners of the second preferred will receive 90 per cent in common and 27 per cent in preferred, and holders of the $20,000,000 old common 87½ per cent of new common and 27 per cent of preferred.

Divisional bonds and certain receiver's certificates amounting to $4,805,000 will be left undisturbed. Holders of the three-year notes have accepted the plan, and its cash requirements have been underwritten by a syndicate headed by the reorganization managers. Stockholders and bondholders are asked to deposit their securities with the Central Trust Company, New York, before October 25.

Luxemburg to Mint Zinc Coins.—The Tägliche Rundschau of Berlin states that the Government of Luxemburg has decided to mint 200,000 francs in small coins from zinc, owing to the lack of copper change.

[ADVERTISEMENT.]

ANNUAL REPORTS

SOUTHERN PACIFIC COMPANY REPORT OF THE BOARD OF DIRECTORS

NEW YORK, September 18, 1916.

TO THE STOCKHOLDERS OF THE SOUTHERN PACIFIC COMPANY:

Your Board of Directors submits this report of the operations of the Southern Pacific Company and of its Proprietary Companies for the fiscal year ended June 30, 1916.

PROPERTIES AND MILEAGE.

The transportation lines constituting the Southern Pacific System, June 30, 1916, were as follows:

DIVISIONS.	First Main Track.	Additional Main Track.	Sidings.	Ferries.	Water Lines.
A.—MILEAGE OF LINES BELONGING TO OR LEASED BY COMPANIES THE CAPITAL STOCKS OF WHICH ARE PRINCIPALLY OWNED BY THE SOUTHERN PACIFIC COMPANY.					
(1)—Operated by the Southern Pacific Company under leases:					
Central Pacific Ry.	2,267.82	256.29	878.51	9.90	125
Oregon & California R. R.	1,101.10	5.81	248.98		
Southern Pacific R. R.	3.489.80	208.29	1,525.32	3.00	
South Pacific Coast Ry.	106.69	20.46	49.93	3.00	
(2) Operated by the owning Companies:					
Morgan's Louisiana & Texas R. R. & S. S. Co.	400.67	58.35	228.73	3.00	
Louisiana Western R. R.	207.74	....	70.26		
Lake Charles & Northern R. R.	71.52	....	12.20		
Texas & New Orleans R. R.	468.14	3.46	208.95		
Galveston, Harrisburg & San Antonio Ry.	1,360.95	6.59	345.26		
Houston, East & West Texas Ry.	190.94	....	57.47		
Houston & Shreveport R. R.	40.72	.69	7.28		
Houston & Texas Central R. R.	894.63	1.65	260.21		
Southern Pacific Terminal Company	....	....	25.68		
Arizona Eastern R. R.	377.74	....	72.67		
Southern Pacific Company	....	....	....	....	4,400
B.—MILEAGE OF LINES BELONGING TO COMPANIES THE CAPITAL STOCKS OF WHICH ARE PRINCIPALLY OWNED BY THE MORGAN'S LOUISIANA & TEXAS R. R. & S. S. CO., BUT WHICH ARE OPERATED BY THE OWNING COMPANIES.					
Iberia & Vermilion R. R.	21.44	....	10.93		
Direct Navigation Co.	....	....	....	....	65
Total	10.999.90	561.59	4,002.38	18.90	4,590
Less operated jointly by Proprietary Co's	43.41	9.97	20.31		
Total miles of road operated June 30, 1916	10,956.49	551.62	3,982.07	18.90	4,590
June 30, 1915	10,587.40	551.50	3,838.05	18.90	4,873
Increase	369.09	.12	144.02		
Decrease	....	....	....	....	283

In addition to the mileage above tabulated, the Southern Pacific Company solely controls through ownership of capital stock, 780.01 miles of electric lines, and 1,242.42 miles of the Southern Pacific R. R. Co. of Mexico; and jointly controls (through ownership of capital stock in equal proportions with the Atchison, Topeka & Santa Fe Ry. Co.) 506.77 miles of the Northwestern Pacific Railroad, and 62.93 miles of the Sunset Railway, an aggregate of 13,548.62 miles.

On July 1, 1915, the Southern Pacific Company purchased the properties of the following affiliated companies, which properties are operated in connection with the property of the Orgeon & California R. R. Co.:

Coos Bay, Roseburg & Eastern R. R. & Nav. Co.	27.77 miles
Pacific Railway & Navigation Co.	91.16 "
Salem, Falls City & Western Ry. Co.	28.17 "
Corvallis & Eastern R. R. Co.	140.58 "
Portland, Eugene & Eastern Ry. Co.	107.76 "
Willamette Pacific R. R. Co.	73.39 "
Total miles of road purchased	468.83 "
Less—Mileage of Willamette Pacific R. R. Co. not in operation July 1, 1915	67.02 "
Miles of road in operation July 1, 1915	401.81 miles

On July 1, 1915, the Lake Charles & Northern R. R. Co., which operates 70.50 miles of road, and which had not before been dealt with as a Proprietary Company, was taken into the system, and its assets and liabilities and the results of its operations are included in the exhibits of Proprietary Companies in this report.

INCOME ACCOUNT.

SOUTHERN PACIFIC COMPANY AND PROPRIETARY COMPANIES, COMBINED.
(Excluding offsetting accounts.)

	This Year.	Last Year.	Decrease. +Increase.	Cent. Per
Average miles of road operated:				
Lines East of El Paso	3,636.14	3,534.12	+ 102.02	2.89
Lines West of El Paso	7,319.83	7,020.12	+ 299.71	4.27
	10,955.97	10,554.24	+ 401.73	3.81
OPERATING INCOME.				
Railway operating revenues	$152,694,228.19	$129,865,675.09	+$22,828,553.10	17.58
Railway operating expenses	97,443,658.23	87,753,842.31	+ 9,689,815.92	11.04
Net revenue from railway operations	$55,250,569.96	$42,111,832.78	+$13,138,737.18	31.20
Railway tax accruals	$7,023,325.97	$6,371,272.84	+ $652,053.13	10.23
Uncollectible railway revenues	37,272.95	50,946.14	— 13,673.19	26.84
Total operating income	$48,189,971.04	$35,689,613.80	+$12,500,357.24	35.03
NONOPERATING INCOME.				
Rent from locomotives	$54,945.04	$72,612.74	— $17,667.70	24.33
Rent from passenger-train cars	324,624.94	282,448.41	+ 42,176.53	14.93
Rent from floating equipment	50,347.10	80,759.03	— 30,411.93	37.66
Rent from work equipment	42,574.07	69,555.19	— 26,981.12	38.79
Joint facility rent income	266,069.21	473,475.01	— 207,405.80	43.81
Income from lease of road	43,085.38	94,996.46	— 51,911.08	54.65
Miscellaneous rent income	549,774.17	444,514.74	+ 105,259.43	23.68
Miscellaneous non-operating physical property	276,310.31	298,358.19	— 22,047.88	7.39
Dividend income	4,418,154.07	4,478,250.00	— 60,095.93	1.34
Income from funded securities — Bonds and notes — Affiliated and other companies	3,799,634.93	3,756,061.84	+ 43,573.09	1.16
Income from funded securities — Investment advances — Affiliated companies	1,015,819.55	2,157,327.50	— 1,141,507.95	52.91
Income from unfunded securities and accounts	584,829.75	494,136.41	+ 90,693.34	18.35
Income from sinking and other reserve funds	653,787.86	678,550.66	— 24,762.80	3.65
Miscellaneous income	123,078.85	577,332.14	— 454,253.29	78.68
Total nonoperating income	$12,203,035.23	$13,958,378.32	— $1,755,343.09	12.58
Gross income	$60,393,006.27	$49,647,992.12	+$10,745,014.15	21.64
DEDUCTIONS FROM GROSS INCOME.				
Hire of freight cars —Debit balance	$405,599.93	$120,850.99	+ $284,748.94	235.62
Rent for locomotives	24,399.00	24,771.52	— 372.52	1.50
Rent for passenger-train cars	249,240.14	172,921.37	+ 76,318.77	44.13
Rent for floating equipment	255,883.16	3,613.92	+ 252,269.24	....
Rent for work equipment	6,583.89	6,960.69	— 376.80	5.41
Joint facility rents	361,527.34	358,839.75	+ 2,687.59	.75
Rent for leased roads	736,465.40	717,904.21	+ 18,561.19	2.59
Miscellaneous rents	669,373.22	647,940.60	+ 21,432.62	3.31
Miscellaneous tax accruals	1,280,390.95	965,387.10	+ 315,003.85	32.63
Interest on funded debt — Bonds and notes	24,663,251.94	25,105,848.89	— 442,596.95	1.76
Interest on funded debt — Nonnegotiable debt to Affiliated Companies	267,290.07	275,536.69	— 8,246.62	2.99
Interest on unfunded debt	31,518.20	81,037.38	— 49,519.18	61.11
Amortization of discount on funded debt	225,343.53	237,540.56	— 12,197.03	5.13
Maintenance of investment organization	142,410.77	125,981.31	+ 16,429.46	13.04
Miscellaneous income charges	188,474.82	232,537.67	— 44,062.85	18.95
Total deductions from gross income	$29,507,752.36	$29,077,672.65	+ $430,079.71	1.48
Net income	$30,885,253.91	$20,570,319.47	+ $10,314,934.44	50.14
DISPOSITION OF NET INCOME.				
Income applied to sinking and other reserve funds	$934,837.82	$939,724.57	— $4,886.75	.52
Income balance transferred to credit of Profit and Loss.	$29,950,416.09	$19,630,594.90	+$10,319,821.19	52.57

	This Year.	Last Year.	Increase. —Decrease.	Per Cent.
Per cent. on outstanding capital stock of Southern Pacific Company..	10.98	7.20	+ 3.78	52.50

In the foregoing table there has been excluded from both sides of the account (Income from Funded Securities, and Interest on Funded Debt) for this year and last, the interest paid and received on bonds of Proprietary Companies owned by Southern Pacific Company and its Proprietary Companies.

The Interstate Commerce Commission, during the year, issued a ruling to the effect that interest on investment advances to affiliated companies, which we have heretofore dealt with as Income from Unfunded Securities and Accounts, should be classified as Income from Funded Securities. In the figures for last year in the foregoing statement the sum of $2,157,327.50, which was included in the $2,651,463.91 reported last year as Income from Unfunded Securities and Accounts, is shown as Income from Funded Securities—Investment Advances—Affiliated Companies.

The details of Railway Operating Revenues and Railway Operating Expenses are fully dealt with under Transportation Operations.

The payments during the year to other companies for rent of equipment exceed the income from rent of equipment by $469,214.97, an increase, as compared with last year, of $645,471.85, of which $362,790.68 is on account of rolling stock, and $282,681.17 is on account of floating equipment.

The decrease of $207,405.80 in Joint Facility Rent Income is the result, principally, of charging against the said account this year the estimated amount of depreciation on certain terminal facilities included in said account in previous years, in order to provide a reserve for the replacement of such facilities.

The decrease of $51,911.08 in Income from Lease of Road is the result, principally, of the termination of the lease to the Butte County Railroad of the branch line from Barber to Stirling City.

The principal cause of the increase in Miscellaneous Rent Income was the collection during the current year of $85,278.55 of rentals which accrued prior to July 1, 1915.

The decrease in Miscellaneous Nonoperating Physical Property is due, principally, to a decrease in the interest on notes received in payment for lands covered by Central Pacific Railway Company Three and One-half Per Cent. Mortgage, resulting from a decrease in the principal of such notes.

The decrease in Income from Funded Securities—Investment Advances—Affiliated Companies is the result principally, of including in the said account last year interest accruing prior to July 1, 1914, on construction advances to affiliated companies; and interest accruing last year on construction advances the principal of which was repaid last year.

The increase in Income from Unfunded Securities and Accounts is the result of including in the said account this year, in accordance with a ruling of the Interstate Commerce Commission, interest on the Companies' own funds used for construction, which was last year included in Miscellaneous Income; and of a decrease in the amount of interest received on bank balances, due to the application of current funds to the purchase of bonds issued under Central Pacific Railway Company Four Per Cent. Thirty-Five Year European Loan of 1911.

The decrease in Miscellaneous Income is the result of taking into last year's income the net receipts from the operations of the steamships Persia and Nile from July 1, 1913, to June 30, 1915; and to the inclusion in the said account last year of interest on the Companies' own funds used for construction, which is this year included in Income from Unfunded Securities and Accounts as explained in the preceding paragraph.

The increase in Miscellaneous Tax Accruals is the result of the assessment by the Government of additional income tax, aggregating $325,179.33, covering the twelve months ended December 31, 1913, and the six months ended June 30, 1914. This tax was paid under protest and suit has been brought for its recovery.

The decrease in Interest on Funded Debt—Bonds and Notes is the result, principally, of the acquisition by the Southern Pacific Company during the year of approximately $21,925,000, par value, of bonds issued under Central Pacific Railway Company Four Per Cent. Thirty-five Year European Loan of 1911, the interest on which, amounting to $443,129.83, has been excluded, in the foregoing statement, both from Interest on Funded Debt and from Income from Funded Securities.

The amounts reported against Maintenance of Investment Organization represent expenses of the Southern Pacific Company for other than railway operations, and the expenses of keeping up the corporate organizations of the Proprietary Companies, the properties of which are operated by the Southern Pacific Company under leases.

On June 30, 1916, the principal of advances to the Southern Pacific Railroad Company of Mexico amounted to $40,048,950.57. Interest accruing on these advances has not been taken into the income of the Southern Pacific Company.

CAPITAL STOCK.

The capital stock of the Southern Pacific Company outstanding at the beginning of the year amounted to		$272,674,405.64
Issued during the year:		
Common stock issued in exchange for a like amount of Five Per Cent. Twenty-Year Convertible Gold Bonds surrendered and cancelled		3,500.00
Amount of Southern Pacific Company stock outstanding June 30, 1916		$272,677,905.64
Capital stocks of Proprietary Companies outstanding as shown by last year's report, viz.:		
Preferred stock	$29,400,000.00	
Common stock	$315,800,572.00	
Add:		
Capital stock of the Lake Charles & Northern R. R. Co. which has not heretofore been dealt with as a "Proprietary Company"	$95,000.00	
Adjustment of difference between amount of Galveston, Harrisburg & San Antonio Ry. Co. capital stock actually outstanding and the amount heretofore reported	28.00	95,028.00
		$315,895,600.00
Deduct:		
Capital stock of the Corvallis & Eastern Railroad Company, which Company was dissolved following the sale of its property, on July 1, 1915, to the Southern Pacific Company	1,410,000.00	
		314,485,600.00
Total stocks of Proprietary Companies outstanding June 30, 1916		$343,885,600.00
Stocks of Proprietary Companies outstanding June 30, 1916, were held as follows:		
Owned by Southern Pacific Company		$343,452,400.00
Owned by Morgan's Louisiana & Texas Railroad & Steamship Company		350,000.00
In the hands of the Public		83,200.00
		$343,885,600.00

FUNDED DEBT.

The funded and other fixed interest bearing debt of the Southern Pacific Company and of its Proprietary Companies outstanding June 30, 1915, was as follows:

Southern Pacific Company	$206,175,910.00	
Proprietary Companies	456,989,256.44	
Total outstanding June 30, 1915		$663,165,166.44
Deduct:		
Funded debt of the Corvallis & Eastern Railroad Company, all of which is owned by the Southern Pacific Company, and which was assumed by the latter Company upon the purchase by it of the property of the former Company on July 1, 1915		2,115,000.00
Retired during the year:		
SOUTHERN PACIFIC COMPANY.		
San Francisco Terminal First Mortgage Four Per Cent. Bonds: Purchased from payments to sinking fund.	$6,800.00	
Five Per Cent. Twenty-Year Convertible Gold Bonds: Retired in exchange for a like amount of common stock issued	$3,500.00	
Adjustment account of forfeiture of unpaid subscriptions	500.00	4,000.00
Equipment Trust Certificates, Series A, due March 1, 1916, paid off		1,012,000.00
Equipment Trust Certificates, Series B, due September 1, 1915, paid off		201,000.00
Equipment Trust Certificates, Series C, due December 1, 1915, paid off		117,000.00
		$1,340,800.00
CENTRAL PACIFIC RAILWAY COMPANY.		
Three and One-Half Per Cent. Mortgage Gold Bonds: Purchased from proceeds of sale of lands	$497,000.00	
Purchased from payments to sinking fund	23,500.00	$520,500.00
First Refunding Mortgage Four Per Cent. Bonds: Purchased from payments to sinking fund	27,000.00	547,500.00
HOUSTON & TEXAS CENTRAL RAILROAD COMPANY.		
First Mortgage Five Per Cent. Bonds: Purchased from proceeds of sales of lands	$22,000.00	
Purchase Money Note due September 30, 1915, matured	50,000.00	72,000.00
SOUTH PACIFIC COAST RAILWAY COMPANY.		
First Mortgage Four Per Cent. Bonds: Purchased from payments to sinking fund.		196,000.00
SOUTHERN PACIFIC RAILROAD COMPANY.		
First Refunding Mortgage Four Per Cent. Gold Bonds: Purchased from payments to sinking fund.		13,000.00
TEXAS & NEW ORLEANS RAILROAD COMPANY.		
Payment to State of Texas on account of School Fund Debt		5,244.31
		2,174,544.31
Amount of funded and other fixed interest bearing debt of the Southern Pacific Company and of its Proprietary Companies, outstanding June 30, 1916		$658,875,622.13
Net decrease during the year (Other than $2,115,000 bonds of Corvallis & Eastern R. R. Co. assumed by Southern Pacific Company as hereinbefore explained)		$2,174,544.31
The outstanding securities are held as follows:		
In the hands of the public		$558,314,510.05
Owned by Southern Pacific Company	$86,903,112.08	
Owned by Proprietary Companies	3,211,000.00	
Held in Sinking Funds of Proprietary Companies	10,447,000.00	100,561,112.08
Total		$658,875,622.13

ASSETS AND LIABILITIES.

The value of the granted lands belonging to the Central Pacific Railway Company and to the Oregon and California Railroad Company, remaining unsold at the close of the year, is not included in the following statement.

The assets and liabilities of the Southern Pacific Company and of its Proprietary Companies, combined, on June 30, 1916, and the increases and decreases during the year, excluding the offsetting accounts between the Companies, summarized, were as follows:

Investments.	Total June 30, 1916.	Increase.	Decrease.
Investment in road and equipment	$939,971,725.25	$31,259,481.79	
Sinking funds	12,599,816.58	638,013.03	
Deposits in lieu of mortgaged property sold	18,702.26	2,704.66	
Improvements on leased railway property	1,372,067.77	.....	$53,857.86
Miscellaneous physical property	17,444,677.25	289,526.65	
Investments in affiliated companies:			
Stocks and bonds	*435,301,609.22	4,561,850.75	
Notes and advances	91,032,155.01	.....	20,143,036.31
Other investments:			
Stocks and bonds	7,182,457.30	.....	724,850.00
Notes, advances and miscellaneous	7,525,750.52	687,195.47	
	$1,512,448,961.16	$16,517,028.18	
Current and Deferred Assets.			
Cash and demand loans and deposits	$18,528,302.59	$2,220,373.95	
Special deposits	92,599.35	.....	$448,570.15
Other cash accounts	12,781,242.38	1,951,613.15	
Material and supplies	16,609,507.87	.....	2,250,371.53
Deferred assets	6,344,044.78	132,523.78	
	$54,355,696.97	$1,605,569.20	
Unadjusted Debits.			
Discount on capital stock	$3,678,600.00		
Discount on funded debt	3,922,233.11	.....	$300,778.27
Other unadjusted debits	4,195,965.44	.....	354,842.22
	$11,796,798.55	.....	$655,620.49
Total assets	$1,578,601,456.68	$17,466,976.89	
Stock.			
Capital stock of Southern Pacific Company	$272,677,905.64	$3,500.00	
Capital stock of Proprietary Companies	*343,885,600.00	.....	$1,314,972.00
	$616,563,505.64	.....	$1,311,472.00
Long Term Debt.			
Funded debt of Southern Pacific Company	$204,835,110.00	.....	$1,340,800.00
Funded debt of Proprietary Companies	*454,040,512.13	.....	2,948,744.31
	$658,875,622.13	.....	‡$4,289,544.31
Nonnegotiable debt to affiliated companies	$7,346,817.56	$1,262,867.64	
	$666,222,439.69	.....	$3,026,676.67
Current and Deferred Liabilities			
Audited accounts and wages payable	$8,557,492.53	$864,701.46	
Interest and dividends matured unpaid	8,893,060.66	340,128.42	
Unmatured dividends declared	4,090,168.58	52.50	
Unmatured interest accrued.	5,452,044.00	.....	$20,731.07
Other cash accounts	3,180,810.73	532,800.07	
Deferred liabilities	244,127.33	.....	151,377.64
	$30,417,703.83	$1,565,573.74	
Unadjusted Credits.			
Accrued depreciation	$36,994,402.85	$850,175.14	
Other unadjusted credits	†36,269,774.64	4,651,946.19	
	$73,264,177.49	$5,502,121.33	
Total liabilities	$1,386,467,826.65	$2,729,546.40	
Corporate Surplus.			
Appropriated surplus	$32,355,136.52	$1,710,664.32	
Profit and loss	159,778,493.51	13,026,766.17	
Total corporate surplus	$192,133,630.03	$14,737,430.49	
Total	$1,578,601,456.68	$17,466,976.89	

*The outstanding capital stock and funded debt include capital stocks and funded debt of Proprietary Companies of the par value of $343,802,400 and $100,561,112.08, respectively, a total of $444,363,512.08, which securities are owned by the Southern Pacific Company or by Proprietary Companies, or are held in sinking funds of Proprietary Companies. The cost of these securities is included in the investments shown above. Of the said amount, stocks of the par value of $249,653,161, which stand charged on the books at $232,932,667.41, are pledged against the issue of Southern Pacific Company stock and bonds. †Represents, principally, interest on construction advances which have not been repaid. ‡Includes $2,115,000 bonds of the Corvallis & Eastern R. R. Co., assumed by Southern Pacific Company as hereinbefore explained.

TRANSPORTATION OPERATIONS.

Southern Pacific Company and Proprietary Companies, Combined.

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Average miles of road operated	10,955.97	10,554.24	401.73	3.81
Railway Operating Revenues.				
Freight	$98,567,886.39	$80,020,751.38	$18,547,135.01	23.18
Passenger	40,338,316.29	36,864,997.50	3,473,318.79	9.42
Mail and express	6,156,770.29	5,922,171.25	234,599.04	3.96
All other transportation	3,031,345.67	3,055,134.36	—23,788.69	.78
Incidental	4,550,621.97	3,941,910.42	608,711.55	15.44
Joint facility—Credit	70,983.93	76,942.58	—5,958.65	7.74
Joint facility—Debit	21,696.35	16,232.40	—5,463.95	33.66
Total	$152,694,228.19	$129,865,675.66	$22,828,553.10	17.58
Railway Operating Expenses.				
Maintenance of way and structures	$18,367,137.29	$15,356,355.77	$3,010,781.52	19.61
Maintenance of equipment	21,866,636.02	19,815,973.36	2,050,662.66	10.35
Total maintenance	$40,233,773.31	$35,172,329.13	$5,061,444.18	14.39
Traffic	$3,131,404.18	$2,915,009.84	$216,394.34	7.42
Transportation	48,027,904.17	44,006,753.11	4,021,151.06	9.14
Miscellaneous operations	2,438,348.43	2,031,856.61	406,491.82	20.01
General	3,913,399.45	3,955,027.24	—41,627.79	1.05
Transportation for investment—Credit	301,171.31	327,133.62	25,962.31	7.94
Total	$97,443,658.23	$87,753,842.31	$9,689,815.92	11.04
Net revenue from railway operations	$55,250,569.96	$42,111,832.78	$13,138,737.18	31.20
Railway tax accruals	$7,023,325.97	$6,371,272.84	$652,053.13	10.23
Uncollectible railway revenues	37,272.95	50,946.14	—13,673.19	26.84
Total operating income	$48,189,971.04	$35,689,613.80	$12,500,357.24	35.03
Freight Traffic.				
Tons—revenue freight—total	37,322,383	31,857,039	5,465,344	17.16
Ton miles—revenue freight—total	9,211,615,334	6,637,345,295	2,574,270,039	38.78
Average ton miles per train mile—all freight	526.30	463.71	62.59	13.50
Average loaded freight car miles per train mile	22.99	22.32	.67	3.00
Average ton miles per loaded freight car mile—all freight	22.89	20.78	2.11	10.15
Percentage of loaded freight car miles to total	71.76	69.84	1.92	2.75
Average freight revenue per train mile	$4.52	$4.39	$0.13	2.96
Average revenue per ton mile of freight—revenue freight	.977 cents.	1.099 cents.	—.122 cents	11.10
Average miles hauled—revenue freight	246.81 miles.	208.35 miles.	38.46 miles.	18.46
Passenger Traffic.				
Passengers carried—revenue—including ferry suburban	45,873,419	41,708,096	4,165,323	9.99
Passenger miles—revenue—including ferry suburban	1,914,189,495	1,662,556,191	251,633,304	15.14
Average passenger service train revenue per train mile	$1.46	$1.51	—$0.05	3.31
Average revenue per passenger mile	2.069 cents.	2.173 cents.	—.104 cents	4.79
Average miles carried—revenue passengers—including ferry suburban	41.73 miles.	39.86 miles	1.87 miles.	4.69

The gross earnings during the year were $152,694,228.19, which are the largest earnings in the history of the company. This showing surpasses the previous high record of 1913 by $9,919,523.12, and is an increase over last year of $22,828,553.10.

There has been no abatement of automobile competition for local passenger travel, but the losses sustained in that direction have been more than counterbalanced by the extraordinary travel which was stimulated by the California Expositions during the first five months of the fiscal year, by the movement of troops between points on the Mexican border, and by a general improvement in agricultural and commercial conditions along your company's lines. The earnings accruing under a new and more favorable contract with the Pullman Company, and the revenue derived from dining cars, hotels and restaurants, were substantially increased by the Exposition travel. The aggregate increase in gross earnings accruing from passenger fares, and from Pullman, dining car, hotel and restaurant business, was $4,804,854.65, equivalent to 12.32 per cent.

The interruption of steamship service through the Panama Canal since September 18, 1915, has minimized sea competition, and has restored to your company's lines the freight which had been diverted from them by the frequent steamship service through the Panama Canal during the previous year, and by the low rates then prevailing. Nearly all the steamers which had operated through the Canal found more profitable employment in consequence of the increased demand for steamship tonnage owing to the European War, and they have not been restored to regular

service between Atlantic and Pacific ports since the reopening of the Canal. Upon the return of normal conditions, however, it may safely be assumed that the intense competition of the Canal steamship lines will be encountered again.

Mineral Products contributed an increase of $5,082,812 in gross earnings, resulting from the unusual demand for copper created by the European War, and the consequent increased tonnage of ores and bullion from Arizona, Mexico, New Mexico, California and Nevada, and by a large movement of fuel consumed in the operation of the mines and smelters.

Agricultural Products brought an increase of $2,319,641 in gross earnings, chiefly received from shipments of barley, rice, beans, dried fruit and other commodities, which shipments were restored to your company's lines after the discontinuance of service through the Panama Canal.

Forest Products yielded an increase in gross earnings of $2,829,874, the lumber industry having benefited both by enlarged mining operations and by a general revival of business.

Manufactured Products have produced an increase in gross earnings of $5,801,075, which has been chiefly received from shipments of automobiles and of such commodities as canned goods, iron and steel articles, and sugar, which shipments have been secured by your company's lines during the interruption of steamship service through the Canal.

General Merchandise and Miscellaneous Traffic enjoyed a recovery, which is largely attributable to the relief of the industries of the United States from the competition of foreign countries during the prosecution of the European War.

Of the total increase in gross earnings, $856,429.60 accrued from Oregon lines, which were not operated as a part of the system prior to this year.

The increase of $22,828,553.10, or 17.58 per cent., in Railway Operating Revenues, was earned with a decrease of 11.10 per cent. in the average revenue per ton mile of revenue freight, a decrease of 4.79 per cent. in the average revenue per passenger mile, and an increase of $9,689,815.92, or 11.04 per cent., in Operating Expenses. After taking into account Railway Tax Accruals, which increased $652,053.13, or 10.23 per cent., and Uncollectible Railway Revenues, Total Operating income increased $12,500,357.24, or 35.03 per cent.

Of the total increase in Railway Operating Expenses, $5,061,444.18, or 14.39 per cent., is allocated to maintenance, and $4,628,371.74, or 8.80 per cent., to transportation and other expenses. The Company's standard of upkeep of its properties has been maintained, and the condition of the roadway has been substantially improved, by heavy renewals of rail with 90-pound sections. The percentage of equipment in repair tracks is normal, although the mileage run during the year shows a large increase. At the close of the year 15 per cent. fewer locomotives and 50 per cent. fewer freight cars awaited repairs than on the corresponding date last year.

Improvements in operating efficiency are shown in average car and train loads, in locomotive fuel consumption, and in the movement of freight cars.

Tons of freight per loaded car increased 2.11 tons to 22.89 tons, or 10.15 per cent.

The average of 526.30 tons of freight per train is the highest on record, being an increase over last year of 62.59 tons, or 13.50 per cent. This increase in train load effected a saving of 2,666,008 freight-train miles.

The greater efficiency in the use of locomotive fuel, shown in last year's operations, not only has been maintained but has been increased. 5.16 gross ton miles were moved per pound of fuel in passenger service, an increase of 2.18 per cent., and 5.93 gross ton miles in freight service, an increase of 2.42 per cent. The money value of this gain is $217,396.08, compared with 1915; $740,395.92, compared with 1914; and $1,515,645.12, compared with 1913.

The average miles run per freight car per day was 34.96, compared with 27.65 last year, a gain of 26.44 per cent. The percentage of empty freight-car mileage decreased from 30.16 per cent. to 28.24 per cent.

Efforts to reduce payments for loss and damage to freight and to increase safety of operation, have been unremitting. A reduction in payments for loss and damage to freight of $336,594.87, or 32.01 per cent., was effected, although an increase of 38.78 per cent. in revenue ton mileage was handled. These payments absorbed 1.442 per cent. of freight revenue in 1915 and only 0.795 per cent. in 1916.

If the demands, backed up with threats of a general strike, of the federated organizations of enginemen, firemen, conductors and brakemen for over 25 per cent. increase in wages, now under discussion with their committees, are conceded, operating expenses of your Company's lines will be increased by about $2,500,000 per annum, which will wipe out these substantial economies achieved by unremitting and strenuous work throughout the year.

In order to maintain the Company's credit, and to provide for the natural growth and development of its lines, such threatened increases of expense can be met in but one of two ways—by an increase of revenue, or by a reduction of expenses in other directions. Embarrassed on the one side by numerous ill-considered Federal and State laws, which largely and unnecessarily increase the cost of operation, and on the other by large increases in prices of supplies, your officers have little opportunity left to effect a material reduction in operating costs.

Comparative prices paid during the year, and in 1913 and 1914, for some of the principal items of materials and supplies, show increases as follows:

Pacific Type Passenger Locomotives	30%
10,000 gallon Locomotive Tenders	48%
12,500 gallon Tank Cars	28%
Plate Girder Bridges	97%
Rolled Beams	97%
Bar Iron	143%
Journal Bearings	99%
Rivets	134%
Barbed Wire	78%
Tie Plates	91%

As little or no more can be accomplished in the direction of reducing costs, efforts will have to be concentrated on raising revenues, and unless the present volume of traffic can be maintained or increased, we shall have to appeal for relief to the same public whose tolerance or tacit consent is responsible for the hardships we are enduring.

The following suggestion, which appeared in the report for 1914, with slight change, is considered timely:

"Your Board repeats the suggestion that you take an active part in repelling the attacks of demagogues on your property. Unfair treatment of railroads is due in great part to the belief of politicians that only financial magnates suffer therefrom. The surest remedy for the evil is for railroad investors to give unmistakeable evidence of their numbers and of their resentment of unfair legislation or regulation. You now number over 33,000, and with the stockholders of other railroads and with investors in their securities you form a body of a million or more voters, whose protests, backed up by ballots, can lawfully exert sufficient force to compel fair treatment by your servants in Congress, in legislatures, and on commissions. The common interests of railroad shareholders and of investors in every community, no matter how small, should cause them to actively participate in every election and to perform faithfully all other duties of citizenship, in order to secure proper representatives and protection for their interests."

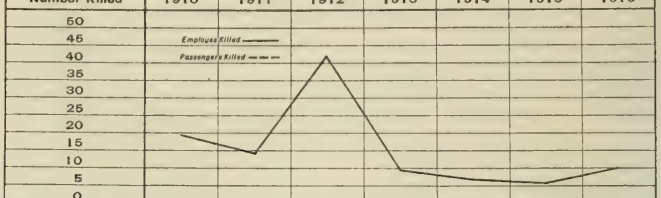
RAILWAY TAX ACCRUALS.

The net operating revenue for the fiscal year ended June 30, 1916, amounted to $55,250,569.96, whereof $7,023,325.97, OR A LITTLE MORE THAN ONE-EIGHTH, WAS PAID IN TAXES. With an increase of 187.93 per cent. in the mileage of all tracks operated during the life of the Company, taxes have increased $6,163,820.91 or 717.14 per cent.

SAFETY OF OPERATION.

During the past year, no passenger lost his life in a train accident, and with but one exception, none has been killed in a train accident for SEVEN YEARS AND ELEVEN MONTHS, during which period 433,935,632 locomotive miles were run and 328,592,863 passengers were carried an average of 42.48 miles, or 13,959,745,239 passengers carried one mile. During

FATALITIES IN TRAIN ACCIDENTS



	1910	1911	1912	1913	1914	1915	1916
TOTAL KILLED							
Employes	19	14	42	9	7	6	10
Passengers	0	0	0	0	1	0	0
TOTAL KILLED PER MILLION LOCOMOTIVE MILES							
Employes	0.360	0.258	0.772	0.166	0.123	0.115	0.165
Passengers	0	0	0	0	0.018	0	0
Passengers Carried	40,190,200	39,989,058	40,329,011	42,006,240	42,744,673	41,708,098	45,873,419
Passengers Carried One Mile	1,805,834,993	1,808,133,603	1,787,640,025	1,834,380,082	1,748,983,080	1,662,566,191	1,914,189,495
Locomotive Mileage	54,457,917	54,227,433	54,427,530	57,883,935	57,054,594	52,127,703	60,702,513
Number Trainmen in Service	9,232	8,605	9,137	9,497	9,418	8,564	9,892

the year only 10 employes out of 9,892 lost their lives through train accidents in a movement of 60,702,513 locomotive miles. Out of 43,885 employes engaged in pursuits not involving train movements, 19 lost their lives—an average of one fatality in 7,695,599 work hours, or 2,300 years of 313 working days each.

THE SUIT INVOLVING THE RIGHT TO CONTROL THE CENTRAL PACIFIC RAILWAY COMPANY.

This case was fully argued in the lower court and submitted early in December, 1915. The Court has since had the case under advisement. A decision is looked for any day. An appeal will lie to the Supreme Court of the United States. In view of the importance of the case and the nature of the questions involved it may be expected that the losing party will take the case to the higher court.

THE SUITS INVOLVING TITLE TO THE OIL LANDS.

The last report contained the following statement:

"The Attorney-General of the United States, deeming it his duty not to abandon the pursuit of the Company's lands without a judicial investigation to determine whether or not our patents were fraudulently obtained, has renewed the litigation, specially alleging such fraud; and, in order to avoid the six years' period of limitation, it has been further alleged that the Government was prevented from suing within the required time, by fraudulent concealment of its acts by the Railroad Company. There has been no final decision in these suits. The fact that they have been instituted does not lessen the confidence expressed in the last annual report as to our ability to sustain our title to the lands in question."

The time which has since intervened has been occupied by the Government in the taking of testimony. It is believed that the cases will be ready for argument in the lower court early in 1917. Nothing has yet occurred to lessen our confidence in the final outcome.

CONTROVERSY OVER THE OREGON & CALIFORNIA RAILROAD'S LAND GRANT.

In the last report attention was called to the decision of the Supreme Court of the United States reversing the forfeiture decree of the court below and declaring that the title of the Railroad Company to the unsold lands had not been forfeited, but that the lands were held subject to the original terms of the grant limiting sales to actual settlers, in quantities not exceeding 160 acres to any one purchaser, and at prices not exceeding $2.50 per acre. It was stated that the Supreme Court, recognizing that such restrictive covenants were not appropriate to lands of the character of those remaining unsold, had practically referred the matter to Congress by enjoining any disposition of the unsold lands or of the timber thereon "until Congress shall have a reasonable opportunity to provide by legislation for their disposition in accordance with such policy as it may deem fitting under the circumstances, and at the same time secure to the defendants all the value the granting acts conferred upon the railroads"; with the proviso that, if Congress did not act within six months, the Railroad Company might apply to the lower court for a modification of so much of the injunction as enjoined any disposition of the land or timber. It was further stated that the Railroad Company was prepared to co-operate with Congress in securing appropriate modification of the original restrictions upon the sales of land, but would insist upon observance of the conditions that the FULL VALUE CONFERRED BY THE GRANTING ACTS BE SECURED TO IT.

Since the last report the lower court, instead of observing the mandate of the Supreme Court and rendering a decree which would maintain the *status quo*, pending action by Congress, undertook to render a decree enjoining the Railroad Company absolutely from ever disposing of the timber apart from the land. As this decree was inconsistent with the mandate of the Supreme Court, and as acquiescence therein would deprive the Company of the value of the grant represented by the timber on the lands, our counsel appealed therefrom to the Court of Appeals. That court certified the matter to the Supreme Court, where the case now pends. It will probably be heard and decided at the next October term.

In the meantime Congress construing, or rather misconstruing, the decision of the Supreme Court as establishing that the value of the land grant to the Railroad Company could not exceed $2.50 per acre, and as authorizing Congress to take back the grant on the payment of such value

to the grantee, has passed an act purporting to revest in the United States the title to the unsold lands and providing for the payment to the Railroad Company for such lands at the rate of $2.50 per acre. The act provides for the sale of the timber apart from the land, and for the sale of the land to actual settlers when the timber has been severed, thus recognizing the contention of the Railroad Company that the timber could and should be disposed of before offering the land for sale for settlement purposes. The moneys so received from the sale of the lands and timber are to be set aside in a special fund to be used first in payment of the amount which may be found due to the Railroad Company, and the balance to be divided between the State of Oregon, and counties traversed by the Railroad Company and the United States. The Attorney-General is directed to bring a suit against the Railroad Company to have determined the amount of moneys which have been received by the Railroad Company on account of any of the granted lands, from past sales or leases or otherwise, and which should be charged against it as a part of the "full value" secured to the grantee by the granting acts as interpreted by the Supreme Court. It is further provided that the United States shall pay to the State of Oregon the taxes levied against the lands since the forfeiture decision of the lower court in 1913; and the Attorney-General is directed to have determined in the above mentioned suit the right of the United States to charge this payment of taxes against the Railroad Company.

Our counsel believe that this act of Congress is inconsistent with the decision of the Supreme Court, unauthorized by the mandate of that court, and in violation of the property rights of the Railroad Company. Appropriate proceedings will therefore be taken to test its validity. It is hoped, however, that in deciding the case now pending before it the Supreme Court will so define the rights of the Railroad Company under the granting acts as to render further litigation unnecessary and bring about a speedy settlement. Our counsel will endeavor to secure the co-operation of counsel for the Government with this end in view.

The position of the Southern Pacific Company, which we believe finds ample support in the decision of the Supreme Court as well as in the granting acts, is that the grantee has full and complete title to the lands and all that thereon is, subject only to the obligation that, when it comes to sell the lands, it must sell them to actual settlers at prices and in quantities not exceeding the prescribed maximums. It has a right to sell or dispose of the timber apart from the land, unless such severance of the timber would prevent sales of the land to the persons and upon the terms prescribed. The recent act of Congress confirms our belief that sale of the timber by the grantee apart from and before sale of the lands would not be a violation of the restrictions which the granting acts imposed upon sales of the lands, and hence that the right to so dispose of the timber is a right which forms part of the value of the grant and cannot be ignored by Congress.

PURCHASE OF CENTRAL PACIFIC RAILWAY COMPANY EUROPEAN LOAN BONDS.

The 1911 report contained the following statement:

"* * * To provide funds for double tracking, for additions and betterments, for extensions to its railroads, and for other corporate purposes, the *Central Pacific Railway Company* executed an indenture dated March 1, 1911, securing an issue of bonds designated as its 'Four Per Cent. Thirty-five Year European Loan of 1911,' limited to an aggregate principal amount of two hundred and fifty million French Francs, or nine million, eight hundred and seventy-five thousands Pounds Sterling. The bonds so authorized mature March 1, 1946, and bear interest from the first day of March, 1911, at the rate of four per cent. per annum, payable semi-annually on March first and September first in each year. Bonds to the amount of 250,000,000 French Francs were issued during the year, of which 200,000,000 Francs were delivered prior to June 30, 1911."

During the year, arrangements were made with bankers for the purchase by the Southern Pacific Company, at a very satisfactory price, of such bonds of the above issue as could be secured. To date of going to press, bonds to the amount of 116,835,500 French Francs, equivalent to 22,555,093.27, have been purchased.

GENERAL

Dividends on the capital stock of your Company were declared during the year, payable as follows:

1½ per cent. paid January 3, 1916	$4,090,131.86
1½ per cent. paid April 1, 1916	4,090,162.94
1½ per cent. payable July 1, 1916	4,090,168.58
1½ per cent. payable October 2, 1916	4,090,168.58
Total	$16,360,631.96

The Southern Pacific Railroad Company of Mexico continued to suffer during the year from revolutionary disturbances. The cost of property destroyed as a result of these disturbances, since the beginning of the Madero Revolution, in 1910, to June 30, 1916, is estimated at 5,020,582 pesos, equivalent to $2,510,276. On account of these losses, claims amounting to 287,953 pesos were filed with the Madero Government, and approved, but have not yet been paid. No further claims for property losses have been filed owing to unsettled conditions. In addition to the above, the Company has claims for freight and passenger services performed, for rental of road and equipment, and for material furnished to or confiscated by the various military authorities, amounting to 9,284,000 pesos. Bills for this amount (less 434,000 pesos received on account), and bills for the property losses mentioned above, will be filed as soon as conditions permit. During the year only such maintenance work has been done as was absolutely necessary to render it possible to operate trains over those portions of the line which were from time to time open for traffic.

In addition to the completed lines of railway reported under Properties and Mileage, and the still incompleted line of the Southern Pacific Railroad Company of Mexico, construction is progressing on the lines of the following companies, viz.:

	Length of Projected Line.	Track Laid.	Graded.	Grading Completed.	Grading Progressing.
	Miles.	Miles.	Miles.	Miles.	Miles.
Colusa & Hamilton Railroad:					
Hamilton to Harrington, Cal.	61.23	[illegible]	12.01		2.56
Southern Pacific Company:					
Eugene to Marshfield, Ore.	120.50				
Less placed in operation	6.37				
	114.13	[illegible]			.32

Under the pension system put into effect on January 1, 1903, eight hundred and twenty-two employes are carried on the pension rolls of the rail and water lines. The payment to them for the year amounted to $349,933.20.

In December, 1915, your Company took advantage of an opportunity to sell its stock in the Pacific Mail Steamship Company, instead of waiting for the liquidation of the Company, which was contemplated at that time.

The Board announces with sorrow the death, on May 1, 1916, of Mr. Charles W. Harkness, who served as a Director and as a member of the Executive Committee from April 9, 1913, to the time of his death.

Mr. E. D. Underwood was elected a Director on November 11, 1915, to fill the vacancy caused by the resignation of Mr. C. N. Bliss; Mr. W. B. Scott was elected a Director on April 5, 1916, to fill the vacancy caused by the death of General Thomas H. Hubbard; and Mr. Edward S. Harkness was elected a Director and a member of the Executive Committee on June 8, 1916, to fill the vacancies caused by the death of Mr. Charles W. Harkness.

The Board is pleased to express to the officers and employes of the Company its appreciation of their loyal and efficient service, the results of which are evidenced in the foregoing statements showing financial and other operations.

By order of the Board of Directors,

JULIUS KRUTTSCHNITT,
Chairman of the Executive Committee.

THE ATCHISON, TOPEKA & SANTA FE RAILWAY COMPANY—TWENTY-FIRST ANNUAL REPORT

SEPTEMBER 12, 1916.

To the Stockholders:

Your Directors submit the following report for the fiscal year July 1, 1915, to June 30, 1916, inclusive.

The Lines comprising the Atchison System, the operations of which are embraced in the following statements, are as follows:

	June 30, 1916.	June 30, 1915.
Atchison, Topeka & Santa Fe Railway	8,647.87 miles.	8,513.48 miles.
Rio Grande, El Paso & Santa Fe Railroad	20.22 "	20.22 "
Gulf, Colorado & Santa Fe Railway	1,937.59 "	1,937.71 "
Panhandle & Santa Fe Railway	665.02 "	665.02 "
	11,270.70 "	11,136.43 "

Increase during the year 134.27 miles.

The average mileage operated during the fiscal year ending June 30, 1916, was 11,246.80 miles, being an increase of 132.28 miles as compared with the average mileage operated during the preceding fiscal year.

In addition to lines covered by this report the Company controls, through ownership of stocks and bonds, other lines aggregating 161.33 miles, and is interested jointly with other companies in 606.52 miles.

For detailed statement of present mileage and of changes in mileage since last Annual Report.

INCOME STATEMENT.

The following is a summary of the transactions of the System for the years ending June 30, 1915 and 1916:

	1915.	1916.
Operating Revenues	$117,665,587.46	$133,762,392.24
Operating Expenses	76,091,553.69	83,730,960.35
Net Operating Revenue	$41,574,033.77	$50,031,431.89
Taxes	5,497,316.77	6,210,366.13
Uncollectible Railway Revenues	25,316.43	41,072.53
Operating Income	$36,051,400.57	$43,779,993.23
Other Income	2,997,150.47	3,307,129.56
Gross Corporate Income	$39,048,551.04	$47,087,122.79
Rentals and Other Charges	2,131,942.03	1,977,654.79
	$36,916,609.01	$45,109,468.00
Interest on Bonds, including accrued interest on Adjustment Bonds	12,785,747.10	12,529,733.40
Net Corporate Income (representing amount available for dividends and surplus and for necessary but unproductive or only partially productive expenditures)	$24,130,861.91	$32,579,734.60

From the net corporate income for the year the following sums have been deducted:

Dividends on Preferred Stock—		
No. 35 (2½%) paid Feb. 1, 1916	$3,104,342.50	
No. 36 (2½%) paid Aug. 1, 1916	3,104,342.50	
	$6,208,685.00	
Dividends on Common Stock		
No. 41 (1½%) paid Sept. 1, 1915	$3,013,377.50	
No. 42 (1½%) paid Dec. 1, 1915	3,014,277.50	
No. 43 (1½%) paid Mar. 1, 1916	3,016,347.50	
No. 44 (1½%) paid June 1, 1916	3,182,197.50	
	$12,226,200.00	
Appropriation for Fuel Reserve Fund	55,248.42	
California-Arizona Lines Bonds Sinking Fund	14,197.46	
Income Appropriated for Investment in Physical Property	7,456,311.60	
		25,760,644.08
Surplus carried to Profit and Loss		$6,819,090.52
Surplus to credit of Profit and Loss June 30, 1915	$6,581,[illegible]1	
Additions to Profit and Loss Account (Sundry Adjustments)	[illegible]	
	$6,783,860.41	
Discount on Capital Stock and Bonds sold during the year	737,162.50	
Surplus appropriated for Investment in Physical Property	[illegible]	
	$916,642.92	
		$19,867,217.49
Surplus to credit of Profit and Loss June 30, [illegible]		$[illegible]

Income from sources other than earnings from operation consisted of interest on cash in banks and sums collected as interest and dividends upon bonds and stocks of companies, the operations of which are not included in the System accounts.

During the fiscal year the sum of $1,200,000 in cash was received as the net proceeds of sale of land embraced in the Santa Fe Pacific Land Grant, but this was directly written off the book value of Railroads, Franchises and Other Property and the transaction does not appear in the Income Account.

CAPITAL EXPENDITURES AND ADJUSTMENT OF BOOK VALUES.

The total charges to Capital Account, as shown by the General Balance Sheet, page 32, at June 30, 1916, aggregated $715,477,622.71 as compared with $683,855,314.09 at June 30, 1915, an increase during the year of $31,622,308.62, which analyzes as follows:

Construction and acquisition of new mileage, including the acquisition of bonds and stocks of other railway and terminal companies:		
Crosbyton-Southplains R. R.	$ 470,092.36	
Eastern Ry. of New Mexico	7,176.24	
Grand Canyon Ry.	51,486.48	
Laton & Western R. R.	179,000.00	
Minkler Southern Ry.	69,009.31	
Oil Fields & Santa Fe Ry.	150,309.29	
Union Passenger Depot Co. of Galveston	889.52	
Verde Valley Ry.	134,000.00	
		$1,061,963.20
Additions and Betterments—System Lines:		
Fixed Property	$ 4,502,488.71	
Additional Equipment	2,015,541.16	
Betterments to Equipment	48,332.04	
		6,566,361.91
Fuel Lands and Other Properties:		
Fuel Lands	$ 1,284,500.00	
Real Estate held for future use	530,409.13	
Tie and Timber Lands	9,224.29	
Miscellaneous Items	39,503.38	
		1,863,636.80
Other Investments		2,357,767.59
Total Charges		$11,849,729.50
Adjustment of Book Values:		
Additions and Betterments written off in years 1901 to 1908, both inclusive, now reinstated in conformity with the present accounting rules of the Interstate Commerce Commission	$21,066,685.78	
Less:		
California, Arizona & Santa Fe Ry.	$ 2,517.95	
Santa Fe Pacific R. R.—Land Sales	1,200,000.00	
Western Oklahoma Ry.—Land Sales	800.50	
Ice Plant, Belen	12,000.00	
Ice Plant, San Bernardino	64,293.03	
Santa Barbara Tie & Pole Co.	14,495.18	
	$1,294,106.66	
		19,772,579.12
Net Increase in Capital Account during the year		$31,622,308.62

For details of Additions and Betterments by accounts see statement on page 40.

The item of $2,015,541.16 for "Additional Equipment" analyzes as follows:

37 Locomotives	$1,204,353.20
1,657 Freight-Train Cars	1,848,385.86
4 Passenger-Train Cars	2,759.40
605 Miscellaneous Work Cars	101,210.76
	$3,156,709.22
Less—Value of Equipment retired during the year as follows:	
63 Locomotives	$413,484.61
1,242 Freight-Train Cars	497,545.34
27 Passenger-Train Cars	106,068.60
Motor Equipment of Cars	18,000.00
1 Car Float	42,661.44
327 Miscellaneous Work Cars	54,896.96
Miscellaneous Adjustments	8,511.11
	$1,141,168.06
	$2,015,541.16

The 605 miscellaneous work cars included in "Additional Equipment" and the 1,242 freight-train cars reported as retired include 588 cars, which, being permanently assigned to work service, were relettered in work service equipment series during the year and transferred from freight equipment to work service equipment at their depreciated value at time of relettering. The equipment reported as retired includes 2 locomotives, 10 freight-train cars and 1 work car leased from the Rocky Mountain and Santa Fe Railway Company on July 1, 1915, which were withdrawn from service during the year.

In addition to the equipment reported retired as above, 2 locomotives and 1 freight-train car leased from the Oklahoma Central Railroad Company, were also retired during the year and liability therefor included in Other Unadjusted Credits in the General Balance Sheet.

MAINTENANCE OF EQUIPMENT.

The following statement shows the sums charged to Operating Expenses for Maintenance of Equipment during each year since July 1, 1896:

Year ending June 30.	Average Operated Mileage.	Total Expenditure.	Expenditure Per Mile.
1897	6,443.81	$3,443,884.82	$534.45
1898	6,936.02	4,659,277.99	671.75
1899	7,032.62	4,810,795.64	684.07
1900	7,341.34	5,267,832.40	717.56
1901	7,807.31	6,257,456.57	801.49
1902	7,855.38	7,864,951.25	1,001.22
1903	7,965.13	8,510,543.09	1,068.48
1904	8,179.59	10,006,135.41	1,223.31
1905	8,305.40	10,914,864.47	1,314.19
1906	8,433.99	10,720,040.43	1,271.05
1907	9,273.15	11,779,846.64	1,270.32
1908	9,415.01	14,246,621.44	1,513.18
1909	9,794.86	13,903,897.37	1,419.51
1910	9,916.33	15,560,047.44	1,569.13
1911	10,350.13	16,686,145.45	1,612.17
1912	10,627.92	16,521,231.41	1,554.51
1913	10,750.31	19,415,224.63	1,806.02
1914	10,908.52	19,100,724.51	1,750.99
1915	11,114.52	19,764,535.40	1,778.26
1916	11,246.80	20,514,960.18	1,824.07

For the year ending June 30, 1916, maintenance charges, including renewals and depreciation, averaged as follows:

Per locomotive	$5,007.86
Per locomotive mile	.1672
Per freight car	121.01
Per freight car mile	.0102
Per passenger car, including mail and express	1,418.50
Per passenger car mile	.0147

The foregoing average maintenance charges include a proportion of unlocated expenditures for Maintenance of Equipment charged to Superintendence, Shop Machinery, Injuries to Persons, Insurance, Stationery and Printing, Other Expenses, and Maintaining Joint Equipment at Terminals. Refrigerator cars are not taken into consideration in arriving at freight car averages, such cars being operated by The Santa Fe Refrigerator Despatch Company, which bears the expense of their maintenance.

A statement of the locomotives in service and of their tractive power will be found on page 48.

MAINTENANCE OF WAY AND STRUCTURES.

The following statement shows the sums charged to Operating Expenses for Maintenance of Way and Structures during each year since July 1, 1896:

Year ending June 30.	Average Operated Mileage.	Total Expenditure.	Expenditure Per Mile.
1897	6,443.81	$6,282,923.15	$975.03
1898	6,936.02	8,281,397.88	1,193.97
1899	7,032.62	7,672,107.62	1,090.93
1900	7,341.34	6,354,372.10	865.56
1901	7,807.31	6,433,840.36	824.08
1902	7,855.38	6,141,466.39	781.82
1903	7,965.13	9,304,892.04	1,168.20
1904	8,179.59	9,170,234.07	1,121.11
1905	8,305.40	11,385,418.33	1,370.85
1906	8,433.99	12,475,407.97	1,479.18
1907	9,273.15	15,286,062.66	1,648.42
1908	9,415.01	14,120,828.02	1,499.82
1909	9,794.86	12,884,406.81	1,315.43
1910	9,916.33	17,807,136.20	1,795.74
1911	10,350.13	16,059,786.90	1,551.65
1912	10,627.92	16,076,833.75	1,512.70
1913	10,750.31	18,054,413.03	1,679.43
1914	10,908.52	15,308,780.25	1,403.38
1915	11,114.52	16,514,467.89	1,485.85
1916	11,246.80	19,518,635.03	1,735.48

COMPARISON OF OPERATING RESULTS.

The following is a statement of revenue and expenses of the System for the fiscal year ending June 30, 1916, in comparison with the previous year:

	Year Ending June 30, 1916.	Year Ending June 30, 1915.	Increase or Decrease.
OPERATING REVENUES:			
Freight	$91,432,428.97	$80,504,393.33	$10,928,035.64
Passenger	31,568,600.55	27,823,063.87	3,745,536.68
Mail, Express, and Miscellaneous	10,761,362.72	9,338,130.26	1,423,232.46
Total Operating Revenues	$133,762,392.24	$117,665,587.46	$16,096,804.78
OPERATING EXPENSES:			
Maintenance of Way and Structures	$19,518,635.03	$16,514,467.89	$3,004,167.14
Maintenance of Equipment	20,514,960.18	19,764,535.40	750,424.78
Traffic	2,755,735.84	2,649,174.86	106,560.98
Transportation—Rail Line	38,281,053.78	34,827,705.34	3,453,348.44
General	2,904,040.13	2,476,595.20	427,444.93
Transportation for Investment—Cr.	*243,464.61*	*140,925.00*	*102,539.61*
Total Operating Expenses	$83,730,960.35	$76,091,553.69	$7,639,406.66
Net Operating Revenue	$50,031,431.89	$41,574,033.77	$8,457,398.12
Ratio of Operating Expenses to Operating Revenues	62.60	64.67	—2.07

Credits in italics.

The following averages are deducted from tables set forth on pages 43 and 46.

The average tons of freight (revenue and company) per loaded car mile increased from 19.71 to 19.96, or 1.27 per cent.

The average tons of freight (revenue and company) carried per freight-train mile (freight and mixed) increased from 442.04 to 468.10, or 5.90 per cent.

The average freight revenue per freight-train mile increased from $3.55 to $3.74, or 5.35 per cent.

The average passenger revenue per passenger-train mile increased from $1.09 to $1.18, or 8.26 per cent.

The average passenger train revenue per passenger-train mile increased from $1.37 to $1.49, or 8.76 per cent.

The tons of freight carried one mile (revenue and company) increased 1,444,330,257, or 14.41 per cent., while miles run by freight cars (loaded and empty) in freight and mixed trains increased 62,769,949, or 8.43 per cent., and the mileage of such trains increased 1,818,402, or 8.03 per cent.

The number of passengers carried one mile increased 242,785,385, or 18.10 per cent., while miles run by passenger cars in passenger and mixed trains increased 15,232,301, or 10.14 per cent., and the mileage of such trains increased 1,243,013, or 4.86 per cent.

While freight operating revenues increased 13.57 per cent., the freight service rendered, as measured by tons transported one mile, increased 14.41 per cent.; and while earnings from passengers carried increased 13.46 per cent., the passenger service rendered, as measured by passengers carried one mile, increased 18.10 per cent.

The following is a consolidated statement of the business of the System for each fiscal year during the period since January 1, 1896:

Fiscal Year Ending June 30.	Average Miles Operated.	Gross Revenues, Including Income from Other Sources.	Expenses, Including Taxes, Rentals and Other Charges.	Interest on Bonds.	Net Corporate Income.
1897 (18 mos.)	6,443.81	$44,532,628.99	$36,038,455.30	$8,440,387.91	$53,785.78
1898	6,936.02	39,396,126.41	30,513,553.17	7,045,988.30	1,836,584.94
1899	7,032.62	40,762,933.47	29,332,964.11	7,241,972.00	4,187,997.36

1900	7,341.34	46,498,899.04	29,414,427.56	7,345,166.50	9,739,304.98
1901	7,807.21	54,807,379.78	34,502,039.87	7,830,810.83	12,474,529.08
1902	7,855.38	60,275,944.33	36,272,432.45	8,438,985.00	15,564,526.88
1903	7,965.13	63,668,390.99	40,635,576.48	9,134,485.24	13,898,329.27
1904	8,179.59	69,419,975.41	44,641,434.10	9,418,770.00	15,359,771.31
1905	8,305.40	69,189,739.65	47,835,883.50	9,611,510.09	11,742,346.06
1906	8,433.99	79,390,749.05	51,035,355.71	10,622,184.22	17,733,209.12
1907	9,273.15	94,436,574.68	61,779,916.16	11,487,934.70	21,168,723.82
1908	9,415.01	91,289,770.61	65,031,582.67	12,579,301.77	13,678,886.17
1909	9,794.86	95,424,091.89	61,458,019.13	13,548,081.93	20,417,990.83
1910	9,916.33	107,543,250.16	75,133,314.54	11,984,151.36	20,425,784.26
1911	10,350.13	109,772,481.69	75,689,094.83	12,712,319.31	21,371,067.55
1912	10,627.92	110,322,328.13	77,001,227.38	13,660,859.50	19,660,241.25
1913	10,750.31	119,411,875.94	83,432,816.21	13,825,325.40	22,153,734.33
1914	10,908.52	113,284,122.98	80,213,746.06	12,886,412.23	20,183,964.69
1915	11,114.52	120,662,737.93	83,746,128.92	12,785,747.10	24,130,861.91
1916	11,246.80	137,069,521.80	91,960,053.80	12,529,733.40	32,579,734.60

The following statement shows the gross operating revenues of the System (exclusive of income from other sources) per mile of road operated for each fiscal year since July 1, 1896:

Year Ending June 30.	Gross Operating Revenues.	Average per Mile of Road.
1897	$30,621,230.10	$4,752.04
1898	39,214,099.24	5,653.69
1899	40,513,498.63	5,760.80
1900	46,232,078.23	6,297.49
1901	54,474,822.61	6,977.41
1902	59,135,085.53	7,527.97
1903	62,350,397.28	7,827.92
1904	68,171,200.18	8,334.31
1905	68,375,837.25	8,232.70
1906	78,044,347.25	9,253.55
1907	93,683,406.91	10,102.65
1908	90,617,796.38	9,624.82
1909	94,265,716.87	9,624.00
1910	104,993,194.67	10,587.91
1911	107,565,115.62	10,392.63
1912	107,752,359.91	10,138.61
1913	116,896,251.98	10,873.75
1914	111,109,769.86	10,185.60
1915	117,665,587.46	10,586.65
1916	133,762,392.24	11,893.37

The following statement shows the development of the freight and passenger revenues of the System since July 1, 1896:

Year Ending June 30.	Freight Revenue.	Passenger Revenue.
1897	$22,067,686.77	$5,574,288.31
1898	28,588,716.76	7,347,361.59
1899	29,492,586.65	8,126,141.85
1900	33,729,332.83	9,334,661.57
1901	39,052,557.43	11,678,017.25
1902	41,815,607.05	13,439,384.57
1903	44,622,438.71	13,469,985.78
1904	47,762,653.23	15,433,773.63
1905	47,408,982.36	16,045,380.27
1906	54,598,902.82	18,013,988.56
1907	65,500,309.42	21,171,629.08
1908	61,848,638.51	21,643,427.49
1909	64,212,638.10	22,734,505.32
1910	71,194,055.59	25,437,181.98
1911	71,787,200.89	27,204,867.66
1912	71,529,574.67	27,453,525.41
1913	78,190,923.18	29,425,922.44
1914	73,638,388.01	28,497,232.68
1915	80,504,393.33	27,823,063.87
1916	91,432,428.97	31,568,600.55

PROPERTY INVESTMENT AND RATE OF RETURN.

The development of the Company's business and of its efficiency have been due principally to the very large expenditures (over $318,000,000) which have been made in the extension and improvement of the property since January 1, 1896. In order to make such expenditures, your Company has raised since 1896 over $232,000,000 of "new money" by the sale of capital stock and of bonds which are now outstanding or which (in the case of many of the Convertible Bonds sold) are represented by Common Stock now outstanding.

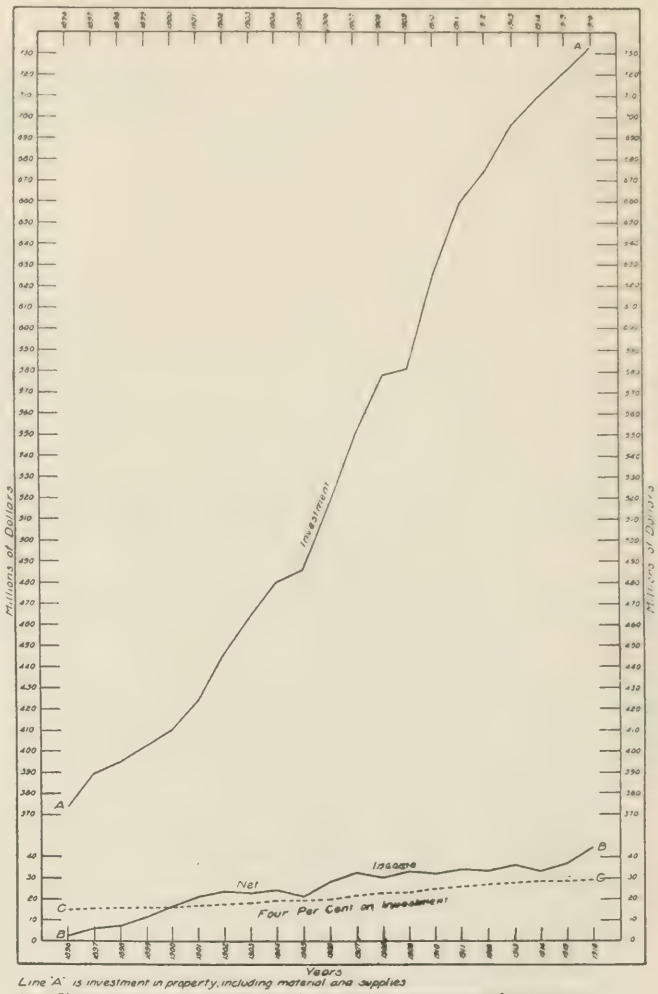
The following statement shows, for each year, the amount of investment, the amount of net income applicable to bond interest, dividends, improvement of property and strengthening of credit, and the rate of return which such net income represents on the amount of the investment.

Year Ending June 30.	Property Investment.*	Income Applicable to Bond, Interest, Dividends, Improvement of Property and Strengthening of Credit.†	Per Cent. Income of Property Investment.
1896 (6 months)	$373,260,004.67	$2,432,870.06	.65
1897	389,118,442.87	6,070,364.45	1.56
1898	394,170,563.40	8,871,947.26	2.25
1899	402,388,222.21	11,409,315.36	2.84
1900	409,670,087.91	17,064,850.91	4.17
1901	423,734,716.52	21,196,714.38	5.00
1902	445,314,062.19	23,921,018.14	5.37
1903	463,230,180.22	23,032,814.51	4.97
1904	479,324,339.26	24,778,541.31	5.17
1905	485,497,374.42	21,353,856.15	4.40
1906	515,557,913.70	28,355,393.34	5.50
1907	550,693,087.37	32,724,274.07	5.94
1908	577,433,073.23	25,633,510.34	4.44
1909	580,297,115.78	33,523,437.28	5.78
1910	625,401,211.54	32,387,712.39	5.18
1911	658,156,763.91	34,102,511.86	5.18
1912	673,465,876.49	33,321,100.75	4.95
1913	695,730,983.22	36,078,744.55	5.19
1914	709,304,446.55	33,070,376.92	4.66
1915	720,792,460.35	36,928,030.11	5.12
1916	732,403,747.71	45,312,106.50	6.19
Annual Average ..	$538,330,698.74	$25,930,219.06	4.82

*The amounts shown above as "Property Investment" include sums invested in material and supplies. For this reason and also because expenditures for additions and betterments "written off" in the years 1901 to 1908 inclusive have been reinstated in the property account, the above figures for the years prior to 1916 are not the same as shown in the corresponding table of the annual report for the previous year.

†The "Income" shown above is determined after allowing for adjustments made through profit and loss.

The following chart brings out still more clearly the significance of the statement and strikingly depicts the progressive increase in investment which has been necessary to enable the Company to render its public service.



Line 'A' is investment in property, including material and supplies

Line 'B' is the net income applicable to bond interest, dividends, improvement of property and strengthening of credit.

Line 'C' is the amount of income which would be equivalent to four per cent on the investment shown.

The striking fact emphasized by the foregoing statement is that the earnings on the entire investment, during this, the most prosperous year in the history of the Company, are but little over six per cent., and, even in recent years, average but little more than five per cent. per annum; and it must be borne in mind that of these earnings it is necessary to appropriate a substantial amount each year for additions and betterments to preserve the Company's credit.

The ability of your Company, under the conditions which this statement exhibits, to pay six per cent. on the common stock, is due to the fact that it pays an average of only slightly more than four per cent. on its bonded debt, much of the bonded debt having been created when money could be obtained at or near four per cent.

CAPITAL STOCK AND FUNDED DEBT.

The outstanding Capital Stock (deducting stock in treasury) on June 30, 1915, consisted of:

Common	$200,489,500.00	
Preferred	114,173,730.00	
		$314,663,230.00
Issued during the year:		
Common Stock issued in exchange for Convertible Bonds retired	$13,823,000.00	
Preferred Stock	9,999,970.00	
		23,822,970.00
Capital Stock outstanding June 30, 1916:		
Common	$214,312,500.00	
Preferred	124,173,700.00	
		$338,486,200.00

The outstanding Funded Debt of the System (deducting bonds in the treasury) amounted on June 30, 1915, to..... $310,975,282.40

The following changes in the Funded Debt occurred during the year:

Obligations Issued:		
Transcontinental Short Line First Mortgage 4% Bonds	$5,545,000.00	
California-Arizona Lines First and Refunding Mortgage 4½% Bonds	153,071.10	
		$5,698,071.10
Obligations Purchased or Retired:		
Convertible 5% Bonds	$1,298,000.00	
Convertible 4% Bonds	13,823,000.00	
		15,121,000.00
Decrease of Funded Debt		$9,422,928.90
Total System Funded Debt outstanding June 30, 1916		$301,552,353.50

Interest charges for year ending June 30, 1917, will be approximately $1,768,000 or an average monthly charge of about $1,022,333. In making this approximation, exchanges of Convertible Bonds for Common Stock made since June 30, 1916, aggregating $737,000, are considered.

TREASURY.

Neither this Company nor any of its auxiliaries has any notes or bills outstanding.

The Company held in its treasury on June 30, 1916, $44,364,922.25 cash, and had available $5,281,000 General Mortgage Bonds, including bonds not yet certified by the Trustee. The Company also has in the treasury unpledge a large amount of stocks and bonds of other companies, of which part are carried in the balance sheet as Investments and part are included under Railroads, Franchises and Other Property.

During the year $10,000,000 Preferred Capital Stock and $5,545,000 Transcontinental Short Line First Mortgage Four Per Cent. Bonds were sold for cash, realizing $14,807,837.50.

FUEL RESERVE FUND.

The fund has been increased during the year by appropriations of income, as follows:

Amount to credit of Fund June 30, 1915	$1,832,834.80
Added during the year	55,481.62
In Fund June 30, 1916	$1,888,316.42

CROSBYTON-SOUTHPLAINS RAILROAD.

This line, 38.45 miles in length, extending from Lubbock, Texas, to Crosbyton, Texas, in the so-called "Plains Country," was acquired during the year. An extension under its charter southwest from Lubbock of about 65 miles is now under construction and will, it is expected, be completed during the current fiscal year.

LATON AND WESTERN RAILROAD.

The capital stock of the company owning this line, extending from Laton to Lanare, Kings County, California, a distance of 17 miles, which has been operated by your Company under lease since February 22, 1911, was acquired during the year. This line while not profitable at present will it is hoped, with the development of the territory it serves, ultimately prove valuable.

MINKLER SOUTHERN RAILWAY.

An extension of this line, from Lindsay to Porterville, California, a distance of about 12 miles, through a rich orchard country, is under construction, and it is expected will be completed and placed in operation before the close of the current fiscal year.

NORTH TEXAS AND SANTA FE RAILWAY.

This company has been organized to construct a line from Hansford, Hansford County, Texas, to a point of connection with your Company's main line at or near Shattuck, Ellis County, Oklahoma, a distance of about 85 miles. The new line will serve a rapidly developing and rich agricultural territory, and will, it is expected, be a valuable feeder to the System.

NORTHWESTERN PACIFIC RAILROAD COMPANY.

Your Company, as indicated in previous reports, has a half interest in the Northwestern Pacific Railroad Company, which on July 1, 1915, completed and placed in operation the line from Willets to Shively, a distance of 105.04 miles, making possible through train service between Eureka on the North and San Francisco Bay on the South. The result of the Company's operations for the last fiscal year, the first since the completion of the new line, show all fixed charges earned, which, all things considered, is as much as could be expected.

OIL FIELDS & SANTA FE RAILWAY.

This line, which was under construction at the date of the last annual report, was completed during the year and its operations since January 1, 1916, have been included in the System accounts. It traverses an important section of the Mid-Continent oil fields and brings a large business to your main lines.

COLINE OIL COMPANY.

The capital stock of this Company, owning valuable oil lands and leases in the Healdton Field in Oklahoma, was acquired during the year. Since the acquisition of its stock by your Company the Coline Company has acquired the oil lands and leases formerly owned by the Gulf, Colorado and Santa Fe Railway Company in the Wheeler Field, near Ardmore, Oklahoma, including a pipe line from Wheeler to Ardmore. The control of this company assures an adequate supply of fuel oil for your Company's lines in this territory for some years to come.

TAXES.

Tax accruals for the fiscal year 1916 were $6,210,366.13 and for the fiscal year 1915 they were $5,497,316.77, or an increase for 1916 of $713,049.36. Assessments were held about as they were in the preceding year. This large increase in tax payments aside from the increase in Federal taxes of $100,856.80 was due almost wholly to increased tax rates in four states, Oklahoma, Texas, Kansas and Arizona.

In previous reports your attention has been directed to the reckless increase of public expenditures and to the efforts that were being made to bring the people back to more conservative views. In several of the states in which your Company operates there are substantial indications that the tide has at least been slowed down. As our assessments of 1916 will be about the same as in 1915 the outlook shows some improvement.

Your officials are doing more than ever before to prevent the wasteful and improper expenditure of public money. They are arousing a feeling against extravagance and they are encouraging the organization of the taxpayers so that their dissatisfaction will not waste itself in profitless scolding. One of our concrete aims is the enactment of workable and effective tax limit laws which will keep the increases from year to year within reasonable bounds. Such a law has been secured in New Mexico.

REINSTATEMENT OF PROPERTY EXPENDITURES.

The Federal Physical Valuation Law, approved March 1, 1913, calls, amongst other things, for the cost of property of common carriers, and so far as it is possible to do so such cost is to be ascertained in accordance with the rules laid down in the Classification of Investment in Road and Equipment as prescribed by the Interstate Commerce Commission effective July 1, 1914. Under these rules expenditures for road and equipment, regardless of the sources from which the funds were derived, are required to be stated as a part of the investment in road and equipment so long as the property units representing them remain in use. For many years past it has been the policy of your Company to make liberal appropriations of income and surplus for additions and betterments, and prior to July 1, 1907, it was the practice to reduce the property account in the amount of such appropriations by charge to income or surplus. In order that the investment in the property of your Company may be more nearly stated in accordance with the present accounting rules above referred to, the expenditures represented by these appropriations, aggregating $19,077,703.33, have been reinstated during the year covered by this report. The present rules of the Commission also provide for carrying as a part of the property account expenditures for improvements on leased railway property when such property is held under long-term leases, and, in harmony with this provision, expenditures for improvements on leased property, aggregating $2,032,378.50, have likewise been reinstated. The credits arising from these reinstatements of property assets are included in the general balance sheet under "Corporate Surplus" in the account "Additions to Property through Income and Surplus."

DEATH BENEFITS TO EMPLOYES.

Your Board has put into operation for two years beginning July 1, 1916, a plan of paying benefits to the families of employes dying while in the service of the Company. The details of the plan are sufficiently explained by the following extract from the circular announcing the plan to employes:

"Beginning on July 1, 1916, the Company proposes to pay to such party, or parties, as such employe, dying while in its service and who has been in its employ for two or more years continuously, may have designated in writing as his beneficiary or beneficiaries, or, in case of failure to make such designation, then to his next of kin dependent on him, a sum equal to five per cent of the salary or wage received by him during the twelve months immediately preceding his death, multiplied by the number of years of continuous service, in accordance with the 'examples' hereafter set forth, provided that the maximum amount to be so paid shall be one year's pay, but shall in no case exceed $3,000.00; and provided further that the minimum shall be $250.00.

"The above plan is put forth in the hope that conditions may enable us to continue it in effect for the future, but it must be distinctly understood that at this time the Company intends to try out such plan for wo years only, and distinctly reserves the right at any time after the expiration of such two-year period to cancel or modify all or so much of the arrangement as may seem necessary or expedient to it.

EXAMPLES:

"A has been in service of Company 2 years; salary or wage last year $75 per month; at his death his beneficiaries would be entitled to 5 per cent of $900 for each year—$45— or $90 for the two years, but the minimum here applies and the amount to be paid is $250.00.

"B has been in service 6 years; salary or wage last year $1,200; at his death his beneficiaries would be entitled to 5 per cent. of $1,200 for each year, or $360.00.

"C has been in service 20 years; salary or wage last year $2,000; his beneficiaries would consequently be entitled to that full amount.

"D has been in service 16 years; salary or wage last year $4,000; his beneficiaries would be entitled to 80 per cent. of $4,000, or $3,200, but the maximum here applies and the amount paid would be $3,000.00."

GENERAL.

Close analysis of operations for the year clearly indicates the enhanced earnings to be almost wholly due to the war in Europe. Even things apparently remote can be traced to this source. On the Pacific coast there is no shipping for Atlantic ports, resulting of course in greatly increased tonnage by rail—in Arizona and New Mexico the copper and zinc industries have had abnormal stimulation—the demand for foodstuffs has produced large prices for a heavy grain crop, thus creating large purchasing power—the oil industry (of great and increasing importance) has felt the interruption of supplies from old world sources and the enormous increase in the use of gasoline—in fact, business of all kinds has been stimulated to such an extent that there have practically been no dull periods during the entire year. So abnormal has the business been that it will doubtless be several years before we again reach the volume of the past year.

We have also had the largest passenger traffic in our history, having carried during the year approximately 112,000 passengers to the Pacific coast from points east of the Rio Grande and 144,000 returning.

It is worthy of note also that the Grand Canyon was visited by 78,000 transcontinental passengers.

While the San Francisco and San Diego fairs were the cause of a large part of the passenger travel, the regular patronage of the line is being steadily increased by the growing popularity of Southern California as a resort and playground for both summer and winter. The rates fixed for the tourist were such as to afford little or no profit, but served to attract strangers to a territory, the attractiveness of which was to many a revelation.

This larger business was handled without friction and to the satisfaction of the public. There were periods when there was a little shortage of box cars, but such times were brief, and there would have been no shortage at any time had our connections been able to return our cars promptly, or had there been ships enough on the ocean to handle that which we were prepared to deliver.

The year was marked by the occurrence of three disasters of unusual magnitude.

First: A tropical storm which flooded the City of Galveston, partially destroying the causeway connecting it with the mainland and injuring us in many minor ways.

Second: The explosion at Ardmore, Oklahoma, of a car-load of gasoline, wrecking the station and a large part of the City and killing 46 people.

Third: An extraordinary rainfall in California and Arizona, resulting in the loss of many miles of track and bridges and interrupting business on some lines for a month.

Roughly, these three items resulted in a loss of two and a half millions of dollars, all of which was charged to operating expenses.

During the entire year the Company has been in litigation in the Federal Courts with the State of Oklahoma over that provision in its Constitution which provides for a passenger rate of two cents per mile. The State has already appropriated $175,000 of the taxpayers' money for the defense of the case and the perpetuation of this iniquitous provision—the Oklahoma Commission has also spent out of its so-called contingent fund a substantial amount for the same purpose. Your Company has also been put to heavy expense in the effort to obtain justice—but the evidence is now all in and, while no decision has yet been rendered, your officers feel confident that it will be in favor of the Company. A similar rate is in force in Kansas and in all probability similar litigation will be necessary in that State.

Thomas P. Fowler, a Director and a member of the Executive Committee from the time of the organization of the Company in 1895, died on October 11, 1915. His study of the problems which confronted the Company in its early days, his knowledge of railroad affairs, his faithful attention to the Company's business, and his constant attendance at the meetings of the Board and the Committee made him a most helpful Director. Your Directors desire to record this expression of sorrow at the loss which they and the stockholders have sustained by his death.

It is with pleasure that your Directors record their appreciation of the faithful and efficient services of the Company's officials and employes.

EDWARD P. RIPLEY,
President.

Railway Age Gazette

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*Illustrated.

There is one aspect of the recently threatened strike of the four brotherhoods of men in train service that was entirely obvious to the men themselves and to transportation officers, but probably never occurred to the great majority of the outside public who discussed the problems involved. A very large per cent of the enginemen on nearly every road are men past the age limit for new employment in train service. The same is true of conductors. On the other hand, a very large per cent of the firemen are young men with many years to work before they will reach the age limit. Assume for a moment that there had been a strike. The engineman of 48 would have had to face the fact that if he threw up his job and the strike was not a complete success he could never get back into train service. He was past the age at which men for train service are employed on any railroad. The same was true with the conductor. The fireman of 25 or 26 if he threw up his job could get another; men of his age are being employed all the time for train service. The young brakeman, if he lost his present job, would have comparatively little difficulty in getting another of about the same kind. The older enginemen and conductors had comparatively little to gain and everything to lose; the younger firemen and trainmen had something to gain and comparatively little to lose. Were the leaders of the enginemen and conductors playing quite fair with their own brotherhood members when they linked up with the firemen and trainmen?

Everything to lose and Nothing to Gain

At a time when grade crossing accidents are the source of ever-increasing expenditures by the railroads to cover the cost of damage suits; of further protection of crossings by grade separation, gates, watchmen, warning devices, lighting, signs, etc.; and unremittant "safety first" campaigns among employees and the public alike; it is refreshing to be reminded that some responsibility rests on the public, and furthermore that the responsibility may be translated into dollars and cents. On June 3 a passenger train on the Chicago & Eastern Illinois was approaching a crossing in open country near Danville, Ill., at its usual speed. The view was unobstructed and the whistles sounded soon enough for the driver of a vehicle near the crossing to have ample time to stop to let the train pass. A man who was driving an automobile towards the crossing at the time paid no heed to the warnings, it is alleged, and was struck and killed. His automobile derailed and wrecked the locomotive and baggage car and caused injuries to the engineer, which later resulted in his death. Mrs. Charles Everhart, wife of the engineman, has filed suit against Daniels' estate for $5,000, and W. J. Jackson, receiver for the C. & E. I., has begun suit for $10,000 to cover the material damage to the train. Should these suits prove successful they will serve as a wholesome deterrent to carelessness by automobile drivers. Disregard of one's personal safety seems to be a common and incurable trait of motorists. Observations by the railroads in California at 34 crossings disclosed the startling fact that out of 17,000 drivers of motor vehicles noted, 69½ per cent looked neither way before crossing tracks, 2.7 per cent looked in one direction only, and but 27.8 per cent looked both ways. Three thousand three hundred drivers observed, ran over the crossings at a reckless rate of speed. The prospect of a considerable monetary loss as the result of careless driving will, it is hoped, cause automobile drivers to stop, look and listen to a more appreciable extent than they have done heretofore.

When the Shoe Pinches the Other Foot

The present national administration may not have had an express understanding with the labor organizations to help the railway brotherhoods get their "basic eight-hour day," in return for which the labor leaders were to try to deliver to the Democratic party the votes of organized labor. But whether there was or was not such an understanding, it is a demonstrable fact that for five months both the administration and the labor leaders have been acting just as they would have acted if there had been such an understanding. The evidence on this subject, available up to the end of August, was reviewed in an editorial entitled, "Was There a Political

Trying to "Deliver the Goods"

Frame-Up?" which was published in the *Railway Age Gazette* for September 1. The Adamson law, providing for the "basic eight-hour day," in other words, for the advance in wages, which the railway brotherhoods demanded, was passed on September 2. If there was an understanding, this was the administration's final act in carrying out its part of it. Since then three of the four heads of the brotherhoods—Stone, of the engineers; Lee, of the trainmen, and Garretson, of the conductors—have issued statements through one channel or another in effect, urging their followers to vote for Mr. Wilson; and grand officers of the brotherhoods are going all over the country attending lodge meetings for the purpose of doing likewise. Suppose that the situation had been reversed; that the relations of the administration with the railroads had been what they have been with the brotherhoods, and that President Wilson had promptly espoused the demands of the railroads instead of the demands of the employees and secured the passage of a law for their benefit at the expense of labor and the public. Suppose that after he had thus won a victory—or what was considered a victory—for the railroads, President Holden of the Burlington, and the other members of the railway executives' "committee of eight" had gone about the country urging people to vote for Wilson. What, then, would have been thought and said on the question of whether there was a "political frame-up"? But, of course, evidence which would be presented from every stump in the country by demagogues of the Senator La Follette and Senator Reed type as absolutely conclusive and wholly damning if capital were involved, means nothing at all when organized labor is involved!

EQUIPMENT MARKET AGAIN ACTIVE

THE equipment market has again become active after a period of quiescence during the Summer months. According to our records for the month of September, the railroads of the United States and Canada placed orders for 9,152 freight cars, or almost as many as were ordered in the three preceding months combined. Orders for 243 locomotives were reported for the same month, or five more than were ordered in June, July and August together. With the shortage of cars becoming more serious every day, and with no prospect of an early peace in Europe, it would appear that the carriers are facing the necessity of making extensive orders for new equipment in spite of high prices and poor deliveries. That there has been reason for postponing purchases is evidenced by the fact that prices today are from 50 to 75 per cent higher than 16 months ago. If buying continues to become heavier during the remaining months of the year, the orders for cars in 1916 will largely exceed those for 1915. According to our records, 68,289 freight cars had been ordered in 1916 at the end of September, as compared with 47,832 contracted for during the same period last year, and with 109,792 ordered during the entire year of 1915. There has been a lull in car buying during the major part of the last five months; in fact approximately 66 per cent of the orders recorded thus far were placed in the first third of the year.

ORDERS OF LOCOMOTIVES AND FREIGHT CARS REPORTED IN 1915 AND 1916

	Locomotives		Freight-Cars	
	1916	1915	1916	1915
January	231	31	14,613	3,300
February	272	36	9,323	4,385
March	634	114	14,233	1,188
April	178	20	7,228	1,000
May	248	101	4,154	19,080
June	172	81	3,031	4,464
July	25	32	1,514	8,595
August	41	117	5,041	1,685
September	243	131	9,152	4,135
Total for Nine Months	2,044	663	68,289	47,832

Likewise, 64 per cent of the locomotive orders reported until September 30, were placed in the first four months of this year. Contracts for tractive power have been proportionately larger, however, than orders for cars, as 2,044 engines were ordered in the first nine months of this year, nearly 400 more than were ordered in the entire year of 1915.

The need for locomotives is not as pressing as the need for cars, and it is likely that the carriers will make proportionately heavier purchases in the latter type of equipment during the remainder of the year. Unfortunately, orders for freight cars placed now will not affect the critical car situation the country is at present facing. According to leading car builders, cars ordered now cannot be completed before some time in the second quarter of 1917, if that early. The orders now on the books of the United States Steel Corporation will keep its mills busy for the next seven months, and it is said other steel companies are in a similar condition. It is very unlikely that car manufacturers will be able to fill new orders any sooner than they have filled those placed so far this year and in the latter part of 1915. Cars are now being delivered by builders which were ordered in December, January, February and March, and some equipment ordered eleven months ago is just now reaching the railroads.

THE ADAMSON LAW SHOULD BE REPEALED

IT is admitted on all hands that the effects which will be produced by the establishment of an eight-hour basic day in railway train service should be investigated by some public tribunal. There is, however, a difference of opinion as to whether the investigation should precede or follow the establishment of the eight-hour basic day. There is also a difference of opinion as to the particular phases of the subject to which the investigation should relate.

The Adamson law, after fixing eight hours as the basis for reckoning compensation, provides: "That the President shall appoint a commission of three, which shall observe the operation and effects of the institution of the eight-hour standard workday as above defined and the facts and conditions affecting the relations between such common carriers and employees during a period of not less than six months nor more than nine months." It is commonly assumed that the main thing which this commission is to ascertain is whether the railways can stand the advance in wages given the train service employees without any advance in their freight and passenger rates.

From the standpoint of the labor brotherhoods this may be the one subject which should be investigated. From the standpoint of the other 80 per cent of railway employees, of the stockholders of the railways, of the traveling and shipping public, and of the people of the United States, this is not the subject which most requires investigation. Even if it should be demonstrated that the railways, with their present rates, could stand the increase in pay voted to the train service employees by Congress and President Wilson, this would not prove that the enactment of the Adamson law was justified or that the results produced by it were satisfactory. If it should be demonstrated that the railways could stand additional regulation tending to reduce their net earnings this would not settle, but would merely raise, the question as to whom such regulation should be adopted to benefit.

A real and thorough investigation of the entire situation might conceivably show that an additional burden in the form of higher wages for the train service employees could be borne by the railways. But it might show that the wages of the train service employees are too high already, and that any increase in wages made should go to the section foremen, the general office clerks, the station agents and other employees of the railways constituting that 80 per cent of

the total number whose existence the Adamson law ignores.

Again, a real and thorough investigation might show that no class of railway employees is entitled to an increase in wages, but that some railway rates ought to be reduced. Finally, such an investigation might show that, in spite of the present large net earnings, the average return earned by the railway companies from year to year on the investment in their properties is too small, and that it is the stockholders rather than either employees, or shippers and travelers who are entitled to more consideration from the regulating authorities.

The one conclusion suggested in the foregoing which it is least likely that a fair and thorough investigation would lead to is that the train service employees are entitled to an increase in their wages. Their maximum and minimum, and their average wages have been presented in these columns repeatedly. Their average wage is almost twice as great as the average wage of the remaining 80 per cent of railway employees. And yet the one change in the situation which a thorough investigation would be least likely to show to be fair and desirable is the one change which the Adamson law provides shall be made without any investigation whatever. This illustrates the essential vice of the policy for which President Wilson stands—that of acting first and investigating afterwards. Once a wrong step is taken it is hard to retrace, and is more likely to be followed by more false steps. If the Adamson law does go into effect it will be difficult to restore wages to the old basis even though the law is subsequently held unconstitutional by the courts.

These being the facts, it is evident that the business interests of the country, instead of leaving the Adamson law to be dealt with by the courts, should start a movement at once for its repeal. The duty of disposing of such legislation ought not to be passed up to the courts. A measure so manifestly unjust and whose passage was secured in the way that it was, is a disgrace to the American nation, and should be removed from the statute books in the same way that it was placed on them, not by a decision of the Supreme Court, which, at the best, would expose that tribunal to harsh and unjust criticism.

Even though the Supreme Court should declare the law invalid this would merely establish a precedent for the courts and not for the lawmaking bodies, and court precedents are often nullified not only by subsequent court decisions but also by constitutional amendments. The thing needed in this instance is not merely for the courts to protect the public from an unjust and probably unconstitutional law, but for the American public through its lawmakers to wipe out the blot upon American history and repair the damage to American institutions and to the welfare of the American public caused by the passage under the most infamous circumstances of this outrageous statute.

The Adamson law should be repealed and then there should be made a real and thorough investigation of the entire railway wage situation, such as that suggested by the Chamber of Commerce of the United States in the resolution which it presented to President Wilson and Congress long before the strike crisis ever came. Only in this way can justice be done to all concerned and their self-respect be restored to the American people.

NORFOLK & WESTERN

ON an average, the Norfolk & Western hauls each ton of freight a little further than from Roanoke, Va., to Norfolk, 257 miles. For this service it gets a total of $1.12, out of which must be paid not only all of the expense of the movement of the ton of freight, the proportionate cost of repairs of cars, locomotives, track, buildings, overhead, interest on the investment and profit to stockholders, but also a certain proportion of the overhead, interest charges, etc., which are properly assignable to passenger service. When you stop to figure out in detail what expenses must come out of this $1.12, it seems nothing short of marvelous that the Norfolk & Western is one of the most profitable railroad properties in the United States. A few extra switching movements of each freight car, a few



The Norfolk & Western

days' delay—either one would turn profitable operation into unprofitable operation. An oversupply of expensive facilities might easily eat up in interest charges nearly all of the profits. Where a railroad has a ton-mile rate of 4.2 mills, as the Norfolk & Western has, niceness of adjustment between facilities and requirements must approach perfection.

In the fiscal year ended June 30, 1915, the Norfolk & Western, operating 2,059 miles of road, with a 4.2 ton-mile rate and a ratio of operating expenses to operating revenues of 56.16 per cent, earned $23,055,000 net after the payment of expenses and taxes. After the payment of interest charges and rentals there was $20,625,000 (which includes $2,127,000 non-operating income) available for dividends. After the payment of regular 4 per cent dividends on the $23,000,000 preferred there was therefore earned 16.7 per cent on the $118,000,000 common stock.

Great prosperity has come to the Norfolk & Western only in the last few years. In 1905 the company was paying only 3 per cent on its common stock. In the following year this was raised to 4 per cent. What might be called the fundamental factor in the success of the management of the Norfolk & Western has been the adjustment of the provision of additional facilities to meet increased business, on the one hand, and the relationship between the securities issued to raise new capital and the expenditure for additions and betterments, on the other hand. Binding these two together and permeating the whole structure is a sureness of operating methods that amounts to genius.

Some years ago it became obvious that the Norfolk & Western would have to carry on a very extensive program of additions and betterments to its property if it was to get its share of the steadily increasing output of the West Virginia coal mines and to handle increased traffic at the same or lower operating ratio in the face of increases in rates of pay and of prices of materials. It is easy enough now to look back and say that the course adopted some years ago was obviously the correct course. It has proved to be the correct course, there is no doubt of that, but it was not probably so obvious at the time it was adopted as it appears to be now. The Norfolk & Western management decided that the primary requisites for the development of the property were terminals always in advance of the needs, yards ample enough to guarantee freedom from congestion at division terminals, and adequate power. In the particular circumstances confronting the Norfolk & Western it was thought that improvement of main line, reduction of grades and replacement of lighter rail with heavier sections should follow, not precede, terminal development. It was recognized that congestion, with a ton-mile rate of in the neighborhood of four mills, would be fatal to profitable operation. The coal pier at Norfolk, the immense terminal yard there, the very ample yards which have been built at all division points, the large expenditures which have been made for additional locomotives and, of great importance, the quite unusually ample facilities for repairs and construction of equipment at Roanoke, have all been a part of the successful guarding against congestion.

Since October 1, 1896, $146,497,000 has been spent on the Norfolk & Western's 2,000 miles of railroad for additions and betterments, and of this amount $41,546,000 has been stockholders' money, against which no securities were issued. The financing of the other $105,000,000 was farsighted and proved to be very successful. Much of it was done through the issue of convertible bonds which the results obtained from operation made it profitable for the purchasers to convert into stock.

When the heavy movement of freight began in 1915 the Norfolk & Western management had a machine and an organization which was ready to take care of each increase in business with precision. The total number of revenue tons carried by the Norfolk & Western in 1916 was 44,373,000, an increase over 1915 of 11,606,000 tons, or 35.42 per cent. The average length of haul was 266 miles as against 272 miles in 1915, so that the increase in ton mileage was approximately 32 per cent. The average receipts per ton per mile were 4.2 mills in 1916 and 4.1 mills in 1915. The great bulk of the increase in freight business was from the movement of bituminous coal and of manufactures. There was also some improvement in the lumber business. The total tonnage of bituminous coal carried in 1916 was 30,269,000, or 6,989,000 tons more than in 1915. The total tonnage of ore was 1,194,000 in 1916, or nearly double that of 1915. The tonnage of manufactures was 5,172,000 in 1916 as against 3,118,000 in 1915. The increase in ore tonnage helped to eliminate empty car mileage and thus automatically increase the average revenue trainload, and combined with this was a great number of factors, each one not very large in itself but, when combined, bulking very large, which made it possible to increase the average revenue trainload by 116 tons, the average in 1916 being 957 tons. The increase in tonnage per freight engine mile was even greater proportionately. The average in 1916 was 669 tons, or 16.87 per cent greater than in 1915.

The table below shows principal figures for 1916 and 1915:

	1916	1915
Average mileage operated	2,059	2,042
Freight revenue	$49,559,140	$36,550,550
Passenger revenue	5,796,583	4,739,538
Total operating revenues	57,304,586	42,987,044
Maintenance of way and structures	6,571,329	5,738,074
Maintenance of equipment	10,046,263	8,342,419
Traffic expenses	703,055	699,827
Transporation expenses	14,135,112	12,521,665
General expenses	891,631	836,607
Total operating expenses	32,181,346	27,831,815
Taxes	2,065,000	1,878,000
Operating income	23,054,786	13,275,462
Gross income	25,181,364	15,318,696
Net income	20,624,059	10,409,905
Dividends	9,232,636	7,396,293
Surplus	11,391,423	3,013,612

CHICAGO, MILWAUKEE & ST. PAUL

THE St. Paul has passed the one hundred million mark in gross earnings for the first time. With the largest wheat crop in its history, added to the great revival in general business, phenomenally large movement of ore, together with considerable improvement in passenger business, the Chicago, Milwaukee & St. Paul earned $105,646,000 in the fiscal year ended June 30, 1916. This is an increase over the previous year of $14,014,000 and the management saved for net approximately half of this increase. The operating ratio in 1916 was 65.43 per cent, comparing with 67.78 per cent in 1915. The following table shows the percentage of each class of operating expenses to total operating revenue:

	1916.	1915.
Maintenance of way and structures	10.95	11.35
Maintenance of equipment	15.63	15.03
Traffic expenses	1.80	1.92
Transportation expenses	35.71	39.04
Miscellaneous expenses	0.70	0.79
General expenses	1.82	2.04
Transportation for investment—Cr.	1.18	2.39
Total operating expenses	65.43	67.78

In the unprosperous year ended June 30, 1915, the St. Paul continued to its standard in maintenance of way expenses, even when so doing necessitated the showing of part of the dividends on the common stock paid from surplus. There was, therefore, in the 1916 fiscal year no deferred maintenance of way. The total expenditures for maintenance of way in 1916 were $11,564,000, comparing with $10,377,000. In part the larger amount spent in 1916 was directly necessitated by the greater movement of traffic and in part it was due to charges for maintenance work in connection with additions and betterments. There was $1,179,000 spent for new additional main line tracks and reducing grades and perfecting line, and $9,309,000 for other additions and betterments to roadway and track, of which the electrification expenditures on the Rocky Moun-

tain division bulked largest, with $3,870,000, and bridge, trestle and culvert renewal and elimination next, with $962,000.

The largest increase in maintenance of way expenditures in 1916 was for track laying and surfacing, which cost $3,571,000, or $728,000 more than in 1915. It is rather interesting to note that the expenditures for ties and for rails was slightly less in 1916 than in 1915. Rates for track laborers were in many instances much higher in 1916 than in 1915, which would in part account for the large increase in the item track laying and surfacing; but since this is in good part the labor cost of putting rails, ties and ballast into track, the large increase in this item as compared with slight decreases in rail and tie accounts, and notwithstanding an increase from $147,000 to $294,000 in ballast account, can hardly be accounted for entirely by the difference in rates paid track labor.

With the unprecedentedly heavy movement of wheat it was to be expected that repairs of freight cars would show a large increase. Total maintenance of equipment expenditures amounted to $16,518,000, or an increase over the previous year of $2,781,000. Of this increase repairs of freight cars accounted for $1,088,000, the total spent on this account in 1916 being $6,130,000. The greater part of the remainder of the increase in maintenance of equipment expenditures is accounted for by an increase in cost of repairs of steam locomotives of $698,000, the total on this account in 1916 being $5,809,000, and by an increase of $303,000 in repairs of passenger cars, the total on this account in 1916 being $1,362,000.

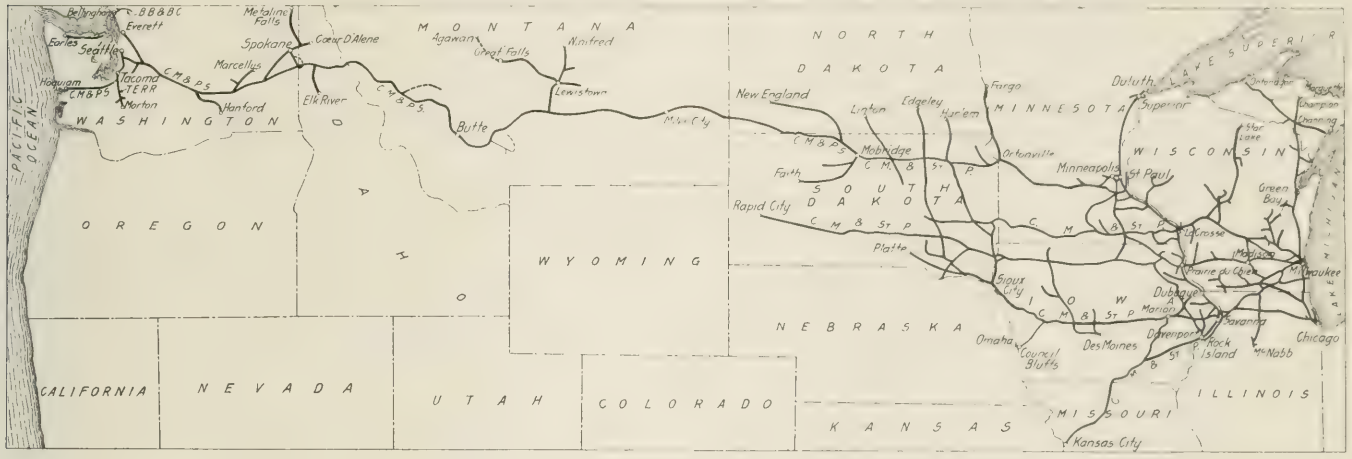
Transportation expenses were held down remarkably well. The total in 1916 was $37,729,000, an increase of $2,031,000, or 5.7 per cent. The increase in revenue ton mileage was 22.69 per cent and in revenue passenger mileage, 4.82 per cent. Increased trainload was an obviously important factor in holding down transportation expenses and was helped by a better balanced traffic, by the electrical operation of part of the Rocky Mountain division, and by a large number of detailed improvements in operation and in supervision. The average revenue trainload in 1916 was 425 tons as against 390 tons in 1915. The average number of loaded freight cars per train was 23.663 in 1916 and 23.179 in 1915. The average number of empty cars per train was 9.517 in 1916 and 10.138 in 1915. The length of haul increased, the average in 1916 being 262 miles and in 1915, 248. The average loading per loaded car was 20.459 tons in 1916 and 19.795 tons in 1915. The average ton-mile rate was 7.571 mills in 1916 and 7.813 mills in 1915.

The total number of passengers carried one mile in 1916 was 899,872,000, comparing with 858,452,000 in 1915. The increase of 4.82 per cent in passenger business measured in passenger mileage was accompanied by an increase of 3 per cent in the mileage made by passenger trains.

In 1916 the Chicago, Milwaukee & St. Paul earned $16,717,000 net available for dividends. The regular 7 per cent dividends on the preferred called for $8,109,206, leaving $8,607,794, or a little over 7.3 per cent on the common stock. The amount paid in dividends was 4½ per cent, the annual rate being raised in January, 1916, from 4 per cent to 5 per cent.

During the year the St. Paul converted the outstanding $30,568,000 European loan of 1910 into a like amount of 4 per cent gold bonds, due 1925. During the year there was $8,556,000 additional general and refunding mortgage bonds issued and held in the treasury. There are now in the treasury $25,000,000 general and refunding mortgage bonds which are available for such corporate purposes as the board of directors may authorize, and in addition $107,259,000 general and refunding mortgage bonds for acquisition of additional property or other additions and betterments. At the end of the year the company had $12,636,000 cash, with no loans and bills payable.

It is, of course, unlikely that there will be another such wheat crop as that of 1915 in the present generation; but in that year the corn crop in a large part of the territory served by the St. Paul was a partial failure. Present indications are that the wheat crop in St. Paul territory will be below normal, measured in bushels per acre, but in Montana especially a greater acreage each year is being brought under cultivation. The prospects are for a very much better corn crop than last year, and while it is only guesswork to say how much of last year's wheat has been held back by the farmers, it is a known fact that there is a large quantity of it along the lines of the St. Paul. With the abnormally high prices for both wheat and other grain, the fiscal year 1916 and the coming year will go a long way to permanently raising the standard of living and prosperity in the territory served by the St. Paul, especially in South Dakota and Montana. This is a permanent factor making for higher earnings for the railroad company.



The Chicago, Milwaukee & St. Paul

The table below shows principal figures for 1916 and 1915:

	1916.	1915.
Average mileage operated	10,130	10,053
Freight revenue	$76,036,097	$63,953,799
Passenger revenue	18,923,893	17,952,428
Total operating revenues	105,046,484	91,435,374
Maintenance of way and structures	11,563,769	10,377,185
Maintenance of equipment	16,518,476	13,737,535
Traffic expenses	1,899,027	1,756,801
Transportation expenses	37,728,571	35,697,961
General expenses	1,920,467	1,862,939
Total operating expenses	69,120,958	61,971,701
Taxes	5,264,331	4,746,721
Operating income	31,261,195	24,716,952
Gross income	34,699,640	28,366,665
Net income	16,717,357	11,968,283
Dividends	13,391,478	13,951,711
Surplus	3,325,879	*1,983,428

*Deficit.

WABASH PITTSBURGH TERMINAL

THE Wabash Pittsburgh Terminal and the West Side Belt together operate only 86 miles of line, of which only four miles is double track. But the company's operations (the Wabash Pittsburgh Terminal and West Side Belt figures are combined in the annual report) are more generally interesting than the size of the property would indicate, because of the ruinous loss which investors in the company's securities have suffered. Plans are now under way for the reorganization of the company; these plans were discussed in the *Railway Age Gazette* of July 23, 1915, page 146.

In the fiscal year ended June 30, 1916, the Wabash Pittsburgh Terminal and the West Side Belt were operated by the receiver. For the first time in the history of the property there was a substantial surplus after interest charges on receiver's indebtedness. No interest has been earned on the $30,000,000 first mortgage bonds of the bankrupt company.

Total operating revenues in 1916 amounted to $1,731,000, compared with $1,186,000 in 1915. Operating expenses amounted to $1,023,000, comparing with $875,000 in 1915. It will be seen, therefore, that the operating ratio was reduced from 73.78 per cent in 1915 to 59.10 per cent in 1916. After the payment of interest on receiver's certificates there was a surplus in 1916. of $378,000. The best previous year since 1908 was 1910, with a surplus of $69,999. In 1915 the deficit was $73,000.

The largest increase in income in 1916 was from the carriage of general freight. The income from this source was $616,000 as against $362,000 in 1915. The revenue from coal freight in 1916 was $763,000 as against $548,000 in 1915. The average revenue per ton per mile for all freight was 1.127 cents in 1916 as against 1.002 cents in 1915, an increase of 12.48 per cent, accounted for by the larger proportion of general freight as compared with the coal carried.

Notwithstanding the smaller proportion of coal traffic, however, the average revenue trainload in 1916 was 750 tons as against 665 tons in 1915, an increase in trainloading of 12.88 per cent. In large part this was accounted for by a greater proportion of loaded freight car miles as compared with total feight car miles. The average number of loaded cars per train in 1916 was 20.49; in 1915, 18.47, an increase of 10.94 per cent. The number of empty cars per train in 1916 was 9.12 and in 1915, 10.75, a decrease of 15.17 per cent. The surplus in 1916 would amount to 7 per cent on only a little over $5,000,000. For the greater part of the fiscal year ended June 30, 1916, the Pittsburgh district was extraordinarily busy, so that the results obtained are probably as favorable as the new company can expect to attain immediately. On the other hand, the ability of the organization to hold down the operating ratio to below 60 is very encouraging. In addition the new company expects to develop sources of traffic which were not contributing to the road in 1916. Since the density of revenue freight (ton miles per mile of road) was 1,572,000 in 1916, there is still a chance for at least double the amount of freight business which is now being handled on the single-track line to be handled economically without double tracking.

The table below shows principal figures for 1916 and 1915:

	1916	1915
Mileage operated	86	86
General freight revenue	$615,634	$362,286
Ore freight revenue	144,216	92,172
Coal freight revenue	763,363	548,417
Passenger revenue	117,614	109,517
Total operating revenues	1,731,192	1,185,697
Maintenance of way and structures	212,597	157,263
Maintenance of equipment	214,302	218,447
Traffic expenses	35,993	33,958
Transportation expenses	465,988	375,710
General expenses	78,728	77,052
Total operating expenses	1,023,096	874,808
Taxes	93,600	93,600
Operating income	614,122	217,286
Gross income	722,320	301,563
Net income	377.847	*73.193

*Deficit.

Letters to the Editor

WEIGHT OF STEEL PASSENGER COACHES

San Francisco, Cal.

To the Editor of the Railway Age Gazette:

In the *Railway Age Gazette* of Friday, June 16, page 1356, you have an article on the weight of steel passenger cars, in which it is stated that the lead, from the standpoint of low deadhead weight per passenger of steel coaches, is retained by the Pennsylvania Railroad with a figure of 1364 lb. per passenger.

The majority of the steel coaches owned by the Southern Pacific Company, Pacific System, run below this figure. Out of a total of 308 main line coaches, 218 have a dead weight per passenger running from 1203 lb. to 1353 lb. The balance of 90 steel coaches run between 1371 lb. and 1500 lb. per person, or an average for the lot of 1428 lb. dead weight per passenger. The average dead weight per passenger for the entire number of all-steel coaches owned by this company is 1318 lb.

All these cars have four-wheel trucks, are equipped with double sash and have a seating capacity of 72 persons. The first all-steel coach in service on this line was built in September, 1906, and the latest in January, 1915.

On our electric suburban lines, operating in Oakland, Alameda and Berkeley, we have electric motor coaches seating 116 persons, with a dead weight per person of 943 lb., and electric trailer coaches (which are not equipped with motors), also of 116 seating capacity, with a dead weight per passenger of 579 lb., an extremely low figure.

T. W. Heintzelman,
General Superintendent Motive Power, Southern Pacific Company.

IMPORTANCE OF POLITENESS ON TRAINS AND AT STATIONS

Boston.

To the Editor of the Railway Age Gazette:

The highbrow stuff that you and the Western Pacific are setting before your readers (August 11, p. 219) surely gives evidence that the world do move. And why not? Graciousness on the part of all men in the train service would be one of the most reasonable things in the world; and if only the W. P. follows up its good words with good practice; and if a few other roads will copy this far western idea—Boston is not jealous—why, there is no limit to the improvement that might be made. Indeed, we ought to be ashamed of ourselves that we have allowed Pullman porters, and even the proprietors of peanut stands—where the competition between the stands is active—to outdo us in suavity. Another *if* must be added; *if* you will give publicity to the work of those roads which really practise politeness. Very little visible progress has been made in real all-around politeness except as some fellow with native gifts in this direction has got into a prominent place as passenger conductor or passenger trainman, and others, consciously or unconsciously, have followed the example thus set. It is the duty of the *Railway Age Gazette* to magnify the virtues of such conductors and brakemen.

Even with politeness in good measure on passenger trains, we haven't attained such a very high level. The Western Pacific book enjoins politeness to fellow employees. How many freight trainmen have got within hailing distance of that ideal? How many men, either passenger or freight, can be classed as well-behaved everywhere? Men who are quite civil to passengers will drop into profanity within five

seconds after the last passenger is out of hearing; and as for freight trains, one is frequently led to ask if we are not still living in the old days of go-as-you-please, when profanity and obscenity were the stock conversation on every local freight. It would be interesting to know what percentage of the trainmen on any given road or division frequent the Young Men's Christian Association rooms at either terminal; and, of those who do avail themselves of the privileges of this institution, what percentage really open their souls to the elevating influences supposed to prevail there? In short, the Western Pacific standard, in enjoining graciousness and a spirt of friendly accommodation, is calling for men who shall be high quality clear through.

And now, lest your readers may think that I am only another highbrow, bobbing up simply for the purpose of keeping you company, I want to commend the W. P. for the good old-fashioned instructive matter in its book. (I have seen a copy of it.) "Short, curt replies give offense," I read in that courtesy rule. That is practical and far enough removed from the spirit of the dilettante. If the rule before referred to (graciousness) is weak because of its softness, no such charge can lie against this one. I should like to see a stiff reprimand addressed to every employee offending against this precept. And for the third offense I would impose something more than a reprimand. Some ticket sellers who are always correct with their figures and immaculate as regard collar and necktie will give short, curt answers for no other purpose than to show passengers their ignorance—information which it is not the function of the ticket seller to give.

In discussing these matters in committee or on paper, we seem to forget that the problem is one of very large proportions. It is a fine thing for a superintendent to publish a letter commending some brakeman or porter for a special act of kindness or consideration, but isn't this liable to blind us to the conditions relative to hundreds of other men? Of these other hundreds some have disposition, but have not had the opportunity to do the brave or tactful act that elicits commendation; others show a decided lack of the disposition; others, and probably the far larger part, are of indifferent quality; cannot be classified as either good or bad.

Why cannot there be arranged some plan to recognize in a material way all positive improvement in treating the public with courtesy and consideration? If we cannot do this it is a duty to stir up the men in some other way. Commending meritorious conduct is desirable; but condemning the faulty is a duty. It is a duty even when the only outward reward is to have people call you grouchy.

Perhaps we have practised gentleness and indirection too long already. Let us jump in and punish "curt answers" as they deserve. In your reference to the affable ticket seller you have touched a fundamental truth—though many railroad men will say that you are too free in encouraging the "sissy." Never mind such critics. Men of ordinary gifts and attainments—a class which takes in nearly all of us—ought constantly to imitate the polite and courteous ticket-seller or trainman. There is no easier or better way to learn. It is quite natural *not* to like to learn from the too-smooth trainman, for such fellows often have other qualities which, to the average trainman or station man, are in some degree offensive, but this dislike is no excuse for refusing to learn efficiency. To learn salutary lessons it is often necessary to put aside naturalness. It is the trainmaster's duty to drill his men, in such degree as may be necessary to become unnatural.

Drilling men in their duties must not be neglected because it is irksome. Exhorting in a general way to good actions is not the whole thing. It is necessary to continue the condemnation of the bad—as the gardener must leave his flowers and kill weeds. A curt tone, even, will turn the passenger's mind the wrong way. "The *spirit* of friendly accommodation" (required by the Western Pacific) is the essence of this rule. It would be a highly profitable thing, on any railroad, if some way could be devised to award premiums for excellent attainment in "the spirit of friendly accommodation."

F. R. GEER.

FROM A RAILWAY EXECUTIVE

NEW YORK, N. Y.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Your paper is far from being an "organ of the railways." As you went so far as to notice that silly accusation in your issue of September 22 (page 484), let me add a little testimony.

No paper has been more vigorous in denouncing bad financial methods. And as you write, as a rule, with real information and sound judgment on such matters, your criticisms carry great weight.

In labor and safety movements, your paper and its predecessors have been independent, often taking sides against the railway managers. For years the *Gazette* took a strong stand on safety appliance matters. The late Mr. Boardman once refused to include safety appliances as a part of the growing cost of railway operations, saying to me, in substance: "I'm not going to give you any credit for changes that you ought to have made on your own volition, but actually made only when kicked into doing so by Congressional enactment."

No, Mr. Editor, the *Railway Age Gazette* is far from being an "organ" or "mouthpiece," but is a model of wide information in its special line, employed by it with sense and courage and without truckling to anybody.

OBSERVER.

"TIMES ARE ROTTEN RIPE FOR A CHANGE"

KANSAS CITY, MO.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE.

The old saying "Times are rotten ripe for a change" can be used with emphasis today in regard to the situation of the railroads with respect to organized labor. Everyone who has had to deal with the brotherhood officers knows that they were bluffing in this case. They admitted at the outset that they were not seeking an eight-hour day. The fact that they so readily agreed to the Adamson bill proves conclusively that the length of the day had nothing to do with it. It was the same old game to get something for nothing.

It should be remembered that the men in train service do not work by the day. Practically speaking, they are contractors. They contract to move a train or cargo a given distance for a given price, and like all other contractors they want to get in all the hours or miles, and particularly miles, that they can. There are passenger runs all over the country where two crews are assigned on the assumption that each crew can make a trip one way each day, and where, at the request of the men, they are permitted to make the entire round trip in one day, consuming from ten to twelve hours, the men thus working only every other day.

The present agitation should not be allowed to subside until we have wiped out forever the innumerable arbitrary allowances which serve to hold the railroads up and act as stumbling blocks in the way of discipline and efficient operation. If the facts are honestly and efficiently investigated, the railroads and the public will have all to gain and nothing to lose; though the railroads will come in for some deserved criticism for the manner in which they have allowed the brotherhoods to obtain concessions, one at a time, with individual roads, which they then used as precedents in making demands on the other roads for similar concessions; they have worked custom and precedent to a finish when it fitted their case.

After the last settlement was made with the Western trainmen a few years ago, the men made no particular secret of

the fact that they intended to make no further direct demands for increases, but would, thereafter, devote their activities to obtaining increases through state and federal legislation or demands for so-called better working conditions. In other words, they would mask the real issue. They realized that the bare figures would not stand the test of public scrutiny. They know that people generally now have a pretty good idea as to the ability required to fill the four different positions—that a very little preparation or apprentice work is necessary. A merchant gets his eyes open when the boy on his delivery wagon, whom he paid $30 or $40 a month gets a position on the railroad as brakeman or fireman and goes to work at full pay, after making only three or four trips as student; and who comes into the store a few months later with a pay check to cash, bearing figures two or three times the salary which he had received from the store. This merchant, and the farmer also, have found out that in addition to there being no great secret in the work in any of the four crafts, the hazard, through modern safety appliances, has been so greatly reduced, that these men are subjected to less danger than the operatives in most factories.

The actual physical and mental labor involved outside of the physical energy required on the part of the fireman on some runs, is light, and even the fireman seldom has two heavy days in succession.

The word brakeman is now a misnomer. This so-called brakeman is no longer required to ride out on top of his train. To more fully appreciate the falsity of the claims that the brotherhood leaders make with tears in their eyes as to the great physical and mental strain imposed on the men in train service, all one needs to do is to ride an engine or caboose a few trips. A large percent of the men in the brotherhoods are very illiterate; they are led by their officers, and the officer must be doing something to hold his job. These officers are politicians; they are not sincerely interested in the workingman, and in many ways have proved themselves to be traitors to society and to their country. They have justified themselves in any move they felt they could force through in order to secure something more for their brotherhoods. They have constantly practiced the sympathetic kind of deception that enabled Garretson to flood his face with tears and choke with sobs in the halls of Congress, while the bill was being put through.

Let us make a few comparisons as to wages. Take the boy referred to from the grocery store. On account of his inexperience he is put on a work train as brakeman or fireman where he has very little to do. This crew, let us say, handles a pile driver. The function of this work train crew is simply to place the pile driver in proper place for driving the pile, and move to and from the side track to let trains pass. The crew, as per contract, consists of an engineer, fireman, conductor and two brakemen. The most the brakeman has to do, as a rule, is to station himself about a half mile out, with a flag, to notify approaching trains. The conductor and engineer are responsible for keeping clear of certain first class trains.

In order to be at the point of work by 7 a. m. the train crew is called for, say, 6 a. m. and when the bridge gang in charge of pile driver works until 6 p. m., it is usually from 6:30 to 7 p. m. when the work train men get into the station and tie up. They are on the side track and idle during the dinner hour, but are paid for the hour just the same. At the present rate the brakeman and fireman draw about a hundred dollars a month. In the above case, 6 a. m. till 6:30 p. m. makes a full day of ten hours and three hours overtime. The conductor's salary is upwards of $150 and the engineer's $175 to $200. The second brakeman is not needed, and not a man on the crew has enough to do to keep him awake; yet the brakemen and firemen now draw more than the foreman of the bridge gang, who must necessarily be a man of years of experience and ability to direct forces of 12 to 20 men in the important work of bridge building. His salary is from $90 to $100 a month. The coming increase will give the brakemen and firemen upwards of $125, a salary equal to that of the roadmaster of the division; while the engineer and conductor will draw more than the master mechanic or the trainmaster, who are in charge of the trainmen and enginemen of the entire division, and who are on duty practically all the time.

The trainmen and enginemen on the preferred through freight runs and on local freight trains will draw still larger salaries. It should be remembered here that in the work train service, on account of the light work, the basic day until only a few years ago, was twelve hours. It was made ten on pressure of the brotherhoods.

Certain it is the other 80 per cent of railroad operatives will have to have a big advance if the increase granted the trainmen stands. Even the superintendent, who is termed the general manager of the division, usually 400 to 600 miles of road, may come in for an increase later, when a large per cent of his engineers will draw more salary than he does.

I don't like to criticise the perplexed railroad executives, but I do here suggest that they cause to be tabulated a list of the various arbitrary allowances, that adversely affect operation and expenses. These will be found on all the railroads in the United States. Make a study of them; not only as to how they directly affect the treasury, but how they tie the hands of the superintendents, trainmasters, master mechanics and the other local officers—the men who finally run the railroad. And don't allow to be overlooked the innocent looking rule that provides that before one of these men is suspended or taken out of service, he must be given a formal trial with witnesses. Also, have a local officer explain how the brotherhoods work it to force him often to pass over gross infractions of rules and even insubordination. Consider the rule that prevents the double heading of engines over the division, and requires them to be run as an extra train, simply to give a conductor a job; the rule that requires a car repairer or inspector to follow up a brakeman and couple and uncouple the air hose for him; the special ruling, called the Chicago agreement, which provides that trainmen in through freight service are automatically released on arrival at any recognized terminal; and a hundred others which make it possible to greatly retard efficiency and increase waste. The special allowances and rulings are so numerous, and in many instances so difficult to verify that the timekeepers as well as the local officers are engaged continually in investigations, made necessary because such a large per cent of the more illiterate present such outrageous and false time claims. Even when these claims are known beyond a doubt to be false, the brotherhoods will fight a discharge or a suspension on the ground that the man did not understand that particular article or ruling.

The officers of the brotherhoods not only actually encourage these unfair practices; they threaten to throw any man out of the order who, through a sense of fairness, has the temerity to oppose crookedness. They are always opposed to any measures tending toward economy. How they systematically fight the full loading of trains! They will actually lose time to keep down the loading of engines to capacity. . . . After all, the managements of the roads and the public are to blame for the situation today; for not allowing these ignorant, arrogant, puerile fellows to run amuck, and be jarred loose from themselves.

A Former Yardmaster.

Bolivian Tin Output.—The Bolivian tin output in 1915 was the largest in history, amounting to 35,000 tons, against 28,000 tons in 1913, and forming 30 per cent of the world's output, against 21 per cent in 1913.

Is Government Ownership in Canada a Failure?

Intercolonial Built for National Purposes, Failure Commercially Due Solely to Low Rates, It is Contended

By J. L. Payne

Comptroller of Statistics, Department of Railways and Canals.

IN offering some criticisms of Mr. Dunn's recent article on "Failure of Government Ownership in Canada" (see Journal of Political Economy for July, and *Railway Age Gazette* for July 14 and 21), I think I ought to make my position clear right at the outset. The last thought in my mind is to discuss the principle of state ownership of railways. I am a neutral on that subject. The nationalization of certain roads is likely very soon to become an issue in Canada, and it would be improper on my part, as a public servant, to put myself in the attitude of a partisan. My purpose is threefold: First, to present the true story of the Intercolonial Railway; second, to show that the experience of the Intercolonial cannot properly be taken as demonstrating either the success or failure of government ownership, and, third, to correct some of Mr. Dunn's assumptions and deductions which were manifestly based upon imperfect or misleading information.

Mr. Dunn has given to his readers the most elaborate array of facts ever published, to my knowledge, with respect to the Canadian government railway system. To his statistical data no exception can be taken. He must have given an immense amount of time to the assembling of facts and the making of calculations based thereon. He covered the whole ground with most commendable thoroughness. He put forward all the arguments which he felt could be urged in defense of the Intercolonial. No one could suspect him of garbling or of other forms of unfairness. Nevertheless, he fell into serious error as to basic facts, and his really vital conclusion—that the Intercolonial had proven the failure of government ownership in Canada—was unwarranted.

The Intercolonial was built and is operated by the government of Canada, but it was not built, nor is it operated, to show the soundness of state ownership. It was built as an essential part of the bargain of confederation. When the provinces of Nova Scotia and New Brunswick were approached in the early sixties on the subject of union with the provinces of Ontario and Quebec they were both unfavorably disposed. Nova Scotia was particularly hostile. "Our market," said the Nova Scotians, "is the eastern states." It lies right at our door. It is open the year round. Ontario and Quebec are a thousand miles away and are accessible to us for not more than seven months in the year. We should lose by casting in our lot with the proposed confederation." These were strong and sound objections. They were put forward with equal candor and forcefulness by New Brunswick. They had to be met or the union of the upper and lower provinces had to be abandoned. The Intercolonial was the solution of the difficulty. "We will build and operate," said the delegates at the famous conference in Quebec, "a railway which shall be open throughout the year, and will enable trade to flow between the eastern and western parties to confederation." On that specific pact the road was constructed. It ran from Halifax in the east to Levis, opposite the city of Quebec, in the west. There it formed a junction with the Grand Trunk, which ran further westward to the Detroit river.

Section 145 of the British North American Act, which Americans would regard as the Canadian constitution, reads as follows:

"Inasmuch as the provinces of Canada, Nova Scotia and New Brunswick have joined in a declaration that the construction of the Intercolonial Railway is essential to the consolidation of the Union of British North America, and to the assent thereto of Nova Scotia and New Brunswick, and have consequently agreed that provision should be made for its immediate construction by the government of Canada: Therefore, in order to give effect to the agreement it shall be the duty of the government and parliament of Canada to provide for the commencement, within six months after the Union, of a railway connecting the River St. Lawrence with the City of Halifax in Nova Scotia, and for the construction thereof without intermission and the completion thereof with all practicable speed."

All arguments respecting the Intercolonial which ignore this historical reason for its existence are certain to lead to erroneous conclusions. The road was not built as a government project because it was believed that form of ownership was preferable to corporate control. It was built solely to secure and maintain confederation. It has accomplished that purpose, and it stands today as the absolute seal of a solemn compact entered into at the birth of the Dominion. No corporation wanted to build it. The undertaking had to be carried out by government. Moreover, no existing corporation would today take over the road and operate it on the terms which were tacitly, if not explicitly, made a part of the primary conditions of union. I shall endeavor to make it perfectly plain a little farther along what bearing this fundamental situation has on rates and operating results, as to which Mr. Dunn gave such an excellent and painstaking analysis.

Reasons for Intercolonial's Location

Mr. Dunn did not get to the root of the matter when he pointed to the location of the Intercolonial as an illustration of the economic mistakes which he seems to assume are inherent in state ownership. He fell into the error of taking it for granted that the government of Canada had a free choice in the matter of route. Certainly no corporation which had commercial results in view would have selected the needlessly long and roundabout course through the wilds of New Brunswick and the south shore of the St. Lawrence in Quebec which was actually taken. That was where the Imperial government came in. For the purely strategic reasons to which Mr. Dunn has alluded the home authorities imperatively insisted that the line should keep as far away from the American boundary as possible. The Dominion government felt bound to concur, and in doing so a section several hundred miles in length was established which does not even now produce any traffic of consequence. If Mr. Dunn had given full value to the real reason for the seemingly absurd location of that portion of the government railway, I am confident he would not have based any deductions whatever upon the fact itself. In other words, the route decided upon was in essential harmony with the peculiar purposes for which the road was built, although those purposes would not in any degree have influenced a corporation looking for a reasonable return upon investment.

If the Intercolonial be accepted as a fair example of government ownership, and the question of success or failure be determined upon operating results, then Mr. Dunn has made out an unanswerable case. It happens, however, that

there is a very big and very important other side. Despite the splendid array of statistical facts which he has given, and the skill with which he has woven those facts into an indictment, he has clearly been misled. With his finding that the government road has never earned fixed charges, and has cost the people of Canada a very large sum of money in interest charges, I cannot find fault. All that is unhappily true. But it is not precisely pertinent. With a large percentage of corporate owned roads in the United States in the hands of receivers it is a little dangerous for an opponent of state control to make net earnings a test of the underlying principle. The advocates of public possession see in large net earnings one of their strongest arguments. Be that as it may, the point I desire now to establish—and it is the kernel of this whole matter—is that the Intercolonial has not paid, in the commercial sense, simply and solely because its freight and passenger rates have been too low. If I fail to prove that contention I shall be left without a vestige of excuse for writing this reply to Mr. Dunn.

Mr. Dunn rests his case very largely on a comparison of the operating results of the Intercolonial with those of the Eastern Lines of the Canadian Pacific. Just why he did this I do not know. In one sense there is no such thing as this group designated "Eastern Lines." They constitute merely a section of a large system. There are no official figures respecting them available. Any data which Mr. Dunn has used must have been obtained from a private source and were obviously based upon wholly arbitrary calculations. I say unhesitatingly that such calculations are not reliable. There is no way by which the operating results of any particular division of a great railway system can be segregated with accuracy. Mr. Dunn probably chose these Eastern Lines because he believed they paralleled in some degree the Intercolonial. They do not. The Canadian Pacific has relatively small interests in the Maritime Provinces. It does not operate a single mile of road, for example, in Nova Scotia, whereas more than one-third of the entire government railway system is in that province. Less than 5 per cent of Canadian Pacific mileage is in the territory which the Intercolonial was built to serve. It would have been entirely fair if Mr. Dunn, for his test of public ownership, had measured the Canadian Pacific as a whole against the Intercolonial as a whole. No question could then have been raised as to the reliability of statistical matter used. I propose to do what I hold Mr. Dunn should have done.

Intercolonial's Losses Due to Low Rates

With the whole railway field open to him, only a man who was not in doubt as to the strength of his position would dream of picking out the Canadian Pacific for the purpose of testing the operating results of the Intercolonial. But I think it only fair to meet Mr. Dunn on his own ground. The Canadian Pacific is beyond all doubt the most prosperous railway in the world. The Intercolonial has not, taking into account its experience from the commencement, earned operating expenses. Yet I shall make it quite plain that if the Intercolonial had enjoyed the passenger and freight rates of the Canadian Pacific—in other words, had imposed the same charges for transportation service—it would have had relatively higher net earnings than had the latter. On the other hand, if the Canadian Pacific had been compelled from the outset to subsist on the earning power of the Intercolonial it would long ago have passed into the hands of a receiver.

For the purposes of the comparison I propose to make I have selected for the Canadian Pacific the statistical year ended June 30, 1913. That was the year before the war, and prior to the coming in of abnormal conditions. It was very much the best year in the history of that system. For the Intercolonial I have taken the regular fiscal year, ended March 31, 1913, which happened to yield an exact balance as between earnings and operating cost. I have done this for the sole reason that I want my figures to agree with those which are annually laid before parliament by the responsible head of the government railway system. The figures from "Railway Statistics," which Mr. Dunn has quoted, would not alter my deductions. The Intercolonial has had many better years; it has also had many that were worse. To be quite candid, it is usually regarded as a good year when the government road splits even. It will not be said, therefore, that I have gone out of my way to select a weak parallel or to choose a year that was favorable to the Intercolonial.

In 1913 the Canadian Pacific had passenger earnings amounting to $34,995,156, based on a rate per passenger per mile of 1.983 cents. The Intercolonial from the same source earned $3,438,447 on a rate of 1.617 cents. The Canadian Pacific rate was 22.6 per cent higher than the Intercolonial rate, and the Intercolonial rate was 18.5 per cent lower than the Canadian Pacific rate. It, therefore, follows that if the Intercolonial had enjoyed the Canadian Pacific rate it would have earned $777,089 more, whereas if the Canadian Pacific had been limited to the Intercolonial rate it would have earned $6,474,104 less. From freight service the Canadian Pacific received $88,101,523 on a ton mile rate of .784. The Intercolonial receipts were $8,028,760 from freight on a .570 rate. The Canadian Pacific rate was 37.5 per cent higher than the Intercolonial rate, and the Intercolonial was 27.3 per cent lower than the Canadian Pacific rate. This means that if the two roads had exchanged freight rates, one would have earned $24,051,716 less and the other $3,010,784 more. Carried a step farther, this exchange would have reduced the net earnings of the Canadian Pacific from $43,049,764 to $12,523,944, a difference of $30,525,820, while it would have given the Intercolonial a surplus of $3,787,873. The former line would have had barely enough to meet fixed charges and not a penny for dividends. The Canadian Pacific would have had net earnings of $969 per mile of line operated while the Intercolonial would have had $2,540.

Is there anything specious or unfair in the foregoing comparison? Not at all. Mr. Dunn at least will not say so. He gave the same facts, although in a slightly different form, and the very essence of his condemnatory findings against the Intercolonial lay in calculations of this nature. He simply did not go far enough. He did not work out the difference in rates. It is, however, perfectly sound to carry the facts to their legitimate conclusion, and I desire, therefore, to point out that if the exchange of earning power, based on passenger and freight rates, had been made in 1913, the Canadian Pacific would have earned precisely 2.6 per cent on its sworn cost of $475,370,064, while the Intercolonial would have earned just a shade under 4 per cent on a cost of $97,127,091. This result, despite the handicap of alleged political interference, waste and so on, upon which Mr. Dunn has laid such great stress, makes the contrast decidedly favorable to the Intercolonial.

Why Not Raise the Rates?

The natural and logical question an uninformed reader would ask is this: "If low rates account wholly for poor operating results by the Intercolonial, why does not government raise them up to the Canadian Pacific level?" The answer carries me back to the historical aspect. Rightly or wrongly, the people of the maritime provinces believe it was an absolute and fundamental part of the original agreement that the rates of the government line should never produce more than operating expenses. They are firm in the assertion that it would be a flagrant breach of faith to attempt the earning of interest on the cost of the road. There are two further reasons: First, the Intercolonial is exposed along its entire length to water competition for seven months in the year, and for the full year along its most productive mileage. That fact should not, however, be given undue importance. The second reason goes much deeper. The

canals of Ontario and Quebec, from which the people of New Brunswick and Nova Scotia do not obtain a particle of direct benefit, are free. They cost in capital outlay about $10,000,000 more than did the Intercolonial, and require an annual expenditure of $1,700,000 for operation and upkeep. The Canadian Confederation is not so perfect that the maritime provinces would consent to pay the fixed charges of the Intercolonial while the upper provinces went scot free on account of the canals. Mr. Dunn will probably find just as costly sectionalism as this in the United States. No government in Canada has felt warranted in disregarding these grounds for resisting rate increases, whatever merits they may have in the eyes of disinterested onlookers.

"Politics" on the Intercolonial

It would take up much space to go fully into Mr. Dunn's statements regarding the probable effect of political interference in the administration of the Intercolonial. There is, unfortunately, some ground for his reproaches. Partisan control has not been productive of economy; but, all said and done, no one may say that it has had a seriously prejudicial effect on operating results. The government road has always been well and cheaply administered. Its weakest spot is its high passenger train mileage per mile of road, which is about 35 per cent above that of the Canadian Pacific, but there are two sides to even that matter. When Mr. Dunn says that men are recklessly and needlessly employed, and kept on the payroll through the influence of politicians, he is repeating mere campaign gossip. There is some truth in it, of course, but not enough to account for more than trivial effects on operating results. There is not a large railway in either the United States or Canada which does not suffer in some degree from practically the same thing. That is not my opinion. It was the deliberate and enlightened judgment of a man who knew—the late James J. Hill. I lived for ten years behind the scenes of responsible Intercolonial administration, and know that too much credence has been given to the stories told about the cost of political meddling and political pull.

Mr. Dunn was misinformed when he declared that the Intercolonial, because of political mismanagement, was overofficered in the higher ranks, and paid high salaries. The opposite is true, as the official records amply prove. Up to the time Mr. Gutelius took hold the general manager was paid but $6,000 a year. The total amount for salaries and expenses of general officers in 1915 was only $50,625, as against $479,080 paid by the Canadian Pacific. This represented $33.95 per mile for the Intercolonial and $37.08 for the Canadian Pacific. To be a little more specific, the Canadian Pacific in 1915 had 56 general officers, to whom it paid an average of $20.12 per day, while the Intercolonial had 11, with an average of $14.39. On the other hand, the Intercolonial had a higher percentage of office clerks, but, as an offset, it paid them a lower rate of compensation. Singularly, in view of Mr. Dunn's comments, the salaries paid to officers in charge of transportation were equal on the mileage basis.

Mr. Dunn was again on weak ground when he lent a credulous ear to the imputation that the government road is adorned with palatial stations. I have seen every station on the Intercolonial many times, and truth compels me to classify them as plain and inexpensive to the point of meanness. The only really inferior thing about the government system is its station buildings. I cannot find the exact cost, but I know that it was relatively far below the cost to any other first-class railway on this continent.

If Mr. Dunn was advised that the Intercolonial has a roadbed of poorer quality than that of the Canadian Pacific, or that the rolling stock is either insufficient or low in standard, he was once more led astray. There is no better roadbed anywhere and the train service equipment is high class in every respect. It is also necessary to correct the statement which Mr. Dunn makes with regard to the relatively low proportion of operating expenses attaching to maintenance of way and structures. To that aspect of the case he gave considerable emphasis. If he had compared the Intercolonial with the Canadian Pacific system as a whole for 1914 he would have found the percentages 16.7 and 20.1 respectively —a difference, nevertheless, of 3.4 per cent in favor of the Canadian Pacific. Had 1915 been selected for the comparison, however, he would have discovered that the two roads were very close together, the figures being 18.7 and 18.9. The actual cause of the difference in any year lies in the fact that the Canadian Pacific pays more for its labor in the west than does the Intercolonial for similar labor in the east, which fact created in 1915 an average for section men on the whole Canadian Pacific line of $1.82 per day, as compared with $1.73 on the government road.

Experience Throws No Light on Government Ownership

I think I ought not, although strongly inclined to do so, take up any further details. Mr. Dunn has made it clear that he regards the poor financial results of Intercolonial operations as pointing to the condemnation of public ownership. I have endeavored to show that the experience of the government road cannot fairly be taken as proving anything, one way or the other, with regard to the basic principle, and that low earnings have been wholly due to the low rates fastened on the system at its birth. This is another way of saying that the Intercolonial is unique among railways, that it was constructed to serve a political purpose, and that its finances have nothing whatever to do with that purpose. It is a first-class railway in all regards, provides an unsurpassed service and has very happily and completely fulfilled its supreme mission as the cement of confederation. It has its defects, no one can deny, and some of them grow directly out of its essential character as a state line. Mr. Dunn has accentuated some of them in his pungent and accurate comparisons. But the pertinence of these comparisons in their application to the broad principle of public ownership has scarcely been established, for it would be a simple matter to find a score of large corporate railways on this continent, any one of which would compare as unfavorably with the Canadian Pacific as does the Intercolonial.

I desire, in conclusion, to express again my appreciation of Mr. Dunn's comprehensive treatment of this subject. It is a subject as to which there are strong convictions, pro and con, both in Canada and the United States. Under such circumstances it is difficult to secure impartial testimony, and equally difficult on the part of those who have taken sides to bring a judicial spirit to bear thereon. I have endeavored, without prejudice, to tell the true story of the Intercolonial, and at the same time to avoid the discussion of public ownership.

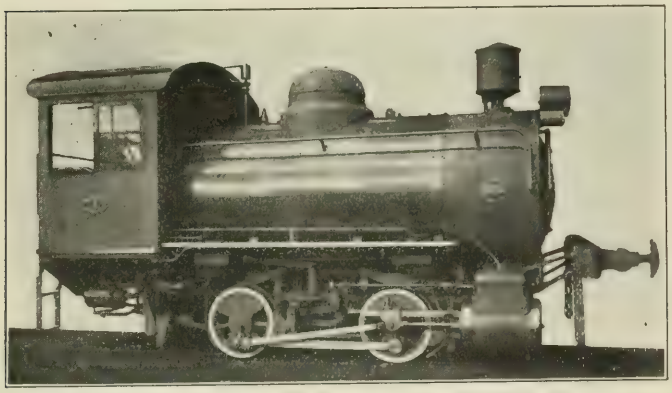
International Aero Post Service.—An international airship corporation in Berlin wishes, after the war, to establish an aerial post service (and if this proves a success, a passenger line) between Berlin and Constantinople. A capital of $6,000,000 is estimated as necessary. Its plan is to have the route extend from Berlin to Carlsbad, continuing to Vienna via Budweis, from there to Budapest, and thence on to Constantinople over Sofia. Between these larger cities are to be numerous landing stations, the cities chosen for landings to subscribe for shares. In this way the corporation hopes to obtain the necessary capital to finance the project. A representative of the corporation has already visited Carlsbad and has talked with the city council as to the probability of obtaining an old race course as a landing station, and as to the chance of the city raising the necessary amount of money as its share of the capital.

STEAM STORAGE INDUSTRIAL LOCOMOTIVES

Among the types of locomotives suitable for industrial service, the steam storage locomotive is receiving an increasing amount of attention, and is proving very successful in certain special classes of service where fire risks must be eliminated.

In the steam storage locomotive the boiler and firebox of an ordinary steam locomotive are replaced by a cylindrical tank, which is charged with steam and water under high pressure. The cylinders and running gear are arranged in the usual manner. The steam, in flowing from the throttle valve to the cylinders, is reduced in pressure to approximately one-third of the initial storage pressure; therefore cylinders of comparatively large diameter are required in order that a tractive effort in proportion to the weight on driving-wheels may be developed. As the steam is drawn from the reservoir, the pressure in the latter is gradually reduced and a certain portion of the water is evaporated by the stored heat. This process continues until the pressure in the reservoir falls to the cylinder working pressure, after which it is necessary to recharge the locomotive. The recharging can readily be done from a stationary boiler plant, through a suitable coupling which is provided on the reservoir. Steam from the stationary boiler enters the reservoir at the bottom, and circulates through the water remaining therein, thus increasing its temperature as well as raising the pressure.

The Baldwin Locomotive Works has recently built seven



Steam Storage Locomotive Built for French War Office

steam storage locomotives for the French War Office, and one each for Carl Koch and the Hormiguero Central Corporation, the two latter being for plantation service in Cuba. The French engines, one of which is shown in the illustration, and that for Carl Koch are of standard gage, and are of the same general dimensions. They have cylinders 15 in. by 16 in. and four driving-wheels 30 in. in diameter. The reservoir is 64 in. in diameter by 13 ft. long; it is charged, in the case of the Cuban engine, at a gage pressure of 160 lb. and in the case of the French engines at a pressure of 170.6 lb. The cylinder working pressure in each case is 50 lb. Plain slide valves are used and are driven by the Stephenson link motion. The weight of each locomotive, ready for service, is approximately 44,000 lb. The locomotive for Carl Koch was designed to haul a load of 176 tons a distance of 8 miles on one charge of steam. The locomotive has a wheel-base of 5 ft. 6 in. and traverses curves of 100 ft. radius. The equipment includes combined steam and hand brakes. The French locomotives have electric headlights and are equipped with a storage battery of sufficient size to keep the lamps burning for ten consecutive hours.

The locomotive for the Hormiguero Central Corporation is considerably lighter than those described above. It is of 2-ft. 6-in. gage, and weighs 28,250 lb. The storage pressure is 100 lb., and the working pressure 40 lb. The cylinders are 13 in. by 12 in., and the four driving-wheels have a diameter of 28 in.

As far as operation on the road is concerned, a locomotive of this type is handled in the same manner as an ordinary steam locomotive, except that there is no firing to be done. The locomotive can therefore easily be operated by one man.

PRESIDENT RIPLEY ON EIGHT-HOUR LAW

E. P. Ripley, president of the Atchison, Topeka & Santa Fe, has issued a circular to the stockholders of the company, which was enclosed with the annual report for the last fiscal year, giving a statement of the events connected with the recent passage of the so-called eight-hour law for railway train employees. After outlining the demands and history of the controversy, he says: "The President urged the railroad companies, for the sake of avoiding this strike, to waive arbitration of the heavy increase in wages and to grant it without any hearing. He did not urge the railroad brotherhoods that they avert a strike by withdrawing their refusal to arbitrate on any terms their demand for this increase."

He also outlines the President's recommendations to Congress, including the proposal for consideration by the Interstate Commerce Commission of an increase in freight rates to meet the additional expense, and that Congress prohibit strikes pending full public investigation.

"From the outset, however," he said, "it seemed generally understood that no such legislation would be seriously considered at this session of Congress. The result appears to be that according to the view of the government it is under existing laws powerless to protect the public against any nation-wide combination on the part of railroad employees to paralyze by strike all the railroads in the country. If this view is correct, it must be on the theory that the Clayton act, which was passed and approved about two years ago, was intended to and does facilitate strikes at the expense of the public by freeing from restraint and punishment any conspiracy, no matter how widespread or unreasonable, to paralyze by strikes the rail transportation upon which the public is dependent.

"Under this view of existing law upon which the government seems to have acted, it appears that until some remedial legislation shall be adopted the only way to avert such tie-ups is for Congress to grant by special legislation whatever demands labor combinations may insist upon as their price for permitting the people to continue to enjoy railway transportation.

"The question, therefore, becomes of profound importance to you, both as a citizen depending upon railroad transportation and as a holder of railroad stock, to consider what can be done to obtain necessary remedial legislation. The brotherhoods made it clear at the session of Congress just ended that they will resist with all their power any such remedial legislation whether it seeks to prohibit strikes in advance of public investigation or to put any form of restraint upon labor combinations. It is, therefore, reasonable to assume that the public demand for a remedy will have to be persistent and forceful or else the public will continue in its present defenceless position.

"Since the precedent of abandoning arbitration and hurriedly paying the demands of railroad unions by special congressional enactment has thus been established, does it not behoove you to exercise your influence in favor of appropriate remedial legislation?

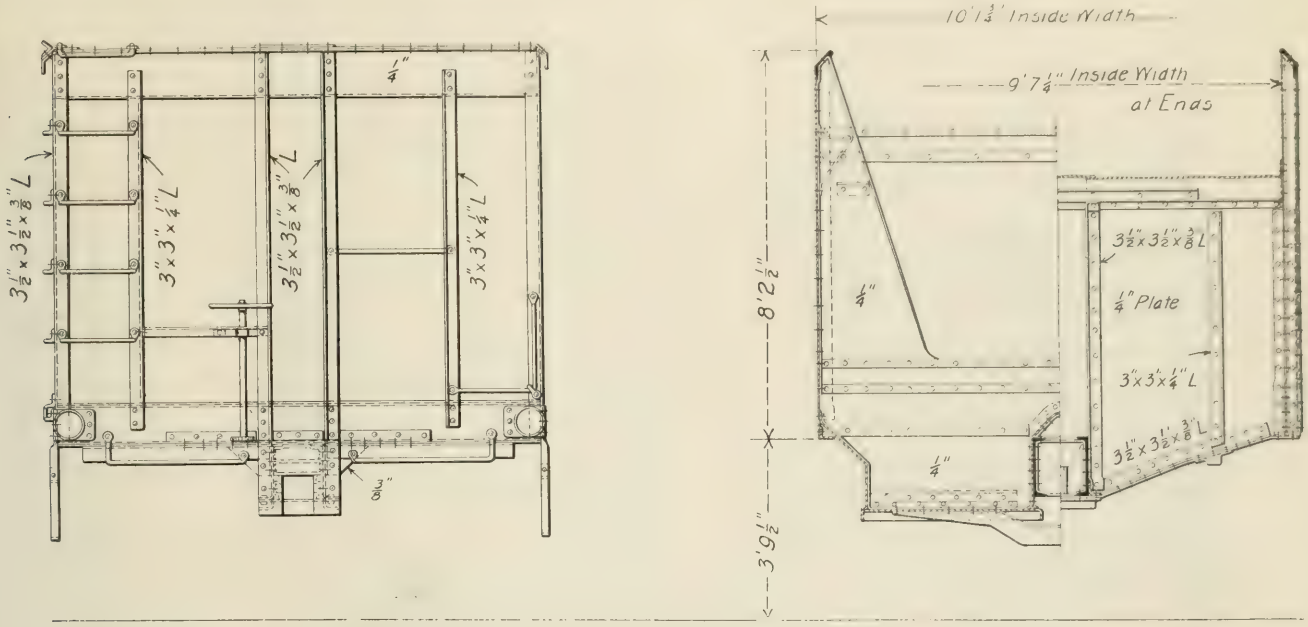
"This company believes that the act which Congress has passed is unconstitutional and that steps should be taken to resist it in every lawful manner."

Hopper Car of 200,000 Lb. Capacity

Length 52 ft. 2 In.; Weight 75,300 Lb.; Six-Wheel Trucks, Built-Up Frames, 6 In. by 11 In. Journals

ALTHOUGH there are several cases where hopper cars of greater than 50 tons capacity are in use, the 50-ton car is still the standard for this type of equipment. Until recently the most notable examples of higher capacity equipment were the 90-ton high side gondola cars which have been in service on the Norfolk & Western since the latter part of 1912. A car of 100 tons rated capacity, however, has been built for the Woodward Iron Company, Woodward, Ala., by the Pressed Steel Car Company, which has now been in coal carrying service for about two years, during which time its performance has been very satisfactory. The first year that it was in service it handled 11,800 tons of coal with no repairs whatever, except to air brake hose.

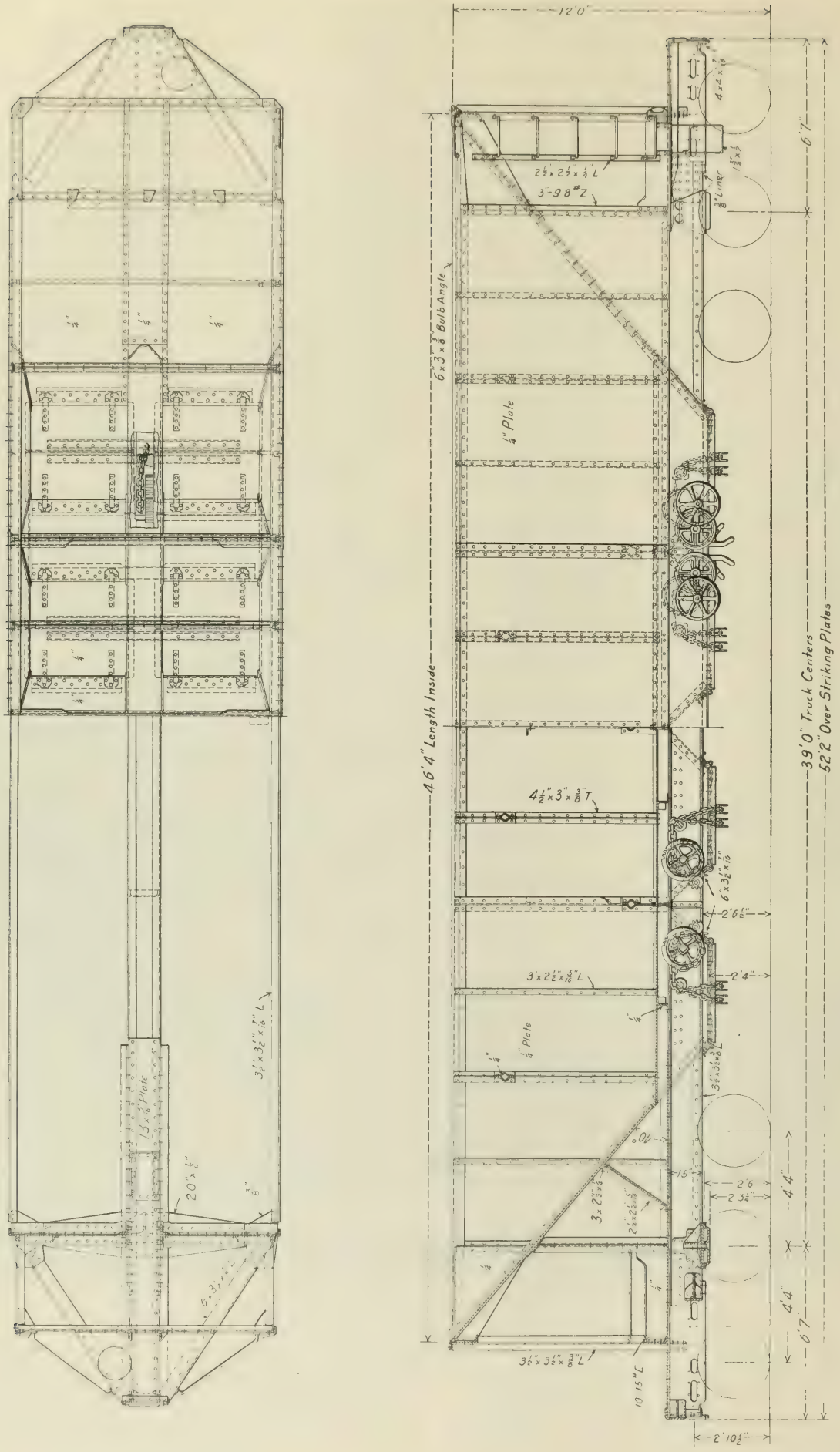
The car is 52 ft. 2 in. long over the striking plates and has a maximum height of 12 ft. above the rails. It will be noted that the hopper angle is 40 deg. from the horizontal, this having been adopted to make the car self-cleaning for ordinary run-of-mine coal. The use of this angle limits the length of the hopper at the top to 46 ft. 4 in., the use of the space at either end over the outside wheels of the six-wheel truck being thus impossible. The cars are 10 ft., 1¾ in. wide inside and have a capacity of 3,600 cu. ft. The light weight is 75,300 lb., and considering the maximum carrying capacity as 10 per cent overload, the ratio of revenue load to total weight of car and lading is 74.5 per cent. This is somewhat less than the same ratio for the Norfolk & Western cars referred to above. These cars with a maximum capacity, including 10 per cent overload, of 198,900 lb. and a light weight of 59,000 lb., have a ratio of revenue load to total load of 77 per cent, six-wheel trucks being used in both



End Elevation and Cross Sections—100-Ton Coal Car



100-Ton Coal Car—Woodward Iron Company

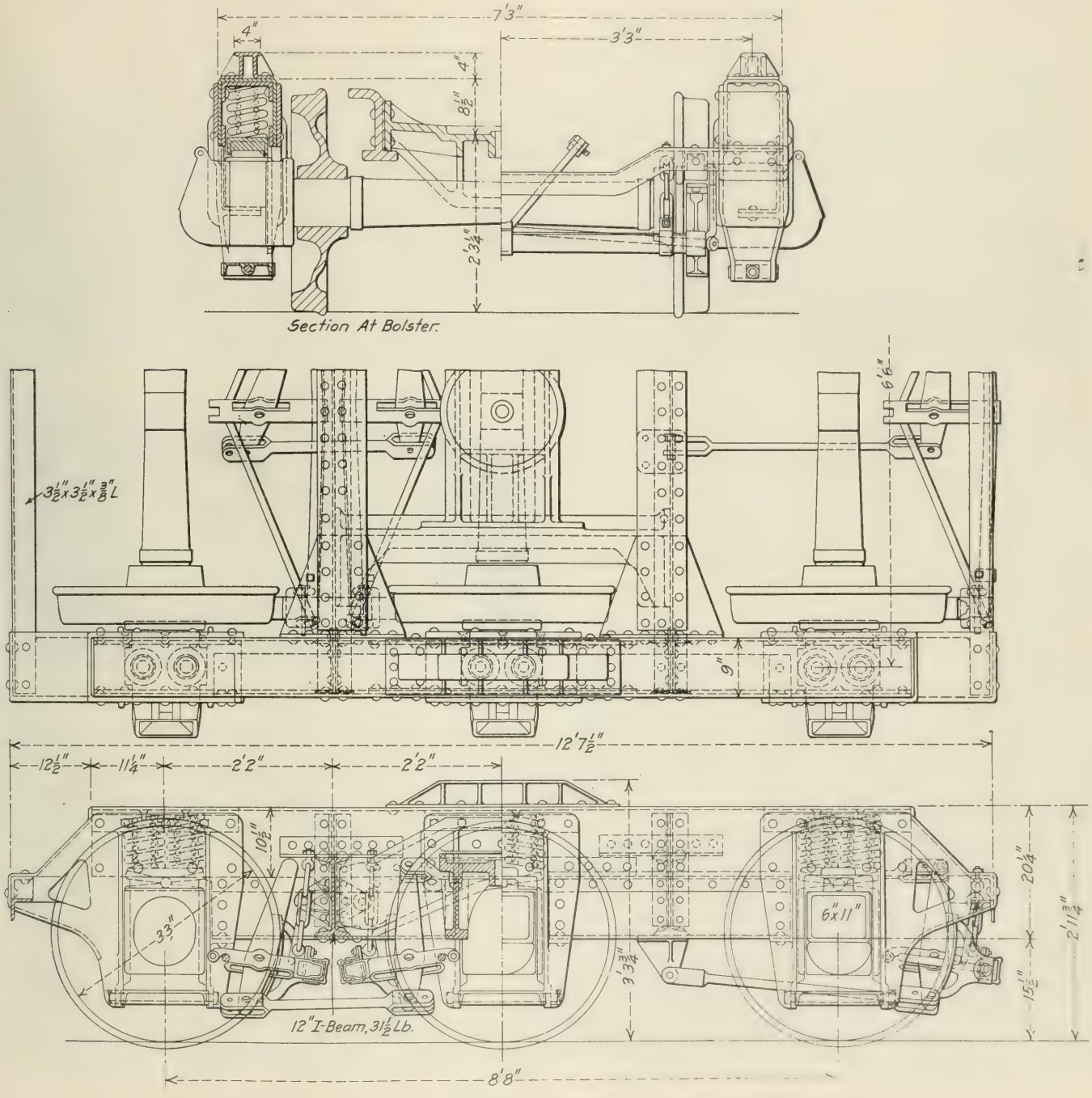


Plan and Elevation of the Woodward Iron Company's 100-Ton Hopper Car

cases. The ratio is better, however, than the average 50-ton car with four-wheel trucks, which will be approximately 72 per cent.

The underframe is of the through center sill design, the sills being 15-in. channels placed with the flanges inward and having a width from back to back of 13 in. Top cover plates of 5/16 in. thick and 13 in. wide extend from about 12 in. inside the hopper to the end sill and the bottom flanges are stiffened by the use of 3½-in. by 3½-in. by ⅜-in. angles sill cover plate is widened to form a deck, completely covering the space between the center sills and the diagonal stiffeners.

The transom is of unique construction. It is carried from the center and side sills up to the bottom of the hopper sheet and consists of vertical ¼-in. plates extending from either side of the center sill to the side of the car, the edge of the plate at the center sill being stiffened vertically by two 3½-in. by 3½-in. by ⅜-in. angles, one on either side, at a point above



Built-Up Six-Wheel Truck for Woodward Iron Company's 100-Ton Car

riveted to the outside of the sills. These extend from the hopper to the draft sills. The end sill is a 10-in., 15-lb. channel, which is placed across the top of the center sills, 2 ft. 11 in. back of the striking plate. The projecting ends of the center sills are stiffened by means of 6-in. by 3½-in. by ⅜-in. angles extending from the end of the sills to the ends of the transom, to which they are attached by means of ⅜-in. horizontal gusset plates. In front of the end sill the center the side bearing by one 3-in. by 3-in. by ¼-in. angle placed on the side of the sheet toward the end of the car, and at the outside to the back of a 3-in. by 3-in. by ¼-in. angle and the web of a 3-in., 9.8-lb. Z-bar. These two members in effect form the cornerpost of the body side frame. The space between the end of the end sill and the transom is closed by a ¼-in. pressed steel channel, the upper flange of which is flattened out to permit the end of the piece to be riveted be-

tween the flanges of the angle and Z-bar members of the post. Flanges are formed at the lower end of the transom plate by two 3½-in. by 3½-in. by ⅜-in. angles, one placed on either side; at the outer end these are riveted to a ⅜-in. gusset plate to which are also attached the flanges of the body and end sections of the side sill and the diagonal channel stiffeners. The two sections of the transom are further stiffened and securely tied to the center sill by a ½-in. bottom cover plate, extending across the center sill from gusset plate to gusset plate. This cover plate tapers from the width of the transom flanges at the ends to a width of 20 in. under the center sill. Pressed steel diaphragm fillers are placed between the center sills at points about half-way between the ends of the hopper and the center of the car, and the center castings form fillers at the transoms. The side sills are 3½-in. by 3½-in. by 7/16-in. angles, the horizontal flanges being turned toward the center of the car.

The end plate is a ¼-in. pressed steel member of Z-bar section, to which is riveted the upper end of the hopper sheet. The end of the hopper is supported by four 3½-in. by 3½-in. by ⅜-in. angles, one at each corner and one on either side of the center sill. In addition to these members two 3-in. by 3-in. by ¼-in. angles are provided to support the ends of the grab irons and ladder irons. The end hopper sheet is a ¼-in. plate, which is supported throughout its width at the transom and from the center sills, at a point midway between the transom and the bottom of the hopper. On the interior of the car the center sills are covered with a housing of ¼-in. plate, which extends below the sides of the sills to form the inside portion of the drop door frames.

There are four sets of doors, those on opposite sides of the center sill being joined by special pressed steel channels, to the center of which are attached the door chains, the operating mechanism being housed between the center sills. To make the car entirely self-clearing, the space between adjoining sets of doors is hoppered, the hopper sheets being supported from transverse stiffeners of ¼-in. plate which extend vertically across the car. At the top these stiffeners are flanged to form a half-diamond section, the diamond being completed by a similar section of ¼-in. plate, riveted in place.

The sides of the car are braced to these members by pressed steel plates, ¼-in. thick, the lower edges of which are riveted between the two pieces of the transverse stiffeners. The sides of the car are also joined near the top by four cross ties of diamond section, the ends of which are secured to vertical stiffeners of 4½-in. by 3-in. by ⅜-in. T section. Longitudinal stiffness of the sides at the top is provided by a 6-in. by 3-in. by ⅜-in. special bulb angle, the web and bulb of which are turned inward.

The cars are carried on six-wheel trucks, the distance between truck centers being 39 ft. The truck is of pressed steel construction, having a wheel base of 8 ft. 8 in. The principal member of the side frame is an inverted U-section of ½-in. plate, 9 in. wide by 10½ in. deep, the outside flange of which is riveted to a pressed steel angle, which gives the frame a total depth of 20¼ in. between the pedestals. The transoms are 12-in., 31.5-lb. I-beams, which are securely framed and gusseted to the side frames and provided with top and bottom cover plates 7½ in. wide by ½ in. thick. The transoms are located 2 ft. 2 in. on either side of the center of the truck and support two heavy longitudinal steel castings which carry the cast steel bolster.

The pedestals are steel castings and are riveted to the side frames. The load is transmitted from the side frames to the journal boxes through two 6¼-in. by 8-in. double coil springs over each journal box. The springs do not rest directly upon the top of the box, an equalizing spring seat being interposed between the box and the springs. The pedestals are closed at the bottom with binders. The wheels are 33 in. in diameter and are mounted on axles with 6-in. by 11-in. journals.

RECLAMATION ON THE ROCK ISLAND*

By J. G. Kirk

District Storekeeper, Chicago, Rock Island & Pacific, Silvis, Ill.

The Rock Island began to enlarge its scrap-handling facilities and reclamation plant in 1906 to handle scrap and reclaim material more systematically. At that time a new scrap dock was erected at Silvis, Ill., where the general shops and general stores are located. The structure was made from second-hand bridge lumber, and all of the handling of scrap at that time was done by men with wheelbarrows. In 1908 a four-ton gantry cantilever-type crane was purchased and installed; in 1911 a second crane of the same type, but of ten tons capacity, was purchased and installed, and the dock was extended to double its capacity. With the completion of the new facilities orders were issued that all the scrap on the railroad should be sent to Silvis. Under the organization built up, men thoroughly trained in the handling and reclamation of scrap go over every piece received and properly classify the material for sale and reclaim that fit for further use. In 1913 a five-ton gantry crane was purchased for the handling of maintenance of way material, such as frogs, switches, boilers, pumps, concrete bars, etc., also to handle the scrap rail. These facilities are all the Rock



Scrap Dock at a Section House

Island has today, although further extensions and improvements are contemplated and will be added as early as practicable.

In the reclaiming of material on any railroad, it is of prime importance that handling of the scrap and the reclaiming of usable material should be carried on as economically as possible, otherwise the maximum saving cannot be realized. To illustrate what can be done along these lines, the following figures show what has been accomplished on the Rock Island. They are based on the tons handled in and out:

Year	Tons handled	Cost of handling	Cost per ton
1906*	2,598	$ 679.59	$0.261
1907	20,325	4,993.09	.245
1908	47,784	7,002.00	.148
1909	34,877	4,275.99	.122
1910	53,953	4,954.09	.091
1911	74,710	6,189.93	.082
1912	73,080	5,789.25	.079
1913	92,534	7,732.52	.083
1914	88,210	7,179.52	.0813
1915	103,460	7,951.36	.0768

*Figures for 1906 are for last three months only.

It will be noted that the installation of machinery to handle the scrap resulted immediately in economies in handling. Had the cost of handling scrap in 1915 been as high as in

*Abstracted from an article which won the first prize in a contest on the Reclamation of Scrap Maintenance of Way Materials, conducted by the Railway Maintenance Engineer.

1906 it would have cost the Rock Island $19,049.33 more to handle its scrap. While the above figures show in dollars and cents what has been saved along this line, the four pictures arranged in pairs show the new and old ways of handling scrap and scrap rail, and illustrate more graphically how this economy has been brought about.

It may be thought by some not thoroughly versed in the plan of handling in use on the Rock Island that on account of the low cost some of the features of reclaiming material may have been sacrificed to reduce this cost. This, however, is not true, as the economy in handling has been brought about almost entirely by a reduction in the costs of unloading and loading. The cost of sorting does not offer as great a possibility for economy as the other two operations, for the reason that every piece of material has to be handled by hand and carefully scrutinized to get it into its correct scrap classification or to reclaim it. It is unloaded from the cars into the center of a sorting bin with a crane, and the sorters then throw one piece at a time into the various small bins provided for scrap and reclaimed material. As soon as the small bins are full they are emptied by the cranes with magnets either into cars being loaded out or into the larger storage bins.



Handling Scrap—Past and Present

During 1915 the Rock Island reclaimed $655,842 of material of all classes. These figures include material for both mechanical and roadway departments. However, as this article deals with roadway materials only, those items of reclamation pertaining to that department will be discussed.

To begin with, the reclaiming of material on the line is encouraged and an effort is made to save as much of it locally as possible, as it is realized that the handling of this material and the unnecessary haul occasioned by sending all of it, whether serviceable or not, to a central station for reclamation and return, costs considerable money on account of the extra labor and haul occasioned as well as the necessity for a larger investment in unapplied material because of the greater length of time it is kept out of service. No particular good is accomplished by sending all second-hand serviceable material to a central reclaiming station other than to pile up a large paper showing of material reclaimed, while if the material is reclaimed locally where practicable and returned at once to service (although the figures as to the material reclaimed may not be available), the railroad will receive a greater real benefit because of the greater economy in handling in this way. The standard section house and scrap dock in use on the Rock Island is an example of what can be accomplished along this line and is shown in one of the photographs. The construction of these docks may at first thought appear to be unnecessary, but it has been found that they go a long way to establish system by providing a place for the material collected, and they can be cheaply constructed from



Old and New Ways of Unloading Scrap Rail

second-hand lumber. Scrap, as soon as made, is picked up and such articles as track spikes, track bolts, rail anchors, etc., which can be used again are reclaimed and placed in the section house to protect them properly, and any material which cannot be repaired or used locally is placed in the scrap bin for shipment to the central reclaiming station.

It is important that the scrap be kept moving as rapidly as possible, in order that the revenue to be derived from its sale be obtained as early as possible, also so that the usable ma-

terial may be returned at once to service. With the idea of expediting the movement of scrap, and at the same time avoiding accumulation, there is in force on this road a regular loading schedule for each division, one division loading its scrap on the first, another on the third of the month, and so on. By following this schedule the divisions are cleaned up at least once each month.

After all the reclamation which can be economically handled in the field is taken care of, the scrap moves to the central station, where it receives the final inspection. Among the items which are being reclaimed at the Silvis plant are track shovels. This is a simple procedure, requiring only the use of an anvil and vise and such tools as hammers, chisels, etc. The operation consists of removing good handles of shovels from broken blades and vice versa, and attaching the good blades and handles so reclaimed together. Thus good, serviceable shovels are obtained with the purchase of practically no new material, with the exception of a few rivets. During 1915, 2,577 track shovels were repaired in this way at a saving of $824.57.

Guard rails are made from rail reclaimed from the scrap at a cost of approximately 35 per cent of the purchase price of new ones, and their service in track will be as long as new material. On roads the size of the Rock Island a saving of $4,200 yearly should be realized in this item alone. Switch points 11 ft. long are being made by cutting back old 15-ft. or 16½-ft. points standard for main line. These 11-ft. points are used for yard and side tracks only. The old points are cut off and new points planed onto them at a cost of from 60 to 65 per cent of what the longer points formerly used to cost. A saving of approximately $3,000 yearly can be made in this way. On roads not possessing a frog shop arrangements can no doubt be made with the various frog manufacturers to take care of these repairs at a considerable saving over the purchase of new material.

During 1915, 15,270 track tools of various kinds were reclaimed and repaired at a saving of $4,787.94. These repairs can be made in any ordinary blacksmith shop. During 1915, 112 flanger, 1,020 whistle, and 431 temporary slow and release signs were made in the shops from flues and iron and sheet steel reclaimed from scrap at a saving of $608.

The following material was reclaimed during 1915:

		Saving
47	derail stands	$ 10.43
31	derails	232.15
49	head rods	98.20
17	connection rods	18.11
58,706	lb. plates	433.23
3,713	rail braces	420.23
2,375	rail anchors	346.96
44,050	lb. track spikes	402.19
53	hand-car wheels	123.86
325	lb. boat spikes	4.36
4,230	lb. screw spikes	75.70
163	slide plate braces	20.64
3	sets slide plates	29.17
26	sets heel block plates	21.76
	Total	$2,236.90

The following are some of the items that were repaired and returned to stock during the same year:

		Saving
588	switch stands	$ 4,098.27
108	frogs	1,434.09
8	roller rail benders	898.65
3	jim crow benders	49.27
258	pieces switch material	256.83
203	11-ft. switch points	407.09
993	hand and push cars	16,275.08
15,270	track tools	4,787.94
810	track jacks	2,833.74
109	velocipedes	2,000.98
18	motor cars	2,318.69
	Total	$35,360.63

The central reclaiming station should also carefully watch the service being given by various articles of material purchased by the railroad and report any that fails to give satisfactory service as indicated by the scrap articles received. Any items purchased subject to guarantee and failing to fulfill the terms of the guarantee should be placed at one side and held for free replacement. From $3,000 to $5,000 per year can be saved in this way on maintenance of way material alone.

RAILWAY MAIL PAY ON SPACE BASIS

By H. F. Lane

Washington, D. C., October 3, 1916.

A statement to the press issued by the Post Office Department last week, announcing the proposed establishment of approximately 90 per cent of the railway mail transportation service on a space basis of pay on November 1, in place of the present weight basis, indicates that Postmaster General Burleson has found a way to do to the railroads what he would like to have the Interstate Commerce Commission do to them, but to do it first.

Under the space basis the department will pay the railroads varying rates per mile for various amounts of space up to a full car, instead of on the present tonnage basis, which is on a sliding scale, decreasing as the tonnage increases, with supplementary payments for full post office cars.

The post office appropriation bill recently passed by Congress and approved on July 28 establishes tentative rates for the compensation of the railways for transporting the mails on the space basis experimentally on routes to be selected by the Postmaster General with the approval of the Interstate Commerce Commission. It also directs the Interstate Commerce Commission, as soon as practicable, to determine fair and reasonable rates of compensation for the transportation of mail matter and to prescribe the method for ascertaining such rate or compensation, by weight or space or both.

"Pending the decision of the Interstate Commerce Commission as hereinafter provided for," the law says, "the existing method and rates of railway mail pay shall remain in effect except on such routes or systems as the Postmaster General shall select, and to the extent he may find it practicable and necessary to place upon the space system or pay in the manner and at the rates provided in this section, in order to properly present to the Interstate Commerce Commission the matters hereinafter referred thereto."

From this language it might be inferred that Congress intended to make possible a comparison between the two systems of basing compensation by a test in actual operation, but it is announced in the statement issued by the Post Office Department that "the Interstate Commerce Commission has given consent to Postmaster General Burleson to place on a space basis experimentally practically all the railway routes on which mail transportation is performed" in order to demonstrate to the commission "the feasibility and practicability of the space system."

The 10 per cent of the service which will not go upon the space basis on November 1 is what is known as the "closed pouch" service, which consists of mail transmitted in locked pouches and sacks and handled in baggage cars by the agents of the railway companies.

The consent and approval of the Interstate Commerce Commission to this plan, although it has just been made public in the Post Office Department statement, was given under date of August 29 in a letter from the secretary of the commission to Postmaster General Burleson. This letter states that the Interstate Commerce Commission has considered the application of the Postmaster General of August 1 and that it "gives consent and approval to the adoption of the space basis plan and the rates provided thereunder on certain routes over which mails are transported, which routes are named in the appendix submitted with your application." This approval, the letter states, is granted "upon your statement and the belief of the commission that it is not only practicable, but necessary, to place this amount of the

postal service upon the space basis plan in order that you may properly present to the commission the matters referred to in section 5 of the act."

By including in his selection of "certain routes" practically all the railway mail routes in the country, the Postmaster General has secured at least a temporary advantage which may last for as long as he is interested in the subject, although the ultimate extent to which either the space or weight basis of pay shall prevail and what the compensation for the service rendered by the railroads in handling the mails shall be, is left to final determination by the Interstate Commerce Commission.

That he has no present intention of ever letting go of this advantage is indicated in the following statement by Second Assistant Postmaster General Praeger: "The Postmaster General has gained experimentally," he says, "all that he has contended for in the Post Office Department's long fight for a just and rational measure of service and pay for railway mail transportation, and in assigning to me the task of inaugurating this far-reaching reform he has directed that full justice be done alike in the matter of service to be required of the railroads and service to be rendered to the public. Canadian officials have assured us that after three years' trial Canada will never change from the space back to the weight basis, and I believe it will be entirely possible to state and administer the great railway mail transportation service of the United States in a manner so just and practicable from a transportation standpoint that the space basis now authorized experimentally will in the end prove acceptable to the Interstate Commerce Commission and the railroads."

In empowering the commission to fix mail pay rates and the basis for ascertaining them, the law provides that within three months from its approval, or as soon thereafter as may be practicable, the Postmaster General shall file with the commission a statement showing the transportation required of all railway common carriers, including the number, equipment, size and construction of the cars necessary for the transaction of the business; the character and speed of the trains which are to carry the various kinds of mail; the service, both terminal and en route, which the carriers are to render, and all other information which may be material to the inquiry. The Postmaster General is also to file with the commission a comprehensive plan for the transportation of the mails, embodying therein what he believes to be the reasonable rate or compensation the carriers should receive. Thereupon the commission is to give notice of not less than 30 days to the carriers, and to proceed with a hearing on the subject in the manner now provided by law for hearings between carriers and shippers, after which it shall establish fair and reasonable rates of compensation. Pending such hearings and the final determination of the question, the commission is authorized to request of the Postmaster General that weighing of mails shall he held for statistical purposes.

Secretary McGinty's letter to the Postmaster General says that promptly after the space basis plan has been inaugurated it is understood that the latter will proceed with the reweighing of the mails on all routes for a period of 30 or 35 days and that he will furnish to the commission statements showing the routes as re-stated or changed, the weights ascertained, the old routes or parts of routes that are included in each of the re-stated routes, the old weights and compensation thereunder, the new weights and the compensation that would accrue thereunder and the compensation accruing under the space basis plan.

Meanwhile, however, the space basis plan will remain in effect for an indefinite period unless changed by the commission.

The law provides that if the final decision of the Interstate Commerce Commission shall be adverse to the space system and if the rates established by it under whatever method or system is adopted shall be greater or less than the rates provided in the law, the Postmaster General shall readjust the compensation of the carriers on such selected routes and systems in accordance therewith from the dates on which the rates named in the law became effective.

By direction of the Postmaster General work is now in progress in the 15 railway mail divisions of the United States for the establishment of the change of basis. Second Assistant Postmaster General Praeger has just concluded a conference with the 15 division superintendents of the railway mail service regarding the change, and on October 4 he will hold a conference with a committee representing the railways on the same subject. This railway committee, however, apparently is to be consulted on details only, as the railways have not been consulted regarding the plan of carrying out the space basis experiment on a nation-wide scale.

The statement issued by the department says:

"The Post Office Department has always desired that Congress should place on a space basis only the character and quantity of service which will go experimentally on space on November 1, and to leave on the weight basis, with annual weighings, the small amount and the character of service which, by the commission's order, will remain on the weight basis. Congress, however, voted to place all of the railway mail transportation on a space basis, subject to the approval of the Interstate Commerce Commission after a full investigation.

"It is expected that the cost of the mail service on a space basis will be somewhat in excess of the cost on a weight basis, at least at the outset, but this excess is counterbalanced by certain economies and savings that can be effected in transporting empty equipment and supplies in the space paid for but unused when mails run light. In the opinion of the Post Office Department the value of the installation of the space basis will be fair both to the department and to the railroads by reason of its elasticity, which will enable the department to pay the roads according as the service which they render increases or decreases."

It will be noted that the commission's "consent and approval" has now been magnified to an "order."

The joint congressional committee on railway mail pay which submitted a report to Congress in 1914 recommending the space basis of payment and also rates of pay on that basis, estimated that the rates would increase the total mail compensation of the railways by about $3,000,000 a year. The Postmaster General evidently does not intend that the railways shall get this money if he can help it.

During the hearings before the Senate committee on post offices and post roads last spring the railways vigorously opposed the space basis of payment as being unscientific and inequitable. They also opposed the proposed rates as being unreasonably low. Their principal effort was to have the mails weighed annually instead of every four years, so that the railways would not have to carry the increased weight of the mails for four years for nothing. As a solution of the question the Railway Mail Pay Committee suggested a bill that would readjust the pay by providing for an annual weighing, pay for space in apartment cars, relief from the side and terminal messenger service, and for an investigation of the entire subject by the Interstate Commerce Commission, with a recommendation by the commission to Congress as a result of this investigation as to whether the pay should be continued on the weight basis or on a combination of weight and space or on a straight space basis. Most of the railway officers said they would be satisfied with the present rates if they could have an annual weighing.

Of course, the primary purpose of the space basis plan is to enable the Post Office Department to put more mail into a mail car without paying the railroads any more for it, thereby enabling the Post Office Department to make a great

showing of economical and efficient administration. As the proposed rates are based on the present average loading of about 3 tons to a car, while the maximum capacity of the cars ranges up to 20 tons, by paying what is now paid for 3 tons the department would have the privilege under the space basis of loading cars in some cases to a capacity of 20 tons without paying the railroads anything for hauling the added weight. It works on the same principle as if the government should lease a passenger car, which had been customarily filled to only a part of its capacity, paying for it on the basis of the average car mile earnings, and then admit additional passengers at so much a head. The railroad would be carrying more passengers and hauling more weight, but it would receive no more money for it.

By estimating that the rates proposed will give the railroads $3,000,000 to $5,000,000 more a year than they are now receiving, the advocates of the law gave themselves a reputation for great generosity, but some of them in defending themselves against the charge of too great liberality to the railroads, have felt called upon to explain the joker to other members of Congress. For example, Representative Moon said in Congress on February 8, 1916:

"But, you may ask me, if it is costing more by three or four million dollars, in the first place, to go to the space basis than to remain on the weight basis, why should we make the change? My answer is * * * your department can handle the cars in which they pay for the space and can so adjust the loading and unloading and the transportation as to recoup within a year or two every dollar that is lost by the change in the basis of compensation from weight to space."

At another time he said:

"* * * it is entirely new law, and it does not show a saving on its face, and cannot do it, but only shows an administrative proposition of saving. The saving will occur, as the department thinks, in the handling of the mail. In other words, you have changed from the quadrennial weighing of the mails on a weight basis, on which the pay is to be computed, to the space provision, and you will have enough space under the contract to carry all your parcel post probably without any additional compensation and save many million dollars annually. That is their theory."

Under the space plan one railroad might carry 1 ton, another 10 tons and another 20 tons of mail the same distance for the same pay. On many routes the railroad mail traffic officers have testified it would be possible for the department to double, treble or quadruple the mail tonnage per car without one cent additional pay to the railroads.

Under the beneficent parcel post rates the new law makes it possible in some instances to take freight out of the freight cars and to put it into storage mail cars without paying the railroads a cent and to offer the shipper a passenger train service instead of freight train service at greatly reduced rates and with free delivery service at destination. It is only necessary for the shipper to pack his freight in 50-lb. packages. Of course, the Post Office Department will receive its revenue on the weight basis and the more mail it can crowd into a given space on the passenger trains, the more money it will make. By consolidating mail now handled in two cars on two trains into one car on one train the department can greatly decrease its expense. This would not be giving the most frequent mail service, but the frequency or infrequency of the service does not show in the public reports of the department.

The basic rate fixed by the law is 21 cents per car mile for a 60-ft. car. That is supposed to be based on slightly less than the present average earnings of the railroads per car mile from passenger and express service. Some roads earn a greater amount than that, while some earn less. Those that earn less naturally hoped to increase their earnings as the traffic develops, but under the space basis of payment for the mails the benefit of the increment goes to the Post Office Department. The roads that now earn more than 21 cents are given an inducement to accept the new rates by a penalty of $1,000 a day provided by the law for refusal.

The commission on Tuesday of this week announced an order instituting a proceeding of inquiry and investigation "with a view to the entry of an order or orders fixing and determining fair and reasonable rates and compensation for the transportation of mail matter by railway common carriers and the service connected therewith, and the method or methods of ascertaining such rates or compensation." The investigation will be set for hearing at such times and places and in such manner as the commission may hereafter direct. The Committee on Railway Mail Pay had previously asked the commission for a hearing on the subject to consider a large number of details incident to the change from the weight to the space basis before the change goes into effect.

The Railway Mail Pay Committee has appointed an advisory committee of counsel to represent the railways in handling the mail pay question before the Interstate Commerce Commission, composed chiefly of lawyers who are continually engaged before the commission in rate matters. The committee is composed of G. S. Patterson, of the Pennsylvania; H. A. Scandrett, of the Union Pacific; R. B. Scott, of the Chicago, Burlington & Quincy; O. E. Butterfield, of the New York Central; F. H. Wood, of the Southern Pacific, and A. P. Thom, counsel of the Railway Executives' Advisory Committee.

* * *

The Eight-Hour Law

Most of the public discussion of the eight-hour law in the last few days has come from the critics of the measure rather than from its advocates. Although several days ago it was announced from President Wilson's headquarters at Long Branch that he would take occasion to refer frequently to his settlement of the threatened railway strike and proposed to feature it in his campaign, he has thus far made only one speech on the subject, that at Shadow Lawn on September 23, and it has since been reported that he has decided not to dwell on this question as much as on other issues. Possibly the Democrats would prefer to have the misleading title of the "eight-hour law" speak for itself.

Representative Adamson, chairman of the House Committee on Interstate and Foreign Commerce, whose name is attached to the bill, has given out a newspaper interview in which he is quoted as taking upon himself the credit or the blame for its passage. "The eight-hour bill was my bill," he says, "not the President's. I had to convince the President that I was right and that he and Senator Newlands were wrong and they finally had to admit I was right."

Meanwhile, however, the Republicans are continuing to make capital of it, apparently with considerable success. Candidate Hughes has attacked the President's course in a large number of his speeches. In an address at Saratoga Springs on September 29 he read letters from Harry A. Wheeler, chairman of the committee on the railroad situation of the Chamber of Commerce of the United States, to the President and to Senator Newlands, chairman of the Senate Committee on Interstate Commerce, showing that the business interests of the country had endeavored to arouse some action on the part of Congress and the President long before the strike situation became acute. On August 12, Mr. Wheeler had telegraphed to President Wilson urging him to put the influence of the administration behind the joint resolution proposed by the chamber providing for an investigation of the entire subject of railway wages by the Interstate Commerce Commission. This resolution had been tabled by the Senate committee on August 4.

Theodore Roosevelt has also joined the ranks of the

critics of the Wilson-Adamson eight-hour law. In a speech at Battle Creek, Mich., last Saturday he said that although for the past 18 years he has supported the railway brotherhoods on every important issue and that although he believes in the eight-hour day as the general rule toward which we must strive, "We have seen in this country few things more discreditable to our representatives and more ominous for the future of the nation than the spectacle of the President and Congress of the United States being required to pass a certain bill before a certain hour at the dictation of certain men who sat in the gallery with their watches in their hands threatening ruin and disaster to the nation if there was the smallest failure to satisfy their demands.

"I believe in the eight-hour day as the general rule toward which we must strive," he continued, "but I recognize that special needs must be met in special industries, and that in all such cases there must be very careful consideration of all the conditions before final action is taken. In this case, however, the eight-hour day is not the issue. The issue is an increase of wages, given by law, without previous investigation or knowledge. The principle of the eight-hour day is not at issue and is adroitly invoked merely to cloak the real issue.

"The case at issue is pre-eminently one that comes in the category of those that can be settled only after careful investigation and full consideration of many important conflicting elements. I believe in the eight-hour day, on moral and sociological grounds, as being the ideal toward which we should strive. I believe in wages being just as high in any business as is compatable with square treatment to the other parties in interest. But if the government is to intervene in order to secure shorter hours and better wages it must do so only after full knowledge and not merely under the duress of threats."

James Wilson, formerly Secretary of Agriculture, has also issued a statement pointing out that the farmer will have to foot a large share of the bill for increase of railway operation due to the eight-hour law. It was an interesting coincidence that on the same day this statement was published, the Illinois Democratic State convention adopted a platform advocating an eight-hour day for all workers except those engaged in agricultural pursuits.

Even the Socialists are not satisfied with the eight-hour law. Allan L. Benson, nominee of the Socialist party for President, in a speech at Brooklyn on September 29 accused President Wilson as being an enemy of labor. Referring to some of the President's remarks about organized labor made while he was president of Princeton University, Mr. Benson said: "The only act of the President that can be construed as friendly to the workman is the passage of the eight-hour law and that, unfortunately, benefits only 400,000 railroad employees. If Mr. Wilson is such a good friend of labor, why didn't he do the same for all classes of workingmen?"

* * *

A Plan for Preventing Strikes

Judson C. Clements, of the Interstate Commerce Commission, has suggested a plan for preventing strikes on railroads or other public service corporations in an address before the annual meeting of the National Grain Dealers' Association at Baltimore on September 26. Stating that he was expressing only his personal views, Judge Clements said that an effective remedy for the dissensions between the railroads and their employees "will be found in the recognition of the principle that those who engage as employees in the public service of the transportation companies are just as much engaged in interstate commerce as are the companies themselves, and that such employees are affected in the same way and to the same extent as are the companies themselves, with a public interest that they can no more ignore than the companies."

Following this thought, Judge Clements continued: "I would suggest, that is, to write into the law a legally established obligation and duty upon every employee who seeks and accepts service with the transportation companies not to leave the service or combine with others to do so on account of any controversy thereafter arising concerning any change in the conditions of service or rates of compensation except upon due notice to be prescribed by statute, permitting a sufficient length of time for a fair and impartial investigation and determination of the matter in controversy, either by arbitration or by some duly constituted public tribunal."

* * *

A History of Arbitration

The special report of the United States Board of Mediation and Conciliation on the effects of arbitration proceedings on rates of pay and working conditions of railway employees has just been printed as a Senate document No. 493, in accordance with the resolution adopted by the Senate in May. The report was called for by a resolution of the Senate, but the fact that it contains 608 closely printed pages may explain why it had not been thoroughly digested by the members of that body by the time the recent controversy with the trainmen became acute in August. The report, which was described in the *Railway Age Gazette* of July 28, 1916, page 153, gives a review of all arbitration proceedings held under the provisions of the federal law and also of four other cases arbitrated outside of the provisions of the law, giving a comparison of rates of pay and working conditions before and after the awards.

There is a black border around the cover, but it is not heavy enough to make clear whether or not it is intended as an obituary. A brief history of the events leading up to the passage of the Newlands arbitration law is given, referring to the fact that a strike vote of the conductors and trainmen on the eastern railroads had been taken, resulting in some 97 per cent of the employees voting to withdraw from the service of the railroads unless their demands were complied with. "The situation was an aggravated one," the report says, "and reached an acute stage early in July, 1913. The public mind was excited and the bill, which had been pending in Congress for some months, was, upon the advice of the President, promptly enacted into law to meet the emergency."

The later history of the President's methods of meeting similar emergencies is not included. The most recent of these emergencies occurred while the report was being printed, and while there is a review of the 1914 controversy with the western engineers and firemen, the simple statement that "on August 3, 1914, the matter was submitted to arbitration by agreement" is all there is to give credit to the President for having averted a national calamity by appealing to the patriotism of the railways to waive their demands.

Pipe Material.—Pipes and tubes are made of a great variety of materials, the most common being iron, steel, copper, brass, lead and tin. In recent years two or more metals have successfully been mechanically combined as a lining or covering for special purposes, aside from galvanizing, tinning or plating by the hot process or by electrically depositing one metal upon another.—*Power.*

England's Petrol Supply.—The Government restriction of the petrol supply has considerably affected railway companies, in common with all commercial users of the spirit, and it has been necessary to curtail the Great Western passenger road motor car services to the extent of about 50 per cent. This has been effected by entirely suspending the services on several of the less important routes, and reducing to a minimum the number of trips on the remaining routes.—*The Engineer.*

Railway Fire Protection Association

The Third Annual Meeting. Reports on Automatic Fire Protection and on Fire Prevention in Grain Elevators

THE Railway Fire Protection Association held its third annual meeting in New York City, on Tuesday, Wednesday and Thursday of this week, with about 75 members and visitors present. The president of this association is F. H. Elmore (Southern Railway), who occupied the chair, and the secretary is C. B. Edwards (Seaboard Air Line.)

The president in his opening address congratulated the association on its rapid and substantial growth since its organization in May, 1913. There are now 95 members, and the number of railroads represented is 57. Progress has been made already in standardizing practices and great encouragement and satisfaction is found in the interchange of views. A handbook of recommended practices is in preparation, and the work promises to be of value to all railroads. The matter of statistics was touched upon, and attention was called to the need of showing in all cases the value of the property at risk. The association should now look forward to membership in and co-operation with the National Fire Protection Association. Every member should have as his ideal, not only the best service to his company, but also the assistance and education of property owners adjacent to the railroads. This last is being accomplished in increasing measure already.

The executive committee reported having held three meetings during the year. The receipts from dues and sales of printed matter, and from other sources, amounted to $795; and the expenditures, including the printing of proceedings, $275, and bulletins, $151, amounted to $632, leaving a balance of $163.

The committee on resolutions, C. N. Rambo (N. & W.), chairman, reported 11 paragraphs in the nature of a platform or declaration of principles for a properly conducted railway fire prevention department. These may be summarized as follows: 1, education of men in fire prevention; 2, general recognition of the importance of fire resisting building construction; 3, proper sub-division of large buildings; proper appliances for fire prevention; drilling of employees; 4, rules and regulations requiring officers and employees to act correctly in all situations; 5, formation of fire prevention committees of executive officers; also division committees and local fire brigades; 6, rigid investigation to fix personal responsibility for fires; 7, employ experienced instructors to enforce cleanliness and good housekeeping; 8, vigorous enforcement of rules for dealing with explosives in freight houses and elsewhere; 9, have meetings of employees; 10, recognize the fact that fire insurance is not full compensation for losses; 11, co-operate in gathering statistical information.

These resolutions, after brief discussion, were unanimously adopted by the association.

E. R. Hardy, assistant manager of the New York Fire Insurance Exchange, gave an address in the nature of a welcome to New York City, and also as a representative of the National Fire Protection Association. Mr. Hardy spoke on some of the common difficulties in prevention work. Nearly all of these, however, he summarized under the head of "Getting Things Done." We have abundance of knowledge; how shall we get our good ideas put into effect? Quoting the colored preacher's recipe for an eloquent sermon—first to 'splain, next to expound, and lastly, to put in the rousements. Mr. Hardy said that the last of the three elements was a really essential one. This is the fire prevention officers' work. Railroad officers know what is needed, but they are not roused. Eternal vigilance must be the every-day watchword. How rare it is to find even so simple a thing as a fire pail in good condition and fit for immediate use.

Addressing the members directly on their work, he said: "Your work is of a kind that cannot be measured in money, therefore you have reason to use the best diplomatic ability in dealing with the manager who demands a financial proof in justification of every new idea. Do not listen to rebuffs based on the hackneyed claim that 'the other roads are not doing it.' Remember, however, that you have the drawback, as compared with some departments that there is nothing dramatic about your work. The fireman who saves one life has more glory than innumerable men who do faithful duty 365 days in the year, but without glamour."

Though emphasizing the drawbacks, the speaker disclaimed any feeling of pessimism. Great progress is being made. In New York City, when the charter was adopted in 1898, building regulations now fully adopted were declared visionary. Limitations on the height of buildings, now accepted in New York, were only a few years ago thought impossible of accomplishment. Remember that standards and statistics and public agitation are not the whole thing; the thing to keep constantly in mind is the rousements.

Fire Prevention in Grain Elevators

This was the subject of a report presented by Anson Murphy (Alabama Great Southern), which is given substantially in full below. This report was commended by numerous speakers for its full, detailed, and accurate information. Replying to questions, the chairman said that his reference to automatic feed spouts, contemplated a spout with a check valve, to be opened when the wind blows against it, and to close by gravity. The only need of such valve is to guard against the carelessness of the fireman in forgetting to disconnect the spout. The disposition of dust from elevators was the subject of a little discussion. An elevator using electric motive power, and having no engines, may have to have its dust carted off. At some elevators it is sold. It should be got out of the building as soon as practicable. The report was unanimously adopted.

Report of Committee on Fire Prevention and Protection at Grain Elevators

In considering fire prevention and fire protection in elevators, all classes of elevators, from the small frame country elevator to the latest concrete terminal elevator, were taken into consideration. The hazards incident to the use of grain dryers cannot be eliminated or safe-guarded to such an extent that their introduction inside the elevator would not cause a material increase in the fire hazard. Their introduction inside the elevator should be prohibited.

The question of construction was not taken up by the committee as construction of the various classes of elevators is covered by standard requirements of the underwriters or rating bureaus.

In taking up the general cause of fires in elevators, it is hard to distinguish the greater of two sources of fires, faults in general house-keeping or in care of machinery.

In the first of the two, we have the ever present dust caused in the general run of business. The reasons that dust must be taken care of from a fire standpoint are many, one of which is the possibility of explosions. These explosions are not caused, as thought by some, by fire communicating with a pile of dust, as a pile of dust ignited in this way will sim-

ply smoulder and burn over the top of the pile, but the dust that accumulates on girders, spouts, ledges, and other projections is dangerous because if disturbed it mixes with the air and if this reaches an open light or fire then an explosion takes place which usually wrecks the building and sets fire to it. Dust should not be allowed to accumulate in any part of the building, but should be kept down to a minimum. All machinery, the journals, pulleys, drip pans, hoppers under elevator heads, the sinks at boots of elevators, the conveyors, should be kept as free from dust as possible. Dust should not be used to catch drippings of oil from journals or oil barrels.

The chaff from corn is a continual source of annoyance to elevator operators, as it is carried by the wind all over the building. In the small or country elevators, where corn is shelled, there is considerable litter caused by cobs, shucks and silk or hair, which causes a distinct hazard on account of the disposition and danger of fire from sparks, from passing locomotives or sparks from smoke stack, outside of the building and on the roof.

The storing of unused spouting, belting and old material about the building makes a ready receptacle for accumulating dust and rubbish. This material should be taken out of the building and stored in some outside building, wherever possible.

The care of old clothing and oily waste is a hazard which should not be overlooked, as the clothing is always full of dust and there is more or less oil on it from contact with machinery. This clothing should not be kept in the elevator when it is possible to keep it in some outside building. Wherever it is necessary, on account of conditions to keep clothing inside of the elevator it should be hung up in metal closets. All waste, after it is used, should be kept in standard self-closing waste cans. These cans should be small so that not over the accumulation of one day's work would be kept in the building. These cans should be emptied daily and the waste burned.

The machinery in elevators is somewhat different from machinery in other plants, as it is likely to be thrown out of line by the raising or lowering of the house caused by loading, unloading or transferring grain from one part of the house to the other. This is the case in the old fashioned elevator with the line shaft upwards of 100 ft. long where bins are constructed of cribbing and the cupola or texas is supported directly on the bins instead of being supported independently. This action of the house is likely to cause hot journals on account of the shafting being out of line or causing a friction between the journal and the collar on the shaft.

This can be overcome by placing a loose soft metal washer between the journal and the collar. Long shafts have been known to creep several inches either way in hot or cold weather on account of expansion or contraction. The heads of elevators or the pulleys or belts at the heads of elevators often become shifted, causing frictions. This can be overcome by regulating the bridge trees, always remembering that the belt will run to the high side of the pulley. The strut board under the head pulley should never be horizontal, but should always be made on an incline towards the down leg sufficiently tapering to be self cleaning. This is to prevent friction between the bottom of head pulley and grain or dust that falls from the buckets onto the strut board. The various methods of operating the head pulleys differ in a number of ways; the most dangerous method being what is known as the friction head, which consists of a pulley made of compressed paper with iron flanges placed at spaces of about 6 to 8 in. between the paper. The paper extends about ¼ in. above the iron flange on which the head pulley runs. This friction pulley is keyed rigidly to the main shaft and revolves all the time the machinery is running. To operate the elevator it is necessary by a lever and rope extending to the first floor, to lower the head pulley onto the friction pulley, so that the weight of pulley, belt and grain that is elevating rests on the friction pulley. The dangerous part of this method consists in the paper on the pulley becoming worn down to the iron flanges, causing a spark. An electric spark can be overcome at least temporarily by connecting a wire from the journal box of this pulley to that of the head pulley, but the proper course to pursue is to have the iron flanges turned down at least ¼ in. below the paper.

The elevators operated by a clutch direct, a gear wheel operated from a gear on a clutch pulley or friction clutch, rope or belt drive are not so dangerous, as these are all outside of the elevator heads, but the shifting ropes on these should extend to the first floor for quick handling to throw the elevator out of gear in case of a choke. Care should be taken to see that these levers are not fastened down in any way that would prevent their operation from the first floor.

A choke in an elevator leg is often the cause of fires as the main shaft continues to run but the head pulley, belt or friction clutch stops, thereby causing a friction, which may cause a fire unless it is relieved by the shifting ropes or the gearing gives way. A choke may be caused by the friction clutch, friction pulley or belt drive slipping, by overloading, by permitting the bucket belt to become loose, by permitting the scale or garner to fill up, the grain back up to the leg or to have an iron bar or board fall out of the car into the boot of the elevator.

At the bottom of the elevator we have a hazard that calls for very close inspection of the elevator boot. This boot is usually constructed of iron with slides at front and rear to remove chokes. Inside of this boot is the pulley and belt. The journals are on the outside of the boot, but in some cases enclosed in an outer cover or pocket to prevent the grain coming out around the journal. The best journal used at this point is what is known as the car journal box, as the pulley acts as an idler, the bearing is on the top, as on a railroad car, and there is room in the bottom of the box to pack hair or moss to hold the supply of oil. This pulley is regulated by rods extending to the first floor, so that when the belt stretches or shifts it can be regulated to prevent friction between the casing and belt or pulley. These journals are often oiled through pipes from the first floor, but this is bad practice as the pipe may become separated, the oil may not feed properly or the journal may be running hot from some cause and not be discovered until too late, as the oiler is not compelled to go down into the sink to do the oiling.

In cold climates the oil is likely to freeze in these pipes and cases have been noted where the oiler, instead of taking the pipe out and having it cleaned, would have a long rod or wire heated red hot and force it through the frozen oil in the pipe. This naturally adds a hazard on account of the method of oiling. A small pipe, say not over one foot in length, would be permissible, as this would provide a reservoir for oil that would hold sufficient oil to keep the journal in good condition for several hours.

The belt conveyors should all be above the floors and all bearings exposed. The screw conveyors should have loose tops, so that in case of a choke the top will raise, permitting the grain to come out on the floor. The shovel shaft, idlers and all journals should be accessible and above the floors. Where cleaning machines are used special care should be taken, as these run at high speed. These should be kept out of main building wherever possible, and where there is a fan attached this should be connected by metal piping to the outside, preferably to a separate house, or if arrangements are made for burning the dust under the boiler through an approved automatic feed spout. This dust should never be blown into a dust room inside the building or out of the ventilator on the roof.

Static electricity has been known to cause a number of fires in elevators, and it is possible that it has caused more

fires than it has been charged with. This is caused by belts slipping, either on account of the belts being overloaded or too loose on the pulleys. Static electricity can be overcome in a large degree by grounding the shafting or bearings. This should be done in all large elevators where the machinery is driven by belts and shafts, but it is unnecessary where elevators are driven direct by motors.

The windows of elevators should be covered with screening of No. 12 wire, 2½ meshes to the inch, to prevent sparks from the outside entering. All windows should be kept open at all times while the elevator is in operation to permit all the dust possible to escape. In large elevators men should be employed constantly sweeping to prevent dust from accumulating. Where grain doors are coopered outside of the building they should be kept at least 50 ft. from the elevator.

The oiler is one of the most important men in the elevator for two reasons. The first is in the necessity for watchfulness and care of machinery to keep it from heating, and the other is because he must keep the journals and drip pans clean. The latter is easily done if the oiler will carry a piece of waste with him and wherever oil is allowed to run over wipe it up so there will be no oil on the outside of the journal to catch the flying dust and cause it to accumulate. If the oil is kept off of the outside of journals and they are kept dry, the matter of cleaning is much easier.

An exhaust fan system for removing the dust is one of the later improvements for keeping the house clean. When a fan system is installed it should be connected above the pulley at the bottom of the elevator leg, at the top of the leg, on the side where the grain is discharged, and at the top of garners and scales. When a fan system is put in it is necessary to have the joints of elevator legs, top and bottom, and the scales and garners kept as tight as possible to get the best results.

Where the machinery is operated by electric motors, these motors should be of the enclosed or induction type, in order to get away from the sparking of the brushes, the starting box and the resistance coils, which are a constant source of danger on account of dust unless enclosed in a separate enclosure. This can be done where there is only one motor, but where there are more it is more or less troublesome.

The lighting in an elevator should be electric, installed according to the requirements of the National electric code. Where there is no electric current, electric flash lights should be used. Open gas jets, kerosene oil lamps, or gasolene lighting systems should never be permitted. Switchmen, while handling cars in the building, should be compelled to use electric flash lights or electric extension lights. In no event should they be permitted to use the ordinary switchmen's lantern.

Locomotives, while switching cars, should never, under any conditions, be permitted to enter building, on account of the possibility of fire from a spark from the stack or dropping fire from the ash pan. Railroad cars should not be left in the elevator or on tracks adjoining over night where it is possible to move them.

There are only two parts of an elevator that need heat, the foreman's office on the ground floor and the weigher's office on the scale floor. These should be heated by steam and all woodwork protected from the steam pipes. These pipes, where passing through the house, should be covered with approved covering to prevent dust settling on them. Stoves should not be permitted in an elevator under any consideration. The oil room, men's lunch room and carpenter shop should be heated by steam or electricity where possible.

It is recommended that the oil room, men's lunch room and carpenter shop be outside of the main building whenever possible.

Smoking should not be permitted in any part of the elevator. Men should not be permitted to carry matches into the building.

Where the wooden bin walls are covered with corrugated iron special attention should be paid to the condition of this iron as an opening would make a ready receptacle for a spark to lodge in.

Lightning, according to statistics from various insurance companies, has been the cause of quite a number of fires in elevators. It is not necessary to speak about this hazard, as it is general in all classes of buildings.

Safeguards Recommended for Dryers and Sulphur Bleachers.—Notwithstanding the fact that the grain and foreign matter mixed therewith are the only materials of a combustible nature contained in a building constructed in accordance with the underwriters' regulations, it is believed that a fan driven fire in this dust and grain would result in considerable damage to the apparatus and possibly to the structure. For this reason the following recommendations for safeguards are appended:

An adequate system of automatic steam jets should be provided for extinguishing fire in the apparatus. High degree automatic sprinklers can be arranged so as to automatically fill the apparatus with steam in cases of fire. The steam pipes for sprinklers and all other parts of the apparatus should be so arranged that all condensation can be removed during cold weather and when the dryer is not in use.

If the fan is driven by an independent engine a system of fusible links should be so arranged that the fusing of any link would close a shut-off valve on the steam connection supplying the engine. Attachments for automatically stopping the fan, when the power is from other sources, should be provided if practicable.

An automatic fire alarm system should be installed, placing alarms in the engine room and at other points if desirable.

A thorough system of automatic sprinklers should be installed when the dryer is used in connection with the sprinklered elevator.

When installed outside the elevator and in accordance with the underwriters' rules and requirements, grain dryers even of approved construction are considered as adding to the fire hazard of the elevators in connection with which they are used, according to the construction of the dryer building, and the distance which they are removed from the elevator.

Sulphur Bleachers.—The sulphur burning furnace should be set at least 25 ft. distant from the elevator and be of fireproof construction. When necessary to get the furnace closer than 25 ft., the fume pipe should be not less than 25 ft. in length.

The same regulations should also apply to sulphur bleachers as to grain dryers in reference to communication, but the enclosure for burning sulphur should be so arranged with division walls that in case of a choke in the conveyor after passing the bleacher the grain cannot back up to the pan in which the sulphur is burned.

Fire Protection.—The best means of fire protection discovered, up to the present time, is a standard installation of automatic sprinklers; although the automatic sprinkler is not as effective in an elevator as in other classes of buildings, as it is necessary to have a dry system on account of cold weather; and when a sprinkler head is released on account of fire the air expelled from this opening blows the dust about in such a manner that it may cause an explosion. The standards of the underwriters require inside stand pipes with hose on the various floors sufficient to reach all parts of the buildings. There is a question whether the hose at the various outlets should be standard 2½ in. fire hose or a smaller size, either 1½ in. or 2 in. hose. It is a well known fact that one man cannot handle a 2½ in. hose if it has any pressure on it. Therefore, it is reasonable to say that a 1½ in. hose with nozzles having ½-in. openings would be the most serviceable. These inside stand pipes

should be supplied from a pump or pumps in the boiler house of sufficient capacity according to the size of the hose. Where water can be obtained from city mains, with sufficient pressure to reach the top of the building, a by-pass around the pumps should be provided so that in case of the elevator being shut down or no steam on the boilers this water could be used. Where pumps are provided, steam pressure sufficient to operate the pump should be maintained at all times. These stand pipes should be arranged for draining, so that in winter there will be no water on the stand pipes as the buildings are open and the water in the pipes would be subject to freezing. Water barrels with buckets should be placed on all floors of the elevators, apportioned about one to each leg in a regular elevator or one to each 500 sq. ft. in warehouses or other buildings.

Three-gallon fire extinguishers are advisable as additional protection, but these would have to be kept in the engine room or offices in the winter unless of the non-freezing type. In elevators where electric motors are used carbon-tetra-chloride extinguishers should be provided. Either these extinguishers or sand in buckets should be provided for oil rooms. Axes and pike poles should be provided on all floors. Signal alarms from all hose outlets to the engine room should be arranged for turning in fire alarms or notifying the engineer to start the fire pump.

Night and Sunday watchman with central station signals or a watchman's clock for reporting at all times when the elevator is not in operation should be provided. Outside fire escape ladders and stand pipes should also be provided.

Electric journal alarms from journals to an indicator in engine room which operates in case of a journal getting hot are recommended, and when installed should be tested daily.

In summing up the various hazards, we have tried to stay on the line of hazards peculiar to elevators and have not dealt with the common hazards, which are usual to all classes of buildings, such as exposure fires, stoves, stove pipes, flues, incendiary and other miscellaneous causes.

Automatic Fire Protection

C. N. Rambo (N. & W.) read a paper on automatic fire protection. He gave a succinct descriptive account of automatic sprinklers. The wet pipe, constantly filled with water under pressure, is the most desirable where practicable; but in cold climates the dry system—pipes filled with air, to be flooded, when necessary, is in common use. With this system sometimes there is two or three minutes or more delay in getting water on the fire after the heat has acted on the fusible link. The significant fact for railway officers to bear in mind is that private industries, by the hundred, have used automatic sprinklers for 20 years past, and have found them a good investment. There would seem to be no reason why every large railroad shop and every large terminal warehouse should not have this protection. It is a mistake to assume that the sprinklers are useful only in rooms with low ceilings. They have acted with success in shops where the pipes are 30 feet above the floor. On a certain group of railroad shops, in a period of 10 years, the fire losses amounted to 27½ cents per $100 of insured value; in a certain other group of shops, not railroads', during the same time—shops equipped with sprinklers—the losses were 3 cents per $100 valuation.

The National Fire Protection Association reported for the year 1915, concerning the records of 1,340 fires in buildings equipped with automatic sprinklers, that 984 fires were extinguished, 305 were held in check and in 51 cases the action of the apparatus was reported as unsatisfactory. In 19 years the percentage of satisfactory operation has been 64.5; but this last year it was 73.4. Mr. Rambo named the causes of failure in a dozen prominent instances.

Out of the 1,340 fires above referred to, 450 were extinguished by water from one sprinkler and 52 per cent of the whole number were put out by one or two. Sprinklers usually are designed to flood a space 10 ft. square.

Statistics of fires in 5,000 properly equipped factories, covering a period of 30 years, show that only five lives were lost; the number of persons employed in these factories aggregated 2,500,000.

Following the reading of the paper, there was a discussion concerning the usefulness of automatic sprinklers in roundhouses. The prevailing view was that the losses in buildings of this class are so small, that the expense is not warranted. If sprinklers are used, it is necessary to guard against corrosion from gases by the use of wax paints. A roundhouse on the Alabama Great Southern has been thus painted for a year and thus far paint of this kind has proved satisfactory.

This discussion brought out the experiences of several members. B. S. Mace (B. & O.) has sprinklers, the dry system, in two warehouses at Locust Point, Baltimore, in which all sorts of commodities are handled, which give entire satisfaction. There have been some small losses from leakage. Leakage insurance is carried. Pipes are boxed where necessary, to guard against freezing.

F. C. Mott: The dry system is generally used in warehouses around New York harbor. The mains are boxed, for cold weather, where necessary. At the Bush Terminal the large warehouses have provision for a master curtain outside the building to protect against fires on boats. The New York Dock Company formerly had rather frequent fires; now, with sprinklers, fires are few and small. This company's piers are of wood with corrugated iron sides and roofs. Curtain boards confine hot air in the upper part under the roof. On large piers the space is divided by such curtains both longitudinally and transversely. Replying to a question Mr. Mott said he knew of no trouble from salt air. All good kinds of sprinkler heads are immune to this.

Anson Murphy (A. G. S.): Daily inspections and reports of conditions are an important essential with automatic sprinklers. The pressure of the water, the condition of the air and the temperature of the valve box should be noted.

P. Hevener (Rock Island) spoke a word in favor of the "flushing" system for cooling stations (water to be turned on by the attendant). Replying to questions, he recognized the superiority of automatic sprinklers; but the other system has served well where it was impossible to get the necessary appropriation for sprinklers.

Wm. McGrath (D. L. & W.) finds the flushing apparatus satisfactory. Mr. Brooks (Ill. Cent.) at a 250-ton coal chute installed sprinklers at a cost of $850.

On Tuesday afternoon the members went to Hoboken, N. J., to inspect the docks and terminals of the Delaware, Lackawanna & Western, and witnessed an exhibition of the automatic fire alarm system of the Metropolitan Electric Protection Company (New York), installed there.

On Wednesday the Association held a long informal discussion on the duties of inspectors, and listened to the reports of the Committee on Locomotive Spark and Ash-pan hazards, presented by W. F. Kaderly (G. S. & F.), and on statistics, presented by F. B. Berry (So. Ry.).

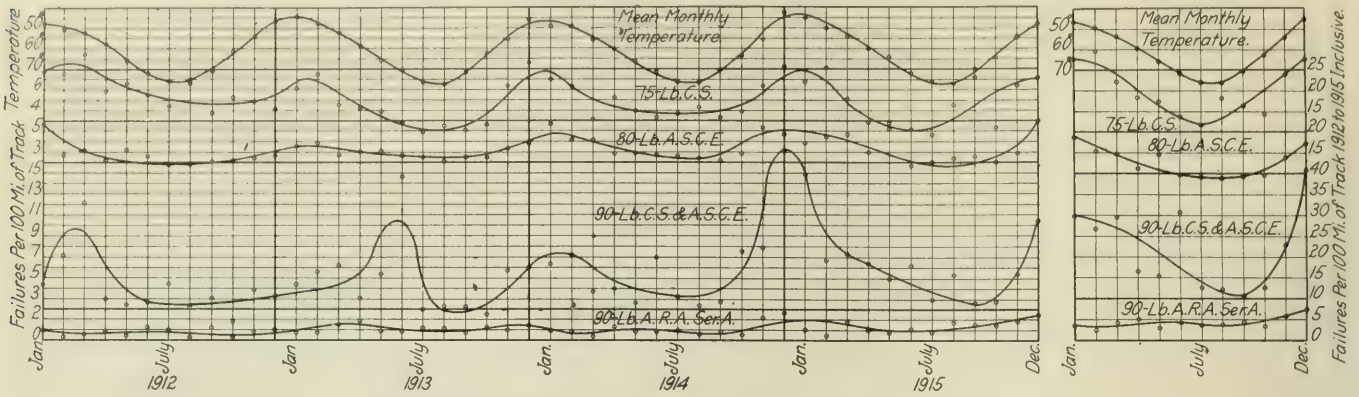
RAIL FAILURES AND TEMPERATURE

The accompanying diagrams show a comparison between rail failures and temperature as obtained from the records of the Southern Pacific for the years 1912 to 1915, inclusive. One diagram shows the number of failures per month per 100 miles of track for different sections of rail—i. e., 75-lb. C. S., 80-lb. A. S. C. E., 90-lb. C. S. and A. S. C. E., and 90-lb. A. R. A., series A. The other diagram shows the sums of the number of failures by months for the four years. On the diagram to the left the mean monthly temperature is plotted in an inverted position; that is, with the temperature increasing downward, and the corresponding average curve is given on the diagram to the right.

It will be noted from a study of these diagrams that the failures of the 75-lb. and 80-lb. rails followed the tempera-

ture very closely. The same is true to a lesser extent for the 90-lb. rail, although the results were erratic in 1913 because of the large number of failures in June of that year. In the case of the 90-lb. A. R. A. type A rails the relation between temperature and failures is scarcely apparent.

Although the diagrams indicate a definite relationship for three sections of rail, it is interesting to note that for the same section under similar conditions of traffic and maintenance, the maximum number of failures does not occur on those portions of the system on which the greatest range of temperatures occurs or on which the lowest temperatures obtain. We are indebted to John D. Isaacs, consulting engineer, Southern Pacific, for the above information.



Rail Failures for Four Years in Relation to Temperature

THE HISTORY OF A WATER STATION

By C. R. Knowles

General Superintendent of Water Service, Illinois Central, Chicago, Ill.

A compilation of the figures showing the consumption of water at Centralia, Ill., for 23 years brings to mind the enormous increase in the consumption of water by the railroads within the last quarter of a century. According to these figures, the consumption has practically doubled every 10 years. The amount used at Centralia in 1895 was 72,000,000 gal., while in 1905 it had increased to 141,404,000 gal., and in 1915 to 238,630,000 gal. It may be said in passing that the consumption in 1915 was 42,000,000 gal. less than that in 1914, because of a campaign against water waste. Except for this the amount used in 1915 would have been fully double that of 1905. While these figures as to the rate of increase may not apply to outlying stations they would certainly appear to apply to main line terminals. They are taken from meter readings throughout the entire period.

The first water supply at Centralia was secured from Shop creek and was barely sufficient for the few engines running into Centralia at the time the road was constructed in 1852. The additions to the motive power were very rapid during the first few years after the road was built and the demand for water soon outgrew the supply from the creek. A new water station was therefore established about two miles north of Centralia early in 1855 at a stream known as Crooked creek. The supply was apparently ample and there being but little contamination, the quality of the water was fairly good. This pumping station was operated by horse power, the first pump being operated by one horse, and later as the consumption increased by two horses. The first steam plant was not erected until about 1858. The tanks were located at the Crooked creek station and it was necessary to bring the engines out from Centralia for water. The supply for the shops at Centralia was secured from a well in the roundhouse, 12 ft. in diameter and 40 ft. deep. Locomotives were also supplied from this well when the supply was low at the creek. This well was dug in 1855 and was used for drinking water and shop supply for over 40 years. A well was drilled at the shops in 1857 to a depth of 1,500 ft. in an effort to secure artesian water, but with no success.

In 1859 the consumption of water had increased to such an extent that it was found necessary to build a dam across Crooked creek, forming a reservoir for the storage of water during the dry seasons. A 300,000-gal. reservoir was also constructed at the shops and walled with stone and the water station was enlarged and rebuilt, involving a 2¼-mile pipe line of 4-in. cast iron pipe from the creek to the shops.

As the old pumping station was destroyed by fire in 1865, it was replaced by a brick pump house, a Weldon pump was installed and two 40,000-gal. tanks were erected. A year later a second pump was added. The four-inch pipe became inadequate for the supply in 1867. It was found heavily incrusted and was cleaned and part of the line was relaid with cleanout boxes every 100 ft. This proved only a temporary relief and 5,000 ft. of four-inch pipe was taken up and relaid with eight-inch pipe in 1868. This pipe is cast iron and is still in service after being in the ground 48 years.

The history of the station for the next few years is incomplete, but it seems that the old Weldon pumps remained in service until the early eighties, when more modern pumping machinery was installed. The pumping equipment in 1885 consisted of a locomotive boiler and two 4-in. by 7-in. by 10-in. Worthington duplex pumps.

In 1891 a contract was executed with the city of Centralia covering the joint use of Crooked creek reservoir. The consumption of water by the city and railroad outgrew the pumping equipment in 1903 when the city constructed its own plant; shortly after this Crooked creek became inadequate for the demand, and it acquired a reputation for pollution.

In 1908 the supply failed and the city was practically out of water for over three months, the shortage of water causing an enormous amount of trouble and expense to the railroad. Temporary stations were established at several points from 2 to 81 miles from Centralia, and water was hauled in trains consisting of 20 large tank cars with a capacity each of from 8,000 to 10,000 gal., each train hauling about 200,000 gal. of water. In spite of the most rigid economy it required at least two trains a day to maintain the supply. It was necessary to haul water from October 30, 1908, until February 6, 1909, during which time 4,450 cars of water were handled at a cost of $16,993.41.

Because of the total failure of the water supply the city of Centralia in 1909 invested $158,000 in a new water supply. A new 1,000,000,000-gal. reservoir was formed by constructing a 650-ft. dam across a valley about 8 miles east of and upstream from the Crooked creek pumping station. The submerged area is approximately 250 acres and the watershed is about 8 square miles. The water flows by gravity through a 20-in. wood stave main to the pumping station, located near the original site of Crooked creek station.

General News Department

The Brotherhood of Locomotive Firemen and Enginemen have leased quarters in the Guardian building, Cleveland, Ohio, and are moving their headquarters there from Peoria, Ill.

A committee of railway mail traffic managers and lawyers conferred with the Second Assistant Postmaster General at Washington last Wednesday to discuss the details connected with the proposed change of railway mail pay, from the weight to the space basis except for "closed pouch service" on November 1. The Postmaster General's interpretation of the new law was explained.

The legislative committee of the Brotherhood of Locomotive Firemen and Enginemen of Illinois met last week at Springfield, Ill., to discuss legislation it expects the next session of the Illinois legislature to consider. The brotherhood will seek the enactment of an anti-injunction law, a law permitting railroad men away from their homes to vote, an eight-hour day for men and women in all industries, and a uniform school text-book law.

A fine new manual training school costing over $3,000,000 has just been dedicated at Pullman, Ill. It is a gift of the late George M. Pullman, founder of the Pullman Car Company. The school is to be opened to the children of Pullman and the children of Pullman employees in general, but the line will not be drawn so as to exclude attendance from other neighborhoods. The school will accommodate 500 pupils. The buildings, athletic fields, gardens, lagoons, etc., cover 40 acres of ground.

Exports of railroad supplies from the United States for the seven months ending with July amounted to $36,215,000, as compared with $9,465,000 for the same period of the preceding year, according to the statement issued by the Department of Commerce. Railway cars increased in value from $1,767,000 to $18,093,000, largely because of the purchases made by the Russian Government for the equipment of its new lines, which have been rushed during the war. Locomotives numbered 363, of which 111 went to Europe, 39 to Canada, 70 to Cuba, 21 to Mexico, and 72 to Russia.

Eighty-five per cent of the 40,000 members of the six railway shopmen's unions employed on 18 western railways voted in favor of rejecting the compromise proposals of the railroads to their demands for an eight-hour day and to a wage increase of five cents per hour. The conference of union representatives which canvassed the referendum vote held its closing session at Kansas City, Mo., on October 1. The delegates returned to their respective roads where further negotiations will be carried on between the unions and the carriers. Seventy-five per cent of the union men are employed in stationary shop work and the other 25 per cent on repairs to rolling stock.

To emphasize what can be accomplished through the exercise of proper care by railroad employees and the public, the Nashville, Chattanooga & St. Louis has set aside October 9 as "Fire and Accident Prevention Day." Through its safety department the road has issued instructions to all employees to endeavor to make that day one free from accidents or fires insofar as it may lie within their power. Special stationery has been used by the several departments of the road for some time on which accidents and fire statistics have been printed in red ink, and in this manner the attention of thousands has been directed to the day and its object. Under the caption, "One Day for Humanity," is an appeal to every employee to be particularly careful and to ask others to do likewise. The nation's fire toll is 5,000 lives a year, a fire loss of $500 per minute, 10,000 persons workless and 20,000 homeless. The accident toll a year is 35,000 deaths and 2,000,000 injuries, to say nothing of the human suffering and financial loss involved. Persons who must use railroad property on October 9 are urged to be unusually careful, especially at crossings where so many accidents occur.

Congressional legislation making federal control of the railroads superior to that by the individual states was asked in resolutions adopted by the savings banks' section of American Bankers' Association, which held its annual convention at Kansas City, Mo., last week. The resolutions point to the fact that less new mileage was built last year than in any year in the preceding half century with more lines in bankruptcy than at any other time in the history of the country, and declare that railroad improvements were arrested because of the "costly conflicts" arising between the Interstate Commerce Commission and the individual state commissions. They further declare that railroad growth has been impaired because of "investment hesitancy," which has arisen in consequence of "the confusion, waste and inefficiency of railroad supervision by Congress and 48 states." The savings banks of the United States are said to hold more than $900,000,000 in railroad stocks, which represent the deposits of more than 10,000,000 people. The resolutions ask Congress to grant a hearing to a committee of the savings banks' section before passing any further railroad legislation.

M. H. Smith Must Answer

Judge Stafford, in the Supreme Court of the District of Columbia, has issued an order directing President Milton H. Smith and other officers of the Louisville & Nashville to answer the questions of J. W. Folk, counsel for the Interstate Commerce Commission, regarding their political activities and contributions. Judge Stafford rules that they must answer, not because the questions involve the political activity of carriers, but because they involve expenditure of funds, and so affect the question of reasonableness of rates and also affect methods of accounting.

Illinois Central Appeals to Motorists

T. J. Foley, general manager of the Illinois Central and the Yazoo & Mississippi Valley, has addressed an appeal to those who drive or ride in automobiles to "Stop, look and listen" at highway crossings. According to Mr. Foley, during the ninety days preceding September 26, 18 persons were killed and 36 persons injured in automobile grade crossing accidents on the Illinois Central. Mr. Foley states further that statistics prove that crossings which are used extensively, and therefore are considered the most dangerous, are really the safest. The great majority of accidents occur at outlying crossings which are the least used. He calls attention to the fact that there are 8,000 grade crossings on the Illinois Central system, and that to separate the grade at these crossings would cost $215,408,020, which is nearly twice as much as the capital stock of the company.

A. S. M. E. Railroad Meeting

The railroad committee of the American Society of Mechanical Engineers has arranged a most attractive program for the meeting of the railroad section, which will be held during the annual meeting of the society at New York early in December. It is planned to hold the railroad section meeting on Friday morning, December 8, with an afternoon session if it should prove necessary. The program will include papers on Mechanical Design of Electric Locomotives, by A. F. Batchelder, railway department, General Electric Company; Clasp Brakes, by Thomas L. Burton, of the American Brake Company, St. Louis; and Pulverized Fuel for Locomotives, by J. E. Muhlfeld, president of the Locomotive Pulverized Fuel Company.

Association of Railway Electrical Engineers

The ninth annual convention of the Association of Railway Electrical Engineers will be held at the LaSalle hotel, Chicago, Ill., October 31 to November 3, inclusive.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, 1916, New Orleans, La.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, East St. Louis, Ill. Next meeting, June, 1917, Denver.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, 1916, New Willard Hotel, Washington, D. C.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, 1916, Atlantic City, N. J.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, 1916, Atlantic City, N. J.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Denver, Colo.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, 1916, New Orleans, La.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 20-22, 1917, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June, 1917.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Annual meeting, May 30, 1917, San Francisco, Cal.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J. Next meeting, May, 1917, Louisville, Ky.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connely, Superintendent of Telegraph, Indiana Harbor Belt, Gibson, Ind.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. F. Conrad, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Annual convention, June 19, 1917, Banff, Alberta.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next annual meeting, August, 1917, Chicago.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago. Next meeting, May, 1917, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, 1916, Philadelphia, Pa.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September, 1917, Chicago.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June, 1917.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago. Next convention, March, 1917, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Annual meeting, December, 1916, Waldorf-Astoria Hotel, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next semi-annual meeting, November 9-10, 1916, La Salle Hotel, Chicago. Annual meeting, May 9-11, 1917, Louisville, Ky.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Office of the President's Assistant, Seaboard Air Line, Norfolk, Va.

RAILWAY REAL ESTATE ASSOCIATION.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 10, 1916, Chicago.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September, 1917, Atlantic City, N. J.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Associations.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings. 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September, 1917, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, 1916, Hotel Raleigh, Washington, D. C.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next meeting, June 19, 1917, Fresno, Cal.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Annual convention, October 24-27, 1916, Hotel Sherman, Chicago.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco. Annual meeting, November 15, 1916, Brown Palace Hotel, Denver, Colo.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY, 1916.

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Atlantic City	170	$86,291	$336,453	$434,595	$21,253	$17,983	$3,542	$154,251	$152	$5,430	$202,604	$231,991	$10.000	$221,971	$70,576
Duluth, Winnipeg & Pacific	191	105,822	20,369	130,444	16,771	17,570	1,847	44,929	557	5,025	86,699	43,746	6,449	37,297	—7,783
Oahu Ry. & Land Co	114	138,439	23.137	167,506	10,533	11,103	776	30,415	.....	4,699	57,507	109,999	9,500	100,499	2,383
Philadelphia & Reading	1,127	3,761,750	651,301	4,705,741	315,495	721,112	52,621	1,581,906	13,443	89,009	2,771,582	1,934,159	117,174	1,816,595	453,371
Virginia & Southwestern merged with Southern Pacific Railway July 1, 1916.															

MONTH OF AUGUST, 1916

Alabama & Vicksburg	143	$91,733	$41,098	$145,082	$19,281	$30,417	$3,190	$49,260	$2,422	$6,550	$111,122	$33,960	$8,600	$25,360	$6,590
Arizona Eastern	378	274,002	44,378	340,192	51,524	32,158	2,477	61,176	2,332	14,768	164,317	175,875	16,601	159,261	50,852
Atchison, Topeka & Santa Fe	8,648	7,953,328	2,460,401	11,193,725	1,487,923	1,622,141	182,628	2,742,440	813	191,641	6,216,606	4,977,119	504,257	4,471,362	964,400
Baltimore, Chesapeake & Atlantic	88	93,510	73,297	172,930	13,269	29,865	2,748	70,302	.....	2,402	118,579	54,350	2,300	52,050	11,731
Belt Ry. Co. of Chicago	31	.....	.....	277,837	24,406	35,641	1,376	102,992	.....	6,113	170,529	107,308	13,768	93,539	22,929
Bessemer & Lake Erie	205	1,303,222	51,919	1,372,459	89,386	218,736	9,298	281,446	.....	14,043	597,064	775,395	22,020	753,374	—9,164
Buffalo & Susquehanna R. R. Corporation	253	141,111	6,559	150,921	23,150	32,457	1,337	39,501	.....	5.559	102,004	48,917	2,600	46,317	20,444
Buffalo, Rochester & Pittsburgh	586	1,042,689	124,335	1,217,819	164,915	277,840	14,784	371,432	1,373	23,175	853,519	364,300	22,000	342,324	102,652
Central of Georgia	1,924	702,766	307,445	1,115,293	168,129	188,406	38,010	340.547	649	40.585	775,130	340.162	61,306	278,421	131,701
Central New England	301	453,863	37,833	515.848	53,999	41,309	1,434	133,338	.....	6.162	236,227	279.622	15,500	264,115	103,999
Charleston & Western Carolina	342	92,464	34,658	135,069	25,761	24,330	3,878	42,810	.....	3.817	100,596	34,472	5,000	29,014	11,400
Chesapeake & Ohio Lines	2,381	3,369.757	655,238	4,307.432	570.979	753,022	59,669	1,130,475	30,660	83.681	2,626,898	1.680,534	127.420	1,553,102	192,510
Chicago & Alton	1,053	1.106.789	410,475	1,628.690	200,682	308,615	42,216	484,633	11,291	31,909	1,071.682	557.609	46,110	510.395	131,469
Chicago & North Western	8,108	5,838,765	2.242,833	9,008,876	1,187,084	1,292,193	118,449	2,855,150	62,323	164,142	5,641,481	3,367,394	435.000	2,932,075	1,152.596
Chicago Junction	13	.....	.....	218,005	24,509	16,560	1,222	115.257	.....	4.689	162,237	55,768	2,351	53,416	10,978
Chicago, Milwaukee & St. Paul	10,238	7,054,405	1,971.174	10,021.195	1,069,510	1,470.011	189,441	3,361,942	67,323	169.742	6,216.690	3,804.505	498,856	3,297,668	789,267
Chicago, Rock Island & Gulf	477	228,635	79,854	330,001	54,064	44,379	10,222	90,595	1.077	9.171	209.457	120.545	7.152	113,242	65.084
Chicago, St. Paul, Minn. & Omaha	1,753	1.088,254	541,286	1,763,210	271,249	225.501	30,283	603,921	17.345	39,862	1,186.151	577,059	88.375	487.746	150.395
Chicago, Terre Haute & Southeastern	373	222,645	18,441	247,430	32,844	104,002	4,180	62,778	1,260	7.039	211.811	35.619	10,883	24,736	—17,511
Cincinnati Northern	246	158,799	24,226	189,288	26,072	28,752	4.090	51,687	.....	2,822	113.423	75.865	6.000	69,865	33.872
Cleveland, Cincinnati, Chic. & St. Louis	2,384	2,879,205	1.031.276	4,251,508	481,311	768,727	96,056	1,296,463	26,805	76,403	2,737.776	1,513,732	149.000	1,364,182	268.737
Colorado Midland	338	137,475	36.963	189,178	35,713	30.635	7,405	72.228	2,470	5.450	153.901	35.277	9,000	26,277	31,366
Duluth & Iron Range	277	931,512	22,787	978.030	94,860	75,380	1,393	189,775	2.246	11 373	375.027	603.003	52,877	550,126	—12,404
Duluth, Missabe & Northern	411	1,975,521	32,204	2.083,452	139,349	118.697	3,393	305.934	710	11,238	579,321	1.504.131	114.641	1,389,490	355,280
El Paso & Southwestern Co	1,028	928.543	201.332	1,188,357	102.734	119,058	18,061	255.205	6,633	24,968	526,659	661.699	39,529	622.168	363.691
Florida East Coast	745	423,715	102,037	587,636	56.227	80,728	5,914	169,926	3,319	17.145	331.668	255.967	25,983	229,970	197.413
Galveston, Harrisburg & San Antonio	1.361	1,057.587	300.686	1,443,146	165,556	184,968	30,618	426,207	9,911	36,541	849,778	593.367	48,502	544,445	317,970
Georgia, Southern & Florida	395	126.539	59,080	205.178	28.386	39,524	7,923	73,661	45	8.147	157,685	47.493	11.115	36,318	17.641
Grand Rapids & Indiana	575	310,670	227,175	585.143	68,389	79,391	9,018	209.745	3,710	17,264	387.517	197,626	24.081	173,500	26.635
Houston, East & West Texas	191	97,513	31,896	137,283	25,137	17.439	2,098	42,401	766	3.213	90,968	46.315	5.360	40,946	32,447
Houston & Texas Central	895	449,478	137,864	627.093	82,551	85,869	16,066	175,218	4.455	18,159	380.885	246.208	30,665	215,492	127,920
Illinois Central	4.767	4.623,923	1,305,621	6,494,108	932.405	1,640.965	108.254	1,816,359	33.293	155.602	4,666.682	1,827,426	355,000	1,470,613	347,053
Indiana Harbor Belt	109	.....	.....	420,497	44,490	53,466	2,610	155.231	.....	8,063	263.861	156.636	8,668	147.954	56,185
Kanawha & Michigan	177	290,560	38,109	337,065	48,898	84,404	2.741	75.001	24	7,138	218,206	118.859	14,400	104,459	8,366
Kansas City Southern	837	688,583	154,183	938.003	96,191	126,823	26,847	279,468	.....	33.437	562,273	375,730	48,447	326,888	39.150
Lake Erie & Western	900	549.099	78,823	660.598	72,643	111,831	14,585	201,198	.....	12,728	412,985	247,613	27,000	220,591	75,635
Lehigh & New England	296	223,267	1.401	242.622	39,440	37,052	1,949	65,598	.....	5.507	149,523	93,099	8,820	84,279	—38,758
Lehigh Valley	1.444	3,636,482	496.669	4,435.645	589,998	766,344	83,452	1,537,340	17.980	76,797	3,069,507	1,366,138	158,000	1,207,101	116.624
Long Island	397	376,836	1,008,866	1,606.940	137,028	144,054	13,202	525,306	5.967	33.124	857,497	749,442	71.905	676,671	58,507
Louisiana Ry. & Navigation Co	350	152,838	25,774	186,368	26.136	21.664	6.779	57,267	.....	6,867	118,713	67.655	11,000	56.655	12,861
Louisiana Western	208	135,597	61,002	209,071	22,550	38,553	7,135	49,664	1,640	6,940	126,482	82,589	11,100	71,275	47,289
Louisville & Nashville	5,671	4,093,731	1,192,414	5,649,838	778,553	1,067,044	120.274	1,544.638	18,186	108,055	3,630,444	2,019,394	226,626	1,792,325	467.940
Louisville, Henderson & St. Louis	200	98.282	42,578	150,741	26,697	29.126	4,655	41,185	.....	2,834	104,497	46.244	3,800	42,388	17.428
Maine Central	1,221	669,898	421,624	1,185,226	156,975	147,706	12,996	414,926	8.872	28,706	769,932	415,294	49,597	365,666	29,287
Midland Valley	385	128.859	44.235	179,190	34,996	29.078	2,828	51,266	.....	6.527	124.661	54.529	5.934	48,279	—155
Missouri & North Arkansas	365	89,533	44,874	141,706	15.701	13,643	3,887	36,957	.....	4,760	74,948	66,758	4,800	61,958	53,877
Missouri, Kansas & Texas System	3,865	2,220 155	822,440	3,244,546	677,408	593,324	55,686	975,372	19,397	96,112	2,413.137	831,408	125,351	700.563	23.934
Monongahela	108	155,858	10,927	170.060	28,582	10,162	736	38.345	.....	4.244	82,070	87,990	4.000	83,990	17.196
Monongahela Connecting	6	.....	.....	116.159	18,529	13,813	300	50.558	.....	2,816	86,016	30.142	3.027	—71.761	—94,758
Morgan's La. & Texas R. R. & S. S. Co.	401	265,026	92,933	385,144	55.367	77,515	11,123	124,538	2,909	11,373	281,832	103,312	22,917	79,209	66,789
Nashville, Chattanooga & St. Louis	1,237	830,325	283,707	1,212.040	142,723	226,337	51,963	375.134	7,645	38,985	841,810	370,230	28,500	340.961	134,342
New Orleans & North Eastern	204	237,617	54,588	326.164	40,560	60,258	9,530	92,403	7,232	12,379	222,363	103,801	15,700	88,101	23,945
New Orleans, Mobile & Chicago	402	146,667	30,329	184,102	26,873	28,946	4,087	53,235	287	6,444	119,872	64,231	6,491	57,619	24,496
New York, New Haven & Hartford	2,095	3,548,102	2,727,353	7,149,733	824,658	818,533	55,862	2,560,232	97,286	160,809	4,525,270	2,624,462	258,000	2,366,073	271,033
New York, Philadelphia & Norfolk	112	342,708	58,429	437,847	38,366	104,242	3,999	145,459	5,332	11,277	308,316	129,531	13,000	116,434	22,018
Norfolk & Western	2,086	4,526,397	583,233	5,343,013	750,958	867,682	64,507	1,240,811	9,041	82,806	2,991,381	2,351,632	205,000	2,146,565	462,666
Northern Pacific	6,535	5,635,620	1,383,255	7,041,003	1,005,216	692,654	99,553	1,854,335	96,139	109,453	3,781,463	3,259,540	485,605	2,772,320	364,993
Pennsylvania Company	1,755	5,531,196	1,135,404	7,336,986	809,141	1,143,336	87,135	2,208,424	38,065	144,804	4,428,751	2,908,235	302,281	2,603,844	626,724

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF AUGUST, 1916—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Pennsylvania Railroad	4,334	$14,660,213	$4,202,401	$20,664,931	$2,497,401	$3,809,045	$204,912	$6,673,095	$274,362	$489,585	$13,942,206	$6,722,725	$738,884	$5,976,311	$648,670
Pere Marquette	2,249	1,280,921	482,520	1,951,947	180,755	351,264	39,787	635,237	5,914	43,528	1,255,795	696,152	51,612	644,183	155,248
Philadelphia, Baltimore & Washington	717	1,149,848	870,912	2,205,431	281,197	418,640	28,800	825,247	118	54,226	1,606,633	598,798	63,732	534,769	64,067
Pittsburgh, Cincinnati, Chic. & St. L.	1,489	3,152,823	874,099	4,504,554	639,946	834,277	71,972	1,403,144	28,780	105,791	3,081,907	1,422,647	175,503	1,246,776	162,135
Richmond, Fredericksburg & Potomac	88	162,177	93,755	283,136	17,556	42,229	3,954	91,554	2,363	7,523	165,179	117,957	9,100	108,847	41,226
Rutland	468	171,077	130,227	353,180	49,905	54,191	9,923	112,451	1,255	6,967	234,691	118,489	17,201	101,288	14,290
St. Joseph & Grand Island	258	150,062	32,798	194,524	30,380	23,212	4,375	51,464	519	4,600	114,550	79,975	7,961	72,000	56,853
St. Louis & San Francisco	4,752	3,168,066	1,211,235	4,663,853	668,406	834,127	64,723	1,382,798	.....	102,811	3,032,974	1,630,879	173,656	1,454,654	374,532
St. Louis, Brownsville & Mexico	548	281,311	102,000	430,665	48,848	38,326	7,658	116,477	.....	9,596	221,002	209,663	8,000	201,641	116,225
St. Louis Merchants' Bridge Terminal	9	.....	397	238,137	35,968	13,509	768	86,378	.....	6,836	143,458	94,678	7,600	87,059	37,324
St. Louis Southwestern	943	580,948	132,559	754,996	54,789	125,728	31,652	176,519	3,118	24,156	415,869	339,127	44,076	294,867	104,668
San Antonio & Aransas Pass	726	265,318	93,148	380,603	57,336	49,312	7,152	142,852	.....	13,578	269,831	110,771	20,000	90,763	56,917
Seaboard	3,449	1,337,808	460,148	1,969,095	254,844	287,540	68,087	662,744	9,599	63,032	1,345,845	623,249	102,505	520,560	.....
Tennessee Central	295	104,461	37,934	150,270	25,520	20,204	5,892	52,893	.....	6,811	111,320	38,950	4,566	34,382	7,403
Terminal R. R. Ass'n of St. Louis	37	.....	276	228,731	31,946	18,979	839	70,875	.....	2,011	124,649	104,082	27,484	76,363	—12,513
Texas & New Orleans	468	291,583	98,395	422,422	54,134	60,245	7,638	123,927	10,757	11,012	267,375	155,047	19,924	135,017	90,839
Texas & Pacific	1,944	1,070,872	438,072	1,625,802	208,102	208,806	40,194	566,319	11,527	51,934	1,086,135	539,667	84,500	455,046	180,558
Toledo, Peoria & Western	248	55,916	28,729	104,116	18,564	26,382	1,888	37,444	.....	4,201	88,480	15,636	6,500	9,136	—6,324
Toledo, St. Louis & Western	451	446,024	53,607	526,591	76,424	73,613	15,780	154,173	.....	8,610	327,581	199,009	19,000	180,009	45,850
Union R. R. of Baltimore	8	136,083	27,078	165,118	12,256	.....	.....	4,623	.....	2,472	19,350	145,767	6,872	138,896	32,130
Union R. R. of Pennsylvania	32	.....	.....	568,334	33,470	90,500	108	201,322	.....	4,057	329,257	239,077	8,201	230,876	—3,485
Vandalia	917	777,059	262,500	1,168,994	210,110	219,065	24,321	372,126	11,536	27,483	863,272	305,721	40,174	265,151	25,431
Vicksburg, Shreveport & Pacific	171	85,256	44,891	142,410	22,466	28,390	4,233	42,101	2,024	5,139	104,353	38,057	9,180	28,877	17,022
Virginian	510	632,174	48,008	725,142	81,009	121,438	5,348	150,635	16,409	15,106	389,497	335,646	30,000	305,614	16,698
Wabash	2,519	2,261,983	726,044	3,249,927	351,514	547,335	89,417	1,065,919	20,575	67,220	2,126,566	1,123,361	98,844	1,024,114	197,379
Washington Southern	36	54,237	53,845	137,152	12,658	13,590	1,412	44,570	1,051	3,453	76,734	60,418	3,900	56,517	17,831
West Jersey & Seashore	359	222,100	813,274	1,117,660	141,827	123,650	13,291	305,528	3,439	19,274	606,996	510,664	38,176	472,434	24,848
Yazoo & Mississippi Valley	1,382	944,911	237,506	1,243,559	201,554	190,060	21,237	355,012	1,697	31,958	799,671	443,888	57,000	386,752	147,162

Traffic News

The Traffic Club of Chicago will have its last outing of the season at the Wheaton (Ill.) Golf Club on October 11.

The Buffalo, Rochester & Pittsburgh has made arrangements for its trainmen to announce to passengers on all trains the scores of the world's series games by innings.

The Southern Pacific has placed an embargo on freight bound for the ports of Galveston and New Orleans, where considerable congestion prevails at the present time. The embargo was effective on October 1.

The grain elevator which is to be put up at Baltimore, Md., by the Pennsylvania Railroad, taking the place of the one recently destroyed by fire, it is understood will have a capacity of 5,000,000 bushels.

Dr. Mary E. Pennington, chief of the bureau of research, Department of Agriculture, Washington, D. C., was scheduled to address the Traffic Club of Chicago at luncheon on October 6, on the refrigeration of perishable food products in transit.

Colorado experienced the largest tourist business in its history in the season just closing. Advance figures show that between 175,000 and 200,000 tourists visited resorts in Colorado this year. Most of this business came after the middle of July. Yellowstone Park and other scenic districts had good seasons, but fell a little behind last year when the California expositions drew traffic to the West.

The Traffic Club of Kansas City gave a dinner at the Hotel Muehlebach on October 3. Among those scheduled to speak on this occasion were Rev. Samuel H. Woodrow of St. Louis on "Industrial Warfare or Co-operation"; C. H. Dietrich, assistant freight claim agent and chairman of the committee on prevention of loss and damage claims of the Chicago, Milwaukee & St. Paul on "Loss and Damage."

The Chicago, Rock Island & Pacific has filed with the Public Utilities Commission of Illinois new tariffs for the Chicago suburban district to become effective on November 1. The rates have been increased to conform more nearly with fares on other lines engaged in suburban traffic. In a circular addressed to the patrons of the road, L. M. Allen, passenger traffic manager, states that the suburban traffic has yielded a return of less than one per cent on the capital invested.

"New York & New Jersey Express Company" is the name of a corporation which has been formed in New York City, to haul freight by motor trucks between New York and places in New Jersey within a radius of 20 miles. The company will have 104 trucks, and expects to haul 55,000 tons of freight the first month. In Newark, ten miles from New York, and Elizabeth, fifteen miles, manufacturing has increased rapidly during the past two years, and the manufacturers have been inconvenienced by the congestion of freight on the railroads. The new concern plans to build a seven-story warehouse on Front street, Newark.

The Pennsylvania Lines provided a special train from Chicago to Philadelphia for delegates to the annual convention of the American Association of Traveling Passenger Agents, which took place on October 2 and 3. The train left Chicago on September 30, and included among those aboard were two regularly accredited women delegates, Miss Avis Lobdell, passenger agent of the Union Pacific at Portland, Ore., and Miss Olive Lender, passenger agent of the Union Pacific at Spokane, Wash. The Union Pacific has two other women passenger agents on its payroll, one at Seattle, Wash., and the other at Walla, Walla.

The Trunk Line Association has announced reduced passenger fares for residents of Washington returning to their homes for the November election or for registration, which are also applicable to members of their families. The rate announced is 2 cents per mile in each direction, with a minimum of $1 for the round trip, going and returning via the same route, from Washington to points in Delaware, Maryland, New Jersey, New York, Pennsylvania and West Virginia, tickets to be sold good

going on dates beginning October 5, and good returning to reach Washington not later than November 12. A joint agency for the identification of voters will be established under the jurisdiction of the Washington terminal lines. The League of Republican State Clubs has also asked other passenger associations to make similar arrangements.

For the purpose of aiding farmers and others along its lines to get in touch with the most advantageous markets for the sale of their products, the Nashville, Chattanooga & St. Louis has inaugurated a free marketing service in charge of L. P. Bellah, general agent. Farmers are asked to communicate with the company for the complete description, prices and other necessary information which will be furnished free of charge. Prospective purchasers of agricultural products are invited, also, to advise the department of their needs so that the supply may be directed to the demand. It is believed that the inauguration of this service will work to great advantage, especially as it will enable the farmers and gardeners in the territory served by the company's lines to dispose of those products not now reaching the market through established channels.

The New York State Public Service Commission, Second district, announces that there has been filed a new joint and local freight tariff making changes in class rates between points in New York state located in Central Freight Association territory, also between points in such territory and Niagara Frontier points. It is issued by E. Morris as agent for various carriers operating in such territories. The rates proposed are based on distance, and they make changes in every class rate. A comparatively small number of the rate changes are reductions; a great majority are increases. The plan of stating rates in the new tariff differs in many respects from that heretofore used, and because thereof, and the great number of rate changes made, as well as the large number of points affected, the commission cannot publish either the new rates or the changes. The tariff is E. Morris, agent, tariff P. S. C. No. 28, to take effect December 1.

The state of Texas has filed an answer in the injunction proceedings instituted by the railroads against the Texas commission's recent order cancelling the advanced rates it had previously allowed, asking that the Interstate Commerce Commission may be made a party to the proceedings and that the Interstate Commerce Commission's order in the Shreveport case be suspended pending the disposition of the suit. The Texas attorney general's department has given out a statement regarding the controversy, in which it says that by the charter contracts between the railroads and the state, the state expressly reserved the right to control intrastate rates, that the laws under which more than 32,000,000 acres of land were donated to the railroads by the state expressly reserved the power to the state to regulate intrastate rates, and that since the railroads have received the lands and the benefits thereof they are estopped to question the power of the state as reserved in such grants. The statement says that if the order of the Interstate Commerce Commission should be given the meaning and effect claimed by the railroads their direct obligations to the state would be repudiated. The Texas Industrial Traffic League, an organization of the traffic departments of Texas shippers, has appointed a committee for the purpose of endeavoring to prevent extended litigation between the railroad commission and the railroads over the questions arising from the decision of the Interstate Commerce Commission. After the Texas commission had cancelled the increased state rates which it had allowed in the hope that the railroads would accept them in place of the higher rates authorized by the Interstate Commerce Commission, this committee communicated with the railroads, inviting their co-operation in an effort to reach a compromise without extended litigation. But since the matter has been taken into the courts and has gone before the Interstate Commerce Commission in a petition of the Louisiana railroad commission, the shippers' committee has issued a statement saying it has received no reply to its proposal to the railroads. In this statement H. H. Haines, traffic manager of the Galveston Commercial Association and chairman of the committee, says "the action of the Texas commission in cancelling at one fell swoop the advanced rates accrued to the carriers as a result of the recent extended hearing was a surprise to everybody," that the action must have been due to a misunderstanding between the carriers and the commission, as a result of which shippers will suffer from the confusion as to rates which must ensue. The committee thinks that there is a common ground on which the Texas railroad commission and the carriers and shippers should come together.

Traffic League and Proposed Changes in Rules of Practise Before Interstate Commerce Commission

In a letter dated September 27, the National Industrial Traffic League calls the attention of its members to proposed changes in rules of practise before the Interstate Commerce Commission, a matter which will be discussed at the annual meeting of the League in November. Believing that no adequate analysis of rate compilations or tabulated statements offered as exhibits can ordinarily be made at the hearing of a case when not filed and served prior to that time, the commission proposes to amend the rules of practise so this evidence must be filed in advance of a hearing. The proposed amendments are as follows:

PROPOSED AMENDMENT TO RULE III.

"To each complaint must be attached a descriptive list of such rate compilations and tabulated statements as are filed therewith in accordance with rule XIII, as amended.

PROPOSED AMENDMENT TO RULE XIII.

"All rate compilations and tabulated statements which the complainant intends to offer in evidence must be filed with the Commission at the time complaint is filed, and any compilations and statements which the defendant desires to submit in answer thereto must be filed with the Commission within 30 days thereafter. Similar data in rebuttal must be filed with the Commission 15 days after the service of the tabulations filed by the defendants.

"In investigation and suspension cases the respondents must file with the Commission all rate compilations and tabulated statements which they intend to offer in evidence within 15 days from the date of service of suspension order upon their agents in Washington. Protestants must file any compilations or statements they desire to submit in answer thereto within 30 days thereafter. Similar data in rebuttal must be filed with the Commission 15 days after the service of the tabulations filed by the protestants. These periods will not be extended except upon application to the Commission and for good cause shown.

"Five copies of all compilations and statements referred to in the two preceding paragraphs must be filed with the Commission, and the Commission will supply three copies thereof to opposing counsel upon request. In special cases the Commission may require additional copies to be furnished.

"Except where such compilations and statements are filed with the complaint, a notice describing such compilations and statements must be served upon all adverse parties."

The letter sent out by the League offers arguments pro and con the proposed changes. Objections are raised to the proposed rules on the ground that a shipper filing a complaint will be compelled to present his principal data to the carriers before the case comes on for hearing, holding that any party to the complaint should have the privilege and right to present at the hearing any data which bears on the subject, whether or not it has been previously submitted to the carriers at the time of filing the complaint. Furthermore, no case from which a material fact has been excluded can be said to have been properly treated or brought to a proper conclusion. It is also stated that one of the rules of the law of pleadings is that the pleadings must contain only the facts that constitute the cause of action and that evidential facts have no place in the pleadings which in this instance would be the petition or complaint filed with the Commission.

On the other hand, it is pointed out that the proposed rules would be of benefit to the shippers in connection with investigation and suspension cases. In these cases the carriers often file voluminous exhibits, making it necessary to ask for postponed hearings so that shippers may have an opportunity to analyze them. Inasmuch as most of the more important cases before the Commission are I. & S. cases the shippers would be better off than under the present mode of procedure. If it develops that additional evidence is required by the shippers in rebuttal, such data could be submitted orally at the hearing or it is likely that consent could be secured from the Commission, permitting such exhibits to be filed at the time of hearing. Under proposed rules points at issue will be more clearly defined and both sides will have a clearer understanding of the questions involved.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The New York Hay Exchange Association has filed a complaint against certain provisions of embargoes on hay issued by the New York Central.

The commission has further suspended from September 29 until March 29, 1917, tariffs providing for the cancellation of certain commodity rates on fireproofing filed by the Chicago Great Western, and by E. B. Boyd.

The commission has further suspended from October 3 until April 3, 1917, proposed increase in class and commodity rates from points in the Scranton and Williamsport, Pa., groups to western lake ports and to St. Paul.

The commission has further suspended from September 29 until March 29, 1917, the operation of proposed increases in rates on cotton bagging and duck from Chicago, Peoria, Ill., and other points to destinations in Kansas.

The commission has suspended from October 1 until January 29, 1917, tariffs filed by the Chicago & North Western proposing increased commodity rates on fuel wood in carloads from various points in Michigan to points in Wisconsin.

Examiner Gartner held a hearing at Washington on September 27 on the application of the Grand Trunk Railway of Canada to continue the operation of the boats of the Canada-Atlantic Transit Company, under the terms of the Panama Canal Act.

The Interstate Commerce Commission has further suspended from October 3, 1916, until April 3, 1917, the operation of tariffs filed by New England lines providing for the cancellation of certain proportional class and commodity rates from New England points to New York.

The Interstate Commerce Commission has suspended from October 4, 1916, to February 1, 1917, a tariff filed by the Carolina, Clinchfield & Ohio increasing the rate on cement in carloads from Kingsport, Tenn., to New Orleans and other Louisiana points from 13 to 15 cents per 100 lb.

The National Livestock Exchange (Chicago) has filed a complaint with the commission alleging that the privileges of feeding, watering, sorting and double-decking stock at certain stopping places on the Burlington, the St. Paul, the Rock Island, the Northwestern and the Minneapolis & St. Louis are discriminatory against many intermediate stations and against the public markets at the stockyards in the large cities in that territory.

Examiner Watkins of the Interstate Commerce Commission held a hearing at Washington on September 28 and 29 on proposed advances ranging up to 8.6 cents in the rates on cotton factory products from points in the Southeast to Chicago, Ft. Wayne, Akron, Cleveland, Detroit and Toledo. The advance applies only to the 20-cent rate north of the Ohio river, which is added to the rate of 35 cents up to the river, and was made by the Central Freight Association lines to restore a rate formerly reduced.

The commission has suspended from September 30 and November 1 until January 28, 1917, new rules in a tariff filed by the Missouri Pacific and St. Louis, Iron Mountain & Southern governing the routing of shipments of cotton from points in Arkansas, Missouri, Oklahoma and other states to interstate destinations reached by these lines and their connections. The present rules permit shippers to designate the delivering carrier, while under the proposed rules the joint through rates would only apply provided the carrier is permitted to control the routing.

The Interstate Commerce Commission has sent blank forms to the carriers involved in the lake cargo coal rate cases for the purpose of obtaining such information as is readily available tending to show the operating conditions obtaining with respect to shipments of lake cargo coal for representative routes from principal bituminous coal producing districts in the territory embraced in the investigation to the lower Lake Erie ports. The blanks call for a large amount of detailed information regarding the operating conditions for the period from July 1, 1915, to June 30, 1916, showing various details in the handling of this coal and loading conditions and other factors affecting the cost of the service.

The Unit Marketing System, a farmers' organization of Texas engaged in shipping and marketing vegetable products, and Roy Campbell, of San Antonio, Texas, engaged in the same business, have filed a complaint with the Interstate Commerce Commission against the St. Louis, Brownsville & Mexico and other southwestern roads against the practice of charging a stated refrigeration charge in addition to the freight rate on shipments of vegetables initially iced by the shipper. Complainants have established pre-cooling plants operating on a system which they prefer to that provided by the railways, and ask a decision similar to that of the commission in the Arlington Heights case, so that they may be allowed to pre-cool and pre-ice carloads of vegetables at their own expense, and that they may pay no more than $7.50 a car in addition to the regular freight rate for the privilege. They state that they are willing to release the railroads from liability for the condition of the shipments provided they are handled in reasonable time.

Coal Rates to Red Wing

Coal to Red Wing, Minn.; also Fourth Section Applications Nos. 2297 and 2874. Opinion by Commissioner Harlan.

The Chicago, Milwaukee & St. Paul is denied authority to maintain a rate on coal from Chicago and Milwaukee to Red Wing, Minn., lower than to intermediate points. The Chicago Great Western is authorized to establish a proportional rate from Chicago on bituminous coal in carloads, when originating at points in Kentucky and West Virginia, to Red Wing, the same as the rate maintained by the St. Paul from Milwaukee to Red Wing; and to maintain higher rates at intermediate points between, but not including, Alta Vista, Iowa, and Red Wing. The orders of suspension are vacated. (41 I. C. C., 309.)

Iron and Steel Tariffs Suspended

The Interstate Commerce Commission has suspended from October 1 and later dates, until January 29, 1917, tariffs providing for the cancellation of export commodity rates on iron and steel articles from Pittsburgh, Pa., Chicago, Ill., and other points in Central Freight Association and eastern Trunk Line territories to Atlantic coast and gulf ports. This would leave the domestic rates in effect and cause advances from Chicago to New York amounting to $1.62 a ton on pig iron, $1.74 on billets and blooms, and 10½ cents on iron and steel articles. A number of representatives of iron and steel companies recently appeared at an informal hearing before the suspension board of the commission and protested against the advances. The commission has also suspended until January 29 the proposed increases on certain iron and steel articles westbound for export from Chicago and Pittsburgh and other eastern points to the Pacific coast. The proposed advance from Chicago is from 30 to 40 cents, and from Pittsburgh from 42 to 45 cents.

STATE COMMISSIONS

The Public Service Commission of Indiana opened a hearing at Indianapolis, on October 2, on the proposed readjustment of freight rates of railroads in the state.

The principal railroads of West Virginia have asked the Public Service Commission of the state for authority to revise their freight rates December 1. The tariffs filed with the commission provide for increases in some cases and reductions in others.

PERSONNEL OF COMMISSIONS

William D. Williams, a member of the Texas State Railroad Commission, died at his home in Austin, Texas, October 1, of heart failure at the age of 59. He had served on the commission seven years.

COURT NEWS

The Baltimore & Ohio Southwestern has taken an appeal from the decision of the Circuit Court of Sangamon county, Ill., holding that the order of the state commission that coal cars be distributed according to the immediate needs of the shippers was neither illegal nor unreasonable. The Baltimore & Ohio Southwestern contends that the ruling of the commission is an attempt to control interstate commerce, as many coal cars are sent out of the state. The commission brought suit against the railroad for distributing coal cars according to the largest number of orders in the preceding 12 months.

Freight Rate Regulation

The Minnesota Supreme Court holds that Chapter 367, Laws 1915, providing that freight rates must be based on distance, and that as an exception to this rule the commission may, in making or adjusting tariffs, unite several communities into a common point regardless of distance, does not violate the provisions of section 1, article 3, of the Minnesota Constitution. It is not an attempt to delegate legislative power.—St. Paul Assn. of Commerce v. Burlington (Minn.), 158 N. W., 982.

Contract Requiring Shipper to Unload Stock

In an action for damages to a shipment of live stock by the carrier's failure to unload it on arrival, the Texas Court of Civil Appeals holds that evidence of a former custom to unload stock shipped to that point when unaccompanied by caretakers was incompetent to abrogate the express terms of a shipping contract requiring the shipper to unload it, if the shipper on a sufficient consideration executed such contract.—Rock Island v. Pavillard (Tex.), 187 S. W., 998.

Crossing Accident—Chauffeur's Negligence

The Supreme Court of the State of Washington holds that the driver of an automobile, who drove up a 12 per cent incline to a crossing on intermediate gear at a speed of 10 to 15 miles an hour, under which circumstances the car could have been stopped in from 3 to 5 feet, but failed to stop, though there was an approaching train in view not more than 300 feet away, was negligent, as matter of law, in attempting to cross in front of the train.—McKinney v. Port Townsend & Puget Sound (Wash.), 158 Pac., 107.

Contracts for Settlement of Claims for Injuries

The Oklahoma Supreme Court holds that a contract between a railroad company and an employee engaged in interstate commerce for the settlement of such employee's claim under the federal employers' liability act for injuries received, entered into after the accident is not void as being in conflict with section 5 of that act, providing that: "Any contract, rule, regulation or device whatsoever, the purpose or intent of which shall be to enable any common carrier to exempt itself from any liability created by this act, shall, to that extent, be void."—Patton v. Atchison, T. & S. F. (Okla.), 158 Pac., 576.

Contract for Payment of Transportation by Installments

The Atchison, Topeka & Santa Fe entered into a contract with a concert company to provide transportation for a number of musicians from points in Mexico, New York, and Texas, to Denver, to be paid for at the rate of $500 a week until paid. The transportation cost $2,000. In an action against the concert company's guarantor, the Colorado Supreme Court held that there was not discrimination within the meaning of the Interstate Commerce act. Some credit may be extended, and this is only unlawful when amounting to a discrimination, depending on the facts in each case.—Atchison, T. & S. F. v. Bowman (Colo.), 158 Pac., 814.

"Actual Cost" of Repairing Cars by Shippers

Construing the words "actual cost of the same" in the tariff provision, "When cars furnished by carriers named below for grain or other loading require repairing in order to insure against leakage in transit, and material necessary for this repair is furnished by the shipper, the carrier will pay the actual cost of the same, but not to exceed 80 cents per car," the Kansas Supreme Court holds that the words include the cost of the material and labor necessary to repair; but not the cost of inspecting or cleaning cars, or the cost of attaching grain doors. Reimbursement of shippers for the latter item is prohibited by rule 78 of the Interstate Commerce Commission when not expressly provided for.—Rock Milling, etc., Co. v. Atchison, T. & S. F. (Kan.), 158 Pac., 859.

Special Contracts as to Passenger Fares

Prior to the passing of the New York public service commission's law in 1910, a country club made a contract with a railroad for a round trip fare to the club members from Syracuse to the clubhouse of 15 cents in place of the ordinary round trip fare of 25 cents. While the contract was valid under the common law it was concededly illegal if entered into after the passing of that act. The railroad contended the act prevented it from carrying club members for less than the filed rates. The New York Supreme Court held that, where the legislature has passed a statute which makes a prior contract between a common carrier and a patron illegal, the carrier cannot be compelled to fulfill its covenant under such contract, and, while the contract was valid in its inception, the act rendered it unenforceable in a court of equity.—Onondaga Golf and County Club v. Syracuse & Suburban, 160 N. Y. Supp., 693.

Sale of Road Under Foreclosure Proceedings

Where a railroad was sold under foreclosure proceedings, and it was necessary to take additional time to search title and ascertain liens, to catalogue the property; or, for an opportunity to form a corporation to take over the operation of the road and its franchises, it is held that these were not grounds for an extension of time to complete the purchase; the statute providing that an individual purchaser at the sale of a railroad may operate for six months until a corporation has been formed for such purpose.

Under the New York statute, providing that a sale made in pursuance of any provision of this title must be at public auction to the highest bidder, with notice given by the officer making it, where a railroad was sold in foreclosure proceedings under an order of the court providing that, if any purchaser shall fail to comply with the terms of sale, the property will be again put up for sale under the same terms without application to the court, and such purchaser shall be held liable for any deficiency caused by the resale, where the purchaser failed to pay the balance of the purchase price in accordance with the terms of the sale, a subsequent private sale by the referee without publication was invalid.—Palmatier v. Catskill Mountain, 160 N. Y. Supp., 49.

Injury to Passenger in Vestibule—Questions of Negligence and Contributory Negligence for Jury

A passenger, while passing with others from one car to another, shortly after the train started, in search of seats, stopped for a short time in the vestibule connecting the cars, and, being jostled by others, placed his hand on the face plates on the connecting vestibules, where it was caught and injured when the plates opened and closed as the train entered or passed from a curve. The plates were not equipped with roller curtains or shield guards to protect passengers from injuries, although such equipment was in common use, and was used in some of the vestibules in the same train. In an action against the railroad the Circuit Court of Appeals, First Circuit, held that the questions of the company's negligence and the passenger's contributory negligence were both for the jury. Mr. Aldrich, district judge, said: "It cannot be that any of the older cases with reference to passengers standing upon the old-style platforms have any particular pertinency. The vestibule system is such as to reasonably present the question of fact whether the purpose was not to afford easy communication between the different parts of the train. We do not think any absolute rule, one way or the other, is created by the fact whether the train was a through one or one made up altogether of parlor cars, or altogether of vestibule cars. Given circumstances in that respect, one way or the other, might have some bearing upon the question of the reosonableness of care."—New Haven v. Kilby, 233 Fed., 252.

Obstruction of Fire Apparatus—No Evidence of Negligence

A novel point has recently been decided by the New York Appellate Division in a case where damages were claimed from a railroad company for a proportion of the value of a building and its contents which had taken fire. It was claimed that a fire engine had been obstructed by one of the defendant's freight trains for from 10 to 15 minutes at a crossing by the negligence of the company's servants. The train was a fast freight, of 53 cars, running on the West Shore tracks through Syracuse. It did not stop at the crossing, though there was evidence that the fire chief called on a brakeman to stop and cut the train in two, which could have been done in two minutes. The court said that the claim of negligence in the management of the train could not be sustained merely because it was now possible, in the light of what had happened, to map out a course which might have been better or wiser than that which was taken. Taking the most favorable view the evidence did not justify the jury's finding of negligence. The train had the right of way, only to be yielded to the fire department in an emergency. No official, no employee of the city, nor any one else by his mere ipse dixit could require the men in charge of the train to stop it or divide it into parts. The delay was partly caused by a freight train ahead, which unexpectedly stopped. Even taking into account the stoppage of this preceding train, which might proceed at any second, a finding of error of judgment on the part of the engineer was not justified.—Globe M. Iron & Steel Co. v. New York Central, 160 N. Y. Supp., 24.

Court Decisions Under the Employers' Liability Law

W. E. Kay, in an address before the Southeastern Association of Railway Claim Agents at Atlantic Beach, Fla., June 30 last, reviewing the present state of the laws regulating the liability of railroad companies for damages in cases where employees are injured, as affected by judicial interpretations, cited 34 illustrations of what had been decided in suits where the law was sustained, as follows:

An engineer switching cars from a train which had just been brought in from another state. K. C. R. Co. v. Pope, 152 S. W. 185.

A brakeman carrying ice for interstate train. Illinois Central v. Nelson, 203 Federal 956.

A brakeman injured by the negligence of a fellow servant working on an intrastate car. Carr v. N. Y. C., 136 N. Y. S. 501.

A brakeman, looking for tin cup for interstate train. B. & O. v. Whitacre, 124 Md. 411.

A brakeman on pick-up train containing interstate freight, setting brake on intrastate car. N. Y. C. v. Carr, 238 U. S. 160.

Firemen, firing engine to be attached to interstate train. Lonesellita v. N. Y. C., 94 Atl. 804.

Switching coal cars containing interstate shipments, for dumping into bunkers for use of interstate locomotives. Barlow v. Lehigh Valley, 143 N. Y. S. 1053.

A yard clerk meeting interstate train. St. Louis v. Seale, 229 U. S. 156.

A section foreman of switch yard where interstate train made up. Willever v. D. & R., 94 Atlantic 595

Inspector helping to clear a yard wreck. Southern Ry. v. Puckett, 85 Southeastern Rep. 809.

A roundhouse employee. Cross v. Chicago, 177 S. W. 1127.

An electric signalman controlling both intra and interstate trains. Cincinnati v. Bonham, 130 Tenn. 435

Truckman wheeling interstate freight from warehouse into car. Illinois Central v. Porter, 207 Fed. 311.

Pumper at station pump for interstate locomotives. Horton v. Oregon, 72 Washington 503.

The hauling of empty freight cars from one state to another. North Carolina v. Zachary, 232 U. S. 248.

Employee assisting in running train, when any cars go outside of state, though employee is not intending to pass state line. Mattox v. C. & A., 187 Ill. App. 529.

An employee reporting on interstate duty at station on express order. Lamphere v. O. R. & N., 196 Fed. 336.

Going to work on switch engine, used at outset of shift in interstate commerce. Knowles v. New York, 150 N. Y. S. 99.

Engineer going home on push car. L. & N. v. Walker, 162 Ky. 299.

Section hand returning on hand car to camp. San Pedro v. Davis, 210 Fed. 870.

Going from saloon to station, after brief absence. Graber v. Duluth, 159 Wis. 414.

Shoveling dirt from between interstate tracks. Lombardo v. Boston, 223 Fed. 427.

Repairs on trestle used in interstate commerce. L. & N. v. Walker's Admr., 162 Ky. 209.

Waiting for train to pass over track used for interstate traffic, on which laborer was repairing rails. Glunt v. Penna., 95 Atl. 109.

Unloading coal from cars. Kamboris v. Oregon, 146 Pac. 1097.

Switching coal cars from another state to trestle for unloading. Barlow v. Lehigh Valley, 214 N. Y. 116.

A member of train crew, weighing cars after delivery to consignee of interstate freight. Wheeling Terminal v. Russell, 209 Fed. 795.

Framing a new office in freight shed, used for both inter and intra-state traffic. Eng. v. Southern Pac., 210 Fed. 92.

Installing block signal system on track over which interstate trains passed. Saunders v. Southern Ry., 167 N. C. 375.

Moving oil from oil car to provide fuel for engines. Montgomery v. Southern Pacific, 64 Or. 597.

Boilermaker's helper, injured while assisting in shop in repairing engine regularly used in interstate commerce. Law v. Illinois Central, 208 Fed. 869.

Machinist in yard, sent to repair switch engine handling interstate freight. Staley v. Illinois Central, 119 N. E. 342.

Repairing switch engine for mixed traffic, temporarily withdrawn. Southern Pacific v. Pillsbury, 151 Pac. 277.

Car diverted for necessary repairs. St. Louis v. Conarty, 155 S. W. 93.

Mr. Kay also referred at length to the Spokane & Inland Empire case (reported in the *Railway Age Gazette* of June 23, 1916, page 1563), where a motorman, who had run past an appointed meeting station, and consequently was injured in a butting collision, recovered damages from the road, in spite of his negligence, because the road, in the opinion of the jury, had not provided adequate brake power, and so was violating the law. This decision was by the Supreme Court of the United States.

The following nine illustrations were quoted on decisions where the accidents, which were the subject of litigation, were held not to be covered by the Federal act:

Extra conductor, riding to serve on work train. Feaster v. P. & R., 197 Fed. 580.

Brakeman running on extra, lone engine, between intrastate points. Wright v. Chicago, 143 N. W. 220.

The Supreme Court of the United States, in Behrens v. Illinois Central, 233 U. S. 473, reversed the District Court of Louisiana and the Fifth Circuit Court of Appeals, which had held in 192 Fed. 581, that a fireman working on an intrastate train, then engaged in intrastate commerce, although ordinarily also engaged in interstate commerce, was included, and held that in this particular case the Federal act did not apply.

The construction of a building to be used in interstate commerce. Brans v. Chicago, 217 Fed. 234.

Building coal chute. Noris v. Chicago, 172 Mo. App. 125.

Repairing car for another railroad company. Heimbach v. Lehigh Valley, 197 Fed. 579.

Repairing boiler of wrecking train engine lying in roundhouse, excluded; it being an appliance which may or may not be used in interstate commerce. Ruck v. Chicago, 153 Wis. 158.

Cleaning stencils. Illinois Central v. Rogers, 221 Fed. 52.

The Supreme Court of the United States, in Robinson v. B. & O., 237 U. S. page 84, held that the Federal act gave no right of recovery to a Pullman porter, because he was not an employee of the railroad company; there is nothing in the act to show a congressional intent to include that class of operatives.

Liability for Acts of Railroads' Peace Officers

The authorities are almost unanimous in holding that when an officer of a railroad acting as a peace officer is merely performing his duty as such, and is not at the time furthering the interests of his company, such company will not be liable for his acts. The North Dakota Supreme Court holds that a railroad is not liable, under the act of 1913, making railroads "responsible for the acts of all conductors or other persons employed by it while acting as peace officers," for a malicious assault committed by a special peace officer employed by it, and a brakeman, when such assault is not committed for the purpose of protecting the company's property, or in the furtherance of its business, or while such persons are acting for it. A man was ejected from a train, about a mile from a station, for stealing a ride. While the train was at the station he came up with it and got into an altercation with another brakeman. He was chased away, and after circling the town returned to the station, where he was arrested on the public street by the peace officer, either on the charge of an assault with a deadly weapon alleged to have been committed during the altercation, or for having unlawfully stolen a ride on the train. After the arrest, he was assaulted by the brakeman, who was aided by the police officer, either by standing by without interfering or by holding the plaintiff. There was no proof whatever that at the time of the assault either the peace officer or the brakeman was acting for the protection of the company's property, or that the plaintiff was about to, or intended again to, board the train, or that the peace officer and brakeman had any idea that he intended so to do. The railroad was held not liable. When an appreciable interval intervenes between the acts of protection which are exercised by persons in the guarding of their employers' property and a malicious assault which they afterwards commit, the assault will be deemed to be a personal act of the servant, and not an act of the employer.—Kinnomen v. Great Northern (N. Dak.), 158 N. W., 1,058.

Railway Officers

Executive, Financial, Legal and Accounting

T. D. Alden has been appointed assistant freight auditor of the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kan.

Oswald J. DeRousse, who has been appointed assistant to the president of the Pennsylvania Railroad at Philadelphia, Pa., was born on February 18, 1867, and entered the service of the Pennsylvania Railroad on July 18, 1884, as telegraph operator at Philadelphia. During the following year he was transferred to the service of the New York, Philadelphia & Norfolk, in the office of A. J. Cassatt, president, where he remained until March, 1897, when he was elected secretary of that company. Upon the election of Mr. Cassatt to the presidency of the Pennsylvania Railroad, June 9, 1899, Mr. DeRousse was transferred to the Broad Street station and was appointed chief clerk in the office of the president. In January, 1913, he was appointed general assistant in the office of the president, which position he held at the time of his appointment on September 30, as assistant to the president, as above noted.



O. J. DeRousse

Operating

G. A. Newell has been appointed to the new office of assistant superintendent of transportation of the Southern Pacific.

P. J. Regan has been appointed trainmaster on the Montana division of the Northern Pacific, with office at Missoula, Mont.

John A. Cook, trainmaster of the Wabash, with office at Moberly, Mo., has been appointed assistant superintendent of terminals at Detroit, Mich.

John Dody, passenger conductor on the Oregon Short Line, has been appointed division trainmaster, with office at Pocatello, Idaho, succeeding G. L. Hickey, assigned to other duties.

C. A. Reinhart, terminal trainmaster of the Central of Georgia at Savannah, Ga., has been appointed trainmaster, with headquarters at Savannah, vice C. E. Scarborough, promoted.

S. S. Huffman, assistant superintendent of the Chicago & Eastern Illinois at Brazil, Ind., has been appointed assistant superintendent of the Illinois and St. Louis divisions, with office at St. Louis, Mo.

B. M. Hudson, general foreman of bridges and buildings of the Trinity & Brazos Valley at Teague, Tex., has been appointed assistant superintendent, vice E. R. Gassman, resigned, to engage in other business.

H. G. Sparks, division engineer of the Chicago & Eastern Illinois at Salem, Ill., has been appointed assistant superintendent of the Chicago division, with office at Brazil, Ind., succeeding S. S. Huffman, promoted.

J. O. Bell, division superintendent of the Chicago & Eastern Illinois at Salem, Ill., has been appointed superintendent of the Chicago division, with office at Danville, Ill., succeeding G. H. Trenary, deceased.

Henry Shearer, assistant general superintendent of the Michigan Central at Detroit, Mich., has been appointed general superintendent, and W. H. O'Keefe, superintendent of terminals at Detroit, has been appointed assistant general superintendent, with headquarters at Detroit, succeeding Mr. Shearer.

E. A. Peck, general superintendent of the Baltimore & Ohio, Pennsylvania district, with headquarters at Pittsburgh, Pa., having been granted leave of absence at his own request, effective October 1, M. H. Cahill, superintendent of the Cumberland division, at Cumberland, Md., has been appointed general superintendent of the Pennsylvania district, with headquarters at Pittsburgh. G. D. Brooke, superintendent of the Ohio division of the Baltimore & Ohio Southwestern, at Chillicothe, Ohio, has been appointed superintendent of the Cumberland division of the Baltimore & Ohio, and A. A. Iams, superintendent of the Wellston & Delphos divisions of the Cincinnati, Hamilton & Dayton, at Dayton, Ohio, has been appointed superintendent of the Ohio division of the Baltimore & Ohio Southwestern, with headquarters at Chillicothe.

H. M. Hallock, the announcement of whose appointment as general manager of the Chicago & Illinois Midland, was recently made, was born June 19, 1873, at Havensville, Kan. After attending the elementary schools of his native city, he entered Campbell University at Holton, Kan., from which institution he graduated in 1890. In September of the same year he took employment with the Atchison, Topeka & Santa Fe as telegraph operator and station agent, serving in these capacities until 1900. He then went to the Chicago, Rock Island & Pacific, passing successively through the grades of telegraph operator, despatcher, chief despatcher, trainmaster, superintendent and general superintendent. In 1912 he became connected with the Chicago & Illinois Midland as general superintendent, which position he held until his present appointment became effective September 1, 1916. He succeeded F. S. Peabody, who was both second vice-president and general manager, but who now retains the former title only.

Arthur B. Clark, assistant engineer of maintenance of way of the Pennsylvania Railroad, in charge of roadway and track at Philadelphia, Pa., has been appointed superintendent of the Renovo division, with headquarters at Renovo, Pa., succeeding J. M. James, deceased. Mr. Clark was born on October 1, 1867, at Green Village, Pa., and was educated at Mercersburg College, and in 1891 graduated from Lafayette College, with the degree of C. E. During his summer vacations in 1889 and 1890 he served as a rodman on the Pennsylvania Railroad, and after graduation he was rodman on the Philadelphia division, at Philadelphia. In July, 1896, he was promoted to assistant supervisor on the Altoona division, and later held the same position on the Pittsburgh division, until July, 1900, when he became supervisor on the Baltimore division, Northern Central Railway; one year later he was transferred to the Pittsburgh division, Pittsburgh. He was made assistant engineer of the Middle and Western division, Philadelphia & Erie, on December 15, 1905, and was subsequently transferred in the same capacity to the West Jersey & Seashore, and later to the Maryland division of the Philadelphia, Baltimore & Washington. In January, 1910, he was appointed principal assistant engineer of the same road, with office at Wilmington, Del., and in June, 1913, he became assistant engineer of maintenance of way of the Pennsylvania Railroad, in charge of roadway and track, which position he held at the time of his recent appointment as superintendent of the Renovo division of the same road, as above noted.



A. B. Clark

A. K. Stone, the announcement of whose promotion from trainmaster to be superintendent of the Montana division of the Great Northern with office at Havre, Mont., was recently made, has been in railway service close to 35 years. He began as a brakeman with the Chicago, Burlington & Quincy and later passed successively through the grades of freight conductor, passenger conductor, assistant trainmaster and trainmaster, on this same road. He resigned this latter position to become superintendent of the Omaha & Council Bluffs Railway & Bridge Company, and a little later on became superintendent of the Kansas City Suburban Belt, now the Pittsburgh & Gulf. For two years he was trainmaster of the Coney Island division of the Brooklyn Rapid Transit and then resigned, taking a position with the Butte Terminal Western Weighing and Classification Bureau, as commissioner. In 1905, he was appointed trainmaster on the Panama Railroad and was soon promoted to master of transportation, which position he held at the time he returned to the States in 1913. He was then made trainmaster of the Great Northern, with office at Grand Forks, N. D., which position he was holding at the time his present appointment became effective, September 10, 1916. Mr. Stone is a brother of Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers.



A. K. Stone

Traffic

N. W. Pringle, division passenger agent of the Lehigh Valley to Buffalo, N. Y., has been appointed division passenger agent with headquarters at Ithaca.

C. B. McCall, general freight and passenger agent of the Charlotte Harbor & Northern, has been appointed traffic manager, with headquarters at Boca Grande, Fla.

John A. Middleton has been appointed general agent of the St. Louis-San Francisco with office at Kansas City, Mo. This is a newly created position, this road not having had representation here in this capacity previously.

N. R. DesBrisay, chief clerk in the passenger department of the Canadian Pacific at New York, has been appointed district passenger agent, with office at St. John, N. B., succeeding M. G. Murphy, who has been appointed general agent, passenger department, with headquarters at Detroit, Mich.

O. P. McCarty, passenger traffic manager of the Baltimore & Ohio, at Baltimore, Md., has had his authority extended over all owned, leased or controlled lines. W. B. Calloway, general passenger agent of the Baltimore & Ohio Southwestern, and the Cincinnati, Hamilton & Dayton at Cincinnati, Ohio, has been appointed general passenger agent of the Eastern Lines, with headquarters at Baltimore, Md.; George W. Squiggins, general passenger agent of the Baltimore & Ohio, at Baltimore, has been appointed general passenger agent of the Southwest district, with headquarters at Cincinnati, Ohio; and B. N. Austin, general passenger agent of the lines west of the Ohio river, at Chicago, has been appointed general passenger agent of the Northwest district, with headquarters at Chicago.

Engineering and Rolling Stock

O. W. Connett has been appointed valuation engineer of the Western Maryland, with headquarters at Baltimore, Md.

W. R. Elmore, acting master mechanic of the Nevada Northern, has been appointed master mechanic, with headquarters at East Ely, Nevada.

H. H. Orr, chief signal inspector of the Chicago & Eastern Illinois, has been appointed signal engineer with office at Chicago, Ill.

A. W. White, office engineer of the Chicago & Eastern Illinois, at Chicago, Ill., has been appoined division engineer with office at Salem, Ill., vice H. G. Sparks, transferred to the operating department.

J. S. McBride, valuation engineer of the Chicago & Eastern Illinois, has been appointed principal assistant engineer, with office at Chicago, Ill. He will still perform the duties connected with his former office as valuation engineer, in addition to those of his new position.

Frank H. Reagan, superintendent of shops of the Delaware, Lackawanna & Western at Scranton, Pa., has been appointed master mechanic of the Scranton, the Syracuse & Utica and the Bangor & Portland divisions, succeeding George Durham, resigned to go to another company. B. H. Davis, road foreman of engines at Scranton, has been appointed assistant master mechanic of the same divisions with headquarters at Scranton.

C. H. Niemeyer, division engineer of the Pittsburgh division of the Pennsylvania Railroad, has been appointed assistant engineer of maintenance of way, in charge of roadway and track, with headquarters at Philadelphia, Pa. J. B. Hutchinson, Jr., division engineer of the Monongahela division, has been appointed division engineer of the Pittsburgh division. C. E. Brinser, division engineer at Williamsport, succeeds Mr. Hutchinson. A. W. McClellan, division engineer of the Trenton division, succeeds Mr. Brinser, and Elmer Irving, supervisor at Lancaster, has been appointed division engineer of the Trenton division, succeeding Mr. McClellan.

H. E. Stevens, engineer of bridges on the Northern Pacific, with office in St. Paul, Minn., has been appointed chief engineer with the same headquarters, effective October 1. He was born March 8, 1874, at Bluehill, Me. After attending the common and high schools of his native community, he entered the University of Maine, from which institution he graduated in 1897, after completing the engineering course. Immediately upon leaving the University he took up private engineering practice. About three years later he became associated with Ralph Modjeski, of Chicago, Ill., with whom he remained until the early part of 1904. In May of that year he entered active railway service with the Northern Pacific, being assigned to the bridge department. For three years he was engaged in bridge construction along various parts of the system. In 1907, he was appointed engineer of bridges, which position he was holding at the time his recent appointment became effective.



H. E. Stevens

F. W. L. Schneider, supervisor of the Pennsylvania Railroad at Tyrone, Pa., has been appointed supervisor with office at Lancaster. S. L. Church, supervisor at Dravosburg has been appointed supervisor with office at Tyrone. H. A. Gass, supervisor at Wilkes-Barre, becomes supervisor at Dravosburg. F. D. Davis, supervisor at Barnesboro, becomes supervisor at Wilkes-Barre. J. D. Archibald, assistant supervisor at Lamokin, has been appointed supervisor with office at Barnesboro. R. L. Kell, assistant supervisor at Altoona, becomes assistant supervisor at Lamokin. H. H. Kauffman, assistant supervisor at York, becomes assistant supervisor at Altoona. R. P. Graham, assistant supervisor at Freeport, becomes assistant supervisor at York, Pa. E. B. Gallow, assistant supervisor at Phillipsburg, N. J., becomes assistant supervisor at Freeport, Pa., and J. G. Poffenberger, transitman in the office of the engineer of maintenance of way, has been appointed assistant supervisor at Phillipsburg.

W. L. Darling, chief engineer of the Northern Pacific, with office at St. Paul, Minn., whose resignation to take effect October 1, has just been accepted, was born March 26, 1856, at Oxford, Mass., where he received his early education. Upon graduating from the Worcester Polytechnic Institute, he entered the engineering department of the Northern Pacific. From June, 1879, to August, 1883, he was first resident and then locating engineer on the Northern Pacific, and from August, 1883, to February, 1884, resident engineer on the St. Paul & Northern Pacific. From April to July, 1884, he was locating engineer on the Chicago, Burlington & Quincy, and from December, 1884, to July, 1885, locating engineer on the Florida Railway. In August, 1885, he was appointed engineer in charge of terminals on the Chicago, Burlington & Northern, which position he held until May, 1887. From May to December of this same year, he was chief engineer of the Duluth, Watertown & Pacific. From December, 1887, to January, 1889, he was assistant engineer of the St. Paul, Minneapolis & Manitoba, and from January, 1889, to March, 1891, assistant engineer on the Northern Pacific. From March, 1891, to July, 1898, he was principal assistant engineer on the same road, being appointed assistant chief engineer in July, 1898. From June, 1901, to August, 1902, he was chief engineer. In August, 1902, he was appointed chief engineer of the Chicago, Burlington & Quincy with office at Chicago, Ill., and held this office until October, 1905, being then appointed chief engineer of the Pacific Railway, with office at Seattle, Wash., resigning in January, 1906, to become chief engineer of the Northern Pacific. During the years 1906 to 1909 inclusive, he was, in addition to his duties as chief engineer of this latter road, also consulting engineer in active charge of construction of the Spokane, Portland & Seattle, from Spokane, Wash., to Portland, Ore. In May of this present year he sent in his resignation to take effect October 1, 1916. He retires to engage in private engineering practice.



W. L. Darling

OBITUARY

W. E. Parrott, commercial agent of the Pennsylvania Lines West, with office at Kansas City, Mo., died at his home in that city, on September 29.

William A. Childs, manager of the Calumet & Hecla, which is operated by the Calumet & Hecla Mining Company, died at his home in Calumet, Mich., on September 27, aged 81 years.

George H. Trenary, the announcement of whose retirement from the superintendency of the Chicago division of the Chicago & Eastern Illinois, with office at Danville, Ill., had scarcely been made when his death followed, was born February 9, 1867. He graduated from the High School at Urbana, Ill., in 1883 and entered railway service almost immediately as a messenger and call boy, learning telegraphy with the Indiana, Bloomington & Western. From that time until 1892 he was agent on this same road and its successors at various points along the line, and from 1892 to 1895 he was joint agent of the Chicago & Eastern Illinois, the Cleveland, Cincinnati, Chicago & St. Louis and the Toledo, St. Louis & Kansas City at Veedersburg, Ind. From 1895 to 1896 he was agent of the Chicago & Eastern Illinois, and from 1896 to 1899 he was chief clerk to the general superintendent on this same road. From July, 1899, to November, 1904, he was division superintendent at Brazil, Ind., and from November, 1904, to July, 1911, he was division superintendent of this same line, with office at St. Elmo, Ill. On July 1, 1911, he was made superintendent of the Chicago division with office at Danville, Ill., which position he was holding when he applied for a leave of absence on account of continued ill health. He died October 2, 1916, after only a few days' leave of absence from his office.

Equipment and Supplies

LOCOMOTIVES

The Wheeling & Lake Erie is inquiring for 15 Mallet type locomotives.

The Western Maryland is asking for prices on 20 Mallet type locomotives.

The Atlanta, Birmingham & Atlantic is inquiring for 3 2-10-2 type locomotives.

The Chesapeake & Ohio is understood to be contemplating the purchase of 25 Mallet type locomotives.

The Worth Brothers Company, Coatesville, Pa., has ordered two 0-4-0 type locomotives from the Baldwin Locomotive Works.

The Cherry River Boom & Lumber Company, Richwood, W. Va., has ordered one 2-6-0 type locomotive from the Baldwin Locomotive Works.

The Carnegie Steel Company is understood to be contemplating the purchase of 10 to 15 locomotives for use in the Youngstown district.

The Paulista Railway of Brazil has ordered 4 Pacific type locomotives from the American Locomotive Company. They will have 23 by 26-in. cylinders, 66-in. driving wheels, and a total weight in working order of 220,000 lb. They will also be equipped with superheaters.

The New York Central was reported in the *Railway Age Gazette* of September 22 as having ordered 115 locomotives from the Lima Locomotive Corporation. The order consists of 55 Mohawk type and 60 eight-wheel switchers. The Mohawk type will have 28 by 28-in. cylinders, 69-in. driving wheels, and a total weight in working order of 343,000 lb. The eight-wheel switchers will have 23½ by 30-in. cylinders, 57-in. driving wheels, and a total weight in working order of 213,000 lb. All these locomotives will be equipped with superheaters.

FREIGHT CARS

The United States Gypsum Company has purchased 25 mine cars.

The Union Tank Line is reported inquiring for 500 to 1,000 tank cars.

The Chicago & North Western is inquiring for 500 50-ton steel ore cars.

The Chesapeake & Ohio is reported to be inquiring for 1,000 50-ton hopper cars.

Gulf States Steel Company is in the market for 8 hopper cars and 10 flat cars.

The Mahoning & Shenango has ordered 10 cars from the St. Louis Car Company.

The Pere Marquette has ordered 100 steel underframes from the Pressed Steel Car Company.

The Ben Franklin Coal Company has ordered four hopper cars from the Pressed Steel Car Company.

The Illinois Central is inquiring for 400 combination ballast and general service cars, also for 600 all-steel composite cars.

The Carolina, Clinchfield & Ohio has purchased 400 all-steel, 50-ton hopper cars, and 100 all-steel, 50-ton gondola cars from the Pressed Steel Car Company.

The Western Maryland, reported in the *Railway Age Gazette* of September 22 as being in the market for 2,000 hopper cars, is reported to have ordered this equipment from the Pullman Company. This item has not been confirmed.

The New York Central is reported to have ordered 2,000 gondolas and 1,000 box cars from the American Car & Foundry Company, and 2,000 gondola cars from the Standard Steel Car Company, in addition to the 5,000 cars previously ordered. This item has not been confirmed.

PASSENGER CARS

The Norfolk & Western is in the market for one private car, and is also inquiring for 50 all-steel passenger cars.

The Chicago Surface Lines are in the market for 30 to 100 street cars.

The Chicago, Lake Shore & South Bend is in the market for 10 trailers and for two combination express and baggage cars.

IRON AND STEEL

The Ann Arbor is reported to be in the market for 2,500 tons of steel rails.

The Chicago & Alton is reported to be in the market for 3,000 tons of steel rails.

The Central of New Jersey is reported to be in the market for 1,000 tons of steel for bridge renewal work.

The Pennsylvania Lines West are reported to be in the market for 5,000 tons of steel rails.

The Ogden, Logan & Idaho has ordered 146 tons of pony through trusses for bridges at Ogden, Utah, from the Ogden Salt Lake Company.

SIGNALING

The Northern Pacific will install a 4-lever addition to the existing 16-lever, model 2, unit lever type electric interlocking machine at Grassy Point, Minn., and will install a 40-lever Saxby & Farmer mechanical interlocking plant with 34 working levers at West Duluth, Minn. The material for these plants is being furnished by the General Railway Signal Company, and the installations will be made by company forces.

The Chicago & North Western has under construction 102.5 miles of single-track signaling between Clyman Junction, Wis., and Wyeville, and 75 miles of single-track signaling between Shoreline (Milwaukee) Wis., and Rosemere (Manitowoc). The absolute permissive block system is being used with G. R. S. model 2A, upper-quadrant signals. In connection with these installations passing tracks will be extended to provide 100-car capacity in each case.

The Baltimore & Ohio and the Wabash contemplate the installation some time next year of an electro-mechanical interlocking plant for the protection of the crossing of these lines in Defiance, Ohio. The machine will have 56 mechanical and 40 electrical levers. In connection with the extension of double-track on the B. & O. from East Defiance to Defiance, automatic signal protection will be extended over this section of line, which is now operated as single-track under the protection of controlled manual block. The B. & O. will probably further extend its automatic signals to Sherwood, a distance of 10.1 miles.

Construction Progress on Kongo Railways.—In the annual report on Kongo for 1914 a review of the progress in railway construction was given. The Cape-to-Cairo Railway is now operating through trains from Cape Town to Kambove, north Elizabethville. The next stretch is from Kambove to Bukama, a distance of 204 miles by the newly adopted route. At the end of March, 1915, 86 miles of this had been entirely completed, and the roadbed finished some 10 miles more, but work is progressing slowly on account of the difficulty in receiving materials. From Bukama there is an all-rail-and-water route to Boma, and when the Kambove-Bukama section is completed it will be possible to travel in comparative comfort from Cape Town through Central Africa to Boma and Banana on the Atlantic coast.

Change British Time October 1.—Legal time will be put back one hour beginning 3 a. m., October 1. This means that British time from October 1 will be the same as it was before the daylight-saving system was inaugurated on the morning of May 21, when all clocks in the country were pushed forward one hour at two o'clock, in accordance with the requirements of the daylight-saving act.

Supply Trade News

The Western Electric Company has moved its offices and show rooms in Buffalo from 98 Terrace to 709-711 Main street. J. W. Tabb is the manager of these offices.

G. L. Simonds & Co., Chicago, have changed their name to the Vulcan Fuel Economy Company. The personnel and policies of the organization remain the same.

Major William G. Ramsay, a vice-president and director of the E. I. du Pont de Nemours Powder Company, Wilmington, Del., and chief engineer of its construction department, died on September 28 of pneumonia.

R. W. Hunt & Co., Chicago, have been awarded the contract for the inspection of all the rails and fastenings, aggregating over 400,000 tons, which have been ordered recently from the steel mills of this country by the Russian government railways.

Robert C. Clifford, who has for the past four years been district sales manager for the United States Cast Iron Pipe & Foundry Company, in charge of its St. Louis & Kansas City offices, is now associated with the Walter A. Zelnicker Supply Company, St. Louis, in charge of their rail department.

The Roberts & Schaefer Company, Chicago, has made a contract with the Union Railway Company, Memphis, Tenn., for the designing and building of an automatic electric, reinforced concrete, standard counterbalanced bucket locomotive coaling plant and sand handling facilities to be installed at Sergeant Yard, Memphis, Tenn.

The McKeen Motor Car Company, Omaha, Neb., builders of electric railway motor cars, has just shipped a 55-ft. 200 hp., combination passenger and baggage motor car to the Lakeside & Marblehead Railway, Danbury, Ohio. This self propelled car will operate between Danbury and Marblehead, in place of the four wheel gasolene motor car now in service.

The St. Louis, Iron Mountain & Southern has awarded a contract to the Roberts & Schaefer Company for the building of a 250-ton capacity automatic electric, reinforced concrete coaling plant for installation at Dupo Yard, south of St. Louis, Mo. The Roberts & Schaefer Company will build a similar plant for the Nevada Northern at East Ely, Nevada.

The Burnside Steel Company, Chicago, Ill., has been incorporated with a capital stock of $100,000. It has purchased a tract of land at Ninety-second and Kimbark Avenue, and is erecting an 80 ft. by 200 ft. foundry building, a 30 ft. by 50 ft. office and pattern storage building, together with material bins, etc. It will produce steel castings and is installing a side blow converter. It will be ready for operation on December 1, this year. The office of the company is at 548 Railway Exchange Building, Chicago. H. F. Wardwell is president, and C. S. Daniels, secretary.

George A. Kyle has been engaged as engineer in charge of location and construction of the railways to be built in China by the American International Corporation, New York City, and the Siems-Carey Railway and Canal Company, St. Paul, Minn. He will work with officials of the Chinese Government in deciding upon the lines to be built. Mr. Kyle has worked in both hemispheres, both north and south of the equator. He was associated with John Hays Hammond in the Rand, in South Africa, and in Alaska he has built over 600 miles of road, including the line from Seward to the Matanuska coal fields and a line to Fairbanks. More recently he has been engineer in charge of location and construction for the Northern Pacific Railroad.

The Edgewater Steel Company, Pittsburgh, Pa., recently incorporated, has purchased the plant of the Kennedy-Stroh Corporation at Oakmont, Pa. In addition to carrying on the lines of manufacture in steel and brass, formerly handled at this plant, new construction is now under way to give this company a well equipped plant for the manufacture of locomotive and car wheel tires, rolled steel wheels, gear rims, roll shells

and turbine rings. The directors of the company include: Chas. T. Schoen, E. W. Mudge, Maurice Falk, Wm. L. Jacoby, E. T. Weir, Leon Falk, W. H. Schoen, M. R. Jackson, C. M. Thorp, J. H. Baily, F. B. Bell. The officers are: President, F. B. Bell; vice-president, M. R. Jackson; treasurer, W. H. Schoen; secretary, J. H. Baily; general manager, F. C. Riddile.

Colonel Robert Cochran McKinney, chairman of the board of directors of the Niles-Bement-Pond Company, Plainfield, N. J., died at his summer residence in Belle Haven, Conn., after an illness of more than two years. He was born at Troy, New York, but in 1861 he moved to Cincinnati where he attended the public schools and Woodward High School until eighteen years of age. He next took a partial course in mechanical engineering in Cornell University. His student life was followed by employment in the draughting room and office of a company which manufactured steam pumping machinery at Hamilton, Ohio. In 1877 Mr. McKinney became associated with the Niles Tool Works and within two years was elected secretary of the company. A short time later he became treasurer and general manager. While with this company he had gained the title of Colonel through his service on the staff of Governor Bushnell, of Ohio. During the reorganization of the Niles Tool Works, necessitated on account of the rapidly expanding business, Colonel McKinney was pre-eminent. In 1898 the Pond Machine Tool Company, Plainfield, New Jersey, was purchased, and options were obtained on the works of the Bement Niles & Company, Philadelphia, Pa., as well as the Philadelphia Engineering Works. Thus the present Niles-Bement Pond Company, was created and Colonel McKinney was elected president of the company, in recognition of his achievement in creating and perfecting its organization. At the time of his death, as noted above, he was chairman of the board of directors.



Col. R. C. McKinney

TRADE PUBLICATIONS

Zelnicker's Bulletin.—The Walter A. Zelnicker Supply Company, St. Louis, has issued bulletin No. 207. This is a 40-page catalogue of rails, cars, locomotives, pipe, steel piling, machinery, tanks, etc.

Multiblade Fans.—The Clarage Fan Company, Kalamazoo, Mich., has recently issued catalogue No. 5, setting forth its line of multiblade fans for heating, ventilating and exhaust purposes. This is a 24-page booklet contained in a mailing folder; it is well illustrated and contains a number of capacity tables for the various size units. A more complete catalogue, No. 51, will be sent on request.

Goodrich Rubber Goods for Railroad Service.—This is the title of an attractive catalogue recently issued by the B. F. Goodrich Company, Akron, Ohio. The booklet, which contains 48 pages, is said to be the first complete catalogue of its kind, and the fact that the B. F. Goodrich Company specializes on rubber goods for railroads makes this catalogue of particular value. Pages 5-23 inclusive are devoted to the various kinds of hose, viz.: Switch engine fire hose, car heating steam hose and pneumatic tool hose. Descriptions of belting and matting fill several pages. The catalogue also describes belt fastenings, rubber cement, vacuum brakes diaphragms, rubber footwear, gaskets, rubber gloves, tiling, packing, respirators, tires, tubing, valves, wires and cables. The booklet is not only well illustrated, but many of the pages contain valuable points regarding the use of rubber goods—for example: "How to Store Rubber Goods," "A Few Points of Caution on Hose" and similar suggestions.

Railway Construction

Alcolu Railroad.—Construction work has been started near Hams, S. C., it is said, on an extension north towards Florence, about 10 miles. The company now operates a line from Alcolu east to Peroda Junction, thence north via Olanta to Hams. From Peroda Junction a branch line extends east to McElveen, in all about 43 miles.

Arizona Extension Railway.—Organized in Arizona to build a railroad from Jerome, Ariz., south to Mesa, on the Arizona Eastern, about 130 miles. J. S. Douglas, of the Phelps, Dodge & Co. interests, is said to be at the head of the new project. He is also largely interested in the United Verde Extension mines at Clarksdale, near Jerome, and it is reported that plans are being made to build a new smelter at these properties. It is understood that the El Paso & Southwestern is to be extended from Tucson northwest to a connection with the new line at Mesa.

Atchison, Topeka & Santa Fe.—The report of this company for the year ended June 30, 1916, shows that the Crosbyton-Southplains, extending from Lubbock, Texas, to Crosbyton, was acquired during the year, and an extension southwest from Lubbock of about 65 miles is now under construction; an extension of the Minkler Southern is also under construction from Lindsay, Cal., to Porterville, 12 miles. It is expected that both these projects will be completed during the current fiscal year. The North Texas & Santa Fe was organized to build from Hansford, Texas, to a point on the Santa Fe main line, at or near Shattuck, Ellis county, Oklahoma, 85 miles. Work was completed during the year on the extension of the Oil Fields & Santa Fe, and the line is now in operation from Jennings, Okla., south to Pemeta, thence southwest to Cushing, 30 miles.

Ettrick & Northern.—Constracts have been awarded to E. J. Matchett and John Raichie, Ettrick, Wis., for the construction of a railroad from Blair, Wis., to Ettrick, about eight miles. The work involves about 12,000 cu. yd. of excavation per mile, a maximum grade of 2.4 per cent and a maximum curvature of about 4 deg. There will be from 8 to 10 pile bridges, involving the use of about 350,000 ft. of lumber. John C. Gavney, president, Arcadia, Wis., Tony Knuth, chief engineer.

Irwin-Herminie Traction.—This company has under consideration plans for building an extension, it is said, from Irwin, Pa., about 10 miles north to Export. The company now operates a line from Irwin south to Herminie.

Kentucky Roads.—The Interstate Coal & Lumber Company, Elkins, W. Va., is planning to build a 12-mile narrow gage line, it is said, along Middlefork and Grassy creeks, in Leslie county, Kentucky.

Los Angeles & Salt Lake.—This company will build a new line from Pico, Cal., through Whittier, Fullerton, Anaheim to Santa Ana, about 25 miles. The contract for the grading work will soon be awarded. Four combination freight and passenger stations will be built. Both steam and gasolene-electric motive power will be used on the new line. A. Maguire, chief engineer, Los Angeles, Cal.

Oregon-Washington Railroad & Navigation Company.—This company has awarded contracts to Twohy Bros., Portland, Ore., for the construction of an extension from the mouth of Beaver Creek to the head of Carbon Creek, a distance of 10 miles. Camps have been erected and active work was commenced, October 1. About 125,000 cu. yd. of grading will be necessary together with the usual clearing, grubbing and the construction of a number of small bridges and culverts. The approximate cost of this undertaking will be close to $200,000.

Pennsylvania Lines West.—A contract has been given to Ferguson & Edmundson, Pittsburgh, Pa., to build part of a new 12-mile line from Chester, W. Va., along the south bank of the Ohio river east to the mouth of Raccoon creek, which is about three miles below Beaver, Pa. Construction will be started at once; it is the intention to have the extension in operation some time in the coming year.

Western Pine Lumber & Mill Company (Lumber Road).—This company will let a contract about the first of the year for the construction of a standard gage railroad from Holbrook, Ariz., to a point 74 miles due south. The primary object of this new line will be to transport this company's timber, but later on it will be divorced entirely from this kind of operation and become a common carrier. F. H. Bowen, Red Kay, Ind., is president.

RAILWAY STRUCTURES

Bryn Athyn, Pa.—The Philadelphia & Reading has given contracts to the J. E. Brenneman Company, for the substructure, to the McClintic-Marshall Company for the superstructure and to the Benjamin Foster Company for the waterproofing for a bridge to be built over Pennypack creek, east of Bryn Athyn. This bridge is being built for the Philadelphia, Newtown & New York Railroad to replace a through wooden truss which was destroyed by fire. It is to be a two span, single track, through plate girder bridge, each span to be 54 ft. 3 in. clear.

Chicago, Ill.—The Chicago, West Pullman & Southern is erecting a combination engine house and machine shop at One Hundred and Fourth street and Manistee avenue. The building will have concrete foundations, brick walls; will be one story high, 125 ft. long and 175 ft. wide. The machine shop will be steam heated. About $40,000 has been appropriated for this undertaking.

Greenville, S. C.—The Southern Railway is planning to carry out improvements to include the elimination of a number of grade crossings in Greenville and vicinity incident to the double tracking of its Washington-Atlanta line through that point. Some of these may be eliminated by the construction of overhead bridges and others by underpasses, the full details not having been worked out as yet.

Halsted, Kan.—A combination passenger and freight station will shortly be erected here by the Atchison, Topeka & Santa Fe. The building will have a concrete foundation, brick superstructure and a tile roof; it will be one story high, 139 ft. long and 38 ft. wide. The cost of this undertaking is estimated at $12,000.

New York.—The Thomas J. Buckley Construction Company, New York City, submitted the lowest bid at $372,892 to the New York Public Service Commission, First district, for the construction of a railroad yard for the storage of subway cars in connection with the White Plains Road extension of the first subway. The yard is to be known as the Two Hundred and Thirty-ninth street yard, and is to have a capacity of 580 subway cars on 37 tracks; an adjoining yard is to be built on the same plot by the Interborough, to have a capacity of about 350 elevated cars. The plot upon which the two yards are to be built is irregular in shape, approximately 800 ft. by 1,100 ft. Elevated trains will obtain access to the yard by means of the Webster avenue-Gun Hill road extension of the Third avenue line, which connects with the White Plains road line. In order to prevent grade crossings at the entrance to the yard, the contract provides for the rebuilding of a portion of the White Plains road structure south of the Two Hundred and Forty-first street terminal station.

Omaha, Neb.—The Missouri Pacific will separate grades on the Belt Line Railway at Dodge, Douglas and Farnam streets, near Forty-sixth street. The work involves the construction of three viaducts masked with concrete, and about 300,000 cu. yd. of fill. The work will be done by company forces and will cost about $200,000. John A. Bruce, city engineer.

Portland, Ore.—The Oregon-Washington Railroad & Navigation Company has awarded a contract to Muir & McClelland, Portland, for the construction of new additions to the Albina shops. The contract includes the construction of a one-story brick addition to a pattern storehouse, a three-story concrete extension, 40 ft. by 40 ft., to a paint vault, a metal storehouse, an anthracite coal bin, an extension to a storehouse for baled waste, a platform extension and open shed, a skylight over present store shed, extension of lumber shed and marquise on east side of storehouse. The work will cost about $25,000. S. Murray, chief engineer.

Railway Financial News

Boston & Maine.—J. H. Williams, Henry P. Binney, Francis R. Hart and William H. Brooks have been elected directors of the Connecticut River Railroad, succeeding Charles E. Gross, Richard Olney, Henry W. Keyes and E. P. Kendrick. The new board of directors, it is said, will probably look more favorably on the provisions of the present reorganization plan by which the Connecticut River Railroad is to be merged with the Boston & Maine.

Chicago & Eastern Illinois.—In accordance with an order of the United States district court, the receiver of the Chicago & Eastern Illinois is paying all coupons due on the following underlying bonds: Danville & Grape Creek first mortgage 6 per cent; Evansville, Terre Haute & Chicago income 6 per cent; Chicago & Eastern Illinois first extension 6 per cent; Chicago & Eastern Illinois first consolidated 6 per cent; Evansville & Terre Haute first consolidated 6 per cent; Evansville Belt first 5 per cent.

Chicago, Rock Island & Pacific.—A protective committee for the St. Paul & Kansas City Short Line first mortgage 4½ per cent bonds has been formed, consisting of Eugene Meyer, Jr., Horace E. Andrews and W. D. Wood. A protective committee has also been formed for the Rock Island, Arkansas & Louisiana first mortgage 4½ per cent bonds, consisting of Henry Ruhlender, Andrew J. Miller and Timothy S. Williams.

Connecticut River Railroad.—See Boston & Maine.

Marietta, Columbus & Cleveland.—A press despatch from Marietta, Ohio, says that this road, which was recently sold under foreclosure, is to be abandoned and the equipment is to be sold. The Marietta, Columbus & Cleveland runs from Marietta, Ohio, to Palos, 45 miles.

Memphis, Dallas & Gulf.—Application has been made for a receiver for the Memphis, Dallas & Gulf by the trustee of the outstanding $420,000 bonds. The Memphis, Dallas & Gulf runs from Hot Springs, Ark., to Texarkana, 135 miles.

Missouri, Kansas & Texas.—The interest coupons, due April 1, 1916, on the $4,000,000 outstanding Missouri, Kansas & Eastern first mortgage bonds are being paid on presentation at the office of the receiver, 61 Broadway, New York.

Union Pacific.—This company has asked an injunction from the United States district court, Kansas City, against the members of the Public Service Commission of Missouri to prevent their interfering with the issuance of $2,000,000 bonds and from attempting to impose penalties for not submitting the proposal to issue the bonds to the Missouri Public Service Commission for approval.

Vicksburg, Shreveport & Pacific.—An annual dividend of 5 per cent has been declared on the outstanding $2,142,800 preferred stock. Nothing was paid on this stock in 1915, and 5 per cent was paid in 1914.

Record in German Freight.—In the period beginning with December of last year, the freight receipts of the German State railroads have surpassed those of any previous time. In the second year of the war (1915) freight receipts were $534,759,000, compared with $443,766,600 in the first year of the war (1914), and $530,233,200 in the last year of peace (1913).

Railway Returns in New South Wales.—The official report of the New South Wales Railways and Tramways Commission shows a deficit for the year ended June 30, 1916, of $668,934. The deficit of the railways was $1,088,874, while the tramways made a profit of $419,940. In 1914-15 the profit for the combined services amounted to $325,102. The total earnings of the tram lines for the year ended June 30, 1916, were $5,799,057. During that year 292,021,774 passengers were carried on the tram lines, as compared with 289,282,845 in 1914-15; the steam railways carried 92,850,838 passengers, against 88,774,451. No passengers were fatally injured by accident to trains.

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Automobiles as Preventatives of Railroad Building

In quite a considerable number of annual reports of railroad presidents in the last two years mention has been made of inroads which automobiles are making on railroad passenger business. There is another aspect, however, of the development of the automobile and automobile truck which may turn out to be of considerable advantage to railroad development. The use of the automobile and the automobile truck is acting as a preventative of branch line railroad building, thus conserving capital for betterments to existing lines. A good road is built by the state or county and this road, with the development of the automobile truck, acts as a feeder for the railroads which it crosses and, moreover, a feeder built with the public's capital and not the railroad company's capital. Unprofitable branch line mileage has been the old man of the sea on the back of many a railroad in this country. A good state or county road crossing a railroad will be a feeder to it for 40 to 50 miles on either side of the track. At the present time there are many rural communities which are sending freight and passengers over 40 miles or more of good road to the nearest railroad by automobile—as much traffic as the railroad could hope to get over a branch line, the interest charges on which would be great enough to eat up nearly all the profit on the line haul.

The Pennsylvania Annual Track Inspection

One outstanding feature of the annual track inspection of the Pennsylvania Railroad, described elsewhere in these columns, is the spirit of friendly rivalry shown by the rank and file of the maintenance forces. As the date of the inspection implies, the inspection trip was made after the summer's work had been completed and the track brought up to its best condition in preparation for the winter. It is apparent that the knowledge that its work is to be inspected causes each section gang to make an especial effort to have conditions on its individual section not only equal to, but better than those obtaining on other sections. The results of this rivalry are evinced in the present condition of the track and structures. Notwithstanding the difficulties that attended the carrying out of the season's program, caused by the great increase in traffic, the difficulty in obtaining materials and the labor shortage, it is the opinion of the higher officers that the tracks and structures were never in better condition.

Car Department Convention

The convention of the Chief Interchange Car Inspectors' and Car Foremen's Association, held at Indianapolis, Ind., last week, proved extraordinarily successful. At previous conventions practically all of the time has been given to the discussion of changes in the interchange rules with a view to securing a correct and uniform interpretation. This year it was not necessary to use all of the time for this purpose and, as will be noted from the report of the meeting, a number of individual papers were read relating to car department problems. This added greatly to the interest and value of the meeting and seemed to be appreciated by all of the unusually large number of members in attendance. Another innovation which was well received was the presentation of the papers in the prize competition on Car Department Apprenticeship and the announcement of the winners. This association, composed of interchange and car inspectors and car foremen who are necessarily in intimate touch with the practical detail problems of the department, should prove a most valuable adjunct to the Master Car Builders' Association and a close second to it. Judging from the forward stride which it has taken during the past year its members are fully awake as to these possibilities and intend to make the most of them.

Economizing with Freight Cars

Nearly every receiver of freight on a large scale has a bunch of grievances, or memories of grievances, against the railroads, because of delays to important shipments, and the railroad agent who has to deal with such receivers has to do a good deal of explaining, of course; many people seem never to realize the impossibility of moving all freight at express speed, and this need of explaining will never end. A perusal of the numerous printed circulars which the railroads everywhere have lately sent to shippers, appealing for prompt loading and unload-

ing of cars, brings this point to mind; for they are uniformly silent concerning it. The Interstate Commerce Commission's appeal looks at both sides of the question, but that appeal is so mild and general that, by itself, it will not arouse anybody. Of course, the railroad officer does not ignore his own part in the problem of averting a car famine, but in his circulars he seems to ignore it. The psychologists tell us that it is well, in many situations, to acknowledge even some faults of which we are not guilty; psychology might be an aid in this matter. Two of these circulars bring out points not usually touched upon. That of the Delaware & Hudson (which is notable for its excellent typography and arrangement) reminds consignees that holding a car overnight with a small quantity of freight—perhaps the last ton—may use up a whole day. It is to be hoped that the teamsters' union will not thwart this suggestion by refusing to work a few minutes after union hours to finish unloading a car. The Texas & Pacific takes the shippers into its confidence, in a practical way, as follows:

> Quite a large percentage of the Texas & Pacific loading goes beyond our rails. We must receive from our connections empties to take the place of these loads in order to keep a supply. That we may secure the largest number of empties in exchange for these loads, it is necessary that the routing beyond the Texas & Pacific rails (except destination delivery) be left open, thus giving us a chance to deliver loads to such of our connections as will give us the most empties for your benefit. Can we depend upon you for this assistance?

To the congressman, jealous of the "rights of the people," this may seem to be a very irregular proposal. To give away the right to route your freight will be looked upon as a dangerous concession. But the proposed arrangement will promote true reciprocity, and, no doubt, conduce to the most expeditious movement of all freight. And, as suggested in the latter part of the paragraph, this will be to the advantage of shippers as well as carriers.

MORE ABOUT THE CAR SITUATION

ALTHOUGH from the standpoint of statistics the car situation today is no more encouraging than it was early last spring when the eastern freight accumulation conference was called and demurrage rates were temporarily increased, railways and shippers seem less perturbed and business not so adversely affected as at that time. Embargoes at the eastern ports are placed with less frequency and although shippers in general are clamoring for cars, little complaint as yet has been heard from consignees. It is nevertheless a fact that the eastern roads now have in their possession about 100,000 cars more than they own, and that the carriers in the rest of the country are having difficulty in handling an unprecedented business with less than normal equipment. There is a severe shortage of box cars in the granger states, of coal and box cars in the territory of the Central Freight Association, of box cars in the South and Southwest, and of coal cars in the East. The railroads, the Interstate Commerce Commission and various state commissions, as well as organizations of the shippers, have issued circulars urging co-operation to the end that equipment be kept circulating as rapidly as possible. State commissions likewise have called hearings with a view of determining ways and means of further alleviating the car shortage.

How much more serious the car situation will become is, of course, a matter of conjecture. Unquestionably both the railroads and the shippers gained much valuable experience during the early part of the year which is of service to them at the present time. Mild weather during the remainder of the fall would do much to facilitate the movement of cars. In some respects the grain movement this year constitutes less of a spectre to railroad men than it did last year, when the crops were unusually heavy and matured late on account of an extended period of rain. The United States Department of Agriculture estimates the yield of winter and spring wheat for 1916 at approximately 600,000,000 bu., as compared with an estimated yield of 1,000,000,000 bu. for last year. The oat crop for 1916 is estimated at 1,230,000,000 bu., as compared with 1,540,000,000 bu. for 1915, and the barley crop for 1916 is estimated at 184,000,000 bu., as against 237,000,000 bu. for 1915. Not only is the yield of grain far short of what it was last year, but the movement of grain started earlier this year than in 1915.

The following table shows the receipts and shipments of oats and wheat to and from western storage centers and ocean ports of the United States, from July 1, to September 30, 1916, inclusive, as compared with the same period in 1915:

RECEIPTS AND SHIPMENTS OF WHEAT AND OATS IN JULY, AUGUST AND SEPTEMBER, 1915 AND 1916

	Wheat		Oats	
Received (bu.)—	1916	1915	1916	1915
Western Points	135,000,000	118,000,000	113,000,000	79,000,000
Seaboard Cities	82,000,000	47,000,000	43,000,000	27,000,000
Shipped (bu.)—				
Western Points	82,000,000	75,000,000	69,000,000	57,000,000
Seaboard Cities	69,000,000	39,000,000	39,000,000	20,000,000

The great corn movement will not begin until spring, and therefore does not concern us in considering the immediate future. Government forecasts of the corn crop, however, indicate that the yield for 1916 will fall short of that of the previous year by about 300,000,000 bu. More than the usual amount of corn may be kept on the farms this year for feeding purposes because of the high prices of cattle and hogs.

In spite of the small crops and the early beginning of the grain movement, the elevators in the middle western storage centers and at the ocean ports are filled to capacity and thousands of grain cars crowd the sidings of these points waiting to be unloaded. The prices of wheat, corn, and rye are the highest in history, with the result that there is a general clamor for cars. The carriers are moving grain as fast as equipment, elevator capacity and ships can handle it. The lack of enough ocean going vessels to take grain from the elevators as fast as it is ready for shipment is largely responsible for the slowness of the movement. The Great Lakes freighters, sold by the railroads under compulsion, have not been available to aid in carrying grain to the East. A negligible tonnage of grain has been shipped from Chicago to Buffalo via water this year, whereas formerly approximately 25 per cent of the total grain shipments from Chicago took the water route. The carriers, who protested against the sale of their lake lines, surely are not to be blamed if their boats have left the lakes or are now engaged in the transportation of other freight for their present owners.

Although the problem confronting transportation officials is a difficult one, according to records of past years we may anticipate a slackening in the demand for cars in the early part of November. In the meantime the trend of traffic continues to be towards the East, and the number of western cars in that territory continues to increase with resultant embarrassment to the originating roads. Car congestion in the East is due rather to the tremendous increase in business activity than to a lack of shipping facilities, as is generally supposed. Our exports for the first seven months of 1916 were 2,926,000,000 tons, as compared with 1,970,000,000 tons for 1915, and 1,201,000,000 tons for a corresponding period in 1914. The great war has transformed the entire territory east of Chicago and north of the Ohio, extending to the seaboard, into one vast workshop. Factories and cities have sprung up where nothing existed before the war. Business has increased faster than the manufacturer's ability to increase his facilities for handling it, with the result that sidings overflow with cars, and cars are received faster than they can be disposed of, resulting in a general accumulation which impedes traffic throughout the entire territory.

It is thought by some, that not only the West and South, but the East itself would be benefited by the voluntary return of cars to the originating roads. No doubt the East needs all the cars that it now has and many more, but it

lacks sufficient trackage and adequate loading and unloading facilities. If some of the western and southern cars were sent to the home roads the circulation of equipment in the East, which is now hampered by the congestion at terminals and at manufacturing centers, would accelerate, to the advantage of both shipper and carrier. An increase in the per diem rate on cars has been suggested as a means of effecting the return of equipment to the home roads.

Although freight cars are obviously designed for transportation purposes, there are still many shippers who find it economical to use them for storage purposes. As long as this is true there is need for a revision of the demurrage rules. No time is better suited to such a reform than the present, when necessity dictates that every means be used to increase the circulation of equipment.

BROTHERHOOD JOURNALS PLEASE COPY

A REPORT of the public hearing before the Senate Committee on Interstate Commerce on August 31 in connection with legislation relative to the threatened strike of railway employees, has just been issued from the government printing oce, having been held up for nearly a month for corrections since a tentative report was issued on the morning following the hearing. A large number of corrections have been made in the report and some additional matter has been inserted, but there is a slight error which was not corrected, to which we feel we ought to call attention, in view of the great interest in this document and the wide circulation it is being given by the brotherhoods, who have had some 400,000 copies printed for distribution among their members.

A. B. Garretson, president of the Order of Railway Conductors, was giving the committee some information regarding railway wages and salaries to guide it in its efforts to determine whether the members of the brotherhood should receive an increase in wages. He said that the total annual payroll of the railways is $1,381,000,000, and he divided it as follows:

"There are 309,000 trainmen accounted for there and they get $387,000,000. The clerical force amounts to 300,000 and they get $216,000,000. All the other employees of the railways, except the official force, get $413,000,000. There are only 52,000 railway officials on this continent. They get $364,000,000 and they do not cut it down and give it to this 80 per cent that are so illy paid. Their average is $7,000 and over half of them do not draw any more money than passenger conductors. So you see that it raises those that are above the average. Charity does not begin at home."

The *Railway Age Gazette,* in its issue for September 22, page 483, published an editorial entitled "More Lies About Railway Salaries." This was devoted to comment on an article which recently was published in the American Railway Employees' Journal. Mr. Garretson's statements are, if possible, more preposterously false than those which we quoted from the Railway Employees' Journal. The fact that they come from the chief spokesman of the labor brotherhoods indicates either an amount of ignorance on the part of the labor leaders that is beyond comprehension or a deliberate attempt by them to mislead their followers and the American public. We believe it is the latter.

The statistics of the Interstate Commerce Commission are the only source available from which to get correct figures regarding the wages and salaries of all classes of railway officers and employees, and these statistics demonstrate the falsity of Mr. Garretson's statements. Mr. Garretson gives the total compensation paid annually to officers and employees as $1,381,000,000. This figure is from the commission's statistics for the year ended June 30, 1914, "Statement No. 24," page 29. In exactly the same statement appear the statistics regarding the total compensation paid to all the eighteen classes into which the commission divides officers and employees, including "general officers," "other officers," "general office clerks," etc. On page 26 of the same volume, in "Statement No. 21," are given the numbers of the officers and employees of all the various classes.

Mr. Garretson ignores all these statistics, and gives figures which are absolutely fictitious. He says, "the clerical force amounts to 300,000, and they get $216,000,000." According to the Interstate Commerce Commission there are 87,106 general office clerks, and they receive $75,429,665. Mr. Garretson says, "There are only 52,000 railway officials on this continent. They get $364,000,000." Mr. Garretson certainly doesn't care what he says! The Interstate Commerce Commission's statistics show that there were in 1914 only 5,740 general officers of the railways, and that their total compensation was only $21,558,995. There were only 11,153 other officers, who received $24,247,155. The average salary of the general officers was, therefore, only $3,717 a year. The average for the other officers was only $2,174 a year. The total salaries of all of the officers of all of the railways amounted to a little over $45,000,000, or $319,000,000 less than Mr. Garretson's total, and the average was $2,106, which is not much more than the passenger conductors receive.

We note that Mr. Garretson or someone has made some corrections in the language of this paragraph because the tentative print quoted him as saying that "very few" of the officers draw less than $7,000, but he has let the figures stand. In view of the fact that the conductors were about to receive an increase in pay of about 21 per cent, possibly Mr. Garretson felt rather liberal at the time, but he should not be so careless with other people's money, especially as some of the 400,000 brotherhood members who read it may become envious of the pay received by their officers and may again feel difficulty in restraining the "primal instincts" which Mr. Garretson said had impelled them to threaten a strike on that occasion. At any rate, they should recall that the officers, although some of them receive more money than the train employees, have not yet been able to persuade Congress to give them the eight-hour day, and that many of them are under responsibility during the full twenty-four hours. As some of the members of the brotherhoods who will be misled by Mr. Garretson's carelessness are not regular readers of the *Railway Age Gazette,* we trust that if the editors of the brotherhood journals, who sometimes do read it, will call this slight additional correction to their attention in their own columns, it may prevent some heartburnings and other primal instincts.

CHESAPEAKE & OHIO

THE Chesapeake & Ohio is the only railroad in the United States operating over 2,000 miles of road that has an average revenue trainload of more than 1,000 tons. In the fiscal year ended June 30, 1916, the average revenue trainload was 1,003 tons, an increase of 97 tons over the average in the previous year. This index of operating efficiency should be kept in mind in studying the financial results which were obtained last year.

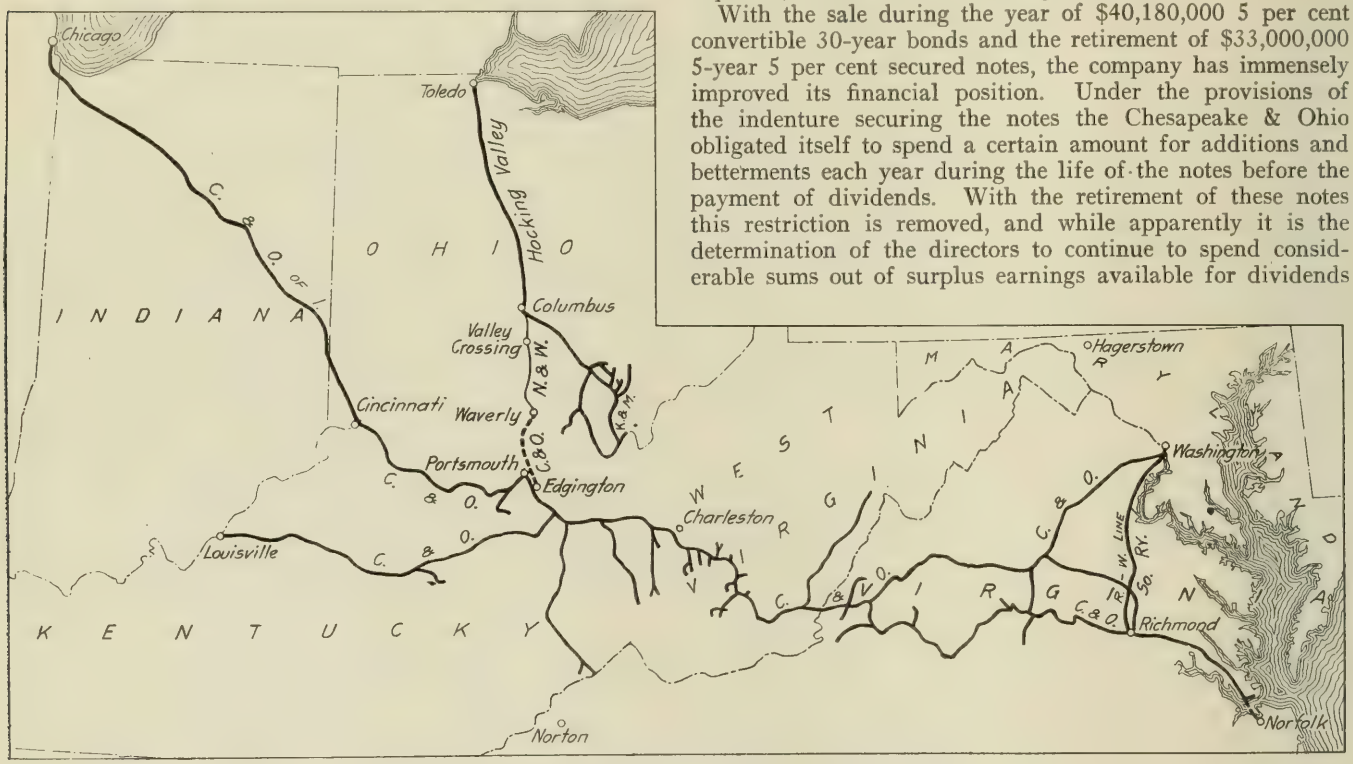
The Chesapeake & Ohio earned in the fiscal year ended June 30, 1916, 10.96 per cent income available for dividends on its outstanding $62,793,000 common stock. This is better even than the best previous record made in 1910 when 10.02 per cent was earned. A very heavy increase in shipments of bituminous coal accounts in large part for the increase in gross earnings in 1916 as compared with 1915. The total tonnage of all freight carried in 1916 was 37,620,000, an increase over 1915 of 7,571,000 tons. The total tonnage of bituminous coal carried in 1916 was 26,494,000, an increase over the previous year of 5,384,000 tons. Industrial activity and prosperity and extraordinary heavy exports of coal due to war conditions are the explanation of the greater part of the increase last year as compared with the year before. Extraordinarily heavy movement of traffic due to these causes is to a certain extent temporary, but it may well be that the gains made in coal traffic can be held in another way.

The Chesapeake & Ohio Northern is the name under which the Chesapeake & Ohio is building a line from Limeville, Ky., on the main line, to Waverly, Ohio, on the Norfolk & Western, 30 miles. This line is nearly completed and it is expected that it will be in operation in time to handle the coal shipments for the Great Lakes at the opening of navigation in 1917. The Chesapeake & Ohio has completed arrangements for trackage rights over the Norfolk & Western from Waverly to Valley Crossing, near Columbus, on the Hocking Valley. A majority of the Hocking Valley stock was bought by the Chesapeake & Ohio in 1910. As an investment pure and simple, this purchase of the Hocking Valley was a profitable one. Up to the present, however, it has failed to serve to the full the other purpose back of the purchase, namely, to provide a means for the shipment of coal originating on the Chesapeake & Ohio north to the lakes by a route which would give the Chesapeake & Ohio a profitable division of the through rate. The Chesapeake & Ohio had a half interest in the Kanawha & Michigan which gave it its connection with the Hocking Valley, but the haul was so short on the Chesapeake & Ohio and the Kanawha & Michigan's share of the through rate so great, that there was little, if any, profit directly to the the Chesapeake & Ohio on coal business originating on its lines and moving via this route to the Great Lakes. With the opening of the Chesapeake & Ohio Northern the Chesapeake & Ohio will get the full haul from the coal fields to Waverly, Ohio, on the Hocking Valley, out of the rate for which it will have to pay only the trackage rental to the Norfolk & Western for use of that company's line from Waverly to Valley Crossing, 61 miles. The opening of this Chesapeake & Ohio Northern line will therefore be of very considerable importance in permanently increasing the Chesapeake & Ohio's coal traffic. A satisfactory outlet to the lakes has been badly needed for a fuller development of what is potentially a very profitable business for the Chesapeake & Ohio.

With operating revenues amounting to $48,239,000 in 1916, an increase over the previous year of $8,775,000, the company had total operating expenses of $31,789,000, an increase of $4,233,000. The increase in revenues amounted to 22.2 per cent and in expenses to 15.4 per cent. More than half of the increase in expenses, however, was in maintenance of equipment. It is pretty safe to say that the Chesapeake & Ohio has in the past few years been hampered by a lack of rolling stock and of locomotives best adapted to the operating needs of the property. It may be that in 1915 maintenance of equipment expenditures were held down almost too rigidly, necessitating expenditures in 1916 that were in the nature of getting back to a higher standard. With the purchase of 34 locomotives and 4,138 freight cars, and with the very large expenditures for maintenance of equipment, the Chesapeake & Ohio has presumably gone a long way toward greatly improving its equipment situation. The remarkably good showing in train loading testifies to the success of these efforts.

With an increase of 26.5 per cent in the ton mileage of revenue freight—the total in 1916 was 10,296,500,000—there was an increase of only 7.1 per cent in transportation expenses, the total in 1916 being $13,810,000.

With the sale during the year of $40,180,000 5 per cent convertible 30-year bonds and the retirement of $33,000,000 5-year 5 per cent secured notes, the company has immensely improved its financial position. Under the provisions of the indenture securing the notes the Chesapeake & Ohio obligated itself to spend a certain amount for additions and betterments each year during the life of the notes before the payment of dividends. With the retirement of these notes this restriction is removed, and while apparently it is the determination of the directors to continue to spend considerable sums out of surplus earnings available for dividends for additions and betterments, the fact that this is a voluntarily adopted policy and not a restriction on the free action of the board, of itself is an improvement to the company's credit.



The Chesapeake & Ohio and the Hocking Valley

In the fiscal year ended June 30, 1916, there was a surplus available for dividends of $6,879,000. All of this was transferred to profit and loss and by so much increased the assets of the company without the issue of any securities. The total discount and expenses in connection with the bond issue and taking up of the notes was charged to profit and loss, necessitating a debit of $2,814,805. At the end of the year there was $7,005,000 free cash on hand and no loans and bills payable, except a nominal $95,000 coming under this head.

It may be recalled that the Chesapeake & Ohio was required to make refunds under the West Virginia two-cent fare law of excess fares collected during the testing of the constitutionality of the law. Apparently about all of these refunds have now been paid, there being less than three thousand dollars paid on this account in 1916.

Since 1909, when the present management took the Chesapeake & Ohio, a total of $153,444,000 par value of securities has been issued or assumed. The company realized $145,429,000 from the sale of these securities and with this money paid off $84,719,000 of securities, leaving net $60,710,000 with which the management bought the stock of the Chesapeake & Ohio of Indiana (the Chicago line), the majority stock of the Hocking Valley, the stock of the White Sulphur Springs, Inc. (new Greenbriar Hotel), and the stock of the Chesapeake & Ohio Northern, beside various other smaller blocks of stock of subsidiaries, at a total cost of $20,929,000; bought bonds of subsidiaries at a total cost of $6,717,000; bought outright the Coal River Railway, the Raleigh & Southwestern and the Virginia Air Line at a total cost of $4,193,000; and spent for additions and betterments to property $18,084,000, and additional equipment, less retirals, $19,849,000. This is a total of $69,773,000. In other words, during the last seven years approximately $9,000,000 of stockholders' money has been invested in additional assets.

The statement of which the above paragraph is an abstract is given in the Chesapeake & Ohio annual report in a form that is unique among American railroad companies. The form of the statement is simple and intelligible to the layman and is an admirable recognition of the duty which rests on a board of directors to give to their stockholders a simple, understandable account of their stewardship of the stockholders' property.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	2,375	2,369
Freight revenue	$39,079,087	$31,288,537
Passenger revenue	5,998,044	5,696,088
Total operating revenues	48,239,012	39,464,037
Maintenance of way and structures	5,553,447	4,694,522
Maintenance of equipment	10,561,094	8,234,170
Traffic expenses	645,189	650,407
Transportation expenses	13,809,686	12,896,079
General expenses	953,685	873,883
Total operating expenses	31,789,179	27,556,414
Taxes	1,587,407	1,349,497
Operating income	14,842,218	10,549,914
Gross income	16,023,752	11,568,133
Net income	6,879,216	2,663,537

ILLINOIS CENTRAL

THE Illinois Central has perfomed the rather remarkable feat of making a substantial reduction in transportation expenses in the fiscal year ended June 30, 1916, as compared with the previous fiscal year. Operating revenues were the largest in the history of the company—$69,077,000, or 11.21 per cent more than in 1915. The ton-mile rate was the lowest in the history of the company—5.46 mills, comparing with 5.48 mills in 1915, the previous low rate. The achievement of reducing the ratio of transportation expenses to total operating expenses from 35.77 in 1915 to 31.62 in 1916 was accomplished by the substitution of 48 Mikado locomotives for 72 smaller locomotives retired; by better supervision of train movement, and by a very successful campaign of fuel economy and of attention to loss and damage and other claims. The new Mikados were equipped with superheaters, and superheaters were put on one Atlantic type and two Pacific type passenger locomotives.

The result of the betterment in available power is striking. The ton mileage of all freight carried was 8,514,500,000 in 1916 as compared with 7,522,100,000 in 1915, an increase of 992,400,000, or 13 per cent. The average length of haul was about the same—243 miles in 1916 and 240 miles in 1915. The mileage of revenue freight trains decreased by 2.14 per cent. The mileage of helping and light freight locomotives decreased by 20.13 per cent. The average trainload of all freight was 595 tons in 1916 as against 523 tons in 1915. The tons of all freight per revenue service locomotive-mile, excluding switching miles, was 582 tons in 1916, comparing with 509 tons in 1915.

The increase in trainload was helped by a better balanced traffic, loaded freight car mileage increasing by 12.63 per cent, with empty car mileage increasing only by 2.39 per cent. The average loading per loaded car, however, was not quite so good in 1916 as in 1915, being 23.80 tons and 24.09 tons respectively. The principal increase in freight traffic was in the tonnage of bituminous coal handled. This amounted to 14,065,000 tons in 1916, or 40.16 per cent of the total tonnage carried, and to 12,389,000 tons in 1915, or 39.57 per cent of the total tonnage carried in 1915.

The Illinois Central had hard sledding from 1911 up to the last half of 1915, through no fault of its management, but because of strikes, washouts and other unfortunate occurrences which could not be guarded against. Even in the fiscal year ended June 30, 1916, one of the factors which added considerably to the revenues of the Atchison, Topeka & Santa Fe and the Southern Pacific—the fact that the Panama canal was closed—probably took away from the Illinois Central's revenue. There is evidence in this year's annual report to show that up to the time of the arrival of the new Mikados the Illinois Central's locomotive situation had never quite recovered from the effects of the shopmen's strike four years ago. In 1911 the Illinois Central was in magnificent physical condition. The strike and the floods since necessitated very heavy maintenance expenditures, and in this connection the Illinois Central management wisely spent considerable sums for additions and betterments, even when new capital was mighty hard to get. The result of this policy was quite suddenly shown up when the locomotives necessary to make a fuller utilization of the plant were bought.

In 1916 there was a total of $6,098,000 spent for additions and betterments to road and equipment, of which approximately $2,400,000 was for equipment covered by equipment trust certificates. There was a credit of $481,000 for steam locomotives retired and $448,000 for freight cars retired. Additions and betterments include the installation of 294 track-miles of electric block signals, there being 452 miles additional now in process of installation. When this work is completed the entire railroad from Chicago to New Orleans will be block signaled. An engine house, car shop, washout plant, office and turntable were built at Dyersburg, Tenn., and a 10-stall roundhouse and 85-ft. turntable, etc., put in at Jackson, Tenn., and improvements were made to mechanical facilities at Freeport, Ill.; Waterloo, Iowa; Ft. Dodge, Iowa; Cherokee, Iowa, and Nonconnah yard, at Memphis. New mechanical coaling stations were built at three points in Illinois and at one point in Iowa and one point in Kentucky.

Maintenance of way expenses were affected by the cost of restoring tracks and bridges damaged by a tornado and high water near New Orleans in October, 1915, and also by higher rates of pay to section men. The total spent for maintenance of way and structures in 1916 was $9,507,000, an increase of $640,000 over the previous year. Maintenance of equipment expenses were abnormally high because of extraordinarily heavy charges for repairs, depreciation and retirement of freight cars. The total spent for maintenance of equipment was $16,548,000, or $2,604,000—18.67 per cent—more than in the previous year.

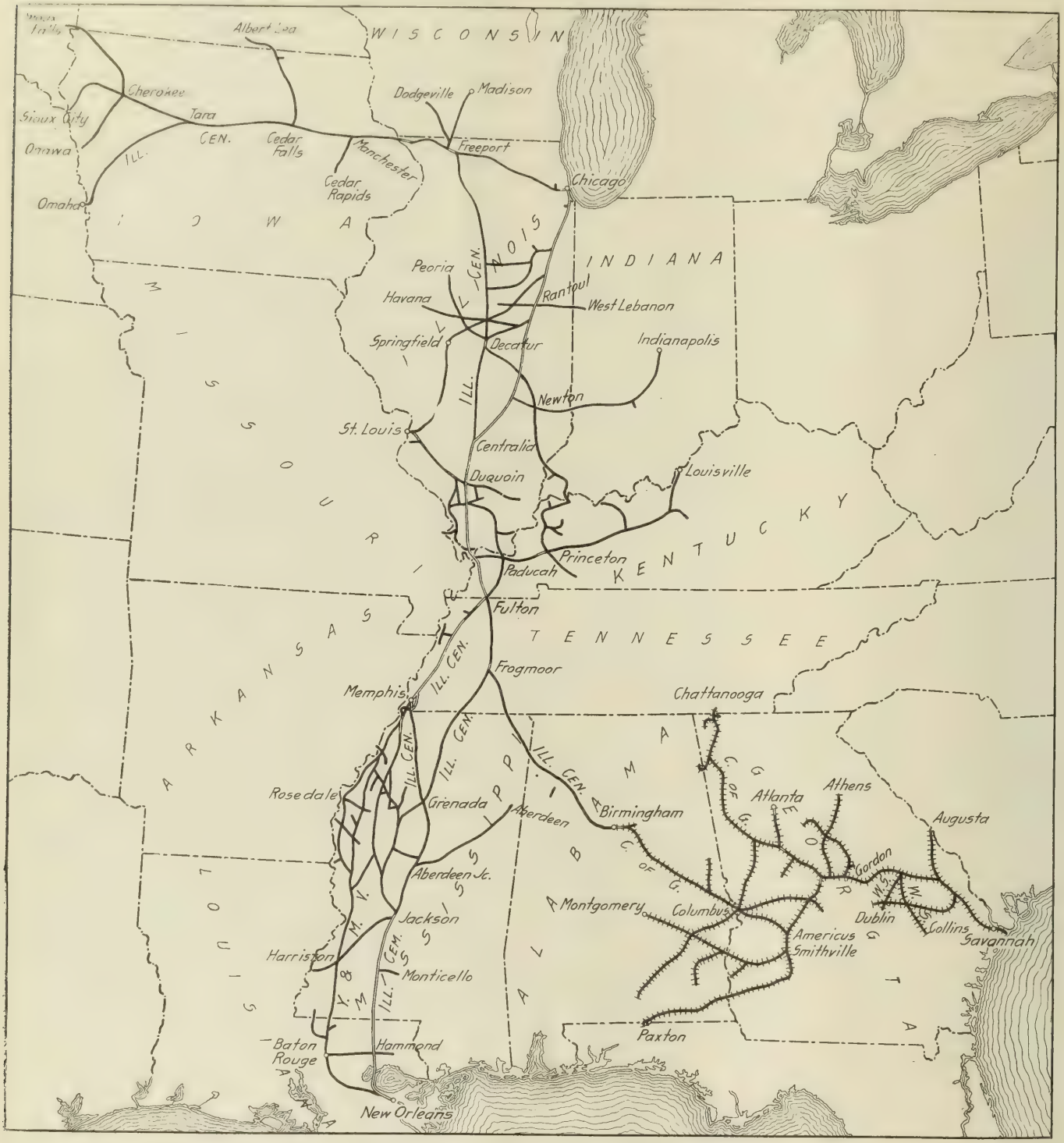
Mention should be made of the fact that the Central Fruit Despatch, which was organized in 1912 to take over the refrigerator service business of the Illinois Central, has proved unprofitable. The operations of this subsidiary were discontinued on September 1, 1914, and the Illinois Central accepted and took into its profit and loss account a loss of $547,000 on the venture.

Notwithstanding the heavy maintenance expenses, the financial results of the year's operations are more nearly like those of the Illinois Central before it ran into its streak of hard luck in 1912. Total operating revenues in 1916

amounted to $69,077,000, an increase of 11.21 per cent over 1915. Notwithstanding an increase in taxes of $490,000, operating income amounted to $14,155,000, an increase of $3,277,000 over 1915. After paying interest charges there was available for dividends $11,655,000, or $4,949,000 more than was available in 1915. The 5 per cent dividends on the $109,286,000 outstanding stock called for less than half of the amount available for dividends in 1916. The only securities sold during the year were $1,900,000 equipment trust certificates. At the end of the year there was $5,638,000 cash on hand, an increase of $3,052,000 over the previous year, and no loans and bills payable, the bills payable of $1,000,000 outstanding at the beginning of the year having been paid off.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	4,767	4,770
Freight revenue	$50,045,039	$44,446,222
Passenger revenue	13,582,092	12,851,677
Total operating revenues	69,077,343	62,111,552
Maintenance of way and structures	9,506,527	8,866,250
Maintenance of equipment	16,547,749	13,943,804
Traffic expenses	1,252,366	1,238,732
Transportation expenses	21,841,050	22,217,903
General expenses	1,763,356	1,655,794
Total operating expenses	51,173,728	47,975,197
Taxes	3,724,021	3,233,838
Operating income	14,155,087	10,878,473
Gross income	23,775,831	18,837,300
Net income	11,807,565	6,859,162
Appropriations	152,932	153,903
Dividends	5,464,800	5,464,800
Surplus	6,189,833	1,240,459



The Illinois Central and the Central of Georgia

CHICAGO & NORTH WESTERN

FOR the first time in its history the Chicago & North Western earned gross over $11,000 per mile. In the fiscal year ended June 30, 1916, total operating revenues for the 8,108 miles operated amounted to $91,314,000. After the payment of expenses, taxes and interest charges there was $17,283,000 available for dividends, and the 8 per cent on the preferred and 7 per cent on the common called for $11,116,000, leaving a surplus to be credited to profit and loss of $6,167,000.

The Chicago & North Western is a refutation of the universal truth of certain generalities which are often applied to railroads. An average of $10,000 earnings per mile for a road doing a high class competitive business is often spoken of as the minimum which a system needs to be moderately profitable to its stockholders. With the exception of 1914 the Chicago & North Western has never earned until this last year as much as $10,000 per mile. A network of branch line mileage, much of it the result of the keenest sort of competition, has often proved very unprofitable. Witness the earlier competitive railroad building in the southeast and the competitive railroad building in the southwest in more recent years. The Chicago & North Western, however, has a network of thousands of miles of branch lines. Very high class competitive passenger business is more often than not unprofitable. The Chicago & North Western does a large passenger business with fast schedules and fine trains in through service.

The Chicago & North Western is one of the most prosperous roads in the country, notwithstanding the facts just mentioned, because, despite its branch line mileage, it has a comparatively heavy average trainload—in 1916, 491 tons, as compared with 443 tons in 1915. Its main line of heavy fast passenger traffic running from Chicago to Omaha is double-tracked, as is also almost all of the important main line between Chicago and St. Paul. It has, moreover, two double-track lines between Chicago and Milwaukee. It is an originating road insofar as grain and agricultural products are concerned, while it is also an intermediary road for through traffic from the Atlantic seaboard to the Pacific coast and intermountain territory. Furthermore, it has very close relations with the New York Central Lines, the Vanderbilts being directors of the North Western as well as the New York Central. Likewise, on the west it has very close relations with the Union Pacific. Its double-track line, therefore, from Chicago to Omaha is in a very strategic position for both east and westbound traffic. Added to these physical characteristics and traffic relations of the road is the fact that the company is not at all heavily capitalized and the relation of bonds to stock is that of 2 to 1½, which is a smaller proportion of bonds than most of the larger railroad systems have. Much of the mileage of the North Westen was not expensive to build, and maintenance costs are not heavy. In its maintenance of equipment the Chicago & North Western has for a number of years had low unit expenditures. Repairs, exclusive of renewals, depreciation and overhead, per locomotive in 1916 cost $2,545; per freight train car, $76; per passenger car, $540. Since it is a fact that the North Western equipment is kept up to a very high standard of repair, the conclusion is inevitable that in its car and locomotive repair costs the company is fortunate either in conditions or in efficiency in the mechanical department, or both.



The Chicago & North Western and the Chicago, St. Paul, Minneapolis & Omaha

In the fiscal year ended June 30, 1916, the total ton mileage of revenue freight was 7,412,300,000, an increase over 1915 of 19.24 per cent. The increase in tonnage was greater than this—26.83 per cent; but the average haul of each ton was 145 miles in 1916 as against 154 miles in 1915. The increase in mileage of freight and mixed trains was only 6.53 per cent, the total in 1916 being 18,377,000.

The total number of passengers carried one mile was 1,156,000,000, an increase of 2.27 per cent. The average revenue per passenger per mile was 1.86 cents in 1916 and 1.82 cents in 1915, and the average freight revenue per ton per mile was 8.1 mills in 1916 and 8.4 mills in 1915.

Transportation expenses in 1916 amounted to $32,119,000, an increase of $2,366,000. The largest increases were in wages of train enginemen and fuel for train locomotives, the increase in enginemen's wages being greater proportionately than in fuel costs.

During the year there was $7,972,000 general mortgage 5 per cent bonds sold to reimburse the company for capital expenditures, and $3,918,000 bonds redeemed or retired, leav-

ing a net increase in funded debt of $4,054,000. The company spent $5,753,000 for additions and betterments. At the end of the year there was $14,476,000 cash, with no loans and bills payable.

The table below shows principal figures for 1916 and 1915:

	1916	1915
Average mileage operated	8,108	8,108
Freight revenue	$60,353,399	$51,923,861
Passenger revenue	21,445,004	20,528,443
Total operating revenues	91,313,866	80,779,675
Maintenance of way and structures	11,608,646	10,450,739
Maintenance of equipment	14,598,777	12,648,935
Traffic expenses	1,307,139	1,288,448
Transportation expenses	32,119,223	29,753,444
General expenses	1,874,091	1,764,487
Total operating expenses	61,952,329	56,371,573
Taxes	4,741,527	4,516,943
Operating income	24,606,707	19,883,904
Gross income	27,660,182	22,683,904
Net income	17,282,510	11,914,049
Dividends	11,116,185*	11,103,669*
Surplus	6,166,325	810,380

*Including $216,570 in 1916 and $204,054 in 1915 appropriated for sinking funds

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA

THE Chicago, St. Paul, Minneapolis & Omaha operates 1,753 miles of road. It is a subsidiary of the Chicago & North Western, operating in close harmony with the parent road. Its line from St. Paul, Minn., to Elroy, Wis., is used as part of the North Western's main line from Chicago to St. Paul, and it has a line from St. Paul to Duluth and Ashland which forms an important outlet for the North Western system. Its lines from Minneapolis into Iowa, South Dakota and Nebraska have the same general characteristics as the North Western lines running into like territory. In the year ended June 30, 1916, the Omaha earned $19,523,000 operating revenues, an increase over the previous year of $1,681,000. This is at the rate, in 1916, of $11,138 per mile of road. Of the total revenue in 1916 $12,860,000 was from freight and $5,191,000 from passengers.

Total operating expenses amounted to $12,959,000, an increase of $851,000. The total ton mileage of revenue freight in 1916 was 1,578,900,000, an increase over the previous year of 18.17 per cent. The passengers carried one mile totaled 254,800,000, about 1 per cent more than in 1915. Total transportation expenses amounted to $7,208,000, or $470,000 more than in 1915. Of the increase, $380,000 was in the amount charged for wages and $236,000 in the amount charged for fuel for locomotives. There was $1,957,000 spent for maintenance of way and structures, an increase over the previous year of $384,000. The increase in maintenance of equipment expenditures was less than $60,000, and the total spent in 1916 was $2,419,000.

The Omaha in 1916 had an average ton-mile rate of 8.1 mills, comparing with 8.6 mills in 1915, and an average passenger-mile rate of 2.038 cents in 1916, comparing with 1.975 cents in 1915. The average haul of freight was 157 miles in 1916 and 152 miles in 1915, and the average passenger journey was 46.86 miles in 1916 and 52.92 miles in 1915. The average trainload of all freight was 390 tons in 1916, an increase of 8.38 per cent over the previous year.

At the end of the year the company had $2,516,000 cash, and no loans and bills payable. During the year there were $2,000,000 5 per cent debenture bonds sold, and the company spent $2,459,000 for additions and betterments.

The table below shows principal figures for 1916 and 1915:

	1916	1915
Average mileage operated	1,753	1,753
Freight revenue	$12,860,214	$11,523,103
Passenger revenue	5,191,441	4,983,700
Total operating revenues	19,522,563	17,841,348
Maintenance of way and structures	2,340,883	1,956,803
Maintenance of equipment	2,419,137	2,476,957
Traffic expenses	350,316	344,363
Transportation expenses	7,208,271	6,737,697
General expenses	472,922	433,205
Total operating expenses	12,958,838	12,107,598
Taxes	1,022,053	1,015,029
Operating income	5,535,335	4,713,887
Gross income	5,991,914	5,069,382
Net income	3,003,027	2,219,085
Dividends	2,087,117	2,086,910
Surplus	915,910	132,175

Letters to the Editor

THE ONLY TEST OF PUBLIC OPINION ON AN EIGHT-HOUR DAY

San Francisco, Cal.

To the Editor of the Railway Age Gazette:

The only test of American public opinion on the question of a general extension of the eight-hour work day to all employments that has ever been recorded was the poll taken at the general election in the state of California held on November 3, 1914.

At this election a total of 843,573 votes of both men and women was cast on the subject, and the proposed eight-hour limitation of labor was rejected almost exactly *two-to-one.* The vote was 560,881 "no" against 282,692 "yes," or an adverse majority of 278,189.

There are fifty-eight counties in California, and at this poll the eight-hour law failed to carry a single county. In some of the counties the majority against it was as high as five-to-one. In the so-called "labor stronghold" of San Francisco the adverse majority was smallest, being 70,909 "no" to 49,629 "yes," but the City of Los Angeles showed 133,704 "no" to 74,583 "yes."

The eight-hour law submitted in California to state-wide referendum was short, simple and excepted only emergency work from the restriction. Its full text, as placed on the ballot, for a "yes" or "no" vote, was as follows:

"Eight-Hour Law, Hours of Labor:

"Any employer who shall require or permit, or who shall suffer or permit any overseer, superintendent, foreman or other agent of such employer, to require or permit any person in his employ to work more than eight hours in one day, or more than forty-eight hours in one week, *except* in case of extraordinary emergency caused by fire, flood, or danger to life or property, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not less than $50 nor more than $500, or imprisoned in the County Jail not less than ten nor more than 90 days, or both so fined and imprisoned."

This proposed law was placed upon the ballot in obedience to petitions bearing some 35,000 signatures of registered voters filed under the Initiative law. The petitions were framed and circulated by the members of the State Socialist party, which had over 50,000 registered voters at the preceding election.

Vigorous campaigns both for and against the eight-hour enactment were made, each side being sufficiently financed. The opposition was headed by farmers, fruit growers and other agriculturists, who organized for the campaign. The eight-hour proposal was third on the ballot among forty-eight propositions submitted, and both in publicity, general interest and total vote polled, was a close second only to the state-wide prohibition measure.

The defeat of prohibition, by "no" 524,781 to "yes" 355,536, was not nearly so overwhelming as the rejection of the eight-hour rule.

The total vote cast for all five candidates for governor at this same election was 926,667, divided as follows: Hiram W. Johnson (Progressive), 460,495; John D. Fredericks (Republican), 271,990; Curtin (Democrat), 116,121; Richardson (Socialist), 50,716; Moore (Prohibitionist) 27,345.

The Progressive party governor (Johnson) was re-elected by 188,505 votes over the Republican, Fredericks, which was the largest plurality ever given a gubernatorial candidate in California's history. Therefore, the eight-hour law could not be called a Progressive measure.

Women worked actively throughout the campaign and cast about 40 per cent of the total vote. The women voters, for sentimental reasons, were a large majority supporters of the eight-hour law, so the male vote must have been four or five to one against the measure.

Observer.

Why the Intercolonial Railway Is a Failure

Uneconomical Government Management as Well as Low Rates Caused Enormous Losses—Recent Improvement

By Samuel O. Dunn
Editor of the *Railway Age Gazette.*

IN the issue of the *Railway Age Gazette* for October 6 there was published an article by J. L. Payne replying to my articles on "The Failures of Government Ownerships in Canada," which were published in the issues of this paper for July 14 and July 21.

I must express my appreciation of the friendly tone of Mr. Payne's criticisms of my article and of the fair and judicial manner in which he has presented his case. I have long entertained a high regard for him and his work, and the good temper and skill with which he has discussed the management and results of the Intercolonial enhance my regard for his fairness and ability. I do not think anybody could make out a better case for the road than he has.

At the same time, after a careful study of the data and arguments he has presented, I am unable to revise the conclusions regarding Government management of the Intercolonial presented in my original article. His main contention is that the facts regarding its management do not constitute an argument either for or against State ownership.

The advocates of Government management claim that it will confer certain advantages on the public. I maintained in my article, and I still maintain, that Government management of the Intercolonial has failed to confer these advantages, and that its results yield evidence which is relevant in a discussion of the general subject of State ownership.

Mr. Payne puts stress on the fact that the Intercolonial was brought into existence to bind together the English and French provinces of Canada, and that a roundabout route was selected to avoid having it pass through a part of the United States or near our border. These circumstances were stated in my article. But, as I also pointed out, the Government has owned the road for a half century. The political conditions which existed at the time of the creation of the Confederation, and the relations prevailing between Canada and the United States, long ago underwent radical changes. Is it not therefore fair to suggest that the Government should long ago have changed the route and modified the management to meet the changed conditions? It would have been feasible years ago to have shortened the line, as the enterprising managements of private railways in the United States, in Canada and in other countries have done.

Mr. Payne raises a question as to why I rested my case largely on a comparison of the operating results of the Intercolonial with those of the Eastern lines of the Canadian Pacific. He asserts that the calculations from which my statistics for the Canadian Pacific eastern lines resulted are not reliable. These statistics were derived from official sources on the Canadian Pacific; the calculations by which they were arrived at were made in the same way as similar calculations are made all over the United States and Canada in segregating the operating and financial statistics of different railways and of different parts of the same railway, and I have no doubt of their reliability.

He says that "the Canadian Pacific has relatively small interests in the maritime provinces," that "it does not operate a single mile of line in Nova Scotia," and that "less than five per cent of Canadian Pacific mileage is in the territory which the Intercolonial was built to serve." A careful check of the authorities shows that the Intercolonial and the Canadian Pacific eastern lines have the following mileages in the territory to which he refers:

	Canadian Pacific	Intercolonial
Nova Scotia	294 miles	473 miles
New Brunswick	443 "	537 "
Quebec (east of Montreal)	348 "	453 "
Total	1,185 miles	1,463 miles

In addition, the Canadian Pacific operates, as a part of its eastern lines, 234 miles in the state of Maine under conditions somewhat similar to those prevailing in the maritime provinces of Canada.*

Mr. Payne says, however, that it would have been entirely fair for me to have measured the Canadian Pacific as a whole against the Intercolonial as a whole, and adds that he will "make it quite plain that if the Intercolonial had enjoyed the passenger and freight rates of the Canadian Pacific it would have had relatively higher net earnings than the latter," "while if the Canadian Pacific had been compelled from the outset to subsist on the earning power of the Intercolonial it would long ago have passed into the hands of a receiver."

The Canadian Pacific lines west of Montreal, and especially those west of Port Arthur and Port William, operate through a territory in which rates are much higher than they are east of Montreal, just as rates in the United States are higher west than they are east of Chicago. But I am quite willing to meet Mr. Payne on his own ground. He says that the application to the Intercolonial's traffic of the average freight and passenger rates of the Canadian Pacific system shows that the losses of the Intercolonial have been due entirely to the lowness of its rates. But when he applies the average rates of the Canadian Pacific to the Intercolonial he shows that with these rates the Intercolonial could not earn four per cent on its cost of construction, which is a much smaller return than the Canadian Pacific does earn with them, while when he applies the average rates of the Intercolonial to the Canadian Pacific he shows that the Canadian Pacific would have earned 2.6 per cent with them, while with these same rates the Intercolonial did not earn any return at all.

Intercolonial Results with "C. P. R." Rates

Mr. Payne's argument from the results in 1913 has, however, a more serious weakness than this. He says that he used the figures for that year for certain reasons which he sets forth, and that "it will not be said, therefore, that I have gone out of my way to select a weak parallel or to choose a year that was favorable to the Intercolonial." I do not question his fairness, but a series of calculations does disclose that, as a matter of fact, the figures for the very year he did choose were the best afforded by any year in history to make out a case for the Intercolonial. I have taken the Canadian Pacific's average freight and passenger rates for each of the last eight fiscal years for which complete figures are available, and applied them to the Intercolonial's business, and the following table shows its percentage of net return on its cost of construction would have been higher on

*Authorities: Railway Statistics of Canada, Poor's Manual, and Official Guide of Railways, and the maps accompanying the annual report of the Department of Railways.

the "C. P. R.'s" basis of rates in 1913 than in any other year.

Actual and Estimated Results of Intercolonial

	Actual Net Earnings or Deficit	Estimated Net Earnings on C. P. R. Rates	Rate of Return on Cost of Road on C. P. R. Rates Per Cent
1915	$89,046	$2,217,639	1.95
1914	291,271	2,824,250	2.46
1913	—161,016	3,806,355	3.75
1912	250,517	3,070,072	3.50
1911	281,857	3,122,850	3.66
1910	700,278	2,695,415	3.68
1909	—449,535	1,973,840	1.73
1908	413,139	1,729,485	1.50

Average rate of return on average cost of road for eight years, if average rates had been same as Canadian Pacific, 2.78 per cent.

It will be seen that the net return earned in 1913 on the Canadian Pacific's rates would have been 3.75 per cent; that the net return in the eight years would have varied from this amount down to as low as 1½ per cent; and that the average return for the entire period would have been 2.78 per cent. These figures show that even if the Intercolonial had had the average rates of the Canadian Pacific system it would have failed in every year, and in most years by a wide margin, to have earned four per cent on its cost, although the Canadian Pacific on these same rates has become, according to Mr. Payne, "beyond all doubt the most prosperous railway in the world." Mr. Payne's figures for the Intercolonial are for its fiscal year, which ends on March 31, while mine are from the Railway Statistics of Canada, which are for the years ending June 30. But, as Mr. Payne points out, this slight discrepancy in dates is of no consequence.

How much could the Intercolonial have earned on the average freight and passenger rates received by the Canadian Pacific's eastern lines? I have the average freight and passenger rates for the eastern lines only for the years 1914 and 1915. In the former the Intercolonial on these rates would have earned only 1½ per cent, and in the latter only 1.1 per cent.

Intercolonial Compared with Pere Marquette

The foregoing statistics sustain rather than refute my contention that the enormous losses of the Intercolonial have been due more to the way in which it has been managed than to the lowness of its rates. But, perhaps, as Mr. Payne implies, it is not entirely fair to compare the Intercolonial with only one road and that one of the most prosperous in the world. I shall, therefore, make a comparison between it and one of the least prosperous railways in the United States, viz., the Pere Marquette. This road has been in the hands of receivers since April 15, 1912, and yet its statistics for the fiscal year it became bankrupt indicate better management in every respect than do the figures of the Intercolonial for the same year. The following are certain statistics for the Intercolonial and the Pere Marquette for the year ended on June 30, 1912:

	1912	
	Intercolonial	Pere Marquette
Mileage	1,463	2,331
Capitalization (or cost of construction) per mile	$64,761	$40,458
Freight density (ton miles per mile of road)	866,490	750,427
Average rate per ton per mile, cents	.565	.643
Pass. density (pass. miles per mile of road)	119,298	96,417
Average passenger rate per mile, cents	1.686	1.80
Total operating revenue per mile	$7,521	$7,154
Operating expenses per mile	$7,349	$5,752
Net operating revenue per mile	$172	$1,402
Total net operating revenue	$250,517	$3,192,447
Taxes, total	None	$667,704
Taxes per mile	None	$286
Total net operating income	$250,517	$2,524,743
Average freight train load, tons	262	335
Average haul per ton, miles	270	168

The Intercolonial's freight density was 15½ per cent greater than that of the Pere Marquette and its passenger density 23.7 greater, while its cost of construction per mile was 60 per cent greater than the Pere Marquette's capitalization, and its operating expenses per mile 27.7 per cent greater. The Pere Marquette's average freight and passenger rates were somewhat higher than those of the Intercolonial and because of this and its more economical construction and operation, it was able, in spite of its lighter traffic, to earn $1,402 net operating revenue per mile, while the Intercolonial's net operating revenue per mile was only $172. The Pere Marquette paid $667,704 in taxes. The Intercolonial paid none; its total net operating revenue was only $250,517; while if it had paid taxes at the same rate as the Pere Marquette, its taxes would have amounted to $418,418. After having paid $668,000 in taxes, the Pere Marquette had left $2,524,743 of net revenue applicable to interest and dividends.

Mr. Payne says, "With a large percentage of corporate-owned roads in the United States in the hands of receivers, it is a little dangerous for an opponent of state control to make net earnings a test of the underlying principle." Manifestly, there is a wide difference between the results of a road like the Intercolonial, which ordinarily does not even earn its operating expenses, and the results of a road like the Pere Marquette, which, after earning its operating expenses, large amounts for taxes and a substantial net return, while charging relatively low rates, becomes bankrupt merely because its net return is not sufficient to pay interest on a relatively small bonded indebtedness. In the year 1912, of course, the Intercolonial did earn its operating expenses, but in that year it happened to be especially prosperous.

One of the main reasons why the Pere Marquette is more economically operated than the Intercolonial is indicated by the statistics regarding the average freight trainload. The Pere Marquette gets an average haul per ton of only 168 miles, as compared with 270 miles for the Intercolonial, and its freight traffic density is less, and yet in 1912 it hauled 335 tons per train as compared with only 262 tons for the Intercolonial.

The Service of the Intercolonial

Mr. Payne contends that the Intercolonial is a well-maintained property and gives "an unsurpassed service," and he assumes that my comments on its physical condition and service were based on information which came to me second-hand. On the contrary, I went to Canada a year ago for the express purpose of observing on the ground the condition and service of the Intercolonial. I rode over the entire main line from St. John to Moncton and from Moncton to Montreal, thereby traversing about two-thirds of its total mileage. I have been seeing from 20,000 to 30,000 miles of railway annually for about 10 years, and I must say that I found little evidence on the Intercolonial of the superior physical conditions and unsurpassed service to which Mr. Payne refers. The roadbed is good in places, but for the most part is of about the same standard as that of the average single track railway in the western part of the United States or Canada.

As to the service, the published schedules show that the only passenger train which makes an average speed of as much as 40 miles an hour is the Ocean Limited which operates between Montreal and Halifax only in the summer time. It makes the run of 836 miles from Montreal to Halifax in 20 hours and 40 minutes. This is 40 miles an hour. From Halifax to Montreal it consumes 25 hours and 5 minutes, averaging only 33.4 miles an hour. The second best train between Halifax and Montreal is the Maritime Limited, and its speed is substantially less than that of the Ocean Limited. I rode part of the way from Moncton to Montreal on the Maritime Limited; and I felt some astonishment when I found that although it was the second best train on the road it was composed of wooden sleeping cars built at the Buffalo works of the Wagner Palace Car Company before this company went out of existence. As the Wagner company was absorbed by the Pullman company 16 years ago, the age of these cars cannot have been less than 15 years. Any railway in the United States which should carry in one of its best

trains wooden sleeping cars 15 or more years old would hardly dare boast of its superior service.

Reduction of Expenses Under Present Management

I have reserved to the last the most conclusive evidence of the justice of my criticism of the uneconomical way in which the Intercolonial has been managed practically throughout the time it has been owned by the government of Canada. Somewhat over two years ago the road was given a new general manager in Frank P. Gutelius. Mr. Gutelius, who had been general superintendent of the Canadian Pacific, was an experienced, able and energetic railway officer, and the government apparently gave him full authority to operate the road as a railway rather than as a political machine. In my previous article I referred to the efforts he was making to improve the operation of the property and the difficulties he was encountering. It appears, however, that the present government has steadily supported him and that he has been highly successful. The statistics of earnings and expenses of the Intercolonial in the year ended March 31, 1916, are now available and they show that in that year the operating ratio of the road was the lowest, being 85.6 per cent, and its net earnings the largest in its history. In my original article I contended that its maintenance of way expenditures were too small, while practically all of its other expenses were too large. I did not know it then, but the figures now available show that Mr. Gutelius was engaged at the time I wrote my article in increasing the only expenses that I said were too low, and in reducing all of those that I said were too high. The following table presents statistics regarding the operating expenses and earnings of the Intercolonial in the two years ended on June 30, 1914, and 1915, and in the year ended on March 31, 1916:

Intercolonial Railway

	(March 31) 1916	(June 30) 1915	(June 30) 1914
Operating Expenses			
Maintenance of way	$2,279,778.20	$2,116,981.64	$2,118,438.46
Maintenance of equipment	2,067,679.33	2,235,592.47	2,791,241.53
Traffic	256,871.81	260,369.34	281,562.58
Transportation	6,980,716.14	6,416,586.68	7,191,476.68
Miscellaneous operation	152,058.44	.....	.....
General	304,391.92	319,225.78	318,959.93
Total	$12,041,495.84	$11,348,755.91	$12,701,679.18
Earnings			
Freight	$9,200,339.21	$7,187,449.01	$8,168,438.32
Passenger	3,994,641.63	3,239,921.44	3,542,332.01
Mail and express	781,452.30	707,969.81	595,323.67
Miscellaneous (net)	92,358.27	124,369.66	104,314.47
Total	$14,068,791.41	$11,259,709.92	$12,410,408.47
Ratio of operating expenses to earnings, per cent	85.6	100.7	102.34

Comparison of results, 1916 with 1914

Reduction in transportation expenses	$210,760.54
Reduction in total operating expenses	660,183.34
Increase in earnings	1,658,382.94
Increase in net earnings	2,318,566.28

As the figures indicate, the road had a large increase in traffic in the year ended March 31, 1916, its total earnings being $1,658,382 larger than in 1914. Furthermore, the expenditures for maintenance of way in 1916 were $161,000 greater than in 1914. But in spite of the large increase in its total traffic, and of the increase in expenditures for maintenance of way, Mr. Gutelius succeeded in reducing total operating expenses by $660,183. The increase in gross earnings and the reduction in operating expenses converted a deficit of almost $300,000 in the year ended on June 30, 1914, into net earnings of $2,027,296 in the year ended on June 30, 1916. What more complete vindication could be given to my contention that the losses of the Intercolonial have been due chiefly to extravagant management?

It may be said that these figures show that railways can be economically managed under government ownership. I have never denied this. I have always contended that the important question is not what *can* be done but what probably *will* be done. The fact that for 50 years the Intercolonial failed, on the whole, to earn its operating expenses, and that then within two years an operating deficit of $300,000 was changed to net earnings exceeding $2,000,000, shows, if it shows anything, that it is about a "fifty-to-one" shot that a government railway will not be efficiently operated. It may be argued that if there had been a proportionately large increase in earnings before, similarly favorable results might have been secured by the preceding management. But, as a matter of fact, between 1912 and 1914 the total earnings increased by $2,285,000—much more than they increased between 1914 and 1916; and yet there was a still greater proportionate increase in operating expenses, with the result that a small amount of net earnings in 1912 was converted into an operating deficit in 1914.

The relatively good showing of the Intercolonial in 1916 is as much an indictment of the previous management of the road for 50 years as it is a tribute to the courage, energy and ability of the present minister of railways, Mr. Cochrane, and the present ganeral manager, Mr. Gutelius. Just how long Mr. Cochrane and Mr. Gutelius will be allowed to continue their good work is an open question. Their popularity in the maritime provinces has not been enhanced by their course in running the railway as a railway instead of as a political machine. When the figures for 1916 were reported in parliament they were sharply criticized by members who find it more advantageous to themselves to have the road run as a political machine. Furthermore it will be noted that even the relatively large net earnings of 1916 fall far short of being adequate to pay four per cent interest on the cost of construction, as officially reported, which now amounts to about $105,000,000.

The evidence seems to establish conclusively the contention made in my original article, that the losses of the Intercolonial have been due mainly to its uneconomical operation and expensive construction.

Should Intercolonial Earn Its Interest?

Suppose, however, that its operation was raised to the highest practicable standard of efficiency, and that because of the lowness of its rates it should continue to fail to earn interest on the investment; should its rates then be raised? Mr. Payne's answer is in the negative, and he bases it on two grounds. These are: (1) "Rightly or wrongly, the people of the maritime provinces believe it was an absolute and fundamental part of the original agreement that the rates of the government line should never produce more than operating expenses"; (2) that the canals of Ontario and Quebec, from which the people of New Brunswick and Nova Scotia do not derive any benefit, require an annual expenditure of $1,700,000 for operation and upkeep and earn no interest. "The Canadian Confederation," says Mr. Payne, "is not so perfect that the maritime provinces would consent to pay the fixed charges of the Intercolonial while the upper provinces went scot free on account of the canals."

I am not concerned with the political situation in Canada, and the only comment I have to make on this phase of the matter is that it is almost universally true in democratic countries, as it is in Canada, that under government ownership political questions get so mixed up with questions of railway management as to render it practically impossible, as is the case in Canada, to consider questions of management on sound, economic grounds. "Politics corrupts the railroads and the railroads corrupt politics."

Mr. Payne's statement that the people of the maritime provinces would not consent to the Intercolonial earning interest on the investment in it so long as the canals in Ontario and Quebec did not earn their upkeep and interest, opens out a vista of rather ominous possibilities in a country which already has entered on a large scale upon public ownership and management, and is considering taking over all the rest of its railways. If the Intercolonial ought not to

be so managed as to earn its interest because the canals are not, then, of course, the National Transcontinental, which the Canadian government now owns, also ought not to be so managed as to earn its interest. If the Intercolonial and the National Transcontinental ought not to be so managed as to earn their interest, then, of course, if the government should take over the Grand Trunk Pacific and the Canadian Northern it ought to run them also at a loss. It would not be right to subject the Canadian Pacific to that kind of competition, and the government probably would have to take it over, too.

The logical result of acting consistently on this principle would be that the government would saddle itself with the ownership and management of canals and railways representing at present a total investment of almost two and a half billion dollars, and that the taxpayers would have to pay out of their pockets interest charges on this investment amounting to about $100,000,000 a year. Canada is a large and growing country. The time will come when it will have railways representing an investment equal to that of the railways of the United States, which is now almost $20,000,000,000, to say nothing of the investment it may make in canals. Following the precedent which has been established in the case of the canals and of the Intercolonial, the government would have to operate all of these railways and canals so as not to earn any interest, which means that the taxpayers would have to pay eight or nine hundred million dollars a year in interest on the investment in them.

If it would be proper and possible for the government of Canada to adopt sound principles 50 years from now in dealing with its railways, and especially in managing the railways which it may then own, it would be equally proper and possible for it to adopt sound principles in dealing with and managing its railways now. The unsound principles according to which the Intercolonial is now managed are said, by the defenders of its management, to be due to the "peculiar conditions" in Canada. But, as a matter of fact, those who have studied the subject of government ownership extensively know that this same argument is advanced in every country where it can be demonstrated that government ownership and management is a failure. The losses of government railways always are attributed by the defenders of that policy to "special conditions"; and always when the facts are investigated it is found that most of the losses are due to wasteful management, and that most of the wasteful management is due to politics.

1915 RAIL FAILURE STATISTICS

The American Railway Engineering Association has just published the statistics of rail failures for the year ending October 31, 1915. This information was compiled by M. H. Wickhorst, engineer of tests for the rail committee of the association, from data furnished by the various railroads and includes 7,397,699 tons of rail of which 1,384,858 tons is Bessemer rail and 6,012,841 tons is open-hearth rail. This tonnage covers rollings for 1910 and succeeding years up to and including rails rolled in 1915. Statistics have been kept also for rails, rolled in 1908 and 1909, but as the records are discontinued after the rail is in track for five full years, the records for 1908 and 1909 are now closed.

The Bessemer rails are continually becoming a small proportion of the total amount of rail reported. Of 634,898 tons reported for 1915 only 13,295 tons is of Bessemer steel. The table below shows the relation between the failures of Bessemer and open-hearth rails for the several years' rollings. In the last two columns comparative failures are indicated by figuring the failures per 100 miles of track for open-hearth rails as 100 for each of the years respectively. It will be noted that the failures in Bessemer rails are about 50 per cent higher per 100 miles of track than those of the open-hearth rails. This probably does not show the real comparison, as the open-hearth rails are undoubtedly used in more severe service:

Failures of Open Hearth and Bessemer Compared

Year Rolled	Years Service	Failures per 100 track miles		Comparative failures	
		Open-hearth	Bessemer	Open-hearth	Bessemer
1910	5	153.1	236.9	100	154
1911	4	115.5	178.8	100	155
1912	3	46.0	66.9	100	143
1913	2	24.8	35.2	100	142

A comparison between open-hearth and Bessemer rails is obtained from the statistics for rails rolled from 1908 to 1913 inclusive, thus including only rails having two years or more service. This is given in the table below:

Bessemer Failures Compared with Open-Hearth Failures Taken as 100

Year Rolled	Years Service			
	2	3	4	5
1908	...	...	...	112
1909	...	...	195	188
1910	...	230	207	154
1911	249	291	155	...
1912	219	143	...	...
1913	142	...	...	...

A comparison of the failures of rails from the different mills from 1910 to 1913 inclusive using 100 to represent the average, of the failures of all mills for each year's rolling, is given in the accompanying table. This gives the record for five mills rolling Bessemer rails and nine mills rolling open-hearth rails.

One of the most important purposes of these statistics is

Comparison of Failures for the Different Mills, using 100 as the Average of Failures of all Mills for Each Years Rollings.

Mill	1910		1911		1912		1913	
	Relative Failures	Rank	Relative Failures	Rank	Relative Failures	Rank	Relative Failures	Rank
BESSEMER								
Illinois	86.9	2	99.4	3	81.9	1	79.0	3
Maryland	77.3	1	35.9	1	97.0	2	165.3	5
Lackawanna	92.6	3	155.0	5	151.7	3	74.4	2
Cambria	171.2	4	138.2	4	188.8	4	57.1	1
Carnegie	203.5	5	88.8	2	212.1	5	84.7	4
OPEN HEARTH								
Tennesses	35.8	1	36.7	1	95.4	5	66.5	2
Colorado	39.8	2	47.3	2	120.9	7	44.4	1
Pennsylvania	80.9	4	107.0	6	59.8	2	84.7	4
Carnegie	66.0	3	110.7	7	120.2	6	78.2	3
Illinois	134.7	8	96.8	4	85.3	3	88.3	5
Lackawanna	97.2	5	97.7	5	86.1	4	126.7	7
Maryland	106.3	6	52.6	3	39.3	1	296.8	9
Bethlehem	216.1	9	226.4	9	113.3	8	108.5	6
Cambria	131.3	7	204.8	8	161.5	9	199.6	8

to obtain comparisons of the performance of rails rolled from year to year and since the records are complete for the three years 1908, 1909 and 1910, it is possible to make comparisons of the total number of failures in rails rolled in these three years for the full five year periods. It is noted that both the Bessemer and open-hearth rails show reductions in the number of failures in the successive years. The average failures per 100 miles of rollings for several years including both Bessemer and open-earth rails is given below:

Year Rolled	Years Service					
	0	1	2	3	4	5
1908	.....	.....	.....	.....	.....	398.1
1909	.....	.....	.....	.....	224.1	277.8
1910	.....	.....	.....	124.0	152.7	198.5
1911	.....	.....	77.0	104.4	133.3	.....
1912	.....	28.9	32.1	49.3	.....	.....
1913	2.0	12.5	25.8	.....	.....	.....
1914	1.2	8.2	.....	.....	.....	.....
1915	0.7	.....	.....	.....	.....	.....

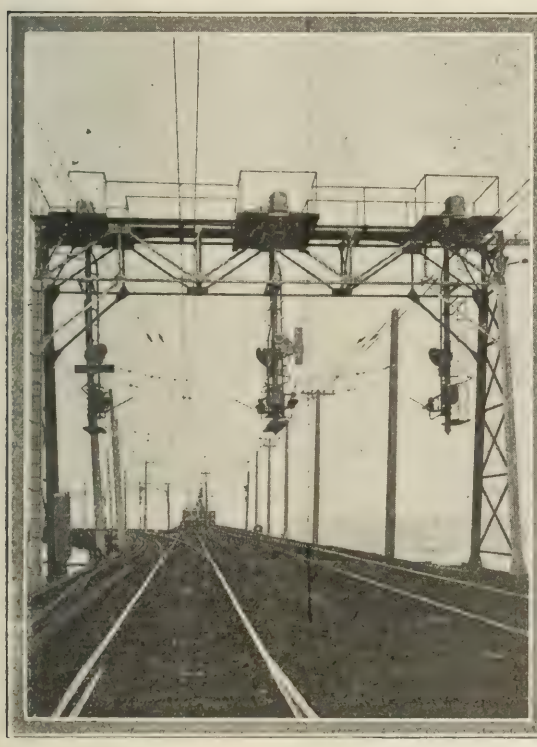
A study of this table shows that there is a decrease in the number of failures from year to year not only in the case of the five year period but also in the case of a less number of years service. This condition is due partly to the gradual replacing of the Bessemer by the open-hearth rail and partly to an improvement in both the Bessemer and the open-hearth records.

Terminal Signaling with 45-Seconds Headway

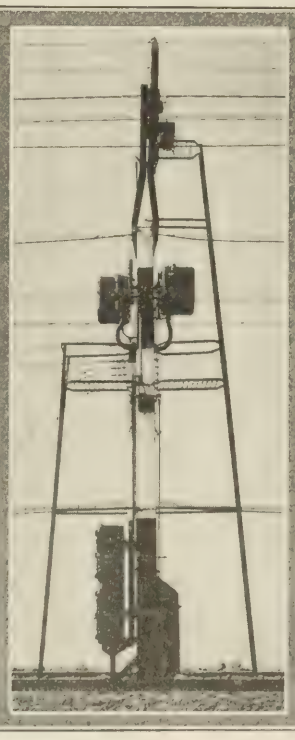
Dense Traffic and Adverse Weather Conditions Made Exceptional Provisions Necessary on New Oakland Pier

AN unusually complete system of terminal signaling and interlocking has been installed by the San Francisco-Oakland Terminal Railway on its pier line recently reconstructed from Oakland, Cal., to the company's ferry terminal located 3.4 miles out in San Francisco bay. While this terminal is used exclusively by electric trains which connect with the trans-bay ferry service, the operating problems presented are not radically dissimilar from those found in similar steam road terminals, and the methods adopted for safeguarding the traffic are, in most respects, applicable to such terminals whether they are electrified or not.

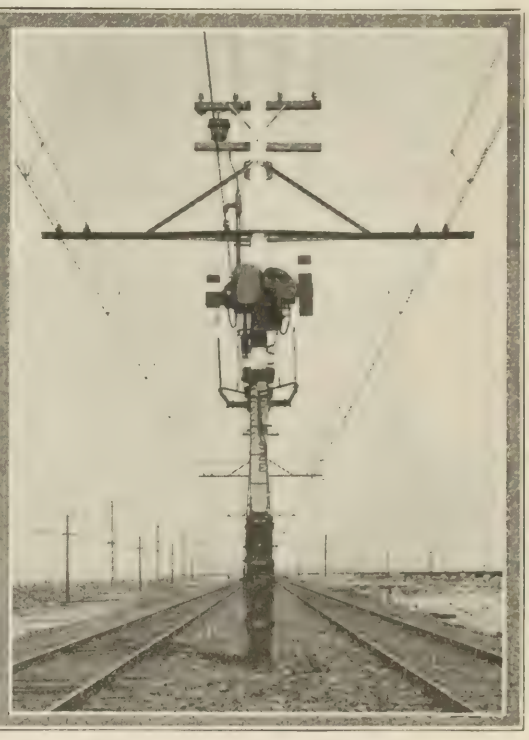
The dense traffic and the extremely heavy fogs encountered require a reliable and efficient signal system which will permit of the closest possible headway, allowing a safe braking distance at the speeds prevailing over the line. The signaling, as adopted, includes 31 new automatic block signals, the relocation and reconstruction of 42 automatic block signals formerly in use on the old line, the addition of signal power equipment and the complete reconstruction of a mechanical interlocking plant located at the pier terminal. The work was done under contract by the Union Signal Construction Company, a subsidiary of the Union Switch & Signal Company.



Double-Track Bridge Showing Suspended Signals



Side View of Double Location



Typical Double Signal Location Showing Mechanism Mountings

Block Signaling

The automatic block signaling provides for the movement of trains under a 45-sec. headway westbound and for leaving the terminal eastbound under a 30-sec. headway, which is gradually increased to 45 sec. when the average running speed of 36 miles an hour is reached. Signals are of the top mast, upper right-hand quadrant, three-position type mounted on center trolley poles and equipped with automatic stops.

The new signals installed are of the U. S. & S. style "T-2" type, equipped with 110-volt, 25-cycle, single-phase induction motors. They require from 8 to 10 sec. to operate from the 0-deg. to the 90-deg. position. In arranging the signal spacing to provide the required headway, 350 ft. was allowed for the average train length, 4½ sec. for sighting time, and 10 sec. for clearing time. Trains running at speeds of 36 m.p.h. under a 45-sec. headway are spaced approximately 2,026 ft. apart, which requires a signal spacing of 420 ft. The full block overlap, with the automatic stop used, provides a braking distance of 420 ft.

Automatic Stops

The automatic stop is considered necessary for the safe operation of trains under the headway and at the speeds demanded by the service, which must be maintained regardless of weather conditions. In the heavy fogs encountered during certain seasons of the year, it is difficult to see a signal indication more than 200 ft. The automatic stop arm is connected to the spectacle casting and when the signal is in the stop position the stop arm is in position to engage the arm of a valve located on the roof of each car. Trains are made up of cars capable of operating at average maximum speeds of 36 m.p.h., the actual braking distance of a loaded 7-car train operating at this speed ranging from 300 to 350 ft. when the automatic stop is applied.

The action of the stop valve may be summed up as follows: When a train running in the normal direction of traffic undertakes to pass a stop signal, the valve is tripped

by the stop arm on the signal, applies the brakes and is automatically restored to its normal position after the required stop has been made; whereas if a train is running against the normal direction of traffic, which is sometimes necessary, the valve is tripped in the against-traffic direction, remains down without applying the brakes and is restored to its normal position by a reduction in train line pressure, which is made when the train stops to reverse direction.

In case a signal is out of order or it is desired to use a cross-over, it becomes necessary to pass an automatic signal in the stop position, provision being made for this by means of a keying device. By inserting a key in the lock located at the base of the signal post, the trainman unlocks the stop arm and is enabled to raise it. The key cannot be taken out of the lock until the stop arm is returned to the stop position, thereby insuring its return after a train has passed under the signal. Each trainman has one key, which he is required to keep on his person at all times.

Pier Terminal Interlocking

The pier terminal interlocking formerly consisted of a mechanical machine of the Saxby & Farmer type, having 28 working levers and one spare space to control 13 wire-connected signals, 12 switches and 7 facing-point locks. Switches were equipped with facing-point locks and detector bars, the plant being mechanical throughout.

The plant as reconstructed consists of a 45-space Saxby & Farmer machine with 44 working levers and 1 spare lever. The machine has 21 levers for the control of 21 semi-automatic electric signals, 21 call-on light signals and 21 automatic stops; 6 levers for the control of 6 single switches, 6 for 6 cross-overs, 1 for 1 movable-point frog, and 8 for 8 facing-point locks. The layout consists of eight terminal tracks converging into the two main-line tracks. The plant handles approximately 520 regular train movements and 270 switching movements per day, the service being maintained through a period of 20 hours. Although the train movements have been handled in the past by the mechanical plant and but few serious accidents have occurred, it was considered advisable in reconstructing and enlarging the plant to provide, among other safety devices, automatic stops to check against the disobedience of signals.

The mechanical work was reconstructed and installed according to standard practice, with the exception of the rail brace and riser plate shown in an accompanying drawing. These are so constructed and so attached to the gage plates that the track is held absolutely to gage at switches, regardless of the condition of other rail braces in the vicinity, and regardless of the strain placed upon the track. They are easily installed and require no adjustment after installation. They were designed by Mr. Casselman, signal foreman, and manufactured by the U. S. & S. Company.

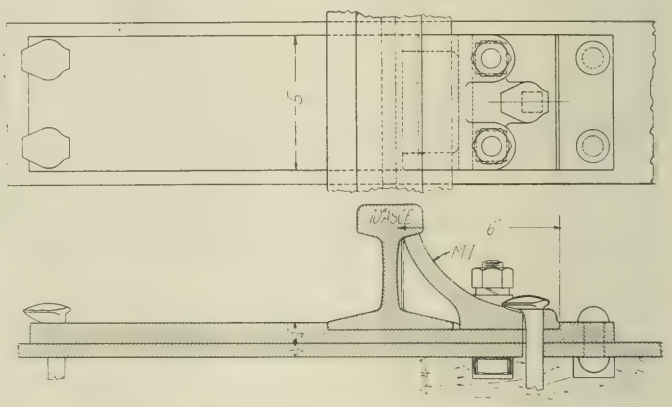
Electrical Features

The use of a yellow light as a "calling-on signal," the application of an overhead automatic stop to interlocked signals and the control of a semaphore signal, a calling-on signal and an automatic stop all from a single lever are probably the most notable features in connection with the installation.

The semaphore arms are placed 17 ft. 3 in. above the top of rail to give the best possible view at short range and, at the same time, provide proper clearances. The point of impact on the stop arms in the normal position is 12 ft. 11⅜ in. above top of rail, and the stop arm must operate to a position at least 45 deg. above normal. Therefore the space available for the location of a calling-on signal was limited, making the use of a light signal for this purpose desirable. From a first cost and maintenance standpoint such a signal offers a number of advantages and the stop arm provides a reliable means of checking its operation. The indication displayed by the yellow light is clearly visible through the required distances in the brightest sunlight.

The application of an overhead automatic stop to interlocked signals at this location presented difficulties which may be outlined as follows: (First) As each car of a train is equipped with automatic stop valves, the stop arm on the signal must be retained in the clear position until the last car of a train has passed under it. (Second) On account of the close train spacing necessary in movements through the plant, the semi-automatic signal cannot be retained in the clear position until the last car of a train has passed it, as was done in automatic signal territory where the full block overlap was used, but must assume the stop position as soon as the first track section over the route is occupied. (Third) The tripping of stop valves in the direction in which they are not effective is undesirable within the interlocking plant, and it is therefore necessary to clear the stop arms on opposing signals as the train passes under them. This must be done without sacrificing the protection for which the stop arm is intended. (Fourth) The stop arm must be cleared when the "calling-on signal" is given, with the semaphore signal in the stop position. (Fifth) The control of the stop arm must be so checked that the towerman cannot unconsciously trip a train which is passing under the stop arm.

In clear weather all of the tracks are in plain view of the



Rail Brace and Riser Plate

towerman, but to indicate the occupancy of tracks in foggy weather an illuminated diagram was installed. The lights in this diagram are controlled directly through corresponding track circuit relays, energy being taken from the 12-volt tap of an air-cooled transformer located in the relay cabinet.

A telautograph set was installed, connecting the train director's stand, located in the terminal shed, with the tower. The set consists of one sending instrument located at the train director's stand and one receiving instrument suspended just beneath the illuminated diagram in the tower. The telautograph furnishes a permanent record, both in the tower and at the train director's stand, of all instructions given, and its use has resulted in the elimination of errors resulting from the towerman's tabulation of information received over the telephone, as was formerly the custom. Its use has also resulted in a great saving of the towerman's time, since he can note instructions written before him on the receiving instrument and manipulate levers at the same time. The set was furnished by the Gray National Telautograph Company, New York.

The semaphore signals are of the style "T-2," three-position type, located to the left of tracks over which they govern, this being necessary to utilize the automatic stop valves

located on the cars. The automatic stop arms are operated by a separate style "T" mechanism, clamped to the signal post just below the semaphore signal.

Operation of Apparatus

As was previously stated, a semaphore signal, a call-on light signal and an automatic stop are all controlled from a single lever. The method of operation is as follows: Under normal operation, with the route set up and all track sections over which a signal governs unoccupied, a semaphore signal is cleared by simply placing the signal lever in the reverse position. The stop arm and signal controlled from this lever assume the clear position immediately upon the reversal of the lever and the stop arm of the opposing signal or signals in the route will remain at stop until the train occupies a short track section immediately ahead of the opposing signal.

Immediately upon the occupancy of the track circuit referred to, the stop arm moves to the clear position, energy being supplied through reversed contacts on the signal lever which permitted the train to occupy the section and a back contact on the track relay of the section. The towerman is prevented from moving the lever referred to from the reverse position until the train occupies the short section, which clears the opposing stop arm. This stop arm is retained in the clear position, after being cleared as already described, until the rear end of the train passes under it, regardless of whether or not the signal lever has been placed normal in the meantime.

If any one of the track sections over which a signal governs is occupied, the towerman notes it by observing the lights in the illuminated diagram or by observing the position of the train in the plant, and may give a call-on signal by standing on a floor push and reversing the signal lever. The call-on signal cannot be given and retained unless a train occupies the approach to the signal, and after being given remains displayed until the train passes off the approach, when it is automatically taken away regardless of the position of the lever. If it is to be displayed for a second train moving over the same route, the lever must be placed on center and again reversed with the operator standing on the floor push.

The stop arm on the signal being controlled from the lever referred to is cleared from either the semaphore signal circuit or the call-on signal circuit and the semaphore signal or call-on signal cannot be displayed until the stop arm has reached its clear position. Stop arm circuits are selected through trailing, as well as facing point switches.

Points Common to Automatic Signals and Interlocking

Keystone insulated joints were used in the interlocking and in that part of the automatic territory located on trestle. This joint is specially adapted to track supported on trestle and required no dapping of the ties.

The signal rail is bonded throughout with two copper-clad No. 8 bond wires to each joint. The copper-clad bond wire withstands the severe vibration at this location better than solid copper and offers more resistance to corrosion than galvanized iron.

With the exception of the weatherproof wire in the transmission line, which was manufactured by the Standard Underground Wire & Cable Company, Kerite wire and cable was used throughout.

All trunking was redwood, which was dipped in a good grade of black paint before installation and painted one coat of black paint after installation. On the solid fill, trunking is supported on oak stakes spaced 4 ft. apart, and on the trestle structure the trunking is supported on the ties and stringers.

RESULTS OF THE M. C. B. LETTER BALLOT

Under Circular No. 6 the Master Car Builders Association presented 95 propositions, occupying a total of 94 pages, to its members for a letter ballot vote. Of those 95 propositions six were rejected, the most important of which was the design of the No. 2 Brake Beam which has been so persistently presented by the Brake Beam Committee for the past five years. This design was shown and described in the report of the committee which was abstracted in the *Daily Railway Age Gazette* of June 15, 1916, on page 1293. This year the vote was even greater for its rejection than on any of the other years at which this beam was presented to the association, the following being a record of the votes cast each year:

Year	Yes	No	Total	Necessary to adoption
1914	834	843	1,677	1,118
1913	806	1,060	1,866	1,244
1914	787	1,343	2,130	1,420
1915	No vote was taken			
1916	710	1,609	2,319	1,546

The other propositions rejected were the placing of the horizontal bars above and below the initials and number of the car in the "Marking of Freight Equipment Car Standard"; the change in the steam hose coupler contour to give a guard arm of sufficient height and length to make all steam hose locks effective; the change in brake beam specifications in which the nominal diameter of the tension member of the beam should be 1¼ in.; the specifications for reinforcing existing car doors, and the change in the revised train lighting rules to the effect that "fuse boxes shall have mounted in them a block provided with fuse contact having a capacity of 101 to 200 amperes."

Of those propositions accepted it is interesting to note that the marking for freight cars has at last been settled, that the train lighting rules have been brought up to date, that the work of the Tank Car Committee received the very strong indorsement of the association and that the association now has a very complete line of specifications covering paint materials.

Marseille-Rhone Canal and Rove Tunnel.—One of the three opening galleries of the Rove tunnel is completed the entire length (23,622 feet). The portion above the towpath is finished on half of the length. The canal ditch in the tunnel is not begun. Between Marseille and Port-de-Bouc the breakwaters in the Mediterranean and in the Etang de Berre are almost completed. Between Port-de-Bouc and Arles, the work begun before the war is being continued. The locks at Arles on the Rhone are built. The total cost of the canal is estimated at $17,756,000, including $10,615,000 for the Rove tunnel and its approaches. It is difficult to fix a date for the completion of the work as about one-third of the Rove tunnel is still unfinished.

Iron and Steel Business in Russia.—The following statistics show the orders received by the Russian "Prodamet" iron and steel selling syndicate during the first six months of 1914, 1915, and 1916:

Articles	Jan. 1-June 30, 1914. Short tons	Jan. 1-June 30, 1915. Short tons	Jan. 1-June 30, 1916. Short tons
Sheet iron	183,169	149,846	115,919
Girders	158,130	106,034	11,529
Sleepers	36,198	33,543	21,756
Hoop iron	71,164	61,346	14,396
Angle, band and section iron	540,637	537,964	632,710
Rails:			
Light	27,900	13,862	51,517
Heavy	209,858	245,341	132,107
Total	1,227,056	1,147,936	979,938

Germans Rebuild Great Warsaw Bridge.—The great Poniatowski bridge across the Vistula at Warsaw, which was destroyed by the Russians when they evacuated the city in August, 1915, has been rebuilt by the Germans.

The Increases in Prices of Railway Material

The Advances in Cost of Most Necessities of Maintenance and Operation Range from 25 to 75 Per Cent

WITHIN the last two years there has been an advance in cost to railways of almost every class of material necessary to be used for purposes of maintenance and operation. The increase has in some instances amounted to several hundred per cent. In most of the staple articles of supplies the advances have ranged from 25 to 75 per cent. In many instances these percentages of increase are not as high as the railways would have had to pay but for the existence of long-time contracts made when prices were lower. Roads that were not in such financial condition as to permit the making of long-time contracts when prices were favorable have had to purchase at still higher rates of increase than are represented by these percentages.

The statistics recently published (*Railway Age Gazette,* September 22, page 482) showing the small increase in operating expenses in 1916, compared either with 1915, in which the increase in volume of business was only beginning, or with one of the best of previous years, 1913, before the late general depression in business had taken place, are all the more remarkable when taken in connection with these increases in cost of supplies. As shown by the returns to the Interstate Commerce Commission for the fiscal year 1916, an abstract of which was published in the *Railway Age Gazette* of September 22, operating expenses for 1916 increased 8.6 per cent compared with 1915 and 1.4 per cent compared with 1913. Yet in the two years between the close of the fiscal year 1914 and the close of the fiscal year 1916 there were increases in cost of nearly every item of material. These increases, particularly in such items as are the staples of railway supplies, range from a small percentage up to 700 per cent in some parts of the country. In the aggregate, and taken in connection with advances in the cost of labor, the increases must have amounted to a much greater percentage than the slight increase shown in the total amount of operating expenses in this period. The small increase in operating expenses in 1916 therefore offers a direct confirmation of the success of the efforts universally put forth to secure greater efficiency in operation.

Some few roads, largely for the purpose of impressing upon officers and employees the necessity of restricting purchases and conserving use as far as possible consistent with efficiency and with maintaining property in condition for safe operation, have issued statements showing increases in the current market price of supplies that have taken place from time to time. In March, 1916, W. C. Nixon, receiver and chief operating officer of the St. Louis & San Francisco, issued a statement showing by items 70 staple articles of supplies upon which increases in cost ranging from 10 to 80 per cent had taken place as compared with the preceding year, and a list of 35 articles on which, during the same period, increases ranging from 80 per cent to 700 per cent had taken place. The average increase in the current market price of all the articles mentioned, and not including the large items of rails, ties, ballast and fuel, was 53.6 per cent. On the St. Louis & San Francisco the purchases of the articles listed amounted to $3,314,753. If the quantities of the same supplies purchased during the current year were equal to the quantities purchased during the preceding year, the total cost would amount to $5,091,460, or an increase of $1,776,707.

In his suggestions as to the practical application of the knowledge of these great advances in prices, Mr. Nixon outlined what has doubtless been the policy followed by other railway managers and which is reflected in the statement of the small increase in operating expenses relative to the increase in the amount of business handled. To officers of the road he said:

"In considering this matter for the territory in your charge, you may find structures and facilities which it would ordinarily be better fully to renew than to repair in part, because the expenditure necessary to make sufficient repairs would go a long way toward covering the cost of complete renewal. A careful analysis may develop, however, that, considering the prevailing excessive prices of material, we would be better off if we made partial repairs at the present time instead of undertaking a complete renewal. . . . Other betterment work that is in contemplation may, perhaps, have to be deferred, even though such action at this time may increase our operating costs. An analysis of such situations may develop that we can better afford to incur increased operating costs rather than to furnish new or additional facilities at this time on account of the excessive cost of the necessary material."

For his purposes, however, Mr. Nixon selected the items of supplies on which the advances in prices had been greatest. Advances in prices have doubtless varied in amount in different sections of the country and, perhaps, with different roads in the same section. For the purpose, therefore, of determining approximately the extent to which the railways of the whole country have been affected by the general advance in prices, and particularly by the advance in prices of representative articles that may be considered as the staples of railway supplies, the *Railway Age Gazette* has undertaken a more extended investigation. A list was prepared, without reference to the advances that might be assumed to have taken place in their current price, of such articles and submitted to several representative roads in different sections.

Ten roads have furnished information based upon prices paid for the articles named as of July 1, 1914; July 1, 1915, and July 1, 1916. The roads from which returns have been received represent an aggregate of 55,000 miles, three being roads in the eastern section of the country with a mileage of about 12,000 miles, six being in the western section and having about 38,000 miles, and one in the southern section, representing about 5,000 miles.

The success of the attempt to make the selection of articles as fully representative as possible within narrow limits as to number rather than to confine the representation to articles upon which advances in price are known to have been large is, perhaps, a fair assumption from the inclusion in the list of some items upon which the advance has been small. In two or three instances there has been a reduction in cost in 1916 as compared with 1914. These slight advances or reductions may be accounted for in various ways. In the statement of average increase for the ten roads included only two items, air-brake hose and lubricating oil, show actual reductions. With reference to both these articles it is fairly to be assumed that prices have been made upon the basis of long term contracts. In the case of lubricating oils it is stated specifically in some of the returns that lubrication is under contract with the Galena Oil Company. The small advance in the cost of illuminating oil may be similarly accounted for. Coal, such as is used for railway fuel purposes, is not subject to great fluctuations, partly for the reason that in many instances the supply is local to the road using it. Track shovels are the only other items on which the percentage of increase is so small as to be an exception to the general rule. Doubtless this could be accounted for by

the small amount of material relative to the amount of labor involved in the manufacture of track shovels and by the fact that no large increases have taken place in the wages of this labor. The date when contracts were made and their duration have had an appreciable effect in varying the percentages of advance developed from the prices reported by different roads.

The percentages of increase in cost of the articles named from July 1, 1914, to July 1, 1916, for all the roads included in the calculation and for the three eastern roads, the six western roads and one southern road, in separate groups, are presented in the accompanying table.

INCREASE IN COST OF CERTAIN ITEMS OF RAILWAY MATERIAL, JULY 1, 1914, TO JULY 1, 1916

	United States. Average increase, Per cent (10 roads)	Eastern District. Average increase, Per cent (3 roads)	Western District. Average increase, Per cent (6 roads)	Southern District. Average increase, Per cent (1 road)
Gravity battery renewals	66	38	74	116
Steel castings	32	39	28	38
Portland cement	18	28	12	25
Wire fencing	43	13	66	20
Glass	34	34	39	12
Air brake hose	4	—4	—4	—5
Bar iron	100	95	103	102
Coal	5	9.5	2	3
Bridge stringers	36	17	48	21
Car siding	26	22	30	20
Lubricating oil—car	2	—2	1	..
Linseed oil	27	27	28	25
Illuminating oil	9	—1	9.7	29
Cast iron pipe	34	39	31	39
Track shovels	2	1	5	—8
Stationery	58	80	47	..
Babbitt metal	81	56	100	79
Fabricated deck plate girders	82	67	83	123
Malleable castings	31	15	35.5	58
Brass	90	144	74.5	73
Boiler flues	74	88	68.5	64
Gasoline	78	87	78	54
Rivets	120	156	113	60
Tool steel (h. s.)	466	495	484	323
Tieplates	84	77	87	92
Waterproof insulated line wire	73	107	48	96
Cotton waste	52	65	40	80

Percentages and averages in studies of this sort are, perhaps, chiefly useful as showing to what extent the tendency of which they are illustrative is general for the country, for a district or for a single item among those under consideration. For the purpose of exhibiting the actual fluctuations in prices more in detail, there are presented herewith reproductions of the actual returns as they were received from the various railways reporting, omitting only the name of the road in each case for reasons which are obvious. The following are the returns from eastern roads:

EASTERN DISTRICT

ROAD A

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals, each	$1.00	$1.05	$1.30
Steel castings, cents per lb.	2.6 to 6.1	2.6 to 6.1	3.4 to 8.5
Portland cement, per bbl.	$1.36	$1.15	$1.74
Wire fencing, per cent disc. list	75	74½	62½
Glass, coach, per light	$1.45	$1.50	$2.30
Air brake hose, cents per ft.	42	30	40
Bar iron, cents per lb.	1.35	1.30	2.50
Coal—			
Bituminous, net ton	$1.12	$1.12	$1.21
Anthracite, gross ton	$2.66	$2.48	$2.58
Bridge stringers, per M. ft.	$36.00	$36.00	$39.50
Car siding, per M. ft.	$19.25	$19.25	$24.00
Lubricating oil—			
Air compressor, cents per gal.	30	30	32
Stationary engine oil, cents per gal. (Equipment lubricated under mileage contract.)	22½	22½	25
Linseed oil, cents per gal.	47½	60½	65
Illuminating oil, cents per gal.	1.28 to 1.44	0.906 to 1.065	1.12
Cast iron pipe, per ton	$20.50	$21.00	$26.50
Track shovels, per doz.	$5.90	$5.50	$5.75
Stationery (index figures)	516	672	928
Babbitt metal, cents per lb.	39	45	54½
Fabricated deck plate girders, cents per lb.	1.96	2	4
Malleable castings, cents per lb	3.20 to 5.85	3.20 to 5.85	4 to 7½
Brass (rods), cents per lb.	13½	27	40
Boiler flues (steel, 2 in. No. 11) cents per ft.	8½	8½	16
Gasoline, cents per gal.	12	12	25
Rivets, cents per lb.	1.45	1.45	4
Tool steel (high speed) cents per lb.	50	65	$3.00
Tie-plates, cents per lb.	1.45	1.30	2.50
Waterproof insulated line wire, cents per lb.	15.55	20.55	30
Cotton waste, cents per lb.	6¼	6	10¼

ROAD B

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals, each	$1.00	$1.13	$1.45
Steel castings, cents per lb.	2.39 to 7.29	2.75 to 7.50	3.18 to 8.29
Portland cement, per bbl.	$1.36½	$1.33	$1.50½
Wire fencing, per cent disc. list	77.50	76.125	72.50
Glass, per cent disc. list	94.906	95.00	93.125
Air brake hose, cents per ft.	42	26	30
Bar iron, cents per lb.	1.15	1.25	2.35
Coal per ton	$0.989	$1.00	$1.075
Bridge stringers, per M. ft.	$27.15	$26.25	$29.00
Car siding, per M. ft.	$22.00	$21.00	$22.00
Lubricating oil, valve, cents per gal.	50	50	50
Linseed oil, cents per gal.	56	54	61
Illuminating oil, cents per gal.	4.00	3.25	4.75
Cast iron pipe, per ton	$21.00	$22.00	$27.75
Track shovels, per doz.	$6.00	$5.00	$5.85
Stationery	.....	.....	.....
Babbitt metal, cents per lb.	5.40	10.90	9.75
Fabricated deck plate girders, cents per lb.	2.05	2.15	3.70
Malleable castings, cents per lb.	3.75	3.40	4.00
Brass	.....	.....	.....
Boiler flues, cents per ft.	9¼	9	17¼
Gasoline, cents per gal.	12¾	9	20
Rivets—			
S, cents per lb.	1.40	1.40	4.00
B, cents per lb.	1.50	1.45	4.10
Tool steel (high speed), cents per lb.	.65	.45	$2.95
Tie-plates, per ton	$24.00	$24.00	$45.00
Waterproof insulated line wire, cents per lb.	14.30	19.06	30.00
Cotton waste, cents per lb.	5.00	5.00	8.00

ROAD C

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals, each	$0.90	$0.95	$1.25
Steel castings, per lb.	0.04	0.04	0.0615
Portland cement, per bbl.	1.00	1.10	1.45
Wire fencing, per rod	0.18	0.20	0.20
Glass (plate)	0.085	0.07	0.12
Air brake hose, per ft.	0.30	0.33	0.40
Bar iron, per cwt.	1.28	1.28	2.50
Coal per ton	2.82	2.75	3.15
Bridge stringers, per M. ft.	26.00	23.75	25.00
Car siding, per M. ft.	24.00	24.25	34.00
Lubricating oil (car), per gal.	0.1842	0.1862	0.16
Linseed oil, per gal.	0.52	0.50	0.63
Illuminating oil (kerosene), per gal.	0.066	0.057	0.065
Cast iron pipe, per ton	25.00	37.00	39.00
Track shovels, per doz.	7.85	6.77	8.45
Stationery	.....	.....	.....
Babbitt metal, per cwt.	29.75	37.95	44.10
Fabricated deck plate girders, per lb.	0.0317	0.0364	0.0372
Malleable castings, per cwt.	3.75	3.80	4.10
Brass, per lb	0.14¾	0.15½	0.28¼
Boiler flues, per ft.	0.09½	0.09	0.18
Gasoline, per gal.	0.11 4/10	0.11¼	0.22¼
Rivets, per cwt.	1.76	1.82	3.85
Tool steel—			
Carbon, per lb.	0.11	0.12	0.18
High speed, per lb.	0.41	0.41	3.00
Tie-plates, per ton	28.30	28.00	48.50
Waterproof insulated line wire, per lb.	0.14¼	0.20½	0.31½
Cotton waste, per lb.	0.045	0.045	0.08

With reference to the statement of Road A, the general observation is made that "we are still getting in some materials at lower figures which we contracted for when prices were lower, but as there is no appreciable tendency toward falling prices the figures I give you represent fairly what our company has to expect. The advance in prices is not the only thing that has caused the increase in the cost of supplies, especially in the value of stock which must be carried on hand. The difficulty of getting materials promptly from the manufacturers and mills and the delays we are subjected to in waiting for the delivery of materials ordered even long ago makes it necessary for us to carry a larger stock than if deliveries were prompt and the getting of material were more flexible than it is. For the same reason, also, we have to take materials from the manufacturers sometimes before we actually want it in order to get it at all, and have to carry a stock predelivered thus at expense to ourselves."

Road C says "the figures illustrate pretty fairly what has transpired in the material market during the past year, and there seems at present no sign of abatement. There have, indeed, been some further increases in price since July 1."

Considered generally, and taking into account that in the case of individual items there are occasional wide divergences in the prices paid by the different roads and in the increases that have taken place from 1914 to 1916, by reason of long-standing contract arrangements, there is, nevertheless, displayed a remarkable similarity of tendency, not only as between roads in the same section, but as between the roads in the two sections. The tendency toward increased prices is general and touches the same items with much the same

degree of intensity in the two sections. This will appear from the detail statements of western roads which follow:

Western District

Road D

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals, each	$1.00	$1.11	$1.54
Steel castings, per cwt.	4.10	3.95	5.95
Portland cement, per bbl.	0.90	0.80	1.25
Wire fencing, per rod	0.2115	0.2185	0.5375
Glass (70 in. by 30 in. D. S. A.) per box	3.27	3.27½	5.45
Air brake hose, per ft.	0.32	0.33	0.40
Bar iron, per cwt.	1.25	1.20	2.35
Coal, per ton	1.642	1.648	1.649
Bridge stringers (Long Leaf Y. P.), per M. ft.	21.00	24.00	35.75
Car siding, per M. ft.	22.75	21.00	22.50
Lubricating oil			
Car oil, per gal.	0.1988	0.1996	0.1996
Valve oil, per gal.	0.4988	0.4996	0.489
Linseed oil (boiled), per gal.	0.51½	0.54	0.68½
Illuminating oil			
Headlight	0.06½	0.02	0.089
Long Time Burner, per gal.	0.06	0.06	0.075
Cast iron pipe, per ton	17.80	20.00	25.00
Track shovels, per doz.	5.75	5.25	6.25
Stationery—Average increase in prices on articles standard to our stock	.....	.....	62.3 per cent over 1915
Babbitt metal, per cwt.	6.00	8.00	15.00
Fabricated deck plate girders, per cwt.	2.06	2.02	4.80
Malleable castings, per cwt.	3.50	3.35	6.00
Brass, per lb.	0.13875	0.19875	0.265
Boiler flues, per ft.	0.08½	0.07¾	0.16
Gasoline, per gal.	0.10	0.06¾	0.184
Rivets, per cwt.	1.775	1.60	3.65
Tool steel (high speed), per lb.	0.57½	0.50	4.00
Tie-plates, each	0.083	0.0795	0.19½
Waterproof insulated line wire, per cwt.	17.85	19.35	22.80
Cotton waste (colored), per lb.	0.04¼	0.038	0.06¾

Road E

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals, each	$0.99½	$1.12¼	$1.41
Steel castings, per cwt.	4.10	3.95	5.30
Portland cement			
Sandusky, per bbl.	1.30	1.30	1.55
Universal, per bbl.	1.38	1.35	1.55
Wire fencing, per rod	0.2475	0.2475	0.27225
Glass, 20 in. by 20 in., per box	3.20	2.90	4.76
Air brake hose, per ft.	0.42	0.33	0.40
Bar iron, per cwt.	1.05	1.15	2.24
Coal—			
Iowa, per ton	1.92½	1.92½	2.02½
Lake, per ton	2.70	2.65	2.95
Illinois (Spring Valley), per ton	1.90	1.90	2.00
Bridge stringers, per M. ft.	23.20	21.70	23.70
Car siding, per M. ft.	23.50	21.00	27.00
Lubricating oil—			
Cylinder, per gal.	0.4831	*0.4840	0.4840
Car, per gal.	0.1831	0.1840	0.1840
Linseed oil, per gal.	0.47¾	0.64½	0.60
Illuminating oil (kerosene), per gal.	0.04⅝	0.03⅞	0.058
Cast iron pipe, per ton	21.55	23.11	29.11
Track shovels, per doz.	6.00	5.75	7.25
Stationery	.....	.....	.....
Babbitt metal, per cwt.	7.00	12.40	18.02
Fabricated deck plate girders, per cwt.	2.14	1.85	2.48 to 2.68
Malleable castings, per cwt.	2.90	2.85	4.20
Brass, red metal, per cwt.	14.91	17.54	26.52
Boiler flues, per ft.	0.08½	0.07¾	0.18
Gasoline, per gal.	0.11½	0.10½	0.18½
Rivets, structural steel, per cwt.	1.60	1.55	3.50
Tool steel—			
Carbon, per cwt.	0.05¾	0.05¾	0.08¼
High speed, per cwt.	0.45	0.40	2.75
Tie-plates, per ton	27.00	25.00	31.50
Waterproof insulated line wire, per cwt.	5.60	7.35	9.77
Cotton waste—			
White, per lb.	0.09	0.08	0.11½
Colored, per lb.	0.05	0.04⅞	0.08¾

*Increase account change in freight rate. Price same account five year contract.

Road F

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals (Edison), each	$0.994	$1.1376	$2.782
Steel castings, per cwt.	3.775	3.70	4.00
Portland cement (year's average), per bbl.	1.437	1.12	1.45
Wire fencing, per cent disc. from list	75	75	72½
Glass			
Window, per cent disc. from list	94.75	95.15	92.2
Plate, per cent disc. from list	93.21	95.125	91.9
Air brake hose, per ft.	$0.50	$0.50	$0.50
Bar iron, per cwt.	1.20	1.20	1.855
Coal, per ton	1.727	1.621	1.698
Bridge stringers (fir), per M. ft.	23.20	21.50	25.20
Car siding (fir), per M. ft.	18.50	15.00	28.00
Lubricating oil, car, tanks, per gal.	0.18	0.1812	0.1812
Linseed oil—			
Raw, per gal.	0.51	0.53	0.66
Boiled, per gal.	0.52	0.54	0.67
Illuminating oil (headlight), per gal.	0.03½	0.02½	0.03
Cast iron pipe, per ton	23.40	23.40	30.15
Track shovels			
Iron D, per doz.	7.00	5.25	6.25
Wood D, per doz.	6.50	5.25	6.25
Babbitt metal, per cwt.	16.75	16.75	16.75
Babbitt metal (special hard), per cwt.	22.00	22.00	22.00
Fabricated deck plate girders, per cwt.	2.15	2.20	3.83
Malleable castings, per cwt.	3.75	3.75	3.75 to 4.25
Brass castings, per lb.	0.16½	0.21	0.28¼
Boiler flues, per ft.	0.12½	0.12¼	0.12½
Gasoline, per gal.	0.076	0.0525	0.1575
Rivets, steel, per cwt.	2.40	2.20	4.00
Tool steel—			
Carbon, per lb.	0.07	0.07	0.0875
High speed, per lb.	0.50	0.50 to 1.60	2.75
Tie plates, per net ton	25.75	23.40	45.00
Waterproof insulated line wire, per M ft.	15.50	12.32	19.35
Cotton waste (colored), per lb.	0.05⅜	0.05⅜	0.06⅛

Road G

	July 1, 1915 Per cent over July 1, 1914	July 1, 1916 Per cent over July 1, 1914
Gravity battery renewals		
Zinc	250	133
Copper	20	30
Steel castings, 100 lb. to 250 lb.	None	30
Portland cement	5 dec	None
Wire fencing	8	80
Glass (window)	16	30
Air brake hose	30 dec.	25 dec.
Bar iron	15	130
Bridge stringers	5 dec.	33⅓
Car siding	25	60
Lubricating oil (car)	None	None
Linseed oil (boiled)	None	30
Illuminating oil (headlight)	33⅓ dec.	None
Cast iron pipe	1	25
Track shovels	None	4
Stationery	10	33⅓
*Babbitt metal (anti-friction)	14	15 dec.
Fabricated deck plate girders	3	60
Malleable castings	None	45
Brass	15	90
Boiler flues (charcoal iron)	None	75
Gasoline	25 dec.	100
Rivets	3	130
Tool steel—		
Carbon	None	50
High speed	150	550
Tie-plates	None	100
Waterproof insulated line wire	6 dec.	None
Cotton waste	10 dec.	10

*Decrease in 1916 partly due to change in specifications.

Road H

	Percentage of increase or decrease July 1, 1915, over July 1, 1914	Percentage of increase or decrease July 1, 1916, over July 1, 1914
Gravity battery renewals—		
Zincs, per 100	67	137.4
Coppers, per 100	3	32
Steel castings, per lb.	....	33.3
Portland cement, per bbl.	....	.....
Wire fencing—		
Galvanized barbed, per 100 lb.	13.5	78
Annealed fence, per 100 lb.	4	92
Painted barbed, per 100 lb.	3.4	79
Galvanized fence, per 100 lb.	15.2	87.9
Glass—		
Plate	11	47
D. S. A.	No change	20
Air brake hose, per ft.	—23	—14
Bar iron, per 100 lb.	16.5	142.7
Coal, per ton	—1.6	3.8
Bridge stringer I-beams, per lb.	2.7	97.3
Car siding, per M ft.	—22.7	23
Lubricating oil	5	5
Illuminating oil, per gal.	—4.7	14.5
Linseed oil, per gal.	4.8	22.3
Cast iron pipe, per ton	—6.9	32.9
Track shovels, per doz.	....	4
Stationery	(*)	(*)
Babbitt metal, per 100 lbs.	131.6	93.5
Fabricated deck plate girders, per lb.	2.7	97.3
Malleable castings, per lb.	—2	12.5
Brass—		
Journal bearings, per lb.	8.86	99.2
Brass castings, per lb.	7.71	84.6
Motor car castings, per lb.	6.45	70.8
Boiler tubes—		
Charcoal iron, per ft.	—5	....
Steel, per ft.	—8.8	41.2
Gasoline, per gal.	—28.9	36.1
Rivets, boiler, 100 lb.	....	134.3
Tool steel, per lb.	....	37.5
Tie plates, flat bottom, per ton	—8.4	90.8
Waterproof insulated line wire, per ft.	30.3	112.7
Cotton waste, per lb.	—10	35

*It does not seem possible to give a fair average of the increase in stationery. Some papers have been withdrawn and others have advanced from 25 per cent upward proportionate to quality. On account of shortage of dye price of inks enters vitally into this item and prices vary so as to make a fair average of increase seem incalculable.

Road I

	July 1, 1914	July 1, 1915	July 1, 1916
Bar steel, per cwt.	$1.31¾	$1.46¾	$2.229
Pig lead, per cwt.	4.20	6.00	7.35
Chain, ⅝ in. link, per cwt.	2.30	2.50	4.60
Sheet copper, per lb.	0.19¼	0.24	0.55
Nails, per cwt.	1.55	1.50	2.55
Oxalic acid, per lb.	0.08½	0.25	0.73
Muriatic acid, per cwt.	1.67	1.90	5.00
Galv. sheets, per cwt.	2.41¾	3.55	4.32
Building paper, tarred, per cwt	1.45	1.40	2.95
Steel castings, 51 lb. to 100 lb.	4.00	3.90	5.00
Portland cement, "Universal," per bbl.	1.57	1.58	1.85
Bar iron, per cwt.	1.19	1.275	2.25
Bridge stringers, per M. ft.	9.00	8.00	16.00
Cast iron pipe, per ton	25.05	24.95	31.30

	July 1, 1914	July 1, 1915	July 1, 1916
Fabricated deck plate, girders, per cwt..	2.09	2.27	4.35
Brass, general machinery, per cwt.....	16.208	19.0833	20.6666
Boiler flues, per ft.....	0.10¼	0.1038	0.20
Rivets, cone head ½ in. and larger, per cwt.	1.73¾	1.58¾	3.85
Tool steel, high speed, per lb.....	0.75	0.75	3.00
Tie plates, per ton.....	24.60	24.00	50.00

Road F comments as follows upon the statement presented above:

"Most all railroads have contracts and these prices do not reflect the current prices as of July 1. They were made prior to that date. Take, for example, our boiler tubes—the price is nearer 20 cents. Track shovels are under contract prior to July 1. This is also true all the way through, except possibly on tie plates, which price is $5 under the market, and cast-iron pipe, which is about the market.

"I have not filled in the blank as to stationery because I don't know how to do it and reflect anything of value."

In the face of constantly advancing prices, as appears to be the case with many of the items included in the list, the inference from the above statement is that the average of increases is rather above than below what is shown in the foregoing returns. The effect of long-time contracts, made two or more years ago, has been to reduce the percentage of increase reported.

The purchasing officer who reports for Road H calls attention to several items not included in our list upon which there have been material increases in cost. Among these he mentions tie preservatives, such as creosote and chloride of zinc; track accessories, such as bolts, nuts and spikes; also rails, which have increased $5 per ton, as well as billets, bars, beams, angels, rods, copper, spelter, tin, lead, antimony, pig iron, ferro-manganese and tank plates. These affect and increase the cost of many items essential to railway operation.

The same officer also adds a statement of the rate of increase in cost of some of the larger items of equipment, comparing prices in 1916 with those in 1913. These are as follows:

Mikado locomotives	10 per cent
Flat cars	10 per cent
Gondolas	13 per cent
Stock cars	5 per cent
Box cars	6 per cent
Steel coaches	9 per cent

Southern District

A report has been received from one southern road. The returns follow rather closely the averages of returns from eastern and western roads. The statement in detail follows:

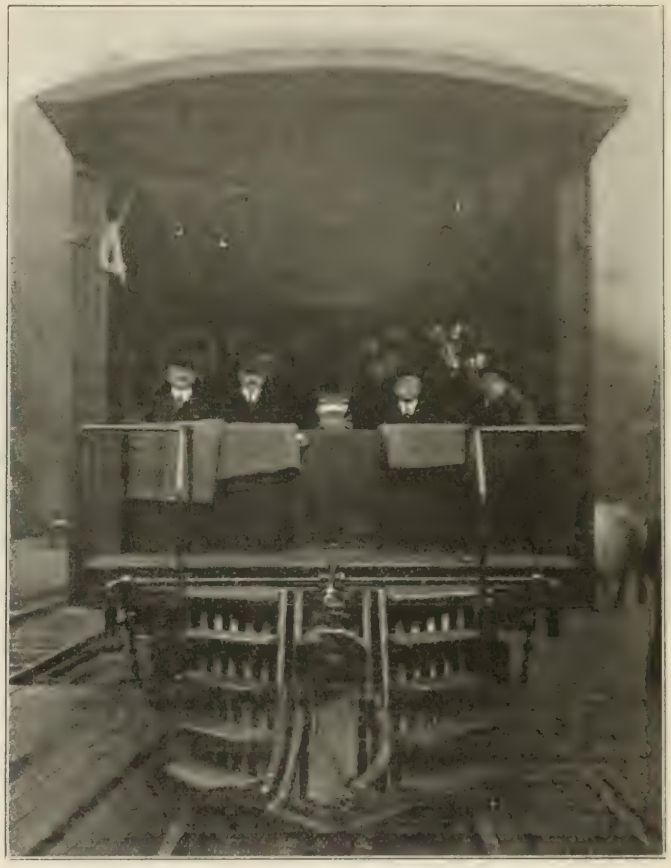
Road J.

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals—			
Gravity copper, per 100.....	$5.50	$6.25	$7.25
Gravity zincs, per 100.....	34.75	81.75	67.75
Blue vitriol, per cwt.....	4.60	6.00	10.75
Steel castings, per net ton.....	66.00	64.00	91.00
Portland cement (including bags), per bbl.	1.24	1.30	1.55
Wire fencing, disc. per cent.....	75	70	62½
Glass, disc. per cent.....	93.1	93.5	92
Air brake hose, per ft...	$0.42	$0.29½	$0.40
Bar iron, per cwt.....	1.04	1.15	2.10
Coal, lump and egg, per ton.....	1.50	1.35	1.55
Bridge stringers, per M. ft.....	19.50	21.50	23.50
Car siding, per M. ft.....	20.00	23.00	24.00
Linseed oil, per gal.....	0.51	0.465	0.64
Illuminating oil, kerosene, per gal.....	0.0350	0.02375	0.045
Illuminating oil, signal, per gal.....	0.26	0.2812	0.2812
Cast iron pipe, per ton.....	18.00	18.00	25.00
Track shovels, per doz.....	6.25	5.75	5.75
Babbitt metal, per cwt.....	5.10	11.25	9.15
Fabricated deck plate girders			
Tank plates, per cwt.....	1.10	1.10	3.44
Steel beams, per cwt.....	1.12	1.20	2.50
Malleable castings, per cwt.....	2.85	3.50	4.50
Brass castings, per lb.....	0.15	0.20½	0.26
Boiler flues, per ft.....	0.09¾	0.09¾	0.16
Gasoline, per gal.....	0.12	0.09½	0.18
Rivets, B. H., per cwt.....	2.20	2.00	3.50
Tool steel, per lb.....	0.65	1.00	2.75
Tie plates, per net ton.....	26.00	26.00	50.00
Waterproof insulated line wire, per cwt.	15.30	17.75	30.00
Cotton waste (colored), per lb.....	0.05	0.05	0.09

Not all roads have been in so good position as have the larger systems, whose reports are given to make long-time contracts for supplies. It would seem, therefore, that in estimating the effect of increased costs of supplies upon the operating expenses of the railways of the country as a whole, a considerably higher percentage should be applied to most of the items.

THE FORTY-FOURTH ANNUAL TRACK INSPECTION OF THE PENNSYLVANIA

The forty-fourth annual track inspection of the main line of the Pennsylvania between Pittsburgh and New York was made on October 3 and 4. This annual inspection as made by the general manager of the Pennsylvania has grown from a small beginning, to be a permanent important institution of the road. At its inception, nearly fifty years ago, the trip was made only by the employees and officers of the maintenance of way department, but with the increasing realization of the benefits derived from a trip of this nature, the party has been increased by invited guests from other depart-



Interior View of the General Manager's Inspection Car

ments to such an extent, that on the occasion of the forty-fourth annual inspection, the general manager was accompanied by more than 300 operating officers. As an institution, and in point of numbers attending, it ranks with the national conventions held by various societies and associations throughout the country, and offers even a greater opportunity than conventions for discussion and the interchange of ideas.

To fully understand the beneficial results of these inspection trips, it is necessary to have a clear understanding of the organization of the maintenance of way department, which has the general manager as its chief officer. Each division superintendent has a division engineer on his staff.

The superintendent reports to a general superintendent, who, in turn, reports to the general manager. The engineer of

maintenance of way also reports to the general manager, and on his staff has three assistants—the assistant engineer in charge of roadway and track, the assistant engineer in charge of structures, and the signal engineer.

The division engineer is the recruiting officer for the corps of maintenance engineers and employs only graduates from engineering colleges of recognized standing. These men make up what is known as the classified service.

The division engineer is in charge of all maintenance on his division and to him report the master carpenter, the supervisor of signals and the supervisors of track. These men are chosen from the classified service after some years of preliminary training and are always under the personal observation of their superiors, and are in constant training for the more responsible positions, it being the almost unvaried custom of the road to fill all positions of responsibility in the maintenance of way department from the men who have come up in the classified service.

The inspection party, while including many of the higher officers, is largely made up of these men of the classified service, in training for the more responsible positions and the management considers these inspection trips to be a vital step in their development. This trip presents the opportunity for them to become acquainted with their superior officers and the men of similar rank, acquaints them with their railroad, broadens their outlook, enables them to discuss methods with

committee No. 2, with ditches, ballast and spacing of ties; committee No. 3, with sidings, road crossings, station grounds and the policing; committee No. 4, with the switches and signals.

The members of the committees were furnished with one of these blank forms for each supervisor's division between Pittsburgh and New York, or eighteen blanks in all. Each member of the various committees was expected to assign figures to the best of his ability for the various items covered, and, at the conclusion of the trip, to forward the marked blanks to the office of the general manager. To avoid confusion of one supervisor's division with another, one man on each inspection car was assigned to watch out for the markers indicating the division line between sections, and, as it was passed, a gong, placed at the front of the car, was rung to notify the committeemen.

As these marked cards are received at the general manager's office, they are sent to the drafting room, where a chart is made, showing the results of the inspection trip. Copies of these charts are then sent out to the general superintendents, division superintendents and division engineers. When the division engineer receives his copy the supervisors are called in conference and plans are made to correct the faults indicated on the chart.

The start was made from Pittsburgh at 9.03 A. M., on October 3, as the first section moved out of the station fol-



A Track Gang Saluting the General Manager and Party

others and to see how the other fellow is meeting his difficulties. It promotes a spirit of good fellowship and co-operation, so essential to the successful operation of a railroad or other corporation.

On October 2, the members of the inspection party, made up of representatives from all divisions east of Pittsburgh, including the branch lines, gathered at Pittsburgh and were assigned hotel accommodations as guests of the Pennsylvania. They had previously been furnished with the itinerary of the trip, showing train schedules and information as to the seating arrangement on the special trains.

The inspection train was made up in six sections, comprised of inspection and business cars. The inspection cars are of special design with the seats arranged in tiers, one above the other in grandstand style, each car seating 30 persons. Ample space is provided in the rear for baggage. Each section, excepting the first, carried two of these cars, one being pushed ahead of the locomotive and the other placed on the rear.

As the members of the party found their seats in the inspection cars, they were assigned to one of the four inspection committees. These committees were furnished with blank forms on which to record their observations, and, as may be seen in the accompanying illustration, committee No. 1 had to do with the line and surface of the main line track;

lowed, at intervals of two minutes, by the remaining five sections. As the several trains passed through the yards, the party was greeted with cheers from employees and citizens collected at all points of vantage along the right of way. This enthusiasm was not confined to Pittsburgh alone, but continued throughout the trip, and was one of its most remarkable features.

The territory between Pittsburgh and Harrisburg was covered on the first day, two stops being made during the run. The first stop was made at the famous Horseshoe Curve, where a photograph was taken of the various sections of the train. The second stop was made at Altoona, where lunch was served. Here the party was entertained by a concert given by the shop band.

On arrival at Harrisburg, the inspection party assembled at the board of trade building, to witness the awards of the special main line track inspection premiums. These awards are made independently of the annual track inspection and are based on the reports of inspections made during the year by the special main line track inspection committee, which for 1915-16 was comprised of: W. G. Coughlin, engineer maintenance of way, chairman; A. B. Clark, assistant engineer maintenance of way; L. W. Allibone, superintendent Sunbury division, and J. K. Johnston, superintendent Tyrone division.

The prizes are six in number and total $5,400. The first, or Klondike prize, amounts to $1,200, $800 for the supervisor and $400 for his assistant, and is awarded for maintaining the best section of tracks throughout the year. This prize was presented to C. M. Wisman, supervisor, and H. M. Grimm, assistant supervisor, who had charge of the section between Liddonfield, Pa., and Plainsboro, N. J.

The special improvement prize of $1,000, $700 to the supervisor and $300 to his assistant, was awarded to J. E. McIntyre, supervisor, and W. W. Portser, assistant supervisor, in charge of the section from Anderson to Thompsontown, Pa. This prize is for the greatest improvement made in the line and surface of a supervisor's section during the year.

PENNSYLVANIA RAILROAD COMPANY

New Jersey Div. New York Div.

REPORT OF CONDITION OF SUPERVISOR'S DIVISION No. A.

R. J. BOND, Supervisor

H. R. GEIB, Assistant Supervisor

1916

SUB-DIVISION FOREMEN	COM. No. 1		COM. No. 2			COM. No. 3			COM. No. 4	
	Main Tracks									
	Line	Surface	Ditches	Ballast	Spacing Ties	Sidings	Road Crossings	Station Grounds & Policing	Swtchs.	Signals
8 Jas. Foran										
7 C. F. Coyne										
6 Jas. Keegan										
5 Michael Crecca										
4 T. M. Dunning										
Total										
Average										

EXPLANATION

COMMITTEE No. 1—Mark the condition of line and surface of all running tracks.

COMMITTEES Nos. 2 and 3—Mark the respective features with reference to their general appearance and conformity to standard requirements.

COMMITTEE No. 4—Mark frogs, switches and alignment through crossovers and turnouts. Mark Signals with respect to condition and adjustment; condition of pipe runs, wire conduits, switch connections, and general conformity to standard construction.

NOTE.—Use marks of merit ranging from 1 to 10; 10 denoting perfect condition; 5 medium; 1 very bad; intermediate numbers denoting intermediate conditions.

INSPECTED BY

(NAME) .....

(TITLE) .....

Form Used by the Inspection Committees

In addition to the special prizes, four prizes of $800 each, $600 to the supervisor and $200 to the assistant, were awarded for maintaining the best line and surface on a main line superintendent's division between Pittsburgh and New York, and Philadelphia and Washington. These prizes were awarded to C. Z. Moore, supervisor, and L. R. Fleming, assistant supervisor in charge of the section between Harrisburg and Dillerville, Pa.; W. R. Hanly, supervisor; B. M. Frymire, assistant, in charge of the section between Thompsontown and Marysville, Pa.; W. E. Brown, supervisor, and G. H. Stewart, assistant, in charge of tracks between New Florence and Donahue, Pa.; W. F. Reuch, supervisor, and A. G. Andrew, assistant, in charge of the section between Perryville, Md., and the Black River Bridge, north of Baltimore.

W. G. Coughlin, engineer maintenance of way, presided as chairman of the meeting, and C. H. Niemeyer, assistant engineer maintenance of way, in charge of road way and track, awarded the prizes. Thomas W. Hulme, real estate agent; H. W. Bekle, assistant general solicitor; H. M. Carson, general superintendent Central division; J. G. Rodgers, general superintendent Northern division; Ivy L. Lee, formerly executive assistant, and S. C. Long, general manager, were the speakers of the evening.



A Section of the Inspection Train Passing Newport, Pa.

On October 4, the trip was continued, covering the territory from Harrisburg to New York, the various committees carrying on their work as on the preceding day. A short stop was made at Overbrook, Pa., to receive box lunches prepared at the Broad Street Station, Philadelphia. On arrival at Manhattan Transfer, the party was transferred from the inspection cars to electric trains for the trip to the Pennsylvania Terminal at New York, where dinner was served in the grill room.

GREAT WESTERN'S ACCIDENT RECORD.—It is three years since the last train accident on the Great Western of England in which a passenger was killed. Since the Slough accident of 1900 there have only been four train accidents on that line in which passengers have been killed, viz., Loughor (3 killed) in 1914, Taunton (1 killed) in 1907, Westbourne Park (1 killed) in 1911, and Yeovil (3 killed) in 1913. In the year 1913 the Great Western carried 109 million passengers, the highest number of passengers of any railway in the United Kingdom.

RAILWAY FIRE PROTECTION ASSOCIATION

An account of the opening sessions of the annual meeting of this association, held in New York City, October 3, 4 and 5, and of the reports on fire prevention in grain elevators and on automatic sprinklers, was given in the *Railway Age Gazette* last week, page 602; there remain to be noticed the reports on locomotive spark and ashpan hazard, on electrical hazards and on the protection of wharves and piers; and also papers by Robert Scott (A. C. L.) on shop property and by President F. H. Elmore (Southern Railway) on statistics.

Locomotive Spark Hazards

This report was presented by W. F. Kaderly, (G. S. & F.). The committee has made a study of locomotive front end appliances, but refrains from recommending any one because of strongly divergent views, among officers consulted, as to merits; and also because experiments are still going on. The Master Mechanics' standard front end, and the Mudge-Slater device are well-recommended. One road reports encouraging success with a device by which cinders are conveyed from the front end of the engine back to the firebox. The principal recommendation of the committee is that front end arrangements should be thoroughly inspected after each trip, and that the inspectors should be men thoroughly familiar with the apparatus; and a daily record should be kept of the condition of engines. Of ashpans, the most popular designs are the double sloping pan and the sliding hopper-bottom pan. Here, also, the principal recommendation is for thorough inspection at the end of each trip. These recommendations, if carried out, will greatly reduce the danger of setting fire on adjacent property. The committee says that the right of way should be burned off at least twice a year; and in heavy forests there should be fire guards fifty feet from the track. Where old ties are burned along the road, the work should be completed early in the day; fires left burning when the men go home are a danger.

The discussion on this paper brought out the experiences of a number of members. The importance of the matter of inspection, as pointed out by the committee, was emphasized by many speakers. It is common to get reports of fires and find the netting, in the locomotive which is blamed, in apparently good condition. Sometimes, however, it will be found that sparks get out around the edge, which is loose; or the plates around the pipes are not well fitted. It was agreed that no single standard of mesh in netting could be settled on, as different coals demand differences in the size of opening. Perforated steel plates are used with satisfaction; they cost more than netting but it was believed that their added durability compensated for the extra cost. The device for returning cinders to the firebox, mentioned by the committee, is in use on switching engines of the Illinois Central; also on large freight engines. It is claimed that these engines have never set a fire.

P. Hevener, (Rock Island) reported satisfactory service with the Mudge-Slater device. It is in use on half of the coal burning locomotives of the Rock Island. The fire losses off the right of way have been reduced 50 per cent and the device is to be put on the rest of these engines. Another road reported that this device showed no marked improvement over other devices in use on the same road.

The association accepted the report as one of progress; and the committee was directed to study its problem in connection with the use of oil fuel and pulverized coal.

Electric Hazards

This report, presented by T. S. Potts, (C. H. & D.) consisted of a six-page tabular statement of the causes of hazards around electric installations used for power purposes, and in connection with signaling systems. The list includes all conceivable troubles with auto-starters, generators, lightning arresters, motors, rheostats, switchboards, signaling systems, storage batteries, transformers and wiring. After a very brief discussion the report was accepted.

Fire Protection on Wharves

This report, presented by W. F. Hickey, (N. Y., N. H. & H.) is a twelve-page essay on the construction of wharves, with special reference to safeguarding the structure and contents against fires. The principal hazard is internal, arising from the large quantities of combustible freight and the difficulty of getting fire apparatus to the seat of the trouble. The entire floor and platforms should be made of reinforced concrete, fireproof construction to be carried down to a safe distance below low water mark. Above the floor, fireproof construction would be heavy and costly; and heavy, smooth timbers are the best material. Wall covering should be of cement and asbestos, or some other completely noncombustible material. The roof should be noncombustible, on thoroughly protected steel or on heavy timber. Sheet metal and unprotected steel framework are undesirable, being quickly buckled by heat.

The height of sheds should be restricted as much as possible, and the space should be divided into maximum sections of 10,000 square feet. Subdividing walls, where made of wood, should be three or four inches thick, and solid; and sheathed with lock jointed metal, laid flat, with all nail heads covered. All fire doors should be labelled, and of the National Standard design. The space under the apex of wooden awnings over platforms should be divided, at least opposite each fire wall or partition. The division should be of metal, or 2-inch plank, and extend down to the lowest point of the awning. Windows should be of the thinnest possible glass with wire screens on the outside. The monitor roof should be a good ventilator and let out smoke; smoke is more troublesome than fire, many times.

Every pier should have standpipes fixed about 100 feet apart, each equipped with 50 feet of hose. Each standpipe should have two hose connections, one for 1½-inch hose, and one for 2½-inch, such as is used by fire departments.

The discussion on this paper dealt mainly with the relative merits of linen hose, unlined, and rubber lined hose. Linen hose is dried with difficulty, and salt water rots it. In handling the hose, after use, it is liable to be broken. One member had substituted rubber lined hose, because the unlined, by excessive friction, reduced the force of the stream. B. S. Mace (B. & O.), had found unlined hose objectionable because of leaking; at small fires, more damage is done by water than by fire. William McGrath, (D. L. & W.) uses cotton rubber-lined hose even in shops. E. W. Reilly, (Erie) believes that where the water pressure is low—40 lb.—it is more economical to use unlined hose and stand the expense of renewal when necessary. On his road there are places where the rubber rots sooner than the unlined.

Because of the varied views brought out in connection with the discussion on hose, and of the expression of many different opinions in connection with fire brigades and alarms, which were touched upon very briefly by the committee, the meeting accepted the report as one of progress, and requested the committee to take up again these two features of the subject.

Shop Property

The paper on this subject, by Robert Scott, superintendent of insurance of the Atlantic Coast Line, which is given in abstract below, was followed by a lively discussion concerning the inspection of shops and the duties of the fire-prevention department in connection with that work. Mr. Scott has weekly inspections and written reports, made by the fire chief or by a specially appointed person. At the Mount Clare shops of the Baltimore & Ohio, the shop foremen are required to go around criticising the conditions in the rooms of other foremen; this is done every week. J. S. Richards, (Southern Pacific, Houston, Texas) has a similar inspection

by foremen. A common difficulty, mentioned by several speakers, is the carelessness of men in leaving greasy clothing in a dangerous situation. A number of members said that greasy garments left by careless men were promptly burnt up. It is essential to require men to hang clothes properly in lockers. In one large shop a man goes around every noon, immediately after dinner, and picks up all loose papers.

The appointment of apprentices to positions in fire brigades, mentioned by Mr. Scott, was criticized as objectionable, because of the less responsible character of the younger men and the fact that each such man is likely soon to be transferred to some other place. It was replied to this that fire brigades should be made up of both old and new men. Each brigade should also have men from all of the different parts of a large plant. Mr. Scott was complimented highly on his paper.

Statistics

F. H. Elmore, president, reporting for the executive committee, gave data which has been gathered from 43 roads, out of the 60 holding membership in the association, 17 roads having failed to furnish any satisfactory response. The roads reporting operate 118,489 miles of line. The report for the year 1915 shows fires 5,123; loss $2,886,020, as compared with 5,900 fires in the preceding year with a loss of $3,795,197. This shows a reduction of 13.20 per cent in the number of fires, and 23.95 per cent in money loss. The seven most important causes in their order are: (1), locomotive sparks; (2), unknown; (3), tramps and trespassers; (4), adjacent property; (5), spontaneous combustion; (6), electric wiring, etc.; (7), wrecks. The number of fires under each head are, in their order: 1431, 920, 382, 293, etc. The seven classes aggregate 3,324 fires. Measured by the amount of loss, the fires from unknown causes stand at the head of the list, the losses amounting to 37 per cent of the total. Locomotive sparks caused less than 10 per cent; tramps and tresspassers, 6 per cent; spontaneous combustion, 8 per cent, etc. Classifying the fires in 1915 according to classes of property, 26 per cent were fires destroying or damaging rolling stock; 21 per cent elevators; 10 per cent merchandise in transit; 8 per cent passenger and freight depots and contents; 8 per cent shop buildings.

The tabular matter of this report is supplemented by a half dozen pages giving details of a number of important fires. In the case of one fire in a heap of coal, 20,000 tons of coal had to be moved to get at the fire. This fire is believed to have been caused by friction of wooden timbers at the bottom of the pile. In the case of a large office building, the circumstances were such that the inspectors concluded that a fire may be caused from the careless dropping of a cigarette, and yet not be discovered for a number of hours afterwards.

In the discussion on this paper, it was the sense of the meeting that the annual statement of losses by fire should show the destructible values of the property; and that the report should be for the fiscal year prescribed by the Interstate Commerce Commission.

Oil Burning Appliances

The committee on this subject, B. S. Mace, (B. & O.) chairman, presented a brief report containing a plan and very brief specifications of a proposed standard arrangement for installing a pressure tank for containing fuel oil. The plan contemplates a tank of a size to hold a half day's supply, for the shop to which it belongs, and a concrete pit large enough to allow the attendant ample space around the tank.

Fire Brigades, Inspection, Etc.

On Wednesday afternoon there was an informal discussion covering a variety of subjects. Rapid changes in the forces at various shops, terminals, etc., since the beginning of the European war have made it difficult to keep fire brigades well recruited. The thing to do, it seems, is to make special effort to see that the experienced men in brigades instruct the new men every day. At Locust Point, (B. & O.) Baltimore, there is a fire brigade of 22 men of whom 9 sleep on the premises and one is a patrolman on duty all night. The men who sleep at the terminal are off duty from 6 p. m. to 8 p. m. All of the 22 men have extra pay. Other speakers, who do not allow firemen extra pay, expressed the opinion that such allowance ought to be made. On the Southern Pacific, in Texas, one hour extra pay is allowed a man for each fire drill; and at fires, time-and-a-half is allowed. On the Erie, shopmen who are in the fire brigades are granted season passes.

The Erie has held a number of annual tournaments, with prizes, which have worked up a good degree of enthusiasm. There are now 20 fire companies on the Erie lines. This year, the employees' bands, organized at a number of cities on the line for musical recreation, went also to the tournament. This gathering was at Huntington, Ind., and 750 men were present. Enough men were left at home to protect the properties.

Fire Extinguishers

In a discussion of this subject it was brought out that in places where there is danger from oil fires, employees are likely to be very free in using extinguishers, and to leave them unfit for use at the next emergency. The foreman, in this case, going around the next day to replenish the extinguishers, calls the men together to observe what he is doing.

The observance of October 9 as fire prevention day, as recommended by the National Fire Protection Association, was the subject of a brief discussion. A number of members are acting in this direction, and co-operating with municipal officers.

The officers elected for the ensuing year are: President, P. Hevener, (Rock Island); Vice-President, B. S. Mace, (B. & O.); Secretary-Treasurer, C. B. Edwards, Seaboard Air Line, Norfolk, Va. Member of the executive committee in place of B. S. Mace, Robert Scott, (A. C. L.); members of executive committee to serve until 1919, F. H. Elmore, (Southern Railway) and W. S. Langford, (N. Y. C.).

Railway Shop Property

Many shop layouts are mainly comprised of buildings that have come into existence through some temporary arrangement, and not by reason of any well ordered plan.

The past record of fire losses on shop property should be sufficient argument for the use of fire-proof, or at least fire-resistive, material in the construction of buildings. Windows and wall openings should, of course, be protected by wired glass and automatic doors. In view of the ever increasing use of electric current for light and power, it is important that intelligent attention be given to the hazards arising from electrical equipment.

Administrative heads should see that a high order of discipline is maintained. That form of discipline is advocated which deals with teaching, instructing and training the mind rather than correction or punishment. To teach employees to have due regard for property rights there should be literature that can be easily comprehended. Such practices as smoking on the premises and the careless handling of oils and explosives should be regarded as offences that call for severe discipline, while a high degree of cleanliness and the very best of good housekeeping methods should be enforced.

Every shop plant should have ample pumping power, with pipes for delivering water in full force and volume to every part of the premises. In all buildings where automatic sprinklers can be used to advantage they should be installed, especially in the woodworking and upholstering departments, storehouses and pattern shops.

In the case of older plants it is well to examine this equip-

ment in order to make certain that the fire protection has kept pace with the growth of other facilities. This is an important feature which should be carefully looked after by those in charge of valuable properties. In selecting men for fire brigades young, vigorous and loyal apprentices usually meet the requirements. A general plan of all underground fire lines should be posted at some suitable place for study on part of the men. The fire alarm system must be reliable. The lapse of a few seconds may bring about conditions that render it impossible to control the flames.

So let us seek to awaken employees to a realization of the fact that the loss of facilities usually means lack of employment, and endeavor to impress upon the entire community that when railroad shops burn they are not always rebuilt in the same locality and that as taxpayers and payroll producers the roads are entitled to all the protection municipalities can afford to give them.

And let us drive home to our executives the conviction that the ever-narrowing margin between income and expense is improved every time a fire loss is averted; that the germ of fire can be controlled if the shop plant begins life with a sound constitution; if its premises are kept clean and free of unnecessary exposures, and a good circulation maintained by the application of energy in the right direction. We ask for no antitoxins, but earnestly plead for a plain and wholesome diet of unstinted co-operation and *water* in abundance.

COMMISSION REGULATION*

By Lewis B. Franklin.

Vice-President Guaranty Trust Company of New York

One of the most serious problems in which we are deeply interested and upon which the public needs educating is the relation of the state and federal governments to our great transportation systems. The regulation of public utility corporations by state commissions, now in effect to a greater or less extent in thirty-three states, has been accepted generally as wise and proper by the banker, the operator and the public. The reason for this approval by all classes is to be found in the fact that for the most part these state commissions have recognized the sound economic principle that regulated monopoly provides the best service to the public at the lowest rates commensurate with a fair return on the investment. The questions as to what constitutes a fair return and on what basis the value of the investment should be computed are still under discussion, but progress is being made from year to year in bringing the various commissions into harmony with each other and with the operators and bankers. As a matter of fact, the question of a fair return is not a theoretical question, but a very practical one. In the last analysis, a fair return must be one that will attract capital in sufficient quantities to provide adequate service, and this necessary return will fluctuate according to the price of capital for that class of undertaking in the market places of the world.

As regulated monopoly has become the practice in our municipalities, so regulated competition has been instituted in the relations of the federal government with our interstate transportation system. Federal regulation of railroad rates, both intra and inter state is, I believe, sound in principle and beneficent in practice, but it can never be practical to have our great transcontinental systems subject to one master as a whole and to forty-eight masters as to their several parts. The time is coming, and I trust is not far off, when the regulation of our railroads will be taken entirely out of the hands of the several state legislatures and placed where it belongs—in the hands of the Interstate Commerce Commission. Some of our legal friends may tell us that this cannot be done; that the sovereign power of the states granted them by the constitution cannot be taken away; that they must continue to supervise and control the corporations which they have created. Sovereign power was not given to each state without exception, but certain important functions were reserved solely for the federal government, including the control of commerce between the several states and the establishment of post roads.

Constitutional Authority

It must be remembered that at the time of the adoption of the Constitution there was in the mind of none of its framers any conception of our modern systems of railroads, of telegraphs, or telephones or of steamships. Interstate travel was by post roads and over the establishment of such means of communication Congress was given power. This power was not limited to interstate roads, but was general in character, thereby indicating that intrastate transportation is only a part of interstate traffic and that control should not be divided but centered in the federal government. I firmly believe that had present conditions of transportation existed at that time, that sole power of regulation of all transportation would have been delegated to the federal government, and sincerely hope that this can be shortly brought about by federal legislation.

If it is proper for the government to establish railroad rates and, therefore, in a large degree, determine the gross revenue of the railroad corporations, is it not also proper that the same power should exercise supervision over such expenses as are subject to control? The trouble with the present system of regulation is that it is founded on the supposition that the railroad corporations are malign creatures of a corrupt money power and, therefore, repressive measures are the only ones needed. While there may in the past have been some warrant for this idea the time has come when our legislators must awake to an appreciation of the fact that the ownership of the railroads is in the hands of a great mass of the people and to the necessity of a constructive policy instead of a destructive policy. What a change in the attitude of the government since the days of the late sixties, when Congress was busily granting aid to the transcontinental lines reaching out across the western prairies! We do not want aid of that kind now, but we do want justice. We want intelligent action on these problems. We do not want legislation by compulsion—compulsion from the railroads, from the shipper or from labor, but a fair decision based on knowledge, not on supposition, on equity, and not on political expedience.

Federal Incorporation

It has seemed to many of those who have studied this question that compulsory federal incorporation of all railroad corporations doing an interstate business is the first step toward the solution of the problem. Our transportation systems are not less important to the country at large than is our national banking system and should even more logically come under federal control. A federal railroad board with regional boards constituted in a way similar to the federal reserve board, with federal incorporation, would, in my opinion, provide for our railroad systems stability, freedom from inexpert regulation and release from outside domination. Such intelligent supervision would lead to a restoration of confidence in railroad securities and thereby enable the companies to borrow money upon reasonable terms to provide funds with which to construct improvements necessary to good service and extensions whereby new territory can be opened up.

*From an address before the Investment Bankers' Association fifth annual convention, October 2, 1916.

Germany's Pig Iron Output.—The German output of pig iron during August was 1,145,000 tons, as against 1,134,000 tons during July.

New Mississippi River Bridge at Memphis

High Water Interfered with Erection of Structure Which Was Placed in Service July 15. Mayari Steel Used



The Two Memphis Bridges

ONE of the most advantageous opportunities for a study of the advancement in bridge design and construction during the last 24 years is afforded by a comparison between the new Harahan bridge just completed over the Mississippi river at Memphis, Tenn., and the Frisco bridge opened for traffic in 1892, which is located only 200 ft. down stream from the new bridge. Conditions are especially favorable for a comparison because the two bridges are of the same type and have almost exactly the same span lengths. Interest is added to such a comparison by the fact that Ralph Modjeski, consulting engineer, in charge of the new structure, was an assistant engineer on the construction of the older bridge. The weight of the last span of the new bridge was taken off the falsework on Friday, June 30, and the bridge was placed in service on July 15.

Aside from the attention merited by the details of the superstructure and substructure of a new bridge over the lower Mississippi, considerable interest attaches to the erection of the steel work because of the unusual flood conditions encountered. High water of unprecedented duration interfered materially with the progress of the work and resulted in a loss of considerable falsework and some structural material.

The new bridge, named after the late J. T. Harahan, was built by the Arkansas & Memphis Railway Bridge & Terminal Company, a corporation controlled jointly by the Chicago, Rock Island & Pacific, the St. Louis Southwestern and the St. Louis, Iron Mountain & Southern, all roads having lines terminating at Memphis. Until the new structure was opened for traffic, they used the old bridge owned by the St. Louis-San Francisco and were tenants of that road from the connections on the west side of the river to junctions with their own terminals in Memphis. In addition to the heavy traffic of the Frisco, between Birmingham and Kansas City, as well as that to St. Louis, the old bridge carried trains of the Rock Island between Memphis and Tucumcari, N. M., of the Iron Mountain from Memphis to Texarkana and St. Louis, and of the Cotton Belt to central Texas, the trains of the last named road running over Rock Island tracks as far as Brinkley, Ark.

General Description

As seen from the accompanying diagram the bridge consists of four spans of a cantilever arrangement having a total length of 2,201 ft. 10½ in., a simple 345-ft. deck span to the west, and west of that a steel viaduct, 2,363 ft. long. The bridge provides for two tracks 14 ft. center to center with a wide clearance of 8 ft. and a vertical clearance of 24 ft. above base of rail. Highway traffic is provided for by cantilever brackets outside of the trusses on either side, affording duplicate roadways, 14 ft. wide.

The tracks ascend from the east to pier 1 on a 1.1 per cent grade, continued on a level grade to pier 4 and then descend on a 1.126 per cent grade across the approach viaduct and an embankment three-quarters of a mile long at its western end. The highway deck is on the same grade as the tracks except on the viaduct, where it descends on a 3 per cent grade.

Commencing at the Tennessee end of the bridge there is an anchor arm of 186 ft. 3¾ in. from the anchorage to pier 1. The distance between piers 1 and 2 is 790 ft. 5¼ in., and is spanned by a suspended span of 417 ft. 9¾ in., carried by two cantilever arms of 186 ft. 3¾ in. each. Between piers 2 and 3 there is a fixed span of 621 ft., while the distance of 604 ft. 1½ in. between piers 3 and 4 is spanned by a semi-suspended span 417 ft. 9¾ in. long supported at its west end by pier 4 and at its east end by a cantilever arm 186 ft. 3¾ in. long. It will be noted that this arrangement permits of a number of duplications, i. e., two suspended spans of 417 ft. 9¾ in., and three cantilever arms of 186 ft. 3¾ in., this also being the length of the anchor arm at the east end of the bridge. The viaduct consists of a succession of 40 ft. towers with 80 ft. clear spans, the four lines of deck girders carrying the two railroad tracks being supported on cross girders at the tops of the bents. The highway decks are carried on brackets supported on the sides of the columns.

The total weight of the metal in the entire structure is about 21,400 tons, of which 14,700 tons is in the main cantilever structure, 1,400 tons in the deck span and 5,300 tons in the viaduct approach. One feature of note in this bridge is the use of an alloy steel (Mayari) to the extent of 8,900 tons. This material was used in all the main members of the trusses of the cantilever structure and in the pins and eye-bars of the deck span. A novel feature in this connection is the use of alloy steel for the bottom laterals of the main structure. The chemical requirements of this material are as follows:

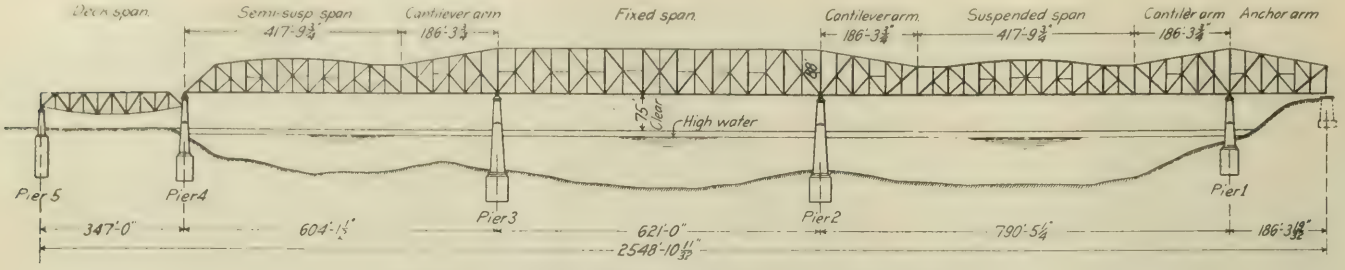
	Rivet steel	All other steel
Manganese	.60	.80
Phosphorus (acid steel)	.04	.06
Phosphorus (basic steel)	.03	.04
Sulphur	.04	.04
Silicon	.15	.15
Carbon	.30	.40

Aside from the limitations as shown above the alloy steel

was required to contain not less than 1.2 per cent of nickel.

The alloy steel was divided into three classes as to physical requirements depending upon the purpose for which it was to be used. The required ultimate strength varied from 70,000 to 110,000 lb., the elastic limit from 45,000 to 55,000 lb. and the minimum reduction of area from 40 per cent to 25 per cent in the order named.

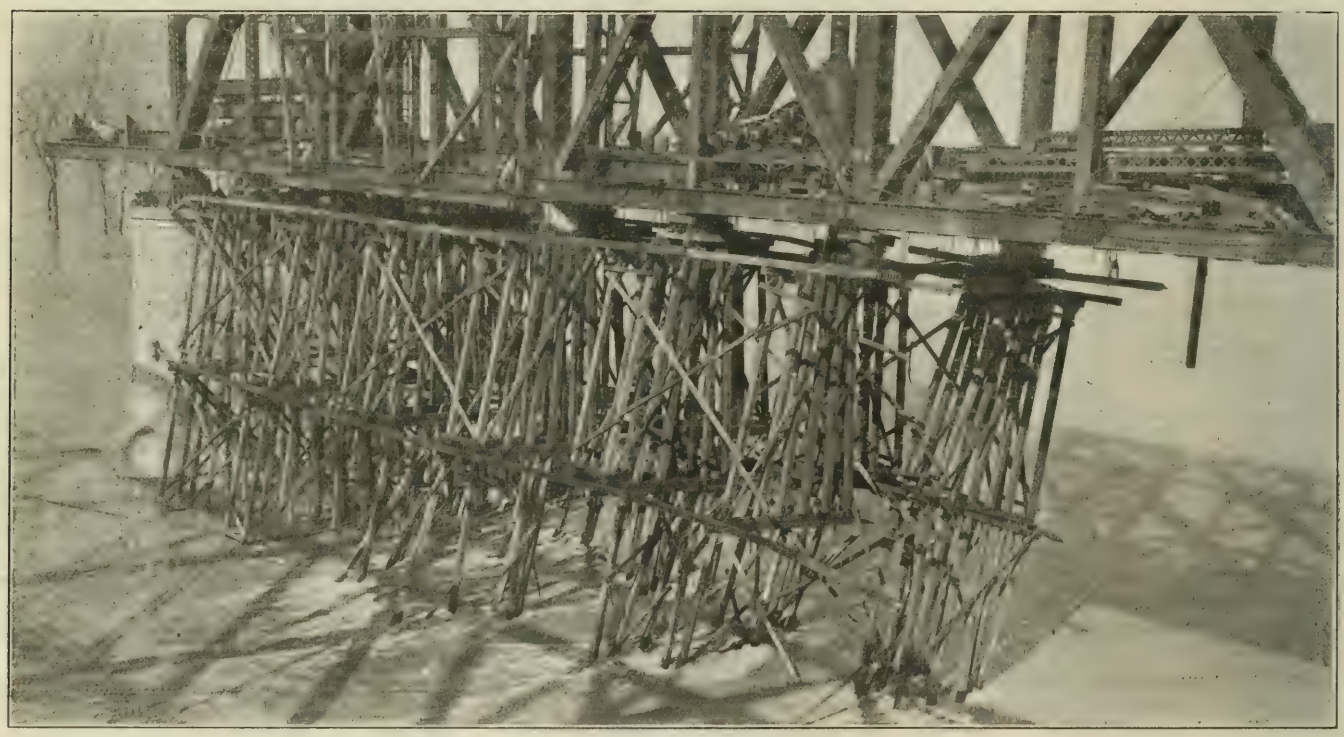
The piers are of granite with concrete backing. They are all supported on pneumatic caisson foundations resting on a very hard blue clay. Piers 2 and 3, with the deepest foundations, were carried 192 ft. and 195 ft. respectively below the elevation of the copings. The 76 pedestals supporting the viaduct contain 55 cu. yd. of concrete each, and are each supported on 16 concrete piles 30 ft. long. A complete account of the construction of the substructure was given in an article by M. B. Case in the *Railway Age Gazette*, April 23, 1915, page 877.



Elevation of New Mississippi Bridge at Memphis

The maximum compression members are the bottom chords of the cantilever arms in the panels next to the piers and have sections of 319.3 sq. in., made up of four web plates 39 in. by 1 3-16 in. and eight angles 8 in. by 8 in. by 1⅛ in. The webs are vertical with heavy double angle lacing on the top and bottom and vertical diaphragms at frequent intervals. The maximum tension members are the top chords directly over the maximum compression members and consist of 10 eye-bars of which 6 are 16 in. by 2¼ in. and 4 are 16 in. by 2 3-16 in. As mentioned previously the bottom laterals are so heavy that alloy steel was found desirable. In the anchor arms these consist of a 24-in. by 13-16 in. plate and two angles 8 in. by 8 in. by ¾ in. maximum section.

The end of the anchor arm was given a vertical portal for the sake of appearance, but it is in reality a false portal because the two vertical members, being tension members under all conditions of loading, consist of eye-bars. To satisfy esthetics, they are enclosed in stiff box section members, cross-braced to give the appearance of heavy portal construction.



Falsework for the Fixed Span Swinging in the Flood

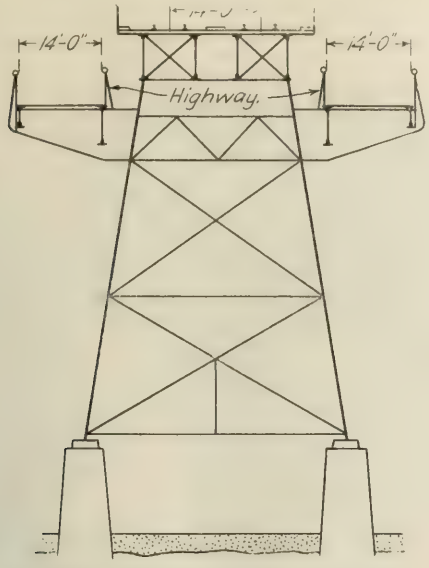
Design and Details

As the new bridge is only 200 ft. from the old one, the locations of the new piers were fixed by the position of the old ones, save that pier 4 was placed 17 ft. farther out in the river, thus shortening the span between piers 3 and 4 a sufficient amount to permit the duplication of the suspended spans previously mentioned. The anchor arm was made sufficiently short to insure an uplift on the anchorage under all conditions of loading. Otherwise the designers were permitted no latitude in the arrangement of the span lengths.

The uplift on the end of the anchor arm varies from 405,000 lb. to 6,892,000 lb. under the different conditions of loading. Consequently an anchorage of considerable size is necessary. As shown in one of the accompanying drawings this consists of a block or abutment of concrete 43 ft. high with a base 34 ft. by 80 ft., its weight of 10,900,000

lb. being sufficient to give a minimum bearing pressure of ¾ ton per sq. ft. under the condition of maximum uplift.

The uplift of the anchor arm is transmitted to the anchorage by means of two groups of eye-bars, each containing 6 bars 16 in. by 1¾ in., the load being transmitted to the bars by means of a structural steel grillage, consisting of 6 girders



Outline Section of West Approach

36 in. deep, assembled in a frame, which was equipped with columns to support it until it was imbedded in the concrete. To preclude the cracking of the concrete surrounding the eye-bars as they became extended under the anchorage stress, open wells were formed around the bars which were not filled with concrete until the uplift had assumed considerable proportions through the erection of the cantilever arm and the



Pier One and the Anchor Arm

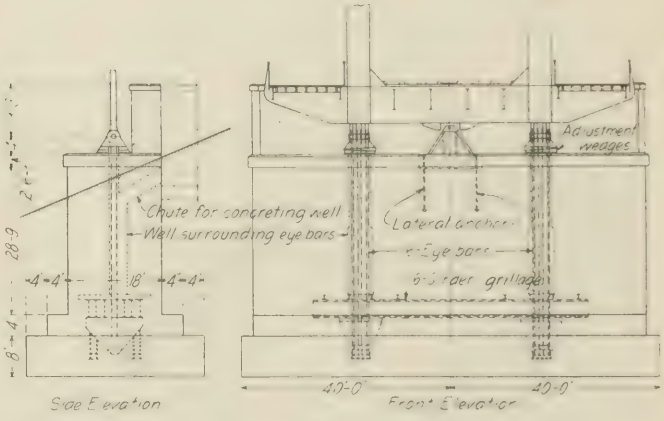
suspended span. The wedges shown in the drawing as forming a part of the shoes at the tops of these bars, were driven home at the same time to insure substantially uniform stress in the bars under all conditions.

On the bridge seat midway between the anchor shoes a bearing is provided to take the lateral forces. As the anchor arm must be left free to expand, this lateral bearing is designed to resist lateral movement only and does not interfere with either the longitudinal or vertical movement of the anchor arm.

Expansion Details

One of the accompanying photographs shows the connection of one end of the suspended span to the cantilever arm, the vertical hangers shown in the center of the picture serving as the supports for the suspended span. During the time that the cantilever arm and the suspended span were being erected, the top and bottom chords were continuous under the cantilever action. However, as soon as the suspended span was completed and supported from the cantilever arm by the hangers shown in the photograph, the panel of the top chord to the left of the hangers and the panel of the bottom chord to the right of the hangers became ineffective and carry no stress except as they are employed in preserving the continuity of the lateral systems. In fact these chords are broken, being provided with sliding joints to allow for the expansion and contraction of the trusses of both the suspended span and the cantilever arms.

This expansion amounts to 8 in. at each end of the suspended span and must be provided for also in the floor and lateral systems. As this is a greater movement than is allowable in any reasonable form of expansion pocket attached to



Details of the Anchorage, Reinforcing Bars Not Shown

the floor beams, the railway floor stringers at the expansion point are supported by a link arrangement as shown in one of the accompanying drawings. A similar arrangement is provided at the same point for the bottom lateral system.

An expansion joint is also provided in the rails at these points as shown in one of the accompanying photographs, and is an application of the principle of the rail lock of the sliding-tongue type used on draw bridges. In this case, however, the tongues do not move but are secured to the rails on one side of the joint. The tongues are made of heat-treated alloy steel.

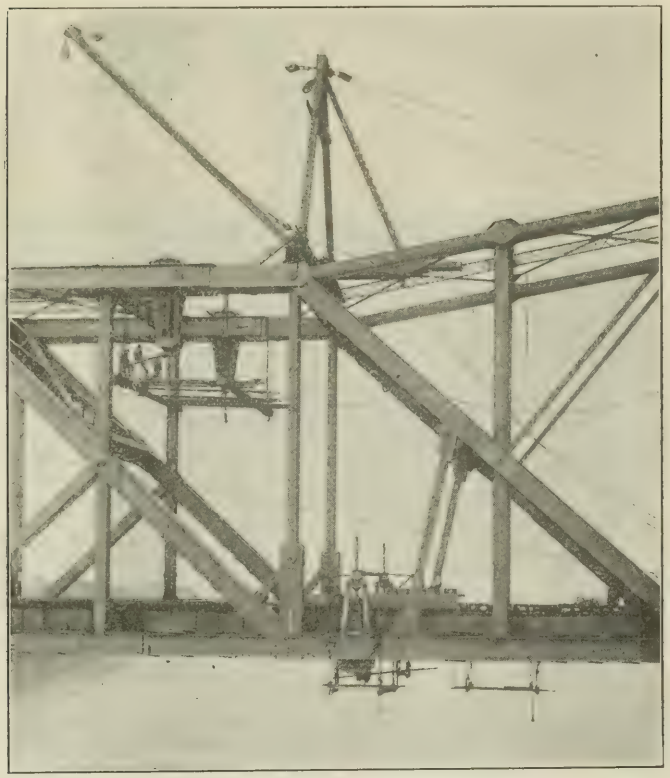
Falsework and Erection

Those portions of the bridge which were not erected by the cantilever method were carried on falsework consisting of towers of two bents each spaced 8 ft. center to center, at every main and sub-panel point. The upper portions of these bents consisted of two stories of frame bents having a total height of about 60 ft., each bent containing 12 posts at the main panel points and 10 posts at the sub-panel points. These frame bents were carried by pile bents of 26 and 22 piles respectively, which, owing to the great depth of water, required piles from 100 to 114 ft. in length, a total of 120,000 ft. of piles being used. The piles were Douglas fir, cut especially for this job. They were driven to about 30 ft. penetration with a marine driver having double leads 85 ft. high. The pile bents were cross-braced with timber from

the caps to the water line, but as this left a considerable height unbraced, cables were clamped to the two outside piles on one side and to three outside piles on the other side at a point that brought the clamps to the river bed when full penetration had been obtained. As each bent was completed, the other ends of these cables were brought over and made fast to the opposite end of the bent at the cap, thus forming a cross bracing of cables.

Stringers for the highway deck were used temporarily as falsework stringers. The superstructure was supported on the falsework on sand boxes consisting of drums 5 ft. in diameter, made of heavy steel plates with plungers cut from tight cribbings of 12 in. by 12 in. timbers.

In accordance with a provision of the specifications, the rivets for all tension splices were set with a pressure riveting machine. In erecting the two halves of the suspended spans by the cantilever method the junction at the mid-point was facilitated by keeping the meeting halves of the trusses a material distance above the final position, with the distance between adjacent panel points in the top chord at a somewhat



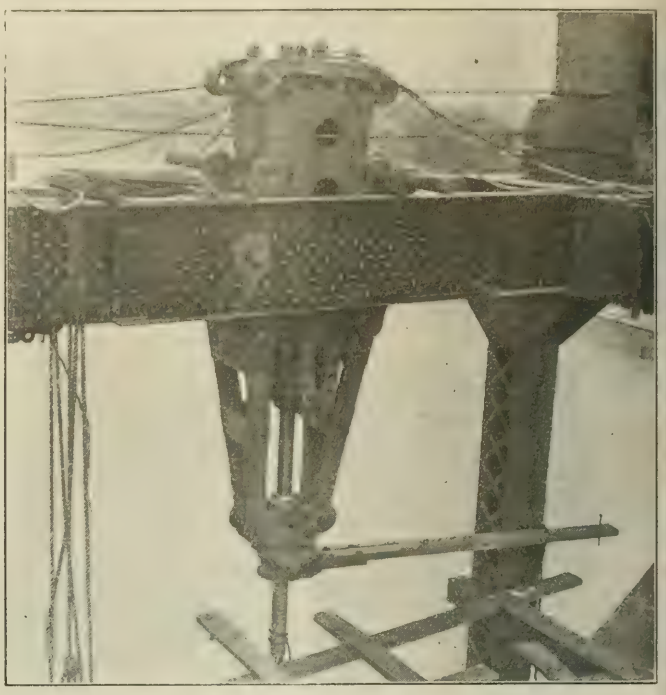
The Support for Suspended Span from Cantilever Arm

greater distance apart than the correct distance between these points, the reverse being the case between the panel points of the bottom chords. The complete assembling of the bottom chords across this panel was made possible by having slotted holes in the eye-bars of the center panel, while the splices in the top chords were left unriveted until the chords came together as the erection camber was taken out.

The camber of the suspended span and the length of the top and bottom chords were controlled during erection by wedges placed between pins in the broken sections of the top and bottom chords at each end of the suspended span as previously mentioned. These wedges, which weigh 50 tons each, are clearly shown in the photograph previously referred to. They were operated by a screw turned by a ratchet and a long lever. The pitch of the wedges is very flat and a delicate adjustment of the ends of the chord was possible. The wedges were used only for lowering the load and care was taken never to withdraw them further than was desired.

Erection Progress

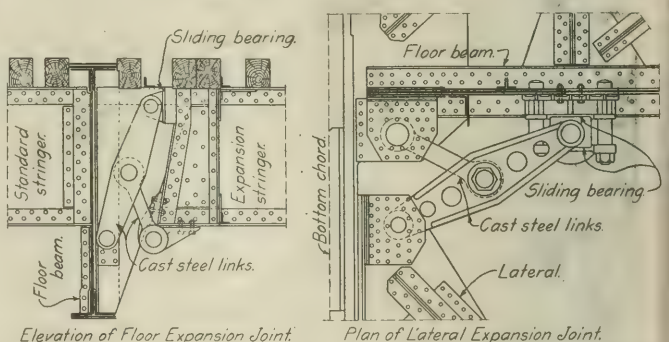
It was the intention to erect the anchor arm and all of the superstructure between piers 2 and 5 on falsework, the suspended span between piers 1 and 2, together with the two cantilever arms, to be erected by the cantilever method. In order to carry on any work on the pile driving or falsework construction, it was necessary that the stage of water in the



Wedge for Adjusting Chord Lengths

river be 20 ft. or less above standard low water level, while for security in the erection it was desirable that the water stage should not greatly exceed this level while work was in progress. It was also expected to time the work so that the erection of spans on falsework would take place late in the summer and in the fall when the river is ordinarily at a low stage.

Accordingly the erection of the anchor arms and the

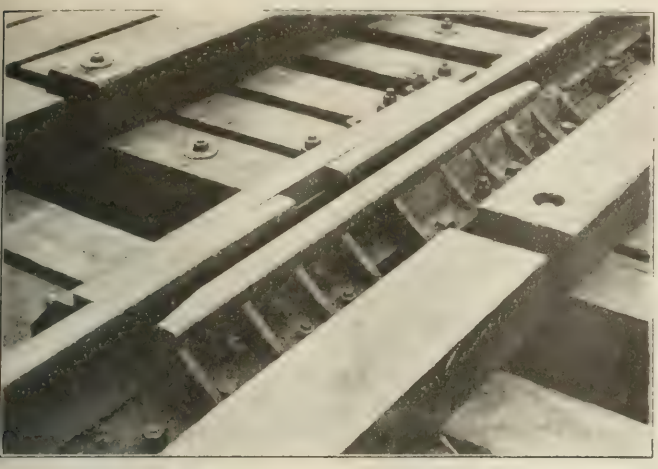


Details of Expansion Joints at the Ends of the Suspended Span

Arkansas viaduct, which was more or less independent of the water stage, was started in April, 1915, and carried to completion during the early summer. The deck span was started in August and finished in October and the east cantilever was finished October 1. Work on the falsework of the fixed span was started the latter part of May but progressed slowly on account of high water. On October 18 the water dropped below 20 ft. and work was rushed, the erection of the fixed span being started on October 15. The

erection of this span was forced at a maximum rate in spite of a rise in the river occurring between November 18 and December 3, and the last pin was driven on December 22.

In the meantime the falsework between piers 3 and 4 had been completed and work had been commenced on the steel erection, but on December 23, the river rose to 28½ ft. and carried out all of the falsework between piers 3 and 4 except five tower bents adjacent to pier 3. In going out, this falsework carried with it the traveler, a mule derrick, the highway



Expansion Joint in the Rail Expansion

deck stringers which were being used in the falsework and four panels of the bottom chord and floor system.

The river continued to rise, going to 43.5 ft. on February 9, and for a time caused grave concern for the safety of the fixed span, the flood having come so quickly that there had not been time to swing this span entirely clear of the falsework after driving the last pin. On December 29 the first bent of this falsework gave way, followed by others until February 2, when all but two pile bents had been washed



Erection Progress on Semi-Suspended Span Showing Canvas Covers Over the Sand Boxes

away. However, the frame bents were not all lost, for by suspending a considerable portion of them from the steelwork it was possible to hold them until the water returned to a stage that made it possible to remove them. An accompanying photograph shows the conditions on February 2. A considerable number of the bents are seen swinging in the water.

On February 2, work was commenced on the creeper traveler to start the erection of the east cantilever from the fixed span, and the suspended span between piers 1 and 2 was completed on April 6. The west cantilever was started on April 27, it having been decided not to use the falsework between piers 3 and 4 except under the half of the suspended span adjacent to pier 4, as the rest of the span could be erected by cantilevering from pier 3. For this purpose the cantilever trusses were suitably reinforced. The falsework, therefore, consisted only of six towers, the one nearest the center of the span having four bents instead of two. The steel erection was started on this falsework on June 10 and the span was swung on June 30.

This bridge was designed and built under the direction of Ralph Modjeski, as consulting engineer in charge, with W. E. Angier as assistant chief engineer and M. B. Case as resident engineer. The substructure was built by the Union Bridge & Construction Company, Kansas City, Mo., and the superstructure was fabricated and erected by the Pennsylvania Steel Company, Philadelphia, Pa.

EIGHT-HOUR DAY COMMISSION APPOINTED

By H. F. Lane

Washington, D. C., October 10, 1916.

While politics played an important part in the passage of the Adamson eight-hour law, President Wilson has evidently not taken political considerations into account in appointing the commission which is to observe the operation and effects of the "eight-hour day" as provided for by the law. The President announced last week that the commission will be composed of Major General George W. Goethals, governor of the Panama Canal Zone and president of the Panama Railroad, who will act as chairman; Edgar E. Clark, of the Interstate Commerce Commission, and George Rublee, a member of the Federal Trade Commission. While none of these men have been active in politics, Mr. Goethals and Mr. Clark are reputed as Republicans and Mr. Rublee has been considered at various times as a Republican, later as a Progressive, and more recently as a Democrat, and the selection of such strong men for this commission seems to have been received with universal approbation.

General Goethals is a graduate of West Point Military Academy and his career has been that of an army officer in the engineering corps. He was chief engineer of the Panama Canal from 1907 until its completion in 1914, when he was appointed civil governor of the Canal Zone, and he has also been president of the Panama Railroad during that time. His prospective retirement from the canal work was announced on his recent return to the United States. Commissioner Clark was engaged in railway service from 1873 to 1889, when he was made Grand Senior Conductor of the Order of Railway Conductors. From 1890 to 1906 he was Grand Chief Conductor of the organization. In October, 1902, he was appointed by President Roosevelt a member of the commission to determine the issues involved in the strike of the anthracite coal operators. On August 28, 1906, he was appointed by President Roosevelt as a member of the Interstate Commerce Commission and he was reappointed by President Wilson on March 5, 1913. Mr. Rublee is a lawyer and was engaged in active practice in New York City for several years, and since March 5, 1916, has been serving a recess appointment as a member of the Federal Trade Commission.

Section 2 of the Adamson act provides for the appointment of this commission "which shall observe the operation and effects of the institution of the eight-hour standard work day, as above defined, and the facts and conditions affecting the relations between such common carriers and employees during the period of not less than six months nor more than nine months, in the discretion of the commission, and within 30 days thereafter such commission shall report its findings to the President and Congress." Members of the commission are to receive such compensation as may be fixed by the

President. The sum of $25,000, or so much thereof as may be necessary, is appropriated for the expenses of the commission.

While the law does not go into effect until January 1, it is understood that the President desires the members of the commission to give close study to the entire situation and that they will begin their investigation very soon. The provision for an investigation of the facts and conditions affecting the relations between the carriers and their employees gives an opportunity for conducting the inquiry on broad lines, and the fact that one of the members of the commission is a member of the Interstate Commerce Commission, who was also formerly the head of a railroad labor organization, insures that the commission will have at its command at the outset information as to all phases of the problem. Mr. Goethals has had experience as the chief executive of an important railroad and has also had practical experience with the operation of an eight-hour work day, as the employees of the Panama Canal have worked under an eight-hour limit.

The eight-hour day on the isthmus is a real eight-hour day and it is not the practice to require overtime work except in emergency, in which event employees paid by the hour receive time and one half for overtime. No extra compensation for overtime work is paid to persons whose compensation is fixed on a monthly or annual basis, except that locomotive engineers and conductors in the employ of the Panama Railroad, who have been working about nine hours a day in order to allow for the time necessary to take their trains to and from the construction work so that the men employed on construction work could work the full eight hours, have received an extra allowance for this time. On September 1, however, as noted in a recent issue of the *Railway Age Gazette,* General Goethals issued an order limiting the working day for train crews and switch engine crews to eight hours except in cases of emergency. At the same time the payment of overtime was discontinued.

The *Railway Age Gazette* has previously called attention to the wide difference between this kind of an eight-hour day and that provided for by the Adamson law, which merely provides for the payment of the present standard day's wage for eight hours' work, and for overtime in excess of eight hours at proportionate rates per hour, especially when this is superimposed on the present schedules which provide for the payment of a day's wage for 100 miles or less, or for 10 hours or less.

Senator Hughes of New Jersey a few days ago gave out a statement, after a conference with President Wilson, it was reported, saying that since Candidate Hughes has declared that he is in favor of a real eight-hour day this "means the disappearance of the eight-hour day controversy as an issue in the present campaign." Senator Hughes, it will be recalled, was the presiding officer of the Senate who signed the Adamson bill after the late Senator James P. Clarke, the president pro-tempore of the Senate, had declined to do so and had nominated Senator Hughes to take his place. A question arose as to whether Senator Hughes had signed the bill before or after the announcement of his appointment as presiding officer and it was stated at the time that he had signed it twice in order to make sure of it.

If he had read Candidate Hughes' statement twice he might not have made the prediction he did about the disappearance of the controversy as an issue in the campaign. At any rate, on the very next day Ex-President Taft joined in the attack on the law in a speech at Trenton, N. J., saying that "unwise subserviency to the demands of leaders of organized labor finds its crowning instance in Mr. Wilson's dealing with the threatened strike of the railway orders of conductors, engineers, trainmen and switchmen." "The issue of this controversy," he said. "is not whether the men were entitled to more pay than they received. They may deserve an increase in pay or a reduction in hours. The eight-hour day when practicable may be considered to be a great advantage. The glaring evil in the result is that by threatening public disaster a group of men has succeeded in compelling the abject surrender by the President and Congress of the principle of arbitration to a peremptory demand for a compliance with their wishes, without an investigation or a hearing of the most important issue." Mr. Taft again attacked the law at Indianapolis on October 6. John M. Parker, the Progressive presidential nominee, has also criticised both the law and the manner of its enactment.

Although President Wilson has continued to keep silent on the subject since his speech on September 23, the Democrats have not felt satisfied to let the Republicans do all the talking. Newton D. Baker, Secretary of War, has delivered a speech in which he made a strong argument for a real eight-hour work day, and Louis F. Post, Assistant Secretary of Labor, has delivered an address explaining the merits of a 12½-mile-an-hour speed basis and wondering why it should cost the railroads any more in wages to cover 100 miles in eight hours than to cover 100 miles in ten hours. He did not claim that the Adamson law contained any provision regulating the speed of trains nor did he say anything about the amount of freight which could be hauled 100 miles in eight hours.

The brotherhood leaders evidently have not been convinced that the issue has disappeared from the campaign. A. B. Garretson, president of the Order of Railroad Conductors, William G. Lee, president of the Brotherhood of Railroad Trainmen, Warren S. Stone, president of the Brotherhood of Locomotive Engineers, and Samuel Gompers, president of the American Federation of Labor, are scheduled as the principal speakers at a mass meeting to be held in Washington on Friday, October 13, under the auspices of the Wilson Eight-hour League. It is said that "a strong defense of President Wilson and Congress will be made."

Theodore Roosevelt recently raised a question as to how President Wilson could get his work done if the staff at the White House were put on an eight-hour day. We do not understand that the question has come quite so close to home as yet, but the subject of the hours of labor has become an issue in some of the executive departments. Thomas F. Flaherty, secretary of the National Federation of Post Office Clerks, has written a letter to President Wilson asking for shorter hours for post office clerks. He says that Postmaster General Burleson has disregarded the law passed by the Sixty-second Congress providing that postal clerks should work no longer than eight hours a day except in emergency, and that in many of the larger post offices the force is required to work 10, 11 and 12 hours a day. President Gompers, of the American Federation of Labor also wrote to President Wilson some weeks ago, urging that the department offices be closed on Saturday afternoon all the year round instead of only during the summer. Copies of this letter were sent to the cabinet officers for their remarks. Secretary Redfield and, it is understood, some of the others, have recommended to the President the issuance of an executive order in accordance with this request. The clerks in the government offices now work seven hours a day.

The coal miners of the country are planning to go the railway brotherhoods one better, according to an announcement by John P. White, president of the United Mine Workers of America, who said in an address at Bellaire, Ohio, on October 7, that demands for a seven-hour work day are to be made by the coal miners at coming wage conferences.

H. N. Pope, president of the Association of Farmers' Union Presidents, has issued a statement asking the farmers to urge their congressmen to repeal the Adamson law at the next session of Congress. "If giving to trainmen is a virtue," he asked, "is not taking from the farmer a crime? Has Congress the power to increase the expenses of industry many millions of dollars without someone paying the bill?"

Representative Kitchin, floor leader of the House, has been

quoted as saying that Congress will take up the consideration of the law soon after the next session convenes, unless an extra session is called, and that the House will oppose any suggestion from the railroads that freight rates be increased to offset the expense.

* * *

Aerial Mail Service.

In case a fine of $1,000 a day is not sufficient to induce the railroads of the country to carry mails at the space basis rates tentatively prescribed by Congress which the Postmaster General is planning to impose on all of the railroads on November 1, the department apparently has another card up its sleeve. It is announced that Second Assistant Postmaster General Praeger has issued an order authorizing Victor Carlstrom, aviator, to inaugurate an experimental mail service by aeroplane between Chicago and New York between October 7 and November 1, giving the aviator the option to make the trip on any day that he may deem favorable for the experiment. Carlstrom is said to have represented to the Post Office department that he could make the trip in 10 hours. Joint committees of the Post Office Department and of the National Advisory Committee for Aeronautics are to study the question of establishing aeroplane mail service.

Supreme Court.

The October term of the United States Supreme Court was begun on Monday, October 9. The court now has about 700 cases on its docket. No opinions were given on the first day, which was devoted to the hearing of motions. The first decisions are expected next Monday. The first arguments were heard by the court on Tuesday and among the cases heard were the suits of the government under the anti-trust law against the Reading and Lehigh Valley companies for alleged monopolization of the anthracite coal industry. A number of very important railway cases are before the court either for decision or for argument, among them being the suit of a number of railways against the Post Office department, involving the basis for computing railway mail pay according to the weight as ascertained by quadrennial weighings. Other cases include that of the Manufacturers' Railway of St. Louis against the decision of the Interstate Commerce Commission prescribing the allowance it may receive for switching service, the case involving Pacific Coast terminal rates, in which the district court of Northern California enjoined the order of the Interstate Commerce Commission denying terminal rates to Sacramento, Stockton, San Jose, Santa Clara, Calif., and other inland points.

* * *

It seems to be taken for granted that there will be an appeal to the United States Supreme Court from the decision of Justice Stafford, of the Supreme Court of the District of Columbia ordering Milton H. Smith, president of the Louisville & Nashville, to answer questions put to him by Chief Counsel Folk of the Interstate Commerce Commission, regarding expenditures of the road for political purposes. The decision was briefly noted in last week's issue. he questions which Mr. Smith refused to answer were asked in a hearing in the consolidated proceedings growing out of a resolution introduced in the Senate by former Senator Luke Lea of Tennessee, and also a case in which he was a complainant. In its petition for an order the commission selected 10 questions, which asked whether funds of the road had been expended for campaign purposes, whether such expenditures had been charged to operating expenses, whether the company had expended funds through an advertising agency in a campaign against rate reductions, and the purpose of certain vouchers regarding which information was refused to the commission's examiners.

While the court declined to grant a motion of the commission to strike out of the defendant's answer a charge that the investigation was instigated as a part of a political campaign against the road by former Senator Lea, it stated that such matters would be treated as immaterial in deciding the case.

The court remarks that the petition does not specify the use expected to be made of the information sought, and then discusses at length the question as to whether it is entitled to the information merely for the purpose of keeping informed regarding the business of the carriers, under a general provision of the act, or whether the case comes within the scope of the amendment to Section 13, of June 18, 1910, giving the commission authority to institute an inquiry "as to any matter or thing concerning which any question may arise under any of the provisions of this act." In giving its decision the court said:

"It is difficult to avoid the conclusion that if the amendment of 1910 is to be given any force whatever it must be considered as having empowered the commission to proceed by way of investigation and the examination of witnesses with respect to such matters as these, not because they involve the political activities of the carrier, but because they involve the expenditures of its funds and so affect the question of the reasonableness of its rates and also involve its method of accounting, under which by means of a false system, it would be possible to keep the commission in ignorance of important elements in the problem with which it has to deal. The conclusion of the court is that when a case is presented from which it clearly appears that the information sought may well be needed by the commission to enable it to enforce the existing provisions of the act in respect to the duties which the act has imposed upon carriers in the transaction of interstate commerce and not merely to inform the mind of the commission to enable it to recommend future legislation, a question does arise under the provisions of the act, entitling the commission to institute an inquiry and examine witnesses and consequently, upon the refusal of the witness to answer, to invoke the aid of the court. The distinction may perhaps still be drawn, as it was in the Harriman case, between the enforcement of the existing provisions of the act which impose duties upon the carrier in respect to its methods of conducting interstate commerce, and those other provisions which are intended to secure to the commission information for the purpose of enabling it to recommend additional legislation; for as to the one matter Congress has already determined how the carrier shall operate in the conduct of its business and has imposed upon the commission the duty of seeing that the law is complied with by the carrier, while as to the other matter the commission is merely expected to inform itself for the purpose of proposing further legislation. It is not necessary in order to sustain the present petition to hold that as to mere matters of information the Commission is authorized to proceed by investigation and examination of witnesses for the case now in hand appears to present a situation within the first division."

Transportation Problems in São Paulo, Brazil.—The president of São Paulo in his recent message to the legislature recommended the leasing by the state government of the principal railways of the state. This matter has been under discussion for several years, and the president regards state control as urgent, in order that the present high freight rates may be lowered. It is stated that foreign investors are inclined to acquire railways which are already in operation, rather than to construct new roads which would aid in the development of the country. In 1915 only 88 miles of railway was constructed, making a total of 3,893 miles of railway in the state. Three-fourths of the whole, or 2,700 miles of railway, is owned by private corporations, 972 miles is owned by the state, and 220 miles by the federal government.

Car Inspectors' and Car Foremen's Convention

Discussion of Rules of Interchange; Interesting Papers on Car Inspection and Car Department Problems

THE eighteenth annual convention of the Chief Interchange Car Inspectors' and Car Foremen's Association was held at the Hotel Severin, Indianapolis, Ind., October 3 to 5, inclusive, A. Kipp, general car inspector, New York, Ontario & Western, presiding. The convention was opened with prayer by Rev. Frank S. Wicks and the association was welcomed to the city by City Corporation Counsel William A. Pickins. During the convention the association was addressed by F. W. Brazier, superintendent of rolling stock, New York Central (East); W. O. Thompson, superintendent of rolling stock, New York Central (West); A. La Mar, master mechanic, Pennsylvania Lines West, and Roy V. Wright, managing editor, *Railway Age Gazette.*

President's Address

We are all familiar with the equipment in use today—some of it has been improved to meet the more severe service conditions brought about by the use of heavier power, but there are still some cars which have not been so improved, and the inspectors must be careful in their inspection and use good judgment in deciding whether or not these cars are safe to run in the long trains of today. A greater uniformity in construction of our freight cars is needed to alleviate some of the serious difficulties encountered in the transportation problem of the present time. This subject deserves considerable thought, and there are none better able to realize what benefits are to be derived from this than the members of this association.

D. R. MacBain, in his presidential address to the Master Car Builders Association, recommended that that association consider the advisability of making the owners of cars assume all responsibility for the damage and repairs to them. This is an excellent idea, but it involves again the question of equipment of uniform construction, for otherwise it would be necessary for the railroads to carry a larger stock of material in order to make prompt repairs.

The establishment of the office of chief joint car inspector has done a great deal toward the improvements in the interchange of cars, and the car inspector himself is a vital factor in the entire plan. Much has been said and written as to the requirements of a good car inspector and much more could be added. In brief, he should be a practical man with a thorough knowledge of car construction, the M. C. B. Rules and their proper interpretations, the M. C. B. loading rules, the safety appliance laws and be a man of good judgment and able to apply the knowledge he has obtained in the performance of his work. He should have close relationship with the general inspectors in order that he may make more judicious inspections and better understand the M. C. B. Rules. The M. C. B. Rules are complicated and require considerable thought. It might be a good plan to have the references and exceptions follow each particular rule, also to incorporate the M. C. B. Rules of Interchange, the loading rules and the safety appliance laws all in one book for the convenience of the inspector.

In regard to the work of the association itself we have this year broadened the scope of the membership to include car inspectors, M. C. B. bill clerks or anyone actively engaged in the work of the car department. In addition to this the association will consider, for the first time, other subjects not relating particularly to the M. C. B. Rules. This brings the association to the task of studying the car problem in the larger sense and will make the association of greater service to the roads of the country.

Address by Mr. Brazier

The young men in the mechanical department of our railways have no better opportunities than in the car department. More than half again as much money is spent by the car department as by the locomotive department and there is just as much demand for bright men to handle this expenditure. The work of the car men is the most important on the railroad. These men have more to do with the safety of operation, and of freight and passengers than any other class of railway men. It is necessary to work hard and continuously to obtain closer inspection and better maintenance. The car department men on the firing line can do a great deal to improve car design by calling the mechanical engineer's attention to the inherent defects as they are found in the equipment. There is much need of strengthening much of the equipment in service on the railroads today. It is many times difficult to collect for damaged equipment which resulted by its being of insufficient strength as the owners claim that it was subjected to unfair usage. A road may protect itself from this by refusing to accept cars of improper construction and insufficient strength.

The work of this association is very commendable. By getting together each year in this manner a clearer understanding of the M. C. B. rules is obtained.

Address by Mr. Thompson

The car end of railroading has improved wonderfully in the past few years. The railways are waking up to learn the needs of the car department. There is still much to be done, and for the young man there is no greater opportunity than in this department. With the large expenditures and the way they are made the car men can save a great deal more money for their railroads than any corresponding man in the locomotive department. An association such as this one is performing one of the most important works in the country, by thoroughly discussing and coming to a common understanding of the M. C. B. Rules of Interchange. It is well worth the expense to the railway companies to have their men attend these conventions for the benefits they receive from the clearer understanding of the rules.

Address by Mr. Wright

There are tremendous possibilities in the car department. It is responsible for large expenditures and needs capable men to see that the expenditures are made to the best advantage. While the men in the car department have not always got their just deserts their relative importance is becoming more apparent each year. They have a real work to perform, and, as suggested by Mr. Brazier and Mr. Thompson, young men should be encouraged to enter this great field. It might be said that there are greater opportunities in the car department than in the locomotive department, for the locomotive has developed at a much more rapid rate than the cars used in train service today. The labor question and organization in the car department demand the most careful study. Team work and esprit-de-corps is absolutely necessary and of prime importance. While many roads are having extreme difficulty in holding their laborers and mechanics in the car department, there is one point which has held its organization to almost 100 per cent efficiency without much increase in wages because of the ability of the foreman in charge.

We sometimes hear criticisms of the mechanical engineers or designers regarding the poor cars in service. These men are not wholly to blame. They are dependent on the men on the firing lines for information regarding the performance

of and the defects found in the equipment. The car men as a general rule have not been aggressive enough. They should keep after the designer and speak loud enough to have their contentions heard until the defects in car construction and design have been corrected. The future of the car department is dependent on the development of the young men. They should be picked carefully and be given specific training for the work that is to come. By broadening out the scope of the association's work, such as has been done this year, you give the railroads what they need; that is, more detailed information from men on the firing line as to the weaknesses of the car department and how they may be corrected.

Discussion of the Interchange Rules

The M. C. B. Rules of Interchange were read by paragraphs, and any questions raised by the members were thoroughly discussed and an agreement reached as to the intended meaning of the rule in question. The following is an abstract of the discussion on the more important questions:

Rule 2 (*b*).—"Cars loaded with explosives must be handled in accordance with the regulations of the Interstate Commerce Commission.

"Cars containing inflammable liquid which is leaking must be repaired or transferred without any unnecessary movement or at nearest available point."

A question was raised as to whether or not the receiving line could be made to accept and repair a leaking tank car received from the delivering line in a leaky condition. Some contended that it was impossible to do so, although the consensus of opinion was to the effect that whichever road had the nearest available repair point should receive the car and make the repairs; and, further, in case the delivering road was responsible and the receiving road made the repairs the delivering road was to be held responsible for the expense.

Rule 2 (*j*).—"When load is not transferred, the car, if foreign, may be returned, when empty, to the delivering line, properly side-carded on both sides of the car with a 'bad order, return when empty card,' showing the defects for which the car is returned, in which case it must be accepted."

While it was generally believed that this rule means that the car should be returned immediately to the interchange point, it was shown that the practices regarding the strict compliance with this meaning varied. For instance, at Chicago such a car will not be accepted if it is not returned within 60 days, while at Cleveland and Cincinnati no time limit is set and the car is received, provided it comes back in the same condition. At St. Louis such cars will be received, even though they come back with more defects than were originally carded, the new defects being carded against the handling line, with the exception, however, that the condition of the car is such that it should be handled under Rule 120.

Rule 3 (*c*) (*third paragraph*).—"All brake beams referred to shall have the letters 'M. C. B.' and proper number stamped or cast on strut, as required by the specifications."

Strong objections were made to this location of the identification marks of the brake beams as it is impossible for an inspector to properly ascertain the size of the beam without placing himself in a hazardous position. It was the unanimous vote of the association to petition the Master Car Builders' Association for immediate action regarding this condition. It was believed that the size of the beam could just as well be shown on the brakehead.

Rule 4 *Paragraph* 2.—"Defect cards shall not be required for any damage that is so slight that no repairs are necessary."

The question as to just how much damage must be caused to require defect cards seems to be an almost indeterminate one. Mr. Schultz of the Chicago Interchange Bureau stated that 75 per cent of the defect cards are such that they should not be necessary for immediate repairs. Some suggested putting a limit to the time of payment on the defect card of something like 60 days. Mr. Harvey of the C. B. & Q. stated that from an investigation made it was found that 51 per cent of the cards issued against that road were not billed on in six months' time, and he expressed the hope that there would come a time when no defect cards were used at all. In order to come to a common understanding as to just what this second paragraph of Rule 4 meant, a committee of car inspectors and car foremen was appointed and its findings are as follows:

"Your committee appointed to take up and report specially on the second clause of Rule 4, in so far as the use of defect cards are concerned for damages too slight to warrant repairs, submits the following:

"First—This rule was incorporated by the Master Car Builders' Association to overcome the abuse of defect cards in interchange and has been in the rules for a number of years, and your committee at the outset feels that we should fully respect and live up to and follow the strict intent of this rule.

"Second—The rule provides that the chief joint interchange inspector is the judge for carrying out the intent of this rule and it is felt by this committee that in many cases it is merely nominal and not positive and that arrangements could be made so that the intent and purpose of this rule could be absolutely covered by the chief joint interchange inspector, and any local changes desired by roads must be handled through the chief joint interchange inspector and his decision be final in all cases.

"Third—In submitting this recommendation, it is given with the full intent and understanding that all members of this association will use their best efforts to correct this evil, as we feel it can only be corrected by the hearty co-operation of the different interchange points, which is submitted with the understanding that it is acceptable."

Unfair Usage.—Under this head the question was raised as to whether or not damage to permanent crossties extending across the top of gondola cars, occasioned by unloading the cars, was an owner's defect. It was pointed out that these cars were built for a special purpose and that if these crossties were damaged while being used for other purposes it should be an owner's responsibility. In cases of this kind it would be necessary for the owners to stencil on the side of these cars that they were to be used only in the specific service for which they were designed.

Rule 43.—Regardless of how trap doors in all-steel or steel underframe cars were lost it was believed that they were chargeable to the owner unless such loss was evident from unfair usage, wreck, derailment, etc.

Rule 60.—It was believed desirable to make the method of stenciling air brake apparatus, as indicated in the last paragraph of this rule, standard instead of optional as trouble has been experienced by some claiming incorrect stenciling. F. C. Schultz stated that some cars have been carded for not having dust collectors, which were never used on the cars, simply because the stenciling contained the words "dust collectors."

Rule 102, *last paragraph.*—"In computing charges for bolts, nuts and forgings, if fractional weight of each entry on billing repair card is less than one-half pound, it must be dropped; if one-half pound or more, charge the entire pound."

There was some dispute as to whether the M. C. B. Association means each individual item or the sum total and it was voted to ask that association for an interpretation.

Rule 120.—It was believed that the M. C. B. Association could give the roads great assistance in disposing of the cars governed by this rule if it was made compulsory for the roads to give the proper authority quickly for the handling of the cars.

FREIGHT CAR MAINTENANCE

I. J. Justus (N. Y. C.).—The importance of the subject of freight car maintenance cannot be overestimated, as the amount annually spent for this purpose staggers the imagination. The all-important matter is how to spend this vast sum of money so that the best possible results will be obtained. Shall it all be spent in maintaining the present light capacity wooden cars, repairing them to their original standard when broken or worn out, or shall a part of it be spent in "betterments" strengthening this type of car by applying steel underframes, steel or strengthened ends, up-to-date draft rigging, steel carlines, metal roofs and doors that are not liable to drop off and will prevent water getting into the car and damaging the lading. Much depends on the decision of these questions. It has been the experience of a well-known railroad that the wooden car, especially the box car, in a generally good condition, should be repaired with a steel underframe, having an improved draft-rigging and strengthened ends, rather than to be repaired to its original standard.

These are the three courses open to the car owner; if sufficient money is available, the old cars may be torn down and replaced with large capacity steel or steel underframe cars. If money is not so abundant, which is the usual condition, the wooden car, particularly the box car, of not less than 60,000 lb. capacity, can be rebuilt with a steel underframe, improved draft-rigging, strengthened ends, etc.; or if the size of the box car is large enough, it could have new trucks of larger capacity, and the carrying capacity of the car thereby increased. The point is often brought up by those in charge of repairs of freight equipment on the smaller roads having light locomotives, that the present wooden car is all right and that they can handle their business satisfactorily with it in its present condition without spending large sums of money to strengthen it. This point might be well taken if their cars always remained on their own road, hauled in short trains by small locomotives, but this is not the case. These cars go all over the country and are subjected to the same conditions of service as the modern steel or steel underframe cars, hauled in the same trains and subjected to the same hump yard switching, with the result that the center sills are cracked or split, the draft arms or bolts broken, allowing the draft arms or the coupler to be pulled out.

Particular attention should be called to the importance of maintaining the doors of box cars in good condition. It is not an uncommon thing to see doors having no metal stiffeners at the bottom, with the corners torn out or rotted away at the point where they should engage the door guides, swinging in and out as the train moves along, with nothing to hold them in place but the door hasp, and liable at any minute to drop to the ground. All doors, when rebuilt, should have a substantial metal bottom stiffener and not less than four deep door guides, securely fastened to the car and a good strong door hasp fastened to the door with at least four bolts. The hasps should, by all means, pass through one of the horizontal battens, all of which should extend the full width of the door. The door should have a good track, substantial hangers, and interlocking spark-strips, which will hold the door securely in place and prevent water leaking into the car around the door. The practice of "repairing in kind" cars having wooden door stops is another bad thing, as the hasp fastener attached to the wooden door stop with two bolts will not stand modern service conditions, and the wooden door stop is soon split and the hasp fastener torn out. I am sorry to be obliged to say that I have seen new cars built this year with wooden door stops, and with hasp holders attached to the door with only one bolt. The repairs to damaged ends are often made with no regard to strength. If the top is pushed out it is crowded back into position and held in place only by a few nails and a new fascia board; if the end sill or an end post is broken, a new one is applied and the end posts fastened to the end sills only with nails and some new end sheathing boards applied. This end, after repairs are made, looks all right, but has not the strength to withstand the shocks that it will be subjected to.

Just as much importance should be attached to the quality of the work turned out as to the quantity. It has been found from a thirty-day record kept on 6,000 miles of railroad that steel and steel underframe cars are in for repairs to draft sills and draft attachments not oftener than once a year and the modern cars considerably less than that, while wooden cars, with wood draft arms, are in for the same class of repairs about two and one-half times a year. It has been the experience of at least one road that wooden cars equipped with properly designed repair steel underframes will hold their own in service with modern steel and steel underframe equipment, and that there is a marked reduction in repair bills when these cars are on foreign roads especially if they also have steel ends. The present practice of replacing arch bar trucks with cast steel side frames is a move in the right direction, as it does away with some bolts that have always given us much trouble to maintain. Standardization of the designs of parts is one reason for the great reduction in maintenance cost.

We should at all times report to the proper officers to have defective designs improved to obtain easier, better and cheaper maintenance. If there is some weak point in a certain series of cars, which is constantly failing, we have not done our full duty by simply repairing these cars. We should earnestly devote ourselves to the task of overcoming this inherent defect in existing cars, in design or material, by such changes as will strengthen the part that has given the trouble and thus put a stop to this unending repairing of this particular defect. In the designing of new equipment the men that are in actual charge of the maintenance should be consulted and work with the designers of the equipment, not only at the time when the cars are designed, but after the cars are in service following them up and reporting from time to time to the mechanical department any defects that may develop, with the idea of having the design changed in the next lot of cars built. A great improvement in the quality of repairs made to freight cars would be apparent in a very short time, if the men in charge were at all times near the work, giving it their close personal supervision instead of being obliged to spend so much of their time attending to office duties which should be handled by others.

CO-OPERATION BETWEEN YARD AND CAR REPAIR FORCES

R. H. Dyer (N. & W.):—Co-operation between the yard and car repair forces is absolutely essential for the promotion of good railroad business as well as necessary for the economical handling of railroad terminal yards. Freight will be delayed and cars will take longer to repair when the two forces fail to work in harmony with each other. Often cars are shifted on incline and gravity tracks at unnecessarily high speeds which result in damaged equipment for which the car repair forces are often held accountable, being called upon to explain why they have so many bad order cars. In the days of the link and pin coupler the yard crews instinctively regulated the movement of the cars, making the couplings at moderate speeds, not solely for their convenience but for their personal safety as well. Unfortunately, with the advent of the automatic coupler the necessity for this care in making couplings has been eliminated and there seems to be an apparent lack of interest in the preservation of the equipment. It matters not from the shop man's point of view whether the cars are destroyed by jerking or buffing, although the latter is the more serious, but it does seem that if the yard forces could be made to realize how costly rough handling is, they would be more careful how they handled the equipment.

In the interest of co-operation with the yard forces, the car inspectors should decide as quickly as possible after a train has arrived at a terminal, upon those loaded cars which will, due to their condition, require transfer. This will per-

mit the yard forces to move those cars direct to the transfer tracks and hasten the transfer of the load. This also applies to the cars that must be set out for repairs whether loaded or empty. The car foremen, in selecting equipment for special lading, should seek to cause the yard forces as little switching as possible. On the other hand the yardmasters can be of great assistance to the repair forces by advising them as soon as possible as to the equipment that will be required for this special lading so that it may be properly prepared, if none is available, with the least possible delay to the shipment. In the larger yards where shop cars are classified on special tracks provided for the purpose, much has been accomplished by the inspectors indicating those cars to receive light and heavy repairs by attaching small red and white cards to the side of the cars. This enables the switching crew to tell at a glance, and at some distance, on what shop tracks the cars are to be located, which greatly assists the repair forces and eliminates extra switching.

When cars are once damaged, particularly the draft gear, the end sill or the center sills, additional handling often means that the damage to the cars will be greatly augmented and that the final cost of the repairs will be much greater than had the repairs been made without further shifting of the cars. For this reason many car repair men advocate locating the repair point as near to the point at which the bad order cars assemble as possible. In this regard attention should be called to the importance of the yard forces respecting the blue flag designating that the cars are undergoing repairs and that they are not to be moved. Likewise the repair forces must remember that the repairs should be made as quickly as possible and never allow the flag to hold up the cars longer than is absolutely necessary for their own personal protection.

The car repair forces occupy an important place in the transportation problem in making it possible to move the equipment with safety to train operation and to the patrons of the road. A good yardmaster will consider the repair forces as assistants to him in expediting traffic and will offer them every means for making quick repairs and the returning of the equipment to service promptly. He will recognize that while the car repair work may be a necessary evil it is an important part of railroading and that any delay to the car department rapidly doing its work will be expensive in that the cost of the work will be greater, cars will be delayed, revenue lost and last, but not least, the shippers may be caused considerable embarrassment.

CAR DEPARTMENT ORGANIZATION AND EFFICIENCY

C. R. Dobson (C. R. I. & P.):—There is no department on a railroad which offers as wide a field for an advance in efficiency as the car department. The shortage of freight car equipment has been very acute in some localities during the past 12 months with no relief in sight. Just think of the cumulative saving in the many directions if a railroad had *all* good car equipment in first-class serviceable condition. Let us analyze the results if such were the case. There would be a considerable reduction in loss and damage claims, reduction in switching cost, and an unusual reduction in amounts of repair bills rendered by foreign lines. It would lessen the Per Diem cost of foreign cars, which would not then be required, and enable such a railroad to secure the cream of the business in highly competitive territory, on account of being able to furnish good equipment. L. F. Loree, president of the Delaware & Hudson, is quoted as being of the opinion that a freight car is at the money-making task of moving goods one-tenth of the time and is idle or imposing upon its owner for switching, storage, repairs, etc., the other nine-tenths of the time. If this is so the mechanical department should be placed in a position to expedite repairs to equipment.

There are three essential factors in a strong car department organization; thorough co-operation in the department; efficiency and economy. Maximum output depends upon a strong organization. With the increase in the cost of both labor and material it is necessary for the car department head to increase the efficiency of his organization, by contributing to or adding to the capacity or skill of each individual department foreman and employee. Co-operation promotes that feeling of good will and reciprocity which results in increased efficiency. No individual in any department begins, or carries to a successful conclusion, all the work in his department. Therefore, it will be readily seen why it is so necessary that harmony and co-operation should prevail at all times.

There are two distinct classes of employees in the car department, the producer and the non-producer, each class being distinct and actually necessary. The producers are the various classes of employees who actually effect repairs to or rebuild car equipment. The non-producers are many and are composed of foremen, clerks, shop inspectors, tool-room men, supply men, laborers and others; this is equally true in either piece work or day work shops and should not be overlooked. It would be well for every general car foreman to check up his forces and ascertain if there are the correct number of each class of employees in his department to constitute a well-balanced force, and thus determine if a maximum output is being obtained on an economical basis.

Freight cars should, when possible, be handled and repaired as near the base of supplies as possible. Freight car material should never be maintained in stock at any great distance from the repair tracks and shops. If the light repair yard is situated some distance from the shop or heavy repair tracks a sufficient amount of ready material should be carried at the light repair tracks. Supply men should be employed to deliver all lumber from the mill or lumber yard, metal roofs, couplers, brake beams, brake connections; in fact all material possible. The results obtained from this practice will be surprising. The saving in cost is also an inviting feature on account of the difference in the rate of pay, etc. This of course applies more forcefully to shops paid on an hourly basis; however, it will also apply to piece work shops.

Every well organized freight car shop and coach shop should maintain a tool room with a man in charge, whose duty it will be to keep all tools in their proper places, in good order and well lubricated where lubrication is necessary. If the entire time of the man in the tool room is not required in caring for the tools, he can reclaim and sort nuts, washers, nails, cotters and lag screws, picked up in the shop and on repair tracks by the labor force and deliver them back into the store stock.

There are also some very interesting as well as profitable results obtained by specializing the men in some lines of car work; for instance, some men are experts in applying roofs, others are more adept in applying sheathing, while still others will be found at their best on rougher work on flat or gondola cars. The appropriation allotted to the car department on most roads usually covers the cost of material used as well as labor, therefore all usable second hand material which accumulates around the larger repair yards and scrap bins should be reclaimed and used on system cars. Every dollar saved can be very profitably applied in repairing bad order cars.

The master car builder or the general foreman of the car department must of necessity be a strong man, of good clear judgment, alert and capable of taking the initiative in all of the many perplexing emergencies which arise in his department, and he must be a good judge of human nature to enable him to perfect an organization which will show results for the money expended. There was a time when we were struggling along on very meager appropriations, and, in order to get by, we resorted to the practice of effecting only such repairs as were necessary to move and keep cars in service. The results have been disastrous, and it seems to be very difficult to get the car department out of this rut. This prac-

tice of "a lick and a promise" resulted in loaded cars being cut out and sent to every repair track or shop along the line of a long haul. I wish to emphasize at this time the necessity of effecting permanent repairs to equipment requiring both light and heavy repairs and not to discriminate between system or foreign cars; treat them all exactly the same, having in mind at all times that both foreign and system cars should be maintained in good serviceable condition. Eternal vigilance, industry and last, but not least, "honesty" are the price of success.

CAR DEPARTMENT APPRENTICES*

B. F. Patram (So. Ry.):—The question of apprenticeship in either car building or car repairing today is one that requires a great deal more thought, study and consideration than it has ever received since its inception. With the proper training along mechanical lines very much better mechanics for the passenger department can be made out of bright, energetic boys than by any other method known to me. However, there are a great many things other than strictly mechanical ideas that should be instilled into the boy's mind during the first and second years of his apprenticeship. The main points that should be carefully considered are to train the boy to be watchful, alert, quick to respond and neat. The first impression made on the apprentice's mind is very important, for his mind is young and receptive and when the boy is made to see and understand he does not soon forget.

An apprentice in the passenger car department should have at least passed through the sixth grammar grade, or its equivalent in schooling and his fitness or degree of education should be determined by an examination prepared by the head of the car department. After passing this examination, and it has been decided that the boy will start on his apprenticeship, he should be put to work, and should carry out the following schedule:

Six months building and repairing passenger car trucks;
Six months building and repairing platforms;
Six months in the mill, laying off work only;
Six months building and repairing engine cabs and pilots;
Twelve months working on the outside of passenger car bodies;
Twelve months working on the inside of passenger car bodies.

If this schedule is thoroughly carried out it should qualify the boy for any position in the car department. If, at the end of the first six months, the boy does not show the proper aptitude to make an efficient car builder and repairer he should be transferred to some other branch of the railroad business to which it is thought he is better suited. During the four years' course the importance of a technical education should be impressed upon the mind of the apprentice and everything possible should be done by those in authority to assist the apprentice in securing it. He should be offered every assistance possible in securing a thorough knowledge of the M. C. B. rules, especially along the lines of interchange work and building and repair work.

As to the building and repairing of freight equipment cars, I am strongly of the opinion that an apprenticeship system in this department of the car business is not only unnecessary but offers no advantage either to the railroad company or to the men employed in this branch of the service. However, I would advocate the use of helpers, who should be advanced as they qualify themselves to do this class of work. My reason for not advocating an apprenticeship course in the freight car department is as follows: First, there is no incentive for the young man to serve as an apprentice as a freight car builder or repairer because it would be necessary, owing to present conditions, for the boy to work side by side with men who were advanced from freight car helpers to freight car builders and repairers, in a much shorter time than is required in the apprenticeship course. Second, the pay of the freight car builders and repairers being so much out of proportion to the pay in other mechanical lines of railroad work, the railroad companies and the employing heads would have difficulty in securing the services of young men meeting the qualifications which would be required of them.

*This article was awarded first prize in the competion conducted by the association.

CAR DEPARTMENT APPRENTICES*

C. N. Swanson (A., T. & S. F.).—Nowhere is there a greater need for definitely and specifically trained men than in the car department of our railroads. The Santa Fe has been especially successful in training its apprentices and for some time it has been unnecessary for us to go outside our ranks for journeymen or for young men to fill our minor foremanships. In addition to this the system has paid its way in dollars and cents from the start.

The course for the coach carpenter apprentices is four years in length, the boy starting out at $1 or $1.20 per day, according to locality, being given an increase of 15 cents per day every six months. The ages at which the boys are accepted vary between 18 and 22. The work they are given is shown in the following schedule:

Nine months in the cabinet shop.
Nine months on outside coach body work.
Nine months on inside coach finishing work.
Six months on trucks, platforms, piping and steel work.
Six months in freight car work.
Nine more months in the cabinet shop.

The freight car apprentices are given a course of 2½ years. These boys are given a thorough experience first on body work of freight cars requiring light repairs, then on trucks, steel work, and air brake equipment. They are then put back on body work of cars undergoing heavy repairs. These men start out at 16½ or 18 cents per hour and are increased in the same proportion as the coach apprentices. As the freight car work is of a heavier nature than that required of the coach apprentices the age limits are 19 and 30 years.

The apprentices attend school on company time. The carpenter apprentices are taught the fundamental operations of arithmetic, including fractions and how to solve problems in board measure, how to make out a bill of material and to estimate the cost of various jobs; also the correct name and function of the various parts of the car. The freight car carpenter apprentices are taught in addition to this the M. C. B. Rules of Interchange. In brief, each boy is taught every thing that will help him with his particular vocation, but nothing that will detract him from that vocation.

A shop instructor is selected for every 25 apprentice boys and he devotes his whole time to instructing them in the practical side of their work. It is his duty to see that each boy gets a thorough training and to arrange for his transfer from one class of work to another, working, of course, in harmony with the foreman. Great care is taken in selecting these men as the success of the system is dependent largely on them.

The apprentices themselves are also carefully selected. Each applicant is required to pass a physical examination by the company's surgeon which is similar to that required of applicants for life insurance. The boys are also given a school examination, the amount of schooling required depending upon the opportunity each boy has had. In general, however, no boy is accepted who cannot add, subtract, multiply, divide, and deal with simple fractions. We are very insistent that no one enters upon work for which he has no natural fitness or liking. If a boy is found to be unfitted to become a mechanic he is kindly told that he is wasting his time in the shop. We have plenty of applicants, each boy employed being a living advertisement for us.

We have found that our apprenticeship system pays in dollars and cents, in the increased output of the shop even from the start. It pays much more in the number of skilled journeymen who are being prepared to recruit our depleting ranks. The kind and considerate treatment given the apprentices has a wholesome effect on the entire shop. One reason for the success of our apprenticeship system is that it has the unlimited support and backing of the manage-

*This paper was awarded the second prize in the association's competition.

ment. Without such backing it would be hard to install any system of this kind. The average railroad man is too proud of his prerogatives to work in harmony with any system which appears to lessen his authority.

INTERCHANGE INSPECTION

W. H. Sagstetter (Kansas City Southern):—The establishment of more Joint Interchange and Inspection Bureaus will systematize the interchange of cars between railroads and result in large savings. Where they have been established they have been very successful. They should, however, be extended to every point where two roads interchange cars. Where there is a chance of difference of opinion one man responsible to all parties interested should handle all interchange if it is possible to do so. This will improve the movement of both the empty and loaded cars.

Another very important question that should be considered is the promulgation of rules relating to the transfer of loads from cars. There is a great deal of unnecessary transferring done, some on account of ignorance, some on account of a too conservative opinion of the poor condition of the car and a great deal through the spirit of reciprocity. The latter condition usually prevails at points where more than one inspector is located and where each suspects the other of making transfers on technicalities and tries to get even. In such cases the railroads hold the sack and pay the money. One of the principal causes for transferred loads is elongated holes in draft sills. Why not set definite limits of 2 or 2½ in. before a transfer should be made? Another matter that needs consideration is the carding of cars on technicalities. Take a raked siding, for instance. Could not a limit be set as to the depth to which the siding is cut before a card is made?

W. H. Bettcher (C. I. & W.).—The importance of strictly adhering to the loading rules cannot be overestimated. The result of improper loading may be the cause of serious accident, badly damaged equipment and costly claims. If shipments improperly loaded are allowed off the home rails there is very liable to be a charge for reloading coming from some interchange point which not only is costly, but causes delays to the shipment. Every effort should be made to educate the shippers as to the proper method of loading their carload shipments and in most cases they will not be adverse to doing the work properly as it is to their best interest to have it done so.

M. C. B. BILLING

To appreciate the importance of M. C. B. billing in railroad work one must take into consideration the number of cars involved. D. R. MacBain, president of the M. C. B. Association, in his opening address called attention to the fact that the members of the association represented 2,853,482 cars. As a general proposition these cars are passed from one road to another throughout the country, often remaining away practically the entire life of the car, and they must be maintained, and by roads other than the owner. One large railroad owned approximately 5,000 cars more than the average number of cars handled by it, but, in spite of this, between 50 per cent and 65 per cent of the cars handled were other than its own equipment. It is essential, therefore, that an up-to-date method of accounting for repairs be maintained. There are various methods in which the information is obtained. Some cars require only very minor repairs, while others require repairs of an extensive nature; therefore, one road is very likely to use two different forms on which the original record is taken.

A material checker is very essential in a large organization to insure proper information being recorded, also to determine whether or not the repairs are properly chargeable to the owner. On some roads it appears to be the practice for the repair work inspector or material checker to make what is commonly known as an M. C. B. billing repair card; also to make the extensions as to the size of material, kind, weight, feet of lumber, etc., and the number of hours chargeable in accordance with M. C. B. Rules, while others only require the repair work inspector or material checker to furnish information as to repairs and size of material used, and clerks at shops are required to fill in billing repair cards, make the extensions as to the weights, number of feet of lumber, hours labor, etc., chargeable.

Each of these systems has its advantages. In having the repair work inspector or material checker fill in the information he is more familiar with the car and, therefore, more likely to enter the information correctly; also if he is required to enter the information there will be a tendency to be more careful to see that all the material used is charged, and as it necessarily involves more direct application of the rules, there is less liability of erroneous charges being made. The advantage in having clerks fill in the billing repair cards, and likewise make the extensions as to the charges under M. C. B. Rules, is that all such men's time would be required to compile the information and they would become expert, consequently giving a greater output. Also it is good training for making the future inspector, foreman or M. C. B. billing clerk in general offices or accounting departments. There is still another system prevalent as to making the extensions on the billing repair card, and that is to have all the billing repair cards properly filled in as to the kind and size of material used, after which the cards are sent to some central office and clerks there make the material and labor extensions and prepare the card preparatory to making the bill. Two general methods prevail in checking the bills. In one the bills of foreign roads are checked in the same office that renders the bills, whereas in the other the bills are checked by a different organization entirely. The only advantage the one has over the other is that if clerks are assigned to check bills of the roads for which they have been assigned to render the bill, a more uniform manner of billing and checking prevails and the possibility of contentions can be averted as the billing clerk knows in the preparation of his charge that under the same condition the road against whom he is preparing the bill would prepare a like bill.

The best methods to bring about accuracy in billing are to have a system of surprise checks, either by one delegated exclusively for this purpose, by a division officer when making his periodical visits, or by the material checkers or M. C. B. billing clerks of different stations. If either of these practices are followed good results will be obtained. The work can be facilitated by the least complicated system, but any system is a failure unless it is properly supervised, as in the billing for repairs a number of different men enter into the practice. The report was signed by J. V. Berg, chairman; E. A. Eyman and F. A. Rawley.

Other Business

Several other papers were received by the convention that were of particular interest to car repair and maintenance forces. These will be published in the Railway Mechanical Engineer for November. The by-laws were amended to include in the active membership of the association car department officers, car foremen, chief interchange inspectors, chief car inspectors, chief clerks, chief M. C. B. billing clerks and representatives of any private car line working in the same capacity as described above. Car inspectors, air brake inspectors and representatives of railway supply firms are to be admitted as associate members.

The secretary-treasurer reported a membership of 554 and a cash balance of $379. The following officers were elected for the ensuing year: President, W. J. Stoll, chief interchange inspector, Toledo, Ohio; first vice-president, J. J. Gainey, general car inspector, C. N. O. & T. P.; second vice-president, E. Pendleton, chief interchange inspector, Peoria, Ill.; secretary-treasurer, W. R. McMunn, general car inspector, New York Central, Albany, N. Y.

General News Department

The department of safety of the St. Louis San Francisco has extended the scope of its work by the appointment of two new safety inspectors, David Smith and W. F. Morrison. Mr. Smith will study shop conditions and Mr. Morrison train service.

C. C. Lary, agent of the Southern Pacific at Visalia, Cal., has induced the school board of the town to redivide the school districts so as to make the Southern Pacific tracks a dividing line, thus obviating the necessity of school children crossing the railroad.

The Baltimore & Ohio, following the recommendation of the United States Board of Mediation and Conciliation has increased the pay of telegraphers an average of 8.2 per cent, and has made changes in working conditions. About 1,600 operators are affected.

Figures compiled by the United States Geological Survey show that 128,200,000 tons of coal or 24 per cent of the total domestic output was consumed by the railroads of the United States in 1915. This is an increase of 31,000,000 tons over the amount used in the year 1914.

The Interstate Commerce Commission has granted permission to the Louisville & Nashville to make use of new box cars which are to move over its line from Cincinnati, to be delivered to the Southern Pacific at New Orleans. The Louisville & Nashville will pay the freight charges on the cars from Columbus, Ohio, to Cincinnati.

The Southern Railway has issued a statement showing that, according to figures announced by Controller A. H. Plant, for every dollar paid to the Southern Railway in freight and passenger rates by the people of the South during the month of August, the Southern Railway paid out in the South $1.12 for labor, materials and supplies and for other purposes. The railway's total disbursements during the month for these expenses were $6,088,749, of which 85 per cent was paid to individuals and industries located in the South. This sum was $637,653 in excess of the total money paid by the South to the railroad for transportation purposes.

Secretary McGinty, of the Interstate Commerce Commission, has written a letter to the National Board of Fire Underwriters, New York, in reply to a request that the commission make an investigation of the recent fire and explosion at Black Tom Island, near New York City. He points out that the commission does not consider this occurrence such an accident as is plainly contemplated by the act authorizing the commission to investigate collisions and other accidents on the lines of common carriers; that it sent an inspector to the scene immediately following the accident to make a report, and that it does not feel that it has any duty to conduct a further investigation.

The Hudson & Manhattan Railroad, operating the tunnel railways between New York, Jersey City and Hoboken, and running trains also through to Newark, N. J., over the tracks of the Pennsylvania, last week discharged 40 guards (trainmen) because they were agitators; and the Brotherhood of Railway Trainmen is said to be preparing to go to the railroad company to get the men taken back. Within the past two months the officers of the Hudson & Manhattan have been guiding the formation of a union among the men in its own service, and it is said that those now discharged had tried to induce their associates to desert the local association, and join the Brotherhood of Railway Trainmen.

According to the Bulletin of the Southern Pacific, one of the agents of the system uses the following methods to facilitate the loading and unloading of cars at his station: whenever possible consignees are persuaded to unload cars first from one end only so that when a sufficient space is cleared a shipper may start loading. Warehouse men of the company are likewise instructed to unload merchandise cars at one end so that loading can be started, if necessary, before the unloading work is completed. If the commodity being unloaded is of a nature that it is liable to become mixed with the commodity that is to be loaded, necessary precautions are taken so that no confusion and complaints on account of shipments being exchanged will result.

The attorneys for the committee on railway mail pay filed a petition with the Interstate Commerce Commission Tuesday, asking that the commission issue an order prescribing the conditions under which a test of the space basis of compensating the railways for handling mails proposed by the postmaster general to begin November 1 is to be conducted. They ask for an order providing for preliminary weighing before the space test is installed, and prescribing that during the entire period of the space test concurrent weighings shall be taken, and providing also for other statistics to be kept contemporaneously and continuously during period of preliminary weighing, and during the test. If the commission is unable to enter an appropriate order before November 1 the petition asks it to rescind its consent for the space test until an appropriate order can be made. The petition points out that the law contemplates the test for the purpose of giving the commission information on the comparative merits of the space and weight systems, and that the postmaster general proposes to install the space basis on practically all mail routes, and that the commission has given its approval on ex parte statements of the postmaster general without giving the railways a hearing.

Luncheons in the Coaches

The Union Pacific now provides food for passengers in chair cars and tourist sleepers. The arrangement is called the "Off-the-Tray" service. Passengers who do not care to go to the dining car may take the "Off-the-Tray" service at a less cost. Waiters bearing large trays pass through the cars, offering various kinds of sandwiches and hard-boiled eggs, hot coffee, fruit, pies and cakes. The service is especially adapted to the convenience of women, particularly when they have children with them. The menu offered, of course, includes milk for the children.

In Behalf of the Eighty Per Cent

R. T. Frazier, Jr., of the Nashville, Chattanooga & St. Louis, and P. W. Waldon, of the Chicago and Alton, who originated, circulated and carried to Washington a petition on behalf of the 80 per cent of American railway employees, who were not in the recent wage movement, asking President Wilson to cause arbitration of the trainmen's demands, have issued a statement showing that President Wilson refused to give them a hearing during the negotiations in Washington, and attacking the Adamson law. They declare that—

"This law absolutely ignores the rights, the welfare and even the existence of the other 80 per cent of railway employees; and Congress, by voting a 25 per cent increase of wages to 20 per cent of the railway employees—and these the very highest paid men in the service—necessarily has rendered it more difficult, perhaps impossible, for the railway companies to make improvements in the wages and the conditions of work of other other 80 per cent"; that "they do not think that the enactment of the Adamson law is in accordance with the fundamental principles of the American nation; and believe that, inasmuch as the government has taken jurisdiction of the matter, we should, as citizens, appeal to the President and Congress, at the next session of Congress, and insist that all railway employees be considered; and that a commission be appointed to investigate all hours of service and wages of all employees."

Copies of the letters, which passed between Mr. Frazier and President Wilson, in which Mr. Frazier appealed to the President for an opportunity to present the claims of the 80 per cent, and the President refused to see him, are appended to the statement.

REVENUES AND EXPENSES OF RAILWAYS

Two Months of Fiscal Year 1917

Name of road	Average mileage operated during period	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Alabama & Vicksburg	143	$177,866	$79,389	$285,907	$35,836	$63,131	$7,187	$97,301	$4,648	$12,680	$220,783	$65,123	$17,200	$47,923	$18,132
Arizona Eastern	378	574,122	87,654	702,536	88,143	65,030	4,765	129,516	4,395	26,920	318,418	384,118	32,801	351,304	125,719
Atchison, Topeka & Santa Fe	8,648	14,621,392	5,063,305	21,209,367	2,741,168	3,171,206	369,289	5,405,101	1,566	385,249	12,048,264	9,161,103	947,280	8,210,808	1,706,727
Baltimore, Chesapeake & Atlantic	88	194,191	125,467	332,527	24,708	58,554	5,597	141,983	.....	4,996	235,789	96,738	4,600	92,130	18,017
Belt Ry. Co. of Chicago	31	.....	.....	519,635	38,120	66,848	2,989	199,123	.....	11,856	318,937	200,698	26,889	173,808	20,230
Bessemer & Lake Erie	205	2,538,649	91,809	2,665,417	174,689	392,320	21,311	564,849	.....	27,151	1,144,968	1,520,449	44,030	1,476,409	—49,491
Buffalo & Susquehanna R. R. Corporation	253	274,683	12,882	293,210	44,076	64,595	2,619	78,276	.....	10,952	200,517	92,692	5,200	87,491	42,852
Buffalo, Rochester & Pittsburgh	586	1,981,326	246,084	2,323,345	320,638	512,816	28,165	710,518	3,343	44,511	1,619,992	703,353	44,000	659,360	162,630
Central of Georgia	1,924	1,407,693	615,270	2,234,462	343,437	387,000	80,661	689,574	1,547	81,684	1,580,657	653,806	115,864	537,001	192,035
Central New England	301	865,861	88,984	1,001,895	96,315	92,674	2,426	254,919	.....	11,647	457,963	543,932	30,500	513,425	185,511
Charleston & Western Carolina	342	181,455	63,676	263,237	54,345	50,177	8,276	87,967	.....	7,877	208,476	54,762	10,000	44,303	17,668
Chesapeake & Ohio Lines	2,381	6,430,319	1,280,221	8,279,586	1,036,384	1,512,955	114,298	2,227,258	61,421	167,888	5,116,246	3,163,340	254,840	2,908,461	405,765
Chicago & Alton	1,053	2,076,893	816,361	3,114,124	363,572	610,381	80,152	954,129	22,288	64,407	2,085,635	1,028,489	92,221	934,830	349,839
Chicago & North Western	8,108	10,812,369	4,429,290	17,094,796	2,334,324	2,486,191	239,930	5,586,974	123,404	328,340	11,007,319	6,087,477	845,000	5,241,865	1,975,564
Chicago Junction	13	.....	.....	412,495	44,952	37,578	2,382	223,566	.....	9,774	318,252	94,243	7,292	86,950	14,010
Chicago, Milwaukee & St. Paul	10,208	13,294,427	3,974,781	19,257,582	2,136,124	2,675,368	363,591	6,377,189	140,393	331,243	11,783,574	7,474,008	979,046	6,486,103	1,167,164
Chicago, Rock Island & Gulf	477	420,709	141,941	602,597	102,068	77,621	19,943	180,135	2,137	18,080	399,933	202,664	17,152	185,290	112,985
Chicago, St. Paul, Minn. & Omaha	1,753	2,032,303	1,057,495	3,360,064	463,529	453,959	62,700	1,147,836	33,981	82,663	2,240,491	1,119,574	174,119	944,097	283,731
Chicago, Terre Haute & Southeastern	373	411,702	34,788	458,349	62,647	154,967	7,933	123,225	2,262	15,488	366,230	92,119	21,767	70,352	2,817
Cincinnati Northern	246	293,406	44,868	351,037	52,320	56,016	7,405	100,596	.....	5,544	221,881	129,156	12,000	117,155	52,068
Cleveland, Cincinnati, Chic. & St. Louis	2,384	5,395,329	2,028,948	8,092,727	927,118	1,510,178	189,533	2,524,492	53,211	151,180	5,340,102	2,752,625	298,000	2,453,401	607,930
Colorado Midland	338	226,655	63,681	316,820	67,974	58,350	15,020	125,900	4,344	10,832	282,420	34,401	18,000	16,401	40,210
Duluth & Iron Range	277	1,904,853	45,257	2,013,159	171,159	151,017	2,865	386,274	4,471	21,869	735,706	1,277,453	109,023	1,168,431	99,821
Duluth, Missabe & Northern	411	3,728,723	67,050	3,981,622	272,627	220,244	6,216	584,774	1,896	22,712	1,108,470	2,873,152	215,988	2,657,164	671,255
El Paso & Southwestern Co	1,028	1,699,448	418,955	2,228,441	213,095	235,777	35,901	492,491	13,301	50,382	1,040,947	1,187,494	79,058	1,108,426	599,006
Florida East Coast	747	773,636	212,791	1,094,540	112,118	158,713	13,619	329,911	6,290	32,521	649,910	444,630	52,015	392,553	308,293
Galveston, Harrisburg & San Antonio	1,361	1,872,982	615,978	2,630,375	326,960	348,315	60,975	823,311	19,460	75,359	1,645,066	985,309	97,604	887,376	496,427
Georgia, Southern & Florida	305	232,251	119,368	393,087	53,421	79,532	15,719	144,721	45	16,832	310,260	82,827	22,220	60,395	8,907
Grand Rapids & Indiana	575	580,089	409,734	1,085,677	129,448	159,676	19,942	408,677	7,107	34,315	759,165	326,512	48,162	278,297	25,473
Houston, East & West Texas	191	180,845	63,533	260,817	49,229	36,004	4,394	81,758	1,630	6,455	179,267	81,551	10,721	70,704	42,832
Houston & Texas Central	895	862,454	317,993	1,259,879	167,727	177,366	31,894	371,946	9,925	36,031	791,676	468,203	61,330	406,623	201,438
Illinois Central	4,767	8,622,479	2,577,657	12,336,600	1,833,650	3,201,376	218,158	3,563,296	67,429	315,745	9,167,261	3,169,339	673,000	2,493,274	838,417
Indiana Harbor Belt	109	.....	.....	780,874	96,160	94,058	5,491	283,096	.....	15,827	494,631	286,242	15,121	271,047	105,132
Kanawha & Michigan	177	529,954	74,059	620,706	93,479	157,343	6,321	148,849	28	13,505	419,425	201,282	28,400	172,881	—14,000
Kansas City Southern	837	1,387,972	319,490	1,885,584	181,047	249,123	52,694	548,145	.....	68,296	1,096,369	789,215	96,530	691,681	85,365
Lake Erie & Western	900	1,076,716	155,437	1,305,005	134,303	207,403	27,042	390,013	.....	24,733	783,493	521,511	54,000	467,371	232,763
Lehigh & New England	296	425,224	2,753	460,397	78,722	73,875	3,755	126,900	.....	11,186	294,278	166,119	17,640	148,457	142,268
Lehigh Valley	1,444	7,118,792	1,022,014	8,743,143	1,146,192	1,447,486	167,520	3,049,860	34,591	164,169	6,005,958	2,737,185	306,500	2,429,424	310,403
Long Island	397	712,673	2,146,231	3,387,576	289,656	282,583	34,152	1,042,128	12,344	66,047	1,724,346	1,563,230	143,810	1,418,406	132,827
Louisiana Ry. & Navigation Co	350	279,387	52,389	350,012	54,616	41,426	13,465	110,256	.....	13,264	233,027	116,985	22,000	94,980	15,488
Louisiana Western	208	250,179	121,434	396,952	46,311	67,270	14,317	96,818	3,352	13,597	241,644	155,303	21,350	133,700	65,780
Louisville & Nashville	5,071	7,740,063	2,312,552	10,752,443	1,516,943	2,026,086	239,209	3,075,497	37,612	222,560	7,101,389	3,651,754	425,265	3,224,687	717,850
Louisville, Henderson & St. Louis	280	185,924	83,434	287,124	50,011	44,988	9,849	81,514	.....	5,677	192,038	95,086	7,600	87,432	55,308
Maine Central	1,021	1,278,792	809,162	2,269,763	301,569	282,442	30,168	809,628	19,765	57,319	1,500,519	769,244	99,199	669,976	87,590
Midland Valley	385	259,269	88,531	359,825	71,732	61,657	5,506	97,529	.....	13,757	250,007	109,818	11,868	97,587	19,568
Missouri & North Arkansas	365	142,615	84,926	242,487	30,822	23,808	7,189	71,856	.....	9,595	143,271	99,216	9,600	89,603	79,099
Missouri, Kansas & Texas System	3,865	4,208,518	1,743,716	6,371,859	1,240,404	1,209,212	116,755	1,995,671	43,862	196,570	4,797,921	1,573,938	256,458	1,317,133	169,019
Monongahela	108	308,372	21,586	336,130	52,522	23,361	1,475	73,260	.....	8,317	158,935	177,196	8,000	169,196	28,789
Monongahela Connecting	6	.....	.....	228,907	33,897	29,124	600	109,436	.....	5,785	178,843	50,064	4,616	58,429	92,289
Morgan's La. & Texas R. R. & S. S. Co.	401	183,667	185,610	723,234	115,877	147,414	22,324	255,663	4,194	23,280	567,682	155,552	46,583	108,751	65,405
Nashville, Chattanooga & St. Louis	1,237	1,559,577	542,895	2,266,307	272,031	433,172	104,542	735,728	16,153	78,448	1,633,613	632,694	57,000	574,759	168,775
New Orleans & North Eastern	264	453,169	114,971	635,125	74,875	116,600	19,678	187,293	14,293	24,357	437,095	198,030	31,400	166,630	29,870
New Orleans, Mobile & Chicago	402	257,402	57,046	329,807	54,004	49,537	8,314	104,768	288	13,207	230,114	99,693	12,981	86,586	24,481
New York, New Haven & Hartford	2,005	6,771,818	5,596,619	14,117,077	1,574,308	1,674,753	93,641	5,005,696	178,357	332,959	8,859,282	5,257,796	514,090	4,743,267	473,467
New York, Philadelphia & Norfolk	112	817,392	108,282	999,822	82,954	202,031	8,279	324,696	10,366	22,718	650,954	348,869	26,000	322,698	64,636
Norfolk & Western	2,086	8,596,612	1,138,740	10,188,134	1,414,058	1,718,559	123,429	2,418,467	18,784	167,913	5,815,268	4,372,866	410,009	3,962,672	462,666
Northern Pacific	6,505	9,645,716	2,872,401	13,773,289	2,062,372	1,536,838	214,785	3,598,396	198,240	213,898	7,706,406	6,066,883	903,364	5,161,056	1,335,906
Pennsylvania Company	1,755	10,505,538	2,292,817	14,197,062	1,603,332	2,195,482	183,868	4,312,716	75,756	296,656	8,044,976	5,552,086	595,026	4,954,265	1,018,242
Pennsylvania Railroad	4,534	28,322,513	8,447,047	40,304,730	4,936,821	7,577,438	419,933	13,293,063	538,370	969,429	27,734,367	12,580,563	1,477,688	11,093,841	1,027,909

REVENUES AND EXPENSES OF RAILWAYS

Two Months of Fiscal Year 1917—Continued

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Pere Marquette	2,249	$2,421,200	$949,045	$3,756,236	$361,377	$674,318	$74,634	$1,225,493	$11,639	$84,176	$2,430,687	$1,325,549	$142,853	$1,222,154	$384,244
Philadelphia, Baltimore & Washington	717	2,405,561	1,692,151	4,488,029	560,094	852,922	57,312	1,679,847	200	108,403	3,256,142	1,231,887	146,196	1,085,691	144,991
Pittsburgh, Cincinnati, Chic. & St. Louis	1,489	5,994,728	1,759,312	8,744,309	1,209,789	1,653,750	148,710	2,730,692	56,116	207,924	6,004,239	2,740,070	345,502	2,394,568	57,141
Richmond, Fredericksburg & Potomac	88	370,112	178,271	608,959	36,316	76,935	7,803	186,282	4,295	15,393	327,024	281,935	19,482	262,453	73,504
Rutland	468	344,522	249,052	693,515	91,324	109,627	21,294	225,167	2,364	13,496	463,273	230,241	34,444	195,798	164,957
St. Joseph & Grand Island	258	287,519	60,274	372,284	57,086	45,612	8,773	102,511	921	9,673	224,574	147,710	15,916	131,743	110,702
St. Louis & San Francisco	4,752	5,938,386	2,424,783	8,907,093	1,271,613	1,943,580	137,360	2,662,402	.....	219,389	6,180,366	2,726,647	347,313	2,379,347	401,571
St. Louis, Brownsville & Mexico	548	497,801	362,636	923,892	114,143	86,021	17,037	248,025	.....	19,816	484,027	439,865	16,000	423,416	295,331
St. Louis Merchants' Bridge Terminal	9	.....	727	424,985	68,098	25,813	1,596	170,008	.....	13,657	279,171	145,814	15,600	130,594	50,359
St. Louis Southwestern	943	1,064,034	295,266	1,441,126	109,080	244,964	62,432	348,274	6,287	48,804	819,628	621,498	76,243	544,965	180,165
San Antonio & Aransas Pass	726	437,150	216,315	697,954	112,607	93,886	15,242	286,167	.....	25,667	533,017	164,938	40,000	124,929	95,819
Seaboard	3,449	2,432,472	881,882	3,660,700	513,800	618,769	139,552	1,303,064	20,533	123,164	2,718,881	941,819	207,596	733,367	.....
Tennessee Central	295	201,316	78,600	295,316	47,982	39,674	11,321	101,184	.....	13,459	213,620	81,696	9,132	72,555	24,154
Terminal R. R. Ass'n of St. Louis	37	.....	501	461,134	55,191	35,616	1,751	139,209	.....	5,293	237,059	224,075	54,569	168,498	4,849
Texas & New Orleans	468	535,401	194,607	798,721	101,804	150,967	15,491	238,899	24,953	21,465	553,037	245,664	39,740	205,457	100,281
Texas & Pacific	1,944	2,070,821	939,466	3,233,582	384,994	414,443	81,695	1,143,802	22,898	111,997	2,156,731	1,076,850	159,500	916,836	317,874
Toledo, Peoria & Western	248	108,835	74,214	200,684	34,031	57,002	3,984	72,997	.....	6,178	176,192	24,492	13,000	11,492	4,969
Toledo, St. Louis & Western	451	834,918	121,159	1,010,582	144,809	145,352	32,565	306,502	.....	17,453	644,641	365,940	36,500	329,440	96,770
Union R. R. of Baltimore	8	275,701	51,737	331,341	24,887	.....	.....	10,966	.....	4,860	40,713	290,628	13,744	276,883	87,381
Union R. R. of Pennsylvania	32	.....	.....	1,138,810	63,457	183,147	217	420,542	.....	8,098	674,423	464,387	16,701	447,686	—977
Vandalia	917	1,482,103	489,364	2,233,758	376,791	427,541	51,696	732,501	22,284	55,101	1,663,785	569,973	80,348	489,030	51,557
Vicksburg, Shreveport & Pacific	171	154,196	86,481	270,517	39,828	55,262	7,367	86,238	4,110	10,149	203,455	67,062	18,360	48,702	25,695
Virginian	510	1,199,514	93,062	1,381,733	157,436	226,590	10,982	283,988	32,297	30,626	741,155	640,578	60,000	580,547	30,427
Wabash	2,519	4,271,166	1,473,210	6,274,847	644,896	1,014,810	182,179	2,136,589	40,779	137,049	4,135,144	2,139,703	197,688	1,941,443	693,618
Washington Southern	36	132,436	101,089	286,348	23,655	30,244	2,856	90,198	1,911	6,895	155,760	130,788	8,093	122,692	47,020
West Jersey & Seashore	359	412,446	1,545,886	2,102,867	267,869	220,814	25,682	602,327	6,605	37,081	1,160,263	942,604	76,374	866,161	47,952
Yazoo & Mississippi Valley	1,382	1,730,067	450,290	2,302,242	407,125	369,485	42,544	693,310	3,454	65,492	1,572,623	729,619	114,000	615,353	230,161

Five Thousand Dollars Fine

The Abilene & Southern was indicted at Abilene, Texas, last Monday on five counts for violation of the Interstate Commerce law by defeating the lawful freight rate applicable on shipments of the company's own material. The company pleaded guilty and was fined $5,000. The material had been billed to a point 20 miles from the actual point of delivery, thereby reducing the rate.

Street Car Disasters

In the derailment of a street car on or near a bridge in West Third street, Cleveland, Ohio, October 3, the conductor and one passenger were killed and forty or more persons were injured. The car, when knocked off the track, ran against a truss of the bridge and weakened it, and the whole structure, with two cars, fell, about 30 feet, to the tracks of the Baltimore & Ohio, below. The collision appears to have been due to the car becoming uncontrollable on a steep descending grade.

By the wrecking of a street car on a crossing of the Grand Trunk in Detroit, Mich., on the night of the first of October, 14 persons were killed and 20 or more injured. A switching engine, pushing two freight cars, struck the street car at Forest avenue. The street car was pushed along at one side of the freight cars for some distance, and the killed were mostly persons who jumped or fell under the moving freight cars.

A Question of "Guests"

A correspondent at Pierre, S. D., anticipates the Court News column as follows:

"A peculiar suit is in process of incubation in Hutchinson county, this state, as to the rights of railways under certain conditions. The Chicago, Milwaukee & St. Paul is the road which is used by transient 'harvest hands' in their annual pilgrimage into this country, and several months ago, in a freight wreck, which occurred in Hutchinson county, three of such travelers were killed and about thirty more or less injured. The injured were taken to a hospital at Yankton for care and attention; and now the railway company takes the position that as the injuries occurred in Hutchinson county, that county is liable for the hospital expenses of the injured men. The county claims that the men were not residents of the county, and were merely passing through, as 'guests' of the railway company, and there is no responsibility. The outcome will be a suit to find what the courts think as to the rights of the contending parties."

Chinese Railway Contract to Americans

The Chinese government on September 30 entered into an agreement with the Siems-Carey Railway & Canal Company, St. Paul, Minn., which company will be financed by the American International Corporation of New York for the construction of 1,100 miles of railway. The railroad lines to be constructed have not yet been decided upon, but will be located by George A. Kyle, who has been appointed engineer, and officials of the Chinese government. The contract provides for the construction of 1,100 miles of road between points to be agreed upon after investigation. When the line to be first constructed has been agreed upon the road will be built by the contractors on a percentage basis. Mr. Kyle, in addition to surveying and locating the lines, will on behalf of the Chinese government superintend the construction, which will be undertaken by the Siems-Carey Railway & Canal Company. It is said that he will act later as chief engineer of the railroad. The Chinese government agreed further to appoint an American auditor, who shall act during construction and operation, as well as an American traffic manager. The contract mentions certain points between which the Chinese government desires lines to be constructed. It is provided, however, that if the construction of these lines is, after investigation, deemed to be inadvisable, the government and the corporation shall agree upon other lines to be constructed to make up the total mileage agreed upon. The American International Corporation has already advanced $500,000 to the Chinese government to be utilized in investigation, survey and location of lines and other preliminary expenses.

The Chinese government and the American International Corporation, in selecting lines for construction, will take pains to avoid interfering with any agreements covering railway construction which have been entered into by the Chinese govern-

ment with the various foreign governments or banking groups. At the present time there are only about 6,000 miles of railroad in China. While a number of roads have been contemplated, they are more or less covered by agreements of the character referred to. The roads already built have been found extremely profitable. China has been sadly lacking in transportation facilities, and wherever these have been improved, immediate increases in business have resulted. There are at present numerous lines which are desired and whose operation it is believed would be at once profitable.

The Siems-Carey Railway & Canal Company was organized recently by the American International Corporation and Siems & Carey, of St. Paul, Minn., undertaking railway and canal work in China. A preliminary contract for the dredging of the grand canal has been concluded, but the final contract is not yet signed. It is estimated that this work will cost somewhere in the neighborhood of $6,000,000.

Chief Interchange Car Inspectors' and Car Foremen's Association

At the recent convention of the Chief Interchange Car Inspectors' and Car Foremen's Association, which was held in Indianapolis, Ind., October 3 to 5, a report of which will be found elsewhere in this issue, the following supply companies had exhibits:

American Steel Foundries, Chicago.—Exhibiting models of the Economy draft arm, reversible coupler pocket with adjustable shelf, Simplex coupler, Vulcan truck sides, Vulcan, Hercules and Ajax brake beams, Atlas safety guards and the Ajax third point support. Represented by M. DeAndrews, F. L. McCune and W. G. Wallace.

Boss Nut Company, Chicago.—Exhibiting Boss lock nuts. Represented by J. W. Fogg and W. G. Wilcoxson.

Gold Car Heating and Lighting Company, New York.—Exhibiting steam hose couplers, brass gaskets, vapor valve, twin inlet valve and a model of a thermostatic regulator for steam heats. Represented by A. E. Robbins.

Grip Nut Company, Chicago.—Exhibiting locomotive, car and Unit Grip nuts, and test demonstrations with a Riehle testing machine, showing the wearing qualities of Grip nuts. Represented by W. C. Fowler, Jr., Albert Roberts and C. J. Wymer.

Joyce Cridland Company, Dayton, Ohio.—Exhibiting inspector jacks. Represented by Charles D. Derby.

Mahr Manufacturing Company, Minneapolis, Minn.—Exhibiting No. 1-C portable steel car repair torch. Represented by H. H. Warner.

Q & C Company, New York.—Exhibiting portable derails and the Peffers air brake hose protector. Represented by Albert Herbster.

Western Railway Equipment Company, St. Louis, Mo.—Exhibiting models of the "Perfect" brake ratchet, "Western" angle cock holder, "Spiral" pipe clamp, and other car devices. Represented by R. L. Langtin.

Templeton, Kenly & Company, Ltd., Chicago.—Exhibiting Simplex jacks, wrecking car jacks and emergency jacks. Represented by Arthur S. Beattys.

American Association of Passenger Traffic Officers

The sixty-first annual convention of the American Association of Passenger Traffic Officers will be held at the New Willard Hotel, Washington, D. C., on October 17 and 18. In addition to the reports from standing and special committees, the subjects to be discussed include Placing of Prepaid Orders by Telegraph or Telephone, Operation and Charges for Dining Cars, Uniformity in Contracts for Inter-line Tickets, Association Multi-route Tickets, Co-Operation in Advertising, Economy in Folder Distribution, City Ticket Office Location, and Checking Baggage to Residence. The program also includes addresses by Frank Trumbull, chairman of the board of the Chesapeake & Ohio; by Harry A. Roemer, traveling passenger agent of the Chicago, Milwaukee & St. Paul, on "The Get-Together Spirit," and by Henry R. Martin, general ticket agent, Union station, Indianapolis, on "Prepaid Ticket Deliveries."

Society of Railway Financial Officers

The annual convention of the Society of Railway Financial Officers will be held at the Hotel Raleigh, Washington, D. C., on October 18, 19 and 20.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, New Orleans, La.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.

American Electric Railway Association.—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.

American Electric Railway Manufacturers Association.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Railway Association.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Brown Palace Hotel, Denver, Colo.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, Gruenwald Hotel, New Orleans, La.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

Association of Manufacturers of Chilled Car Wheels.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

Association of Transportation and Car Accounting Officers.—G. F. Conrad, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

Bridge and Building Supply Men's Association.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Laylor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

Maintenance of Way and Master Painters' Association of the United States and Canada.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 30 Church St., New York. Next annual meeting, December, 1916, Waldorf-Astoria Hotel, New York.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

Railway Development Association.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next meeting, November 9-10, La Salle Hotel, Chicago.

Railway Real Estate Association.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 11-13, Hotel Sherman, Chicago.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Society of Railway Financial Officers.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Hotel Raleigh, Washington, D. C.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Annual convention, October 24-27, Hotel Sherman, Chicago.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Association of Short Line Railroads.—Clarence M. Oddie, Mills Bldg., San Francisco. Annual meeting, November 15, Brown Palace Hotel, Denver, Colo.

Western Canada Railway Club.—I. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

There were 3,500 more commuters over the lines of the Long Island in the month of September, 1916, than during the corresponding month of 1915.

Because of heavy sleeping car travel on the Pioneer Limited between Chicago and St. Paul, the Chicago, Milwaukee & St. Paul has assigned a second dining car to that train.

The Trunk Line railroads carrying grain from Lake Erie ports to New York announce an increase of one cent per 100 lb. on wheat for export, beginning November 1. Advances are proposed also in the rates on barley, rye, corn, oats and flaxseed.

The Texas railways have filed tariffs with the Interstate Commerce Commission to become effective on November 1, increasing rates in East Texas in accordance with the order of the Interstate Commerce Commission issued last July in the Shreveport rate case.

Cattle, hogs and sheep are now being grown in the South to such an extent that the Southern Railway runs a daily live stock train from points in Western North Carolina, East Tennessee and Southwest Virginia to eastern and southern markets and to Virginia feeding grounds; and from Alabama points to the St. Louis, Louisville and Cincinnati markets. Stock going East is consolidated at Asheville and the animals are fed and rested at Spencer. Stock for St. Louis is concentrated at Birmingham and sent to St. Louis over the Mobile & Ohio.

The Southern Pacific, the Atchison, Topeka & Santa Fe and the Western Pacific have announced changes in miscellaneous transcontinental freight rates, to become effective November 24. The rate on oleo oil and oleo stearines in packages, minimum carload 36,000 lb., from California terminals and intermediate points to all eastern territory, will be reduced to $1.25 per 100 lb. Reductions are announced in packing house products, brick and cement, iron and steel forms and molds, concrete construction and window glass for export. A reduction on west-bound crude or calcined magnesite also is announced. Transit privileges have been granted to shippers of fresh vegetables and fruits. Other commodities affected by the change in rates are tobacco, steel fence posts, toy drums, tea, spineless cactus, imported pickled sheep pelts, bichromate of soda, thermos bottles, barley and kelp. Some of the rates were changed to conform with the rates now in force in Oregon and Washington and others were established on application of California shippers to favor new industries in that state.

The increases in local freight rates announced by the New York State Public Service Commission, second district, last week are the subject of a more detailed statement in the bulletin issued by the commission this week. Examples of the changes shown in the new tariffs are given in the following table, showing rates on freight from Buffalo, to Dunkirk, Westfield, Cherry Valley and Jamestown:

		Classes					
		1	2	3	4	5	6
Dunkirk, N. Y. (N. Y. C.)	Proposed rates	22.5	19.	14.5	10.	8.	6.
	Present rates	12.6	12.1	11.	8.9	6.8	5.3
	Rate advances	9.9	6.9	3.5	1.1	1.2	.7
Dunkirk, N. Y. (N. Y. C. & St. L.)	Proposed rates	20.	16.5	14.	9.5	7.5	6.
	Present rates	12.6	12.1	11.	8.9	6.8	5.3
	Rate advances	7.4	4.4	3.	.6	.7	.7
Westfield, N. Y. (N. Y. C. or N. Y. C. & St. L.)	Proposed rates	26.	22.	17.	11.5	9.	7.
	Present rates	15.2	13.7	12.6	10.5	7.9	6.8
	Rate advances	10.8	8.3	4.4	1.	1.1	.2
Cherry Valley, N. Y. (Erie)	Proposed rates	24.5	20.5	15.5	10.5	8.5	6.5
	Present rates	18.9	16.8	15.8	11.	8.4	7.4
	Rate advances	5.6	3.7	....	....	.1	....
	Rate reductions	....	....	.3	.5	....	.9
Jamestown, N. Y. (Erie)	Proposed rates	29.	25.	19.	13.	10.5	8.
	Present rates	23.1	21.	17.9	12.6	9.5	8.4
	Rate advances	5.9	4.	1.1	4	1.	....
	Rate reductions	....	....	....	....	....	.4

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission has denied a large number of applications filed by the Union Pacific for authority to continue rates without observing the long and short haul clause.

The Interstate Commerce Commission has issued an amended order on the fourth section application of A. C. Fonda, agent for the Texas lines, authorizing these carriers to establish class and commodity rates between Shreveport, La., and Texas points without observing the long and short haul clause, pending action of the commission on the application.

The Interstate Commerce Commission has announced the reopening of the coal and coke rate case because the parties have been unable to agree on the division of the rates prescribed, and the Louisville & Nashville has asked the commission to prescribe such divisions. The hearing has been set for November 1 at Louisville, Ky., before Commissioner McChord.

The Interstate Commerce Commission has suspended from October 10 and 20 until February 7, 1917, the operation of certain items of tariff filed by Joseph Richardson, agent, providing for the withdrawal of rates and charges now in effect for the movement of special baggage and passenger cars from, to and between points located on the Southern Railway in Mississippi and the Mobile & Ohio.

The Interstate Commerce Commission has suspended from October 11 until February 8, 1917, proposed increases in rates on logs in carloads from points on the Chicago, Memphis & Gulf and the Illinois Central, in Kentucky, Tennessee, Alabama and Mississippi, to New Albany, Ind.; Louisville, Ky., and certain other Ohio river crossings. The proposed rates are from ½ to 2 cents per 100 lb. higher than those now in effect.

The commission has suspended from October 7 until February 4, 1917, the operation of items in tariffs filed by F. A. Leland and Eugene Morris providing for the cancellation of a proportional commodity rate of 68½ cents per 100 lb. on fresh meats in carloads from St. Louis, Mo., to Fort Worth, Texas, applicable on shipments originating at New York, Jersey City and Newark. The proposed rate from St. Louis to Fort Worth is 89.3 cents.

STATE COMMISSIONS

The Public Service Commission of Alabama has refused to continue beyond October 13, the limit originally fixed, the increased freight rates authorized by the commission two years ago on a large number of important commodities. The roads interested are the Central of Georgia, the Western of Alabama, the Seaboard Air Line and the Atlanta, Birmingham & Atlantic. These rates, because of the high cost of railway operation, were allowed by the Commission to be advanced 10 per cent. The carriers had applied for an indefinite continuation of the higher rates.

The Missouri Grain Dealers' Association has asked the Missouri Public Service Commission to revise grain rates in Missouri, alleging that intrastate rates are not uniform north and south of the Missouri river. For the purpose of equalizing markets there is a proportional rate of nine cents per 100 lb. on wheat; for example, from Omaha, Nebr., or Kansas City, Mo., to all Mississippi river crossings. This results in a maximum local rate of 13 cents per 100 lb., from Omaha or Kansas City to St. Louis, which may be applied as a maximum from directly intermediate points. As a result the maximum rate of 13 cents may be applied from the northwest corner of the state; for example, Tarkio, to St. Louis, and at the same time from Pleasant Hill to St. Louis, a considerably shorter distance. Likewise lines north of the Missouri have a maximum of 11¾ cents per 100 lb. on wheat from such points as Plattsburg and Lathrop to St. Louis, whereas somewhat higher rates obtain for corresponding distances south of the Missouri river. The Commission has

deferred consideration of the complaint to await the outcome of an injunction suit brought against it in the Missouri Supreme Court, seeking to deny the Commission the right to increase any rates fixed by statute. Some months ago the Commission undertook, after a hearing, to increase certain commodity rates which had been fixed by statute, among which were included rates on grain.

COURT NEWS

Abolition of Fellow Servant Defense

Action was brought under the North Dakota act of 1907, taking away from railroads the defense of negligence of fellow servant, for injuries to an employee through the carelessness of a fellow servant in allowing a feed grinder to fall on him while unloading freight. The North Dakota Supreme Court held that the unloading of freight trains is work which is directly connected with the operation of the road, and belongs to the class which may be termed railroad work proper; that the statute was not unlawfully discriminative; and that it applied to the plaintiff's case.—Gunn v. St. Paul (N. Dak.), 158 N. W., 1,004.

Alabama Anti-Shipping Law

The Alabama Supreme Court, in an action to compel a railroad to transport certain liquors within the state, tendered by officers who had seized it under warrant, holds that the state anti-shipping law, in connection with the prohibition laws, has no application to intrastate shipments of liquors seized under legal process and their transportation in response to court process. Under this law it is incumbent on the officer having possession of such liquor, in order to put a railroad in default for not receiving it for shipment, to show his authority under legal process, as by presenting a written order from the proper court, and not by a mere statement or his writing on the package.—Central of Georgia v. State (Ala.), 72 So., 555.

Look and Listen Rule—Private Crossings

In an action for the death of a boy of 13, who was riding in a wagon driven by another, the boy's father's hired man, and was killed at a private crossing, the Nebraska Supreme Court holds that the act of a person in going on a crossing, without first listening and looking, in the absence of a reasonable excuse therefor, is such as permits of no other inference than that of negligence; and if such failure to look and listen contributes to the party's injury he cannot recover. Where two persons of equal authority are riding in a vehicle, which is driven upon a railroad track in front of an approaching train in full, unobstructed view, it is immaterial which is driving, since, if either party looked and listened, he must have seen the train approaching.

A railroad company may run its trains whenever necessary in the conduct of its business, and travelers at a private crossing are guilty of negligence if they assume to know when the trains will be run, and so fail to look and listen before crossing. Judgment for the plaintiff was reversed.—Johnson v. Delano (Neb.), 158 N. W., 1,034.

Fellow-Servant or Passenger?

A switch and signal company, installing electric signals for a railroad, was transporting one of its servants, whose employment was cleaning out battery wells, on a gasolene rail car, to and from a boarding house operated by it, when he was injured through his gang foreman throwing on the brakes too sharply. In an action against the company the South Dakota Supreme Court held, by a divided court, that the plaintiff was a passenger, and was not injured by the negligence of a fellow servant, and so could recover. Whiting, J., dissenting, said: "Under the contract it was his duty to ride on this car to and from work, morning and evening, and to and from the place for meals at the noon hour. The transportation was not 'furnished as a matter of convenience to appellant, but as a necessary and essential element in the carrying out of the enterprise in which appellant and his fellow workmen were engaged."—Williams v. Union Switch & Signal Company (South Dakota), 158 N. W., 901.

Alighting from Train—Unforeseen Accident

In an action for personal injuries to a passenger the railroad offered evidence that the train stopped a few hundred feet from the station for an intersecting train, and that the conductor told all passengers to keep their seats unless they were changing to the other train. He put down the step and assisted passengers to alight, and waited ten minutes for any passengers who wished to alight. He then removed the step and went up to talk to the engineer. The plaintiff then tried to alight and fell. The Texas Court of Civil Appeals held that the railroad was entitled to have submitted to the jury the special issue whether a very prudent person under the circumstances would have foreseen the plaintiff's act and her injury, since, if employees, exercising the highest degree of care, could not have foreseen the result, the road was not liable.—Texas Central v. Driver (Tex.), 187 S. W., 981.

Excessive Taxation of Insolvent Road

Although a railroad company, by failing to take the steps prescribed by statute, has lost the right to question the validity of tax levies against its property, where its affairs are being administered by a federal court of equity through a receiver, that court has power to determine the validity of the claim for taxes, and if it appears that they were so erroneous in the methods of assessment, imposition or computation as to be fraudulent, to direct that only the proper amount shall be paid from the estate. The taxes levied upon the property and franchise of the Babylon, whose estate was being administered in equity, were held by the federal district court, E. D., New York, to be so excessive, as compared with those levied on similar property of other companies, that their allowance in full would operate as a fraud on other creditors, and to require the court to reduce the same to a just amount.—Spencer v. Babylon, 233 Fed., 803.

Right to Build Third Track

The New York Supreme Court, Special Term, Erie County, holds that when a railroad with two tracks granted other roads the right to cross, the grant did not carry with it the right permanently to compel the railroad to maintain its then manner of conducting its business at the crossing point, over two tracks only, so that its building a third track might be enjoined.

Where a double-track railroad has been in operation for more than 50 years, since 1891 being intersected by another double-track road, the laying of a third track for switching and other purposes, by the side and but a few feet from the westerly of the two tracks upon the first road's right of way, does not make such third track a "new railroad," within Railroad Law (Consol. Laws, c. 49) § 22, relating to intersections of roads, or a "steam railroad hereafter constructed," within section 98; the term "railroad," as used in the statute, meaning the tracks on a single right of way.—Buffalo Creek v. N. Y. C., 160 N. Y. Supp., 546.

Frog Blocking Statute Construed

The Arkansas Supreme Court holds that the statute of 1911, requiring railroads to block frogs, being a penal statute, must be construed strictly. A prosecution was filed on August 10 for failure to block a frog in a certain county on August 2, and on August 11 another was filed in the same county for failure to block another frog on August 3. The railroad contended that but one penalty could be recovered for a violation of the act in each county. On the other hand it was contended by the state that the railroad should be liable for a penalty if it failed to comply with the act at every station and every frog at every station. It was held that the failure to maintain blocks at any and all of the road's frogs constitutes but one offense. A separate penalty does not accrue for the failure to place and maintain blocks at each of its frogs. If the railroad has 12 frogs in any one county and fails to block all of them, this constitutes but one offense. If it fails to block one of them, this still constitutes one offense. Only one penalty can be collected in one county to the date of beginning the prosecution, regardless of the number of frogs left unblocked. But if, after the commencement of the prosecution, the statute is again violated, another penalty may be recovered in another prosecution commenced thereafter, and so on as long as violations continue.—St. Louis, I. M. & S. (Ark.), 187 S. W., 1,064.

Railway Officers

Executive, Financial, Legal and Accounting

A. J. Biard, acting auditor of the Texas & Pacific at Dallas, has been appointed auditor.

J. A. Sandberg, auditor of disbursements for the Great Northern, has been appointed auditor of joint facility accounts, a newly created position.

J. H. Boyd, assistant auditor of disbursements for the Great Northern, has been appointed auditor of disbursements, having headquarters as at present at St. Paul, Minn.

F. H. Hill has been appointed auditor of the Kinston Carolina Railroad & Lumber Company, with headquarters at Norfolk, Va., succeeding T. Gibson Broughton, resigned to enter another line of business.

George H. Earl, secretary and assistant treasurer of the Northern Pacific, with office at New York, has been elected third vice-president, and E. A. Gay, assistant secretary at New York, has been elected secretary and assistant treasurer.

Operating

E. M. Cooper has been appointed assistant superintendent of the St. Louis-Southwestern, succeeding F. S. Stimson.

R. F. Beaudry, trainmaster of the Elgin, Joliet & Eastern, at Joliet, Ill., has been appointed superintendent of the Joliet division, with same headquarters.

R. J. Harlan has been appointed general manager of the Louisville & Wadley, with office at Wadley, Ga., in place of T. T. Holloman, general superintendent, resigned.

H. C. Holmes has been appointed superintendent of the Guantanamo & Western, with office at Guantanamo, Cuba, vice H. H. McGinty, resigned to accept service elsewhere.

John M. Condon, special agent of the Erie at Youngstown, Ohio, has been appointed trainmaster of the Kent division, with office at Marion, Ohio, relieving Frank Eberhart, transferred.

Carl Bucholtz, trainmaster of the Marion division of the Erie at Huntington, Ind., has been appointed assistant superintendent of the Kent division, with office at Kent, Ohio, relieving P. O'Neill, assigned to other duties.

J. E. Reilly has been appointed trainmaster of the Joliet division of the Elgin, Joliet & Eastern, except the Joliet terminals, with office at Joliet, Ill. He succeeded R. F. Beaudry, promoted. W. H. Conine has been appointed assistant trainmaster, with same headquarters.

William Wilson, trainmaster of the Southern Pacific at Yuma, Ariz., has been appointed assistant superintendent of the Portland division, with office at Portland, Ore., assuming part of the duties heretofore devolving upon C. W. Martyn, assistant superintendent, with the same headquarters. Both of these officials will report to F. L. Burckhalter, division superintendent.

W. H. O'Keefe, whose appointment as assistant general superintendent of the Michigan Central, with office at Detroit, Mich., has already been announced in these columns, began railway work in 1880 with the Michigan Central, and has been continuously in the employ of this one company since. In 1883 he was made trainmaster's clerk, and from this time up to 1913, when he was appointed superintendent of terminals at Detroit, Mich., he passed consecutively through the grades of clerk, chief clerk to the superintendent, assistant yardmaster, yardmaster, general yardmaster, assistant trainmaster, trainmaster, assistant superintendent and superintendent. His present appointment as assistant general superintendent became effective on October 1, 1916.

Traffic

W. T. Walsh has been appointed general agent of the Ft. Smith & Western, with office at Atlanta, Ga., in place of T. C. Tipton, resigned.

S. B. Murray has been appointed commercial agent of the Seaboard Air Line, with office at Birmingham, Ala., vice S. K. Hawkins, resigned.

L. W. Hazelhurst, assistant commercial agent of the Illinois Central at Chicago, Ill., has been appointed commercial agent, with office at Memphis, Tenn.

John D. Marney, division freight agent of the Baltimore & Ohio Southwestern at Springfield, Ill., has been appointed division freight agent at Louisville, Ky.

E. S. Vincent, commercial agent of the Texas & Pacific, with office at Little Rock, Ark., has been appointed commercial agent, with office at Shreveport, La., succeeding T. J. Keen, transferred.

T. J. Keen, commercial agent of the Texas & Pacific, at Shreveport, La., has been appointed commercial agent with office at Little Rock, Ark., succeeding E. S. Vincent, assigned to other duties.

J. V. McCullough, commercial agent of the Seaboard Air Line at St. Petersburg, Fla., has been appointed commercial agent, with office at Miami; and S. J. Corey is appointed commercial agent at St. Petersburg, Fla., succeeding Mr. McCullough. Mr. Corey will have jurisdiction over all matters pertaining to passenger and freight solicitation at points on the Tampa & Gulf Coast.

C. W. Tomlinson, general eastern freight agent of the Baltimore & Ohio at New York, has been appointed to the newly created position of general traveling freight agent, with headquarters at Cincinnati, Ohio; Stuart Allen, manager of the Continental Line and the Central States Dispatch, Cincinnati, fast freight connections of the Baltimore & Ohio, succeeds Mr. Tomlinson as general eastern freight agent at New York; T. J. Walters, division freight agent of the Baltimore & Ohio at Pittsburgh, Pa., has been promoted to manager of the Continental Line and the Central States Dispatch, and J. C. Kimes, commercial freight agent of the Baltimore & Ohio at Pittsburgh, succeeds Mr. Walters as division freight agent.

O. P. McCarty, passenger traffic manager of the Baltimore & Ohio, with headquarters at Baltimore, Md., whose authority was extended recently over all owned, leased or controlled lines, as has already been announced in these columns, was born at Massillon, Ohio, and began railway work on June 1, 1864. He served until 1866 as a clerk in the general ticket office of the Cincinnati & Chicago Air Line, and from May to July, 1866, was city ticket agent of the Chicago & Great Eastern. He then went with the Columbus & Indianapolis Central, and later entered the service of the Pittsburgh, Cincinnati & St. Louis. The next 10 years he spent as chief clerk in the general ticket office of the Indianapolis, Bloomington & Western, and from January to April, 1880, was division clerk in the general ticket office of the Union Pacific. He was then, to May, 1881, chief clerk in the ticket department, and later served until August, 1887, as assistant general ticket agent of the same road. From November, 1887, to May, 1888, he was chief rate clerk of the Trunk Line Passenger Committee at New York, and then, to August of the following year, was chief clerk in the general passenger office of the Baltimore & Ohio. He subsequently served as assistant general passenger agent of the same road until March, 1890, then as general passenger agent of the Baltimore & Ohio Southwestern Railroad until November, 1893. From October, 1889, to July, 1890, he was also general passenger agent of the Columbus, Cincinnati & Midland, now part of the Baltimore & Ohio. From May 1, to November 1, 1893, he also served as acting general



O. P. McCarty

passenger agent of the Ohio & Mississippi. From November, 1893 to September, 1894, he was general passenger agent of the Baltimore & Ohio Southwestern Railway, which was formed by a consolidation of the Baltimore & Ohio Southwestern Railroad and the Ohio & Mississippi. From October, 1894, to December, 1896, he was general traveling passenger agent of the Southern Pacific; then to September of the following year was assistant general passenger agent of the same road at New Orleans, La. In October, 1897, he returned to the service of the Baltimore & Ohio Southwestern, as general passenger agent, remaining in that position until September, 1911. From March, 1911, to the following September he was also general passenger agent of the Cincinnati, Hamilton & Dayton, and on September 1, 1911, was appointed passenger traffic manager of the Baltimore & Ohio.

Engineering and Rolling Stock

F. B. Rosencrans has been appointed signal inspector of the Great Northern with headquarters at St. Paul, Minn.

A. H. Kendall has been appointed master mechanic of the Canadian Pacific, with office at Toronto, Ont., in place of W. J. Pickrell, transferred.

J. D. Elder has been appointed division engineer of the west division of the Michigan Central, with office at Niles, Mich., vice C. C. Hill, transferred to the valuation department. E. C. Wurzer has been appointed division engineer of the Detroit division, with office at Detroit, Mich., and John Evans, division engineer at Detroit, has been appointed division engineer of Detroit terminal and Toledo division, with office at Detroit.

William Kelly, general master mechanic of the Great Northern at Spokane, Wash., has been appointed assistant superintendent of motive power, with headquarters at Spokane, with jurisdiction over the Central and Western districts. M. J. Flanigan, who was recently appointed master mechanic of the Minot division, with office at Minot, S. Dak., has been appointed general master mechanic, with headquarters at Great Falls, Mont., vice F. M. Fryburg, who has been appointed master mechanic of the Butte division, with headquarters at Great Falls, Mont., vice J. C. Benson, who becomes master mechanic of the Montana division, with headquarters at Havre, Mont., vice R. R. Schule, assigned to other duties. N. C. Bettenburg has been appointed master mechanic of the Minot division, with headquarters at Minot, N. D., vice Mr. Flanigan, and J. J. Dowling is now master mechanic of the Cascade division, with headquarters at Delta, Wash.

OBITUARY

William Bross Jansen, formerly vice-president and assistant to president of the Atchison, Topeka & Santa Fe, died on October 7, at Chicago, Ill. He was born on November 22, 1868, at Chicago and on September 15, 1886, began railway work. He served consecutively as chief clerk in the yard of the Atchison, Topeka & Santa Fe, at Topeka, Kan.; ticket collector on passenger trains; clerk in the general manager's office; private secretary to general manager, and then as chief clerk in the general manager's office, until April, 1897, when he was appointed secretary to president. From June, 1901, to September, 1910, he was assistant to president, and from January, 1906, to September, 1909, also fourth vice-president; from September, 1909, to September, 1910, vice-president and assistant to president. His entire railway service had been with the Atchison, Topeka & Santa Fe system.

William McWood, formerly superintendent of the car department of the Grand Trunk, from which position he retired on a pension in 1908, died on October 4, after a long illness. He was born in 1830 at Montreal, Quebec, and served an apprenticeship with John Thorton, coach builder. He entered the services of the Grand Trunk in 1855, and from 1860 to 1873 was foreman on the same road. He then served as assistant mechanical superintendent, and superintendent of the car department of the same road, in charge of the car department of the entire line from 1873 until his retirement on January 1, 1908, after a continuous service of 53 years with the Grand Trunk. Mr. McWood took a very active part in the organization of the Master Car Builders' Association, having been a member of that association since 1875. From 1882 to 1887 he served as vice-president, and for the three years 1888, 1889 and 1890 as president of the same association.

Equipment and Supplies

LOCOMOTIVES

The Chicago & North Western is inquiring for 25 Mikado, 25 switching, 15 transfer switching and 12 Pacific locomotives.

The Long Island has ordered 6 superheater ten-wheel locomotives from the American Locomotive Company. These locomotives will have 21 by 26 in. cylinders, 60½ in. driving wheels, and a total weight in working order of 178,000 lb.

The Atlanta, Birmingham & Atlantic has ordered 3 superheater Santa Fe type locomotives from the Baldwin Locomotive Works. These locomotives will have 27 by 30 in. cylinders, 57-in. driving wheels, and a total weight in working order of 314,000 lb.

The Chesapeake & Ohio, reported in last week's issue as contemplating the purchase of 25 Mallet type locomotives, has ordered 25 superheater Mallet type locomotives from the American Locomotive Company. These locomotives will have 22 and 35 by 32 in. cylinders, 56 in. driving wheels, and a total weight in working order of 435,000 lb.

The Wheeling & Lake Erie, reported in last week's issue as inquiring for 15 Mallet type locomotives, has ordered 10 superheater Mallet type locomotives from the American Locomotive Company. These locomotives will have 25½ and 39 by 32 in. cylinders, 63 in. driving wheels, and a total weight in working order of 435,000 lb.

FREIGHT CARS

The Western Pacific is building 100 stock cars.

The Birmingham Southern is in the market for 50 coke, 25 flat and 15 box cars.

The Detroit, Toledo & Ironton is in the market for 100 to 200 automobile box cars.

The Brier Hill Steel Company, Youngstown, O., is in the market for 30 coke cars.

The Cold Blast Transportation Company is inquiring for a number of refrigerator cars.

The Milwaukee Coal & Gas Company has ordered 300 gondola cars from the American Car & Foundry Company.

The Island Petroleum Company, Pittsburgh, Pa., has ordered 10 tank cars from the Pressed Steel Car Company.

The Wheeling & Lake Erie has ordered 500 gondola cars from the Pressed Steel Car Company and 500 from the Standard Steel Car Company.

The Marcel Tank Line has ordered 60 40-ton, 8,000 gal. tank cars and 40 50-ton, 10,000 gal. tank cars from the American Car & Foundry Company.

The Chicago & North Western, reported in last week's issue as inquiring for 500 50-ton steel ore cars, has also issued inquiries for 1,700 50-ton composite gondola cars and 1,000 30-ton wooden box cars.

The Chicago & Alton, reported in the *Railway Age Gazette* of September 22 as inquiring for 200 automobile cars, has ordered these cars from the Haskell & Barker Car Company. These are in addition to 150 automobile cars also being built by the same company.

PASSENGER CARS

The Baltimore & Ohio is reported in the market for possibly 100 passenger train cars.

The New York Central has issued inquiries for 25 or more 60 ft. 6 in. baggage cars, and 50 or more 70 ft. coaches, and is building 4 dining cars in its own shops.

The Long Island, reported in the *Railway Age Gazette* of September 8 as inquiring for 60 coaches and 10 baggage cars, is reported to have ordered a number of cars from the Pressed Steel Car Company.

Supply Trade News

The Westinghouse Air Brake Company on October 6 declared a special dividend of $5 a share, or 10 per cent.

Stanley H. Smith, of the sales staff of the Bethlehem Steel Company, at Chicago, Ill., has been appointed sales agent of the Cleveland district, with office at Cleveland, Ohio.

The unfilled orders of the United States Steel Corporation on September 30 totaled 9,522,584 tons, as compared with 9,660,357 tons on August 31, or 5,317,618 tons on September 30, 1915.

At a meeting of the board of directors of the Hess-Bright Manufacturing Company, Philadelphia, Pa., on October 6, B. D. Gray was elected president succeeding F. E. Bright who is now chairman of the board.

The Western Electric Company is now employing 23,000 persons, the largest number in its history. It is expected that the company's gross sales this year will total over $100,000,000 as compared with $77,000,000 last year.

The Union Switch & Signal Company announces the following appointments: M. L. Gray, assistant to general sales manager; H. A. Wallace, signal engineer; H. S. Loomis, commercial engineer, all with office at Swissvale, Pa.

The H. W. Johns-Manville Company, New York, has opened a new branch office at Great Falls, Mont. The office is at room 418, Ford building, and is in charge of J. H. Roe. With the opening of the Great Falls office the H. W. Johns-Manville Company increases the number of its branches to 55.

Articles of incorporation have been filed in Delaware for the Inter-Continental Machinery Corporation with a nominal authorized capital stock of $500,000. It is understood that the new enterprise will deal in machinery in general, but specialize in machine tools both in the United States and foreign countries. The organization is headed by Charles N. Thorn, until recently vice-president of the Allied Machinery Company of America, which is now part of the American International Corporation. Mr. Thorn had been connected with Manning, Maxwell & Moore for 14 years. The other officers consist of Joseph S. Clark, of E. W. Clark & Co., Philadelphia; R. E. Robinson, of R. E. Robinson & Co., bankers, New York, and Chester B. Overbaugh, formerly manager of the Thompson-Starrett Company, Washington, D. C., vice-presidents, and Arthur M. Watkins, secretary. The company will establish branch offices in the principal countries of Europe, beginning with Russia, in which country the company will establish its branch in Petrograd, following with Moscow, Odessa and Vladivostok. An office and salesroom at Paris, France, and also one in London, will follow rapidly. It is also planned to open offices in China and Japan.

Westinghouse Air Brake Company

A statement to the stockholders of the Westinghouse Air Brake Company, issued by President H. H. Westinghouse, says in part:

The net profit for the year, after the usual scheduled monthly charges against production to cover depreciation, also charges to cover workmen's compensation fund and pension fund requirements, totals $9,396,103, as compared with $1,575,838 for the previous year. This result is due to a recovery in the company's brake business to a point somewhat in excess of its normal level, as determined by the five-year average, and to the satisfactory conclusion of our contract for 1,250,000 18-lb. shrapnel. It is gratifying to state that the estimates made by the management on undertaking this business have been confirmed, not only with respect to the profit resulting therefrom, but as to its beneficial effect on the community at large. The shop pay rolls of the year under review aggregated $4,713,377 as compared with $2,048,245 for the previous year, while in addition to this increase of $2,665,132 in wages paid directly to employees of the Westinghouse Air Brake Company, a very large amount was disbursed among workmen in other plants which furnished material purchased by the Brake company to meet the requirements of its munition contracts.

In connection with these contracts an ample reserve has been set up to cover the munition tax on deliveries made during the calendar year 1916, by which the United States Government will ultimately become a beneficiary of this branch of our business provided an excise tax levied subsequently to the sale of the product taxed is found to be constitutional.

Your company is now engaged in executing a contract for 1,100,000 time fuses, which will be completed during the current calendar year. No additional business of this character is now in sight.

During the year the Westinghouse Brake Company, Ltd., of London, has paid dividends aggregating 12½ per cent and continues to do well. The Russian and Italian companies are likewise prosperous, the former having recently declared a dividend of 12 per cent out of the earnings of the year ended December 31, 1915. The French Brake Company is steadily increasing its resources, and its future prosperity seems to be assured. The current electrical business of the Canadian Westinghouse Company, Ltd., is exceptionally heavy and its net earnings this year will exceed those of 1915, out of which dividends aggregating 9 per cent were declared and paid.

The consolidated balance sheet follows:

ASSETS

Cash	$3,432,177
Accounts and bills receivable	6,079,744
Inventory at cost, including material, supplies, goods in progress and finished stores	7,908,194
Deferred charges to operation	84,655
Investments, including 22,974 shares Westinghouse Brake Co., Ltd., of London, par value £10 per share; 17,270 shares Canadian Westinghouse Co., Ltd., par value $100 per share, and sundry other investments	8,316,959
Factories, less Reserves for Depreciation	6,549,649
Real Estate, other than for factories	1,950,254
Patents and Goodwill	2,515,345
	$36,836,977

LIABILITIES

Accounts payable	$1,566,281
Advances on contracts	70,710
Accrued liabilities	745,134
Contingent liability on account of sales, subject to future settlements	289,636
Capital Stock	19,638,467
Sundry Reserves	2,691,450
Contingent surplus, excess par value capital stock of American Brake Company, over value on books of Westinghouse Air Brake Company	1,000,000
Surplus, applicable to dividends	10,835,299
	$36,836,977

A meeting of the stockholders has been called for October 19, at Wilmerding, Pa. Proposed changes in the by-laws, including the creation of the office of chairman of the board, will be voted on.

W. P. Barba Resigns from Midvale Steel Company

W. P. Barba, vice-president of the Midvale Steel Company, Worth Brothers Company and the Wilmington Steel Company, has resigned, and the duties of vice-president of these three companies will be assumed by E. E. Slick, vice-president of the Cambria Steel Company. Mr. Barba will take a few months' rest and travel before taking up some special work along the lines of his wide experience at Midvale; he does not intend to undertake the same character of work that he is now relinquishing. Mr. Barba had been in the employ of the Midvale Steel Company for 36 years. Entering Midvale in 1880 as a boy, in nine years he was made chief chemist, then department superintendent, and, not long after, general manager of sales. A few years ago he was made general superintendent, and upon the resignation of the general manager he was called upon to fill that position, which he held until he was made vice-president at the time of the taking over of the plant by the Corey interests.

TRADE PUBLICATIONS

BURNING CRUDE OIL.—A booklet recently issued by the De La Vergne Machine Company, New York, says that in the De La Vergne oil engine one cubic inch of oil has 6,000 sq. in. of surface all exposed to the high temperature oxygen at the same instant.

SIMPLEX JACKS.—Templeton, Kenly & Co., Ltd., Chicago, has issued a 32-page pamphlet illustrating and describing the simplex jack and its application to various industrial purposes. Of special interest to railway men is the application of these jacks to car repairs, the several designs of track jacks and the Simplex

Pole jack, designed for placing, straightening or pulling telephone, telegraph or power line poles.

Milling Machines.—Catalogue No. 19, recently issued by the Kearney & Trecker Company, Milwaukee, Wis., is an 86-page booklet describing and illustrating the company's line of milling machines. The Kearney & Trecker Company manufactures milling machines only. In its catalogue it takes up point by point every part of the machines, emphasizing each detail of mechanical correctness and summarizing the advantages of its unique and patented features.

Horizontal Power Pumps.—Bulletin No. 201 of the National Transit Pump & Machine Co., Oil City, Pa., is a 20-page pamphlet devoted to the company's line of horizontal piston power pumps, which are designed to cover a wide range of general service. The pumps are designed either for belt or direct connection to the prime mover and are furnished direct connected to National Transit gas and oil engines of the vertical type. The pamphlet is a complete catalogue, giving sizes and dimensions of the various types.

Building Code Suggestions—The National Lumber Manufacturers' Association has recently issued technical letters No. 4 and No. 5 under this title which contain many valuable suggestions for the safeguarding of frame and ordinary construction buildings against fire loss or damage. The papers are prepared primarily from the standpoint of the dwelling, but the information contained is applicable in the main to any buildings of wood construction or those having brick or masonry walls with wooden floors, roof, etc. Letter No. 4 contains information concerning various construction details, while No. 5 specializes on chimneys and smoke pipes.

Feed Water Treatment.—One of the latest publications of the Dearborn Chemical Company, Chicago, bears the title, "Incrustation, Corrosion, Foaming and Other Effects of Water Used in Steam Making and Methods of Prevention." The booklet first emphasizes that the Dearborn Chemical Company does not supply a "cure-all," and that it is not a "boiler compound house." The book in three chapters takes up respectively the subjects of corrosion, including pitting, grooving and electrolysis; incrustation, including soft and hard scale of varying compositions; and foaming, including priming, bagging, causes of explosion, etc., with a discussion of oil in boilers. One section deals with the Dearborn Chemical Company itself, showing how its experts make analyses, work out formulas and compound the proper remedies. The book is well illustrated, several pictures showing parts of the office and plant.

Taps and Dies.—The Greenfield Tap & Die Corporation, Greenfield, Mass., has recently issued catalogue No. 37, containing the entire line of the Greenfield Tap & Die Corporation, and taking the place of the old divisional catalogues as follows: Wells Brothers Company, Division No. 34; Wiley & Russell Manufacturing Company, Division No. 36; A. J. Smart Manufacturing Company, Division No. 3. By combining the tools of the different divisions, the line has been much simplified. The famous old trade marks, "Little Giant," "Lightning," "Green River" and "Smart," are still retained as applies to taps, dies and screw plates, these brand names having reference particularly to the various styles of dies which have so long been marketed under these names. The new G. T. D. trade mark is already making its appearance on some of the tools of the corporation, and will be added to others as fast as practicable. The line illustrated in the new catalogue includes taps, dies, screw plates, reamers, gages, threading machines, tap and die holders, the friction tap chuck, the Wells self-opening die, the new "Gun" tap, pipe threading tools, etc.

Canada's Wire Nails and Cast-Iron Pipe.—Canada's production of wire nails in 1915 is estimated at 1,636,000 kegs of 100 pounds, as compared with 1,144,000 kegs in 1914. The output of cast-iron pipe amounted to 53,700 net tons, as compared with 93,200 tons in 1914.

Electrification of Norwegian Railways.—A beginning is soon to be made for the electrification of the State railways of Norway. The railway committee of the Storthing recently approved the proposal for the electrification of the line running from Christiania to Drammen, the estimated cost of which will be $6,520,000.

Railway Construction

Canadian Pacific.—The Stirling subdivision of the Alberta division has been extended from Foremost, Alta., east to Pakowki, 22.2 miles.

Guelph Junction Railway.—See Guelph Radial.

Guelph Radial Railway.—Plans are under consideration for building under the name of the Guelph Junction Railway a branch line from Linwood, Ont., south to Wellesley, about 9 miles. J. W. Lyon, president, Guelph.

McDonald & Burgettstown (Electric).—Incorporated in Pennsylvania with $100,000 capital, it is said, to build a 15-mile electric line in Washington county. R. L. Henderson, Pittsburgh, Pa., may be addressed.

Mitchell & Northwestern.—The Railroad Commissioners of South Dakota have granted a permit to this company to build the proposed line from Mitchell, S. Dak. northwest to Highmore about 100 miles. (Sept. 8, p. 434.)

New York Subways.—The New York Public Service Commission, First district, has let to the Thomas J. Buckley Construction Company, the lowest bidder, at $372,893, the contract for the construction of the Two Hundred and Thirty-ninth street railroad yard for the storage of subway cars. (October 6, p. 620.

The commission will open bids on October 19 for the construction of concrete track floors and platforms over the mezzanine of eleven stations on the Culver Rapid Transit road in the borough of Brooklyn.

Philadelphia Roads.—Bids are wanted until November 2 by William S. Twining, director, department of city transit, Philadelphia, Pa., for the construction of a section of the Broad street subway, comprising a portion of the station under City Hall, and the Market street subway, and work appurtenant thereto, known as Contract 102. This section will be about 300 ft. long and 106 ft. wide, embracing four tracks with two station platforms, and will include the underpinning of the west side of City Hall, and also the Market street subway.

Pittsburgh & Lake Erie.—This company is planning to build an extension, it is said, from a point near Connellsville, Pa., west to Darnley, about six miles.

Roach Timber Company (Lumber Road).—This concern is constructing a line from Sutherlin, Ore., on the Southern Pacific to Hinkle creek, and thence seven miles into the forest a total distance of 21 miles. About five miles of grading has already been finished. The excavation is averaging 7,000 cu yd. to the mile; the maximum grade is about 1 per cent and the maximum curve 15 deg. It is the plan of the company to finish the line to the sawmill sites during the coming winter All the work is being done by the company's own forces. W. L Roach, of Muscatine, Iowa, is president.

St. Louis & Southern Illinois (Electric).—Work will commence on a new interurban system, as named above, on or about November 1 of this year. The line will run from Marion through Harrisburg, Herrin, Benton and West Frankfort to Johnson City, a distance of 81 miles. These towns are all located in Southern Illinois, in Williamson, Saline and Franklin counties, the average population being about 5,000. This project has been under consideration for several years, but has been delayed until now. It is estimated that it will cost $3,000,000.

San Antonio & Austin Interurban.—This company, which has been working on the project to build an interurban electric railway between San Antonio, Texas, and Austin, 82 miles, for the last three years, expects to begin work on the line in a short time, it is announced by Vorhis P. Brown, of San Antonio president of the company. In addition it is announced that a branch line will be built from Austin to Lockhart, 30 miles (June 2, p. 1205.)

Tennessee Railway.—This road has been extended from Charleys Branch, Tenn., to Rosedale, two miles. (September 17, 1915, p. 547.)

Virginian Railway.—According to press reports this com-

pany is planning to build an extension in Raleigh county, W. Va., of 7 miles and another extension of 9 miles.

West Virginia Traction & Electric Company.—According to press reports this company contemplates building an extension in West Virginia. This company now operates a line from Morgantown to Sabraton.

RAILWAY STRUCTURES

Asheboro, N. C.—Bids were opened recently by the Norfolk Southern for the construction of a combined passenger and freight station to be built on Depot street, at Asheboro. The proposed structure will be 30 ft. wide and 124 ft. long. It will have concrete foundations, brick walls and a metal or asbestos shingle roof (June 9, p. 1246).

Belmont, N. C.—Contracts have been let by the Southern Railway for the construction of a new concrete and steel bridge across the Catawba river, near Belmont, to take the place of the temporary structure, erected after the destruction of the old bridge by the flood in July. Contract for the steel work has been awarded to the Virginia Bridge & Iron Company, Roanoke, Va., and contract for the masonry and for line revision 4,800 feet east of the new bridge, and 3,300 feet west, has been let to Robert Russell. The new bridge will be located about 40 feet north of the site of the old bridge; it will be 900 ft. long, and will be 11 ft. higher than the old bridge. It will consist of 9 100-ft. deck plate girders, each weighing 170,000 pounds, and will be supported by concrete piers. The piers will be built for double track, but girders for only one track will be put in at the present time. (September 1, 1916, p. 391.)

Blairsville, Pa.—A contract has been let to G. C. Overdorf, Blairsville, for work on a 20-ft. two-track concrete arch bridge. It is to be built over Robinson run, at a point 16 miles west of Blairsville, and will cost about $10,000.

Boston, Mass.—The New York, New Haven & Hartford has given a contract to H. L. Hemenway, Boston, for building an extension to the present engine house and constructing a new shop building at Dover street, Boston. The extension will consist of 14 stalls to the engine house, and the new shop building will be about 60 ft. by 200 ft., one story high, with hollow tile walls and concrete foundations.

Edmonton, Alta.—The Canadian Northern is erecting a warehouse at this point. The building is to be 86 ft. long, 48 ft. wide, 27 ft. high from base of rail to the eaves, and two stories high. It will have concrete foundations and brick walls. The approximate cost is $90,000.

Madison, N. C.—The Norfolk & Western, it is said, will build a station, also a platform and shed, at Madison.

Manchester, N. Y.—Work was begun recently by the Lehigh Valley on the construction of a large engine terminal and roundhouse at Manchester (June 16, p. 1353).

Montreal, Que.—Bids will be asked for about November 1, it is said, for work on the Lagauchetiere street station of the Canadian Northern.

Rideau Junction, Ont.—The Canadian Northern Ontario has awarded a contract to the Roberts & Schaefer Company, of Chicago, Ill., for the rebuilding of the frame-constructed automatic coaling plant at this point, which was recently destroyed by fire.

Rutherford, Pa.—The Philadelphia & Reading has given a contract to the James McGraw Company, Philadelphia, Pa., for the concrete foundation work in connection with bridge improvements, consisting of an extension for additional track, to be made to the bridge over Lebanon and Harrisburg turnpike at a point west of Rutherford. Contracts have not yet been let for the steel superstructure.

Washington, D. C.—The Southern Railway has given a general contract to James L. Marshall, Washington, D. C., it is understood, to build a new office building at Thirteenth street and Pennsylvania avenue, Washington, and construction work is now under way. The building will be 120 ft. by 90 ft., nine stories high, of fireproof construction, with steel frame, slag roof, tile floor arches, and will cost about $400,000 for the building alone. The construction work is expected to be completed by April 1, 1917.

Railway Financial News

Boston & Maine.—Richard Billings, of Woodstock, Vt., has been elected president of the Connecticut River Railroad at the meeting of the new board of directors, succeeding William H. McClintock. A committee has been named to confer with the Boston & Maine, consisting of Mr. Billings; Henry B. Binney, of Brown Brothers, Boston office; William H. Brooks; Francis R. Hart, of the Old Colony Trust Company, Boston; and Mr. McClintock.

Connecticut River Railroad.—See Boston & Maine.

New York, New Haven & Hartford.—Stockholders are to vote on October 25 on the question of authorizing $700,000 5 per cent debenture bonds, the proceeds of the sale of which are to be used to pay for the proposed new passenger station at New Haven, Conn.

Pere Marquette.—The following committee has been formed to protect the interests of the holders of the outstanding $5,000,000 Flint & Pere Marquette first mortgage 6 and 4 per cent bonds due 1920. E. H. Ladd, Jr., of Ladd & Wood; George E. Ide, president of the Home Life Insurance Company; John M. Holcombe, president of the Phoenix Mutual Life Insurance Company; Frederick H. Shipman, treasurer of the New York Life Insurance Company; and George S. Coe, of A. M. Kidder & Co., all of New York.

Southern Railway.—The Wall Street Journal says that at this month's meeting of the Southern Railway directors it is expected that a plan will be considered for releasing the company from the restriction in its development and general mortgage which limits the rate of interest on bonds issued thereunder to 4 per cent To secure the consent of holders of the outstanding development and general mortgage 4 per cent bonds it is likely that they will be offered an increase in the rate on their bonds to probably 4½ per cent, and the mortgage would be changed so that additional bonds could be issued bearing 5 per cent interest. The Southern Railway has $5,000,000 5½ per cent extended notes due February 1, 1917, and $10,000,000 5 per cent notes due March 2, 1917.

A resolution was adopted at the annual meeting of stockholders approving the withholding of dividends on the preferred stock for the present.

Toledo & Ohio Central.—The New York Supreme Court has held that this company must carry out the terms of its guarantee of $3,500,000 first mortgage 5 per cent bonds of the Kanawha & Hocking Coal & Coke Company which have been defaulted.

East Indian Railway.—The total length of the East Indian Railway proper is 2,448.22 miles, of which .85 of a mile is 6 track, 3.58 miles are 4 track, 24.21 miles 3 track, 610.72 miles double track, and 1,808.86 miles single track. In addition the Delhi-Umballa-Kalka Railway, 191.64 miles, and the South Behar Railway, 79.19 miles, were operated by the company, making the total length operated on March 31, 1916, 2,719.05 miles. The mean length operated (including foreign lines, 54.16 miles) during the half-year was 2,772.71 miles.

Railway Fire Protection in Canada.—The work of preventing fires in Canada has been under the control of the board of railway commissioners for the past four seasons. Federal, provincial and railway officials have co-operated with good results. Conservation, a Dominion publication, gives details of the work. There were 686 forest fires which originated within 300 feet of the railway lines under the board's control. The area burned was 37,263 acres, 33.1 per cent being chargeable to the railways, 20.9 to other known causes, and the remainder undetermined. The estimated damage was $74,256, of which only 11.2 per cent is chargeable to the railways. Of all forest fires on property under the board's control, causes assigned are: Locomotives, 33.9 per cent; railway employees, 9.5 per cent; tramps, etc., 11.4 per cent; settlers, 12.5 per cent.

ANNUAL REPORTS

ILLINOIS CENTRAL RAILROAD COMPANY—SIXTY-SIXTH ANNUAL REPORT

To the Stockholders of the Illinois Central Railroad Company:

The following report of the operations and affairs of your Company for the year ended June 30, 1916, is respectfully submitted by the Board of Directors:

The number of miles operated on June 30, 1915, was.....4,767.14
On June 1, 1916, there was a reduction in the mileage due to putting in crossover at Aberdeen Junction, Miss., and a consequent reclassification of a portion of the former main track as sidetrack, of ..... .21
The number of miles in operation on June 30, 1916, was.....4,766.93
The average miles of road operated during the year were.....4,767.12

INCOME

The income account for the year as stated below is compiled in accordance with the Interstate Commerce Commission's classifications and, for comparative purposes, the account for the preceding year is restated:

	1916	1915	INCREASE + DECREASE—
Average miles operated during year	4,767.12	4,770.03	— 2.91
Railway operating revenues:			
Freight (including bridge tolls and miscellaneous freight)	$ 50,045,039.44	$ 44,446,221.85	+$5,598,817.59
Passenger (including bridge tolls and miscellaneous passenger)	13,582,091.99	12,851,677.38	+ 730,414.61
Mail	1,146,298.72	1,050,706.59	+ 95,592.13
Express	1,872,273.76	1,589,501.31	+ 282,772.45
Other passenger train	480,885.99	457,177.96	+ 23,708.03
Other transportation	906,517.68	766,286.52	+ 140,231.16
Incidental and joint facility	1,044,234.98	949,980.64	+ 94,254.34
Total railway operating revenues	69,077,342.56	62,111,552.25	+ 6,965,790.31
Railway operating expenses:			
Maintenance of way and structures	9,506,526.60	8,866,250.34	+ 640,276.26
Maintenance of equipment	16,547,749.43	13,943,804.48	+ 2,603,944.95
Traffic	1,252,366.08	1,238,731.70	+ 13,634.38
Transportation	21,841,049.72	22,217,902.68	— 376,852.96
Miscellaneous operations	375,222.27	355,991.97	+ 19,230.30
General	1,763,356.06	1,655,794.46	+ 107,561.60
Transportation for investment—Cr.	Cr. 112,542.42	Cr. 303,278.88	+ 190,736.46
Total railway operating expenses	51,173,727.74	47,975,196.75	+ 3,198,530.99
Net revenue from railway operations	17,903,614.82	14,136,355.50	+ 3,767,259.32
Railway tax accruals	3,724,020.73	3,233,838.38	+ 490,182.35
Uncollectible railway revenues	24,507.09	24,044.24	+ 462.85
Railway operating income	14,155,087.00	10,878,472.88	+ 3,276,614.12
Non-operating income	9,620,743.92	7,958,827.25	+ 1,661,916.67
Gross income	23,775,830.92	18,837,300.13	+ 4,938,530.79
Deductions from gross income	11,968,266.19	11,978,138.47	— 9,872.28
Net income	11,807,564.73	6,859,161.66	+ 4,948,403.07
Disposition of net income:			
Income applied to sinking and other reserve funds	111,725.00	107,875.00	+ 3,850.00
Income appropriated for investment in physical property	41,206.50	46,027.77	— 4,821.27
Total appropriations of income	152,931.50	153,902.77	— 971.27
Income balance transferred to credit of profit and loss	11,654,633.23	6,705,258.89	+ 4,949,374.34

REVENUES

The operating revenues amounted to $69,077,423.56 this year, as compared with $62,111,552.25 last year, an increase of $6,965,790.31, or 11.21 per cent.

Revenue from the transportation of freight, including bridge tolls and miscellaneous freight, amounted to $50,045,039.44, an increase as compared with the previous year of $5,598,817.59, or 12.60 per cent. The increase in freight traffic was general in practically all classes of business, although the increase in the transportation of bituminous coal and lumber was more marked than in the other commodities. The tonnage of bituminous coal transported exceeded that of the previous year by 13.53 per cent and constituted 40.16 per cent of the total tonnage carried by the Company. The lumber moved, while not as great in volume as in the year ending June 30, 1914, showed an increase over last year of 20.77 per cent. The larger portion of the increase in freight revenue was on the lines north of Cairo and east of Dubuque, although there was a substantial increase in freight revenue on the lines south of the Ohio River and a moderate increase on the lines west of Dubuque.

Passenger revenue, including bridge tolls and miscellaneous passenger, amounted to $13,582,091.99, an increase over the preceding year of $730,414.61, or 5.68 per cent. The increase in the revenue from the transportation of passengers was general over the entire system, but the total revenue was not equal to that for the year ending June 30, 1914.

Table No. 12 contains general details as to freight and passenger traffic.

EXPENSES

The operating expenses for the year were $51,173,727.74, as compared with $47,975,196.75 the previous year, an increase of $3,198,530.99, or 6.67 per cent.

MAINTENANCE OF WAY AND STRUCTURES

The expenditures for maintenance of way and structures amounted to $9,506,526.60, being $640,276.26, or 7.22 per cent, in excess of the previous year. The increase was occasioned by large expenditures made to restore tracks and bridges damaged by the tornado and high water in and near New Orleans, La., in October, 1915, to increased rates of wages paid section men and to increased expenditures for maintenance of buildings, fences and miscellaneous other work.

Some of the important renewals made, the cost of which was charged to operating expenses, were as follows:

2,110,328 cross ties were renewed, being equivalent to 680.69 miles of continuous track, or 9.05 per cent of all ties in track, including sidings.

26.83 miles of track were relaid with new steel rail, and 13.89 miles with second-hand steel rail, replacing rail of the same weight.

5,647 lineal feet of pile and timber bridges were replaced by embankments.

1,899 lineal feet of iron and 3,110 lineal feet of concrete pipe culverts were installed.

382 miles of ballasted track were repaired or renewed to restore the track to its original standard.

For particulars as to work, the cost of which was charged wholly or in part to "Road and Equipment," attention is invited to remarks on page 10 of this report under "Physical Changes."

MAINTENANCE OF EQUIPMENT

Maintenance of equipment expenditures amounted to $16,547,749.43, being an increase of $2,603,944.95, or 18.67 per cent, as compared with last year. The greater portion of the increase for the year was due to heavier charges for repairs, depreciation and retirements of freight-train cars.

Charges for depreciation amounted to $2,652,185.01, being an increase over last year of $560,589.17.

207 locomotives received general repairs this year, as compared with 246 in the previous year, and 376 were given thorough repairs, as against 404 last year.

327 passenger train cars were given medium repairs this year, as against 561 last year, and 263 received heavy repairs, as compared with 148 last year.

The average mileage per serviceable locomotive for the year was 27,480 miles.

The average age of locomotives was 11.98 years, of revenue freight train cars 9.35 years and of passenger train cars 16.19 years.

TRAFFIC EXPENSES

Traffic expenses were $1,252,366.08, an increase of $13,634.38, or 1.10 per cent.

TRANSPORTATION EXPENSES

Transportation expenses amounted to $21,841,049.72, a decrease of $376,852.96, or 1.70 per cent. Additional superheater locomotives of greater tractive power were substituted on portions of the main lines for locomotives of lighter power, resulting in a further substantial increase in the train load. The special attention referred to in last year's report in connection with fuel economy, loss and damage and other claims has been continued and the results of the year's operations show substantial decreases in those items. Increases in the rates of pay have been granted to a number of the different classes of employes in the transportation department.

MISCELLANEOUS OPERATIONS

Expenses for miscellaneous operations were $375,222.27, an increase of $19,230.30, or 5.40 per cent, as compared with the preceding year.

GENERAL EXPENSES

General expenses amounted to $1,763,356.06, an increase of $107,561.60, or 6.50 per cent. The greater portion of this increase was due to expenses incurred by the Company in connection with the valuation of its physical property being made in accordance with the requirements of an act of Congress providing for the physical valuation of railroads.

TAXES.

Taxes amounted to $3,724,020.73 this year, being an increase of $490,182.35, or 15.16 per cent, as compared with last year. The greater portion of this increase was for taxes accruing to the State of Illinois, due in part to an increase in the Charter Tax caused by increased gross receipts on the Charter Line this year as compared with the previous year and partially to a substantial increase in the taxes on the Non-Charter Lines growing out of increase in levy rates throughout the State. There were substantial increases in taxes in other states through which the Company's lines extend, due in some instances to increased gross receipts and in other cases to increased levy rates and assessments. There was also a marked increase in the Federal Excise Tax.

FINANCIAL

The general balance sheet, Table No. 4, shows the financial condition of the Company at the close of the year, as compared with the previous year.

CAPITAL STOCK AND FUNDED DEBT

The Capital Stock remained unchanged during the year.

$1,900,000.00 of Illinois Central Equipment Trust Certificates, Series "D," were issued and sold in January, 1916.

There were delivered to the Trustee and cancelled under the terms of the mortgage, $2,000,000.00 Illinois Central Railroad Company First Lien Equipment Bonds. Additional bonds of this issue to the amount of $7,817,000.00 were also surrendered to the Trustee for cancellation in connection with the release of retired and other equipment covered by the mortgage.

There were retired and cancelled under the terms of the several Trust Agreements $800,000.00 of Illinois Central Equipment Trust Certificates, Series "A," $350,000.00 of Illinois Central Equipment Trust Certificates, Series "B," $198,000.00 of Illinois Central Equipment Trust Certificates, Series "C," and $95,000.00 of Illinois Central Equipment Trust Certificates, Series "D."

SECURITIES OWNED.

There were acquired during the year $1,257,000.00 of The Yazoo & Mississippi Valley Railroad Company Five Per Cent Gold Improvement Bonds in liquidation of indebtedness for improvements made to that Company's property.

The entire capital stocks of the Herrin Northern Railroad Company, Fredonia & Reeds Railroad Company, Benton Southern Railroad Company, and Johnston City Southern Railroad Company, the amount in each case being $2,500.00, were purchased during the year. These companies were organized in the interest of your Company for the purpose of constructing several branch lines in the southern portion of the State of Illinois.

The Central Fruit Despatch, which was organized in January, 1912, to take over the refrigerator service business of this Company, having proved unprofitable, the operations were discontinued as of September 1, 1914. The liquidation of the Company's affairs was practically completed during the past year and your Company surrendered to the Central Fruit Despatch all but five shares of its Capital Stock and charged off to Profit and Loss $547,430.89, this sum representing the depreciation in value of the stock. The amount written off is included in the item "Miscellaneous Debits," in Table No. 3.

$70,000.00 of Chicago, St. Louis & New Orleans Railroad Company Equipment Trust Certificates, Series "A," held in the treasury matured and were redeemed during the year.

The Peoria & Pekin Union Railway Company redeemed $12,500.00 par value of its Five Per Cent Debenture Bonds, maturing August 1, 1915.

$96,000.00 par value of The Yazoo & Mississippi Valley Railroad Company Five Per Cent Gold Improvement Bonds were transferred to the Insurance Fund, and $56,000.00 par value were sold.

INSURANCE AND OTHER FUNDS.

The changes in the Insurance Fund during the year and the condition of the fund at the close of the year are shown in the following table:

	Year Ending June 30, 1916	Year Ending June 30, 1915
Amount at credit of fund beginning of year	$2,215,372.56	$2,129,835.52
Added through monthly charges to operating expenses	60,000.00	60,000.00
Collected from lessees account of insurance	1,099.92	1,099.92
Interest received on investments of the fund	111,725.00	107,875.00
Fire losses collected	29,784.20	12,604.82
	$2,417,981.68	$2,311,415.26
Losses by fire	$58,327.07	$50,714.86
Premiums paid for reinsurance	48,279.78	45,327.84
	$106,606.85	$96,042.70
Amount at credit of fund June 30	$2,311,374.83	$2,215,372.56

The balances in the sinking funds as of June 30, 1916, and the increases during the year were as follows:

The Farmers' Loan and Trust Company, Trustee—Cairo Bridge Contingent Fund, $504,180.00.

The Farmers' Loan and Trust Company, Trustee—Cairo Bridge Sinking Fund, $381,998.59, an increase of $37,418.35.

United States Trust Company of New York, Trustee—Sinking Fund for Western Lines Bonds, $1,522,298.45, an increase of $104,410.72.

United States Trust Company of New York, Trustee—Sinking Fund for Omaha Division Bonds, $210,869.15, an increase of $17,947.65.

ROAD AND EQUIPMENT

There was expended during the year for Road and Equipment (including improvements on subsidiary properties) $6,097,616.21. The following is a classified statement of these expenditures:

	Additions and Betterments on Owned Lines	Advances for Additions and Betterments to Lines of Subsidiary Companies
ROAD:		
Engineering	$42,513.68	$24,879.24
Land for transportation purposes	173,137.95	23,249.24
Grading	155,007.43	78,101.85
Tunnels and subways	76.27	253.39
Bridges, trestles and culverts	622,411.27	374,906.88
Ties	46,486.17	43,670.99
Rails	155,750.83	120,020.15
Other track material	224,672.48	258,537.41
Ballast	17,137.25	36,945.01
Track laying and surfacing	125,235.90	102,679.25
Right of way fences	5,581.76	8,653.30
Snow and sand fences and snowsheds	124.01	Cr. 124.17
Crossings and signs	112,123.00	14,098.21
Station and office buildings	154,609.23	Cr. 36,223.83
Roadway buildings	3,403.19	13,843.49
Water stations	36,021.52	35,599.95
Fuel stations	3,503.72	818.98
Shops and enginehouses	141,952.10	361,349.52
Grain elevators	1,066,59	Cr. 120.02
Wharves and docks	409.94	4,983.62
Coal and ore wharves	.....	2,478.21
Telegraph and telephone lines	2,684.39	10,579.84
Signals and interlockers	109.945.70	130,154.98
Power plant buildings	2,725.56	4,098.82
Power transmission systems	52.90	Cr. 633.15
Power distribution systems	1,163.71	.....
Power line poles and fixtures	407.61	2.89
Miscellaneous structures	430.63	.....
Paving	4,318.33	1,727.97
Roadway machines	69,535.09	1,164.06
Roadway small tools	30.29	Cr. 943.90
Assessments for public improvements	43,242.85	28,429.02
Revenues and operating expenses during construction	Cr. 300.00	.....
Other expenditures—Road	97,554.17	35,013.12
Shop machinery	39,674.77	25,811.31
Power plant machinery	8,760.00	7,382.98

	Covered by Equipment Trust Series "C"	Covered by Equipment Trust Series "D"		
EQUIPMENT:				
Steam locomotives	$Cr. 14,859.63	$1,076,574.46	Cr. 480.820.06	
Freight train cars	Cr. 8,699.52	1,308,789.30	Cr. 448.165.59	570.000.00
Passenger train cars	Cr. 421.70	.....	2,692.28	.....
Motor equipment of cars	.....	.....	8,000.00	.....
Floating equipment	.....	.....	Cr. 12,770.00	.....
Work equipment	.....	.....	Cr. 27,056.32	.....
GENERAL:				
Organization expenses	.....	.....	.....	18.10
Law	.....	.....	266.30	.....
Interest during construction	.....	.....	4,367.11	6,852.58
Other expenditures—General	.....	.....	.....	10.00
	$Cr. 23,980.85	$2,385,363.76	$1,447,964.01	$2,288,269.29

The following shows the amount advanced during the year to each of the subsidiary companies, these amounts being included in total advances shown in Table No. 6 of this report:

Chicago, St. Louis & New Orleans R. R.		$1,690,081.92
Canton, Aberdeen & Nashville R. R.		46,283.58
South Chicago R. R.		3,770.84
Blue Island R. R.		4,942.79
Dubuque & Sioux City R. R.		482,888.59
Kensington & Eastern R. R.		983.39
Batesville Southwestern R. R.		57.40
Bloomington Southern R. R.		12.30
Johnston City Southern R. R.	Cr.	2,496.50
Benton Southern R. R.		52,371.55
Herrin Northern R. R.		11,869.93
Fredonia & Reeds R. R.	Cr.	2,496.50
Total		$2,288,269.29

PHYSICAL CHANGES

The physical condition of the Company's road and equipment was materially improved during the year.

There is given below a summary of the principal improvements, the cost of which was wholly or partially charged to Road and Equipment.

ROADWAY AND STRUCTURES:

There were 249.78 miles of track laid with 90-pound new steel rail and 121.04 miles of track relaid with second-hand steel rail during the year, all of which replaced rail of lighter pattern.

Eighty-four new industrial sidings were built or extended, making a net addition for the year of 6.72 miles, after allowing for industrial tracks taken up.

One hundred and eighty-two new Company sidings were built or extended; allowing for tracks taken up there was a net addition for the year of 32.64 miles.

Freight yard facilities were increased at Indianapolis, Ind., by the construction of 2.54 miles of sidings, and at Dubuque, Ia., by the construction of 1.78 miles of track.

Grade reduction work between Princeton, Ky., and Paducah, Ky., including the enlargement of the yard facilities at Princeton, was completed during the year.

The grade crossing elimination work at Grand Crossing, Chicago, Ill., and also the grade reduction at Mattoon, Ill., were completed during the year. The elevation of tracks through Cicero, Ill., and the grade crossing elimination work between 79th Street and 116th Street, Chicago, Ill., were continued. Preliminary arrangements are being made for the elevation of tracks at Indianapolis, Ind.

A new draw bridge was installed over the New Basin Canal at New Orleans. Steel bridges on the Kentucky Division were strengthened, so as to permit of their use by Mikado type locomotives.

The renewal of bridges over the several street crossings between 63rd Street and 67th Street, Chicago, Ill., was begun during the year.

An electric interlocking plant was installed at Pontiac, Ill., replacing the mechanical one. The work of installing similar plants at Rockport, Ky., and at Pullman Junction, Ill., is in progress.

Subways were completed at Franklin Street, and Prairie Avenue, Decatur, Ill., Phinney Park Boulevard, Fort Dodge, Ia., and at Harahan, La.

New station buildings were completed at Storm Lake, Ia., Millwood, Ky., Kensington, Ill., Mt. Pulaski, Ill., Lincoln, Ill., and La Salle, Ill. Others are in course of construction at Raleigh, Ill., Argyle, Wis., and Bryant, Miss. Station buildings were enlarged or improved at Hallidayboro, Ill., Cherokee, Ia., Wingo, Ky., and Jackson, Miss.

The construction of a new office and depot building at 63rd Street, Chicago, Ill., was commenced.

New freight houses were constructed at Evansville, Ind., and Lincoln, Ill., and an extension is now being built to the freight house at Cairo, Ill.

Water stations were improved by the installation of 100,000 gallon steel tanks to replace wooden tanks of smaller capacity at Kensington, Ill., Olney, Ill., Freeport, Ill., Vandalia, Ill., Rockford, Ill., Gravel Switch, Ky., and Jackson, Tenn. At Benton, Ill., Dixon, Ill., Cherokee, Ia., and Fulton, Ky., the existing water facilities were improved.

New mechanical facilities, consisting of an engine house, car shop, wash-out plant, office and turntable, were constructed at Dyersburg, Tenn., and a ten stall roundhouse, eighty-five foot turntable, boiler and wash-out buildings, power house, oil house and cinder conveyors put in at Jackson, Tenn.

Improvements were made to mechanical facilities at Freeport, Ill., Waterloo, Ia., Fort Dodge, Ia., Cherokee, Ia., and Nonconnah Yard, Memphis, Tenn.

The erection of new mechanical coaling plants at Effingham, Ill., Assumption, Ill., Hart, Ill., Waterloo, Ia., and Cecilia, Ky., is in progress.

A new eighty-five foot steel turntable was installed at Clinton, Ill., and second-hand turntables were put in at Dodgeville, Wis., Corinth, Miss., and Aberdeen, Miss.

The installation of electric block signals reported in progress last year embracing 39.9 miles of track, was completed and additional installations made, aggregating in all an increase for the year of 294.1 miles of track. With the trackage previously equipped there was a total of 1,556.5 miles of protected track at the close of the year.

Block signals are now being installed at various points on the Mississippi and Louisiana Divisions aggregating 452.2 miles, at Unionville, Ind., 1.4 miles and between Munger and Coleman, Ill., 3.5 miles, a total of 457.1 miles. With the completion of the work on the Mississippi and Louisiana Divisions the railroad between Chicago, Ill., and New Orleans, La., will be completely block signalled.

7,663 lineal feet of permanent bridges and trestles were constructed, replacing pile and timber bridges, trestles and embankments.

1,652 lineal feet of permanent bridges and trestles were rebuilt or replaced by embankments.

30,058 lineal feet of pile and timber bridges or trestles were rebuilt or replaced by embankments.

EQUIPMENT:

Forty-eight Mikado type freight locomotives and three switching locomotives were added during the year. Seventy-two locomotives were retired and fifteen small saddle-tank type switching locomotives engaged in shop service were transferred to work equipment, resulting in a decrease of thirty-six locomotives for the year, but an increase of 1,121,318 pounds in the tractive power. During the year one Atlantic type and two Pacific type passenger engines were converted into superheated locomotives, thus increasing their tractive power 7,460 pounds. This increase is included in the general increase for the year as stated above.

No new passenger-train cars were added during the year. Fourteen cars, heretofore included in work equipment, were changed to passenger-train equipment as thirteen smoker and excursion cars and one mail and express car. Six passenger and chair cars, one smoker and excursion car, one baggage and express car and one coach assigned to mixed train service, or a total of nine cars were destroyed, resulting in a net increase of five passenger-train cars for the year.

One thousand one hundred and fifty-one new freight-train cars were

added and three thousand three hundred and eighty-one cars were sold, destroyed or transferred to other service, making a net decrease of two thousand two hundred and thirty cars during the year. Nine thousand one hundred and eighty-one cars were rebuilt during the year. In the process of rebuilding, only such parts of the original car were retained as were in first class condition, the result being that the rebuilt equipment was practically equal to new cars suitable to present day requirements. The average capacity of cars owned at the close of the year was 41.69 tons as against 41.46 tons last year, and the total capacity of cars was 2,567,570 tons, compared with 2,647,730 tons.

GENERAL REMARKS.

The volume of freight traffic handled and the revenue derived therefrom were the largest in the Company's history. A large portion of the increased revenue this year was undoubtedly due to a recovery from the depression in business existing last year. There was, however, a substantial increase in both the volume of tonnage and revenue over the year ended June 30, 1914, during which year the Company moved a larger volume of freight and received greater freight revenue than in any previous like period.

As a result of the large expenditures made in recent years for the extensive improvement of the road-bed and for increased facilities, as well as for the acquisition of a large number of heavy locomotives of increased tractive power and cars of greater capacity than those formerly in service, your company was in a position to take care of the increased volume of business during the past year with a material reduction in Transportation Expenses as compared with the two preceding years.

Equipment Trust Certificates amounting to $1,900,000 were issued under a lease and agreement dated January 3, 1916, known as "Illinois Central Equipment Trust, Series 'D,'" for the purpose of providing funds in part with which to pay for 50 locomotives and 1,000 refrigerator cars. The equipment covered by this Trust was received and placed in service during the year.

The number of the Company's stockholders as of June 30, 1916, was 10,697, as compared with 10,963 on the same date of the previous year.

The number of pensioners on the pay rolls at the close of the year was 530, and the amount of pensions paid during the year was $144,063.34, an increase of $14,794.01 over the preceding year.

The Board takes this opportunity of expressing its appreciation to the officers and employees for their loyal and efficient service during the past year.

By order of the Board of Directors.

C. H. MARKHAM,
President.

CHICAGO AND NORTH WESTERN RAILWAY COMPANY—FIFTY-SEVENTH ANNUAL REPORT

To the Stockholders of the Chicago and North Western Railway Company:

The Board of Directors submit herewith their report of the operations and affairs of the Chicago and North Western Railway Company for the fiscal year ending June 30, 1916.

Average number of miles operated, 8,107.82.

OPERATING REVENUES:		
Freight	$60,353,399.00	
Passenger	21,445,004.22	
Other Transportation	7,448,365.75	
Incidental	2,067,096.93	
Total Operating Revenues		$91,313,865.90
OPERATING EXPENSES (67.85 per cent. of Operating Revenues)		61,952,329.34
Net Revenue from Railway Operations		$29,361,536.56
RAILWAY TAX ACCRUALS (5.19 per cent. of Operating Revenues)	$4,741,527.44	
UNCOLLECTIBLE RAILWAY REVENUES	13,302.60	
		4,754,830.04
Railway Operating Income		$24,606,706.52
NONOPERATING INCOME:		
Rental Income	$841,242.34	
Dividend Income	1,561,932.00	
Income from Funded Securities	5,895.75	
Income from Unfunded Securities and Accounts, and Other Items	644,405.68	
Total Nonoperating Income		3,053,475.77
Gross Income, carried forward		$27,660,182.29
DEDUCTIONS FROM GROSS INCOME:		
Rental Payments	$941,168.86	
Interest on Funded Debt	9,312,124.54	
Other Deductions	124,378.87	
Total Deductions from Gross Income		10,377,672.27
Net Income		$17,282,510.02
DISPOSITION OF NET INCOME:		
Sinking Funds	$216,569.82	
Dividends—		
8% on Preferred Stock	1,791,600.00	
7% on Common Stock	9,108,015.00	
Total Appropriations		11,116,184.82
Balance Income for the year		$6,166,325.20

The operating results as compared with the preceding year were as follows:

Freight Revenue increased	$8,429,538.26
Passenger Revenue increased	916,560.76
Other Transportation Revenue increased	754,116.11
Incidental Revenue increased	433,975.47
Total Operating Revenues increased	$10,534,190.60
Operating Expenses increased	5,580,756.30
Net Revenue from Railway Operations increased	$4,953,434.30
Railway Tax Accruals increased	$224,584.34
Uncollectible Railway Revenues increased	6,047.96
	230,632.30
Railway Operating Income increased	$4,722,802.00

Of the Operating Expenses for the current fiscal year $36,001,249.65, or 58.11 per cent., was paid employes for Labor, as compared with $32,920,365.11, or 58.40 per cent., paid during the preceding fiscal year. The increase of $3,080,884.54 in the amount paid is accounted for as follows:

Increase account more time worked	$2,359,595.37
Increase account higher rates of compensation	721,289.17
	$3,080,884.54

FREIGHT TRAFFIC

The details of Freight Traffic for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	Increase Amount	Increase Per Cent.
FREIGHT REVENUE	$51,923,860.74	$60,353,399.00	$8,429,538.26	16.23

	1915	1916	Percentage of Increase or Decrease
TONS OF REVENUE FREIGHT CARRIED	40,399,215	51,238,459	26.83 Inc.
TONS OF REVENUE FREIGHT CARRIED ONE MILE	6,216,280,599	7,412,265,747	19.24 Inc.
AVERAGE REVENUE RECEIVED PER TON	$1.29	$1.18	8.53 Dec.
AVERAGE REVENUE RECEIVED PER TON PER MILE	.84 of a cent	.81 of a cent	3.57 Dec.
AVERAGE DISTANCE EACH REVENUE TON WAS HAULED	153.87 miles	144.66 miles	5.99 Dec.
MILEAGE OF FREIGHT AND MIXED TRAINS	17,250,535	18,376,722	6.53 Inc.
AVERAGE NUMBER OF TONS OF REVENUE AND NON-REVENUE FREIGHT CARRIED PER TRAIN MILE:			
East of Missouri River	479.68	534.93	11.52 Inc.
West of Missouri River	203.49	208.93	2.67 Inc.
Whole Road	443.10	491.14	10.84 Inc.
AVERAGE NUMBER OF TONS OF REVENUE AND NON-REVENUE FREIGHT CARRIED PER LOADED CAR MILE	21.11	22.06	4.50 Inc.
AVERAGE FREIGHT REVENUE PER TRAIN MILE	$3.01	$3.28	8.97 Inc.

PASSENGER TRAFFIC

The details of Passenger Traffic for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	Increase Amount	Increase Per Cent.
PASSENGER REVENUE	$20,528,443.46	$21,445,004.22	$916,560.76	4.46

	1915	1916	Percentage of Increase
REVENUE PASSENGERS CARRIED	33,079,550	33,328,529	.75 Inc.
REVENUE PASSENGERS CARRIED ONE MILE	1,130,297,641	1,155,960,132	2.27 Inc.
AVERAGE FARE PAID PER PASSENGER	62 cents	64 cents	3.23 Inc.
AVERAGE RATE PAID PER PASSENGER PER MILE	1.82 cents	1.86 cents	2.20 Inc.
AVERAGE DISTANCE TRAVELED PER REVENUE PASSENGER	34.17 miles	34.68 miles	1.49 Inc.
MILEAGE OF PASSENGER AND MIXED TRAINS	21,372,414	21,613,332	1.13 Inc.
AVERAGE PASSENGER-TRAIN REVENUE PER TRAIN MILE	$1.22	$1.27	4.10 Inc.

MAINTENANCE OF WAY AND STRUCTURES

The total Operating Expenses of the Company for the year ending June 30, 1916, were $61,952,329.34; of this amount $11,608,646.14 was for charges pertaining to the Maintenance of Way and Structures. Included in these charges is a large part of the cost of 82,109 tons of steel rails, the greater portion of which was laid in replacement of rails of lighter weight in 595.98 miles of track; also the cost of 3,819,928 new ties.

The charges for Maintenance of Way and Structures also include a portion of the cost of ballasting 35.01 miles of track with crushed stone, 126.16 miles with gravel, and 122.09 miles with cinders; the erection, in place of wooden structures, of 23 new steel bridges on masonry, and 12 on pile supports, aggregating 1,526 feet in length and containing 978 tons of bridge metal; and the replacement of other wooden structures with masonry arch and box culverts and cast-iron pipes, the openings being filled with earth. The wooden structures replaced by permanent work aggregate 5,227 feet in length.

The charges on account of Maintenance of Way and Structures for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	Increase or Decrease
COST OF RAILS:			
New steel rails	$698,965.82	$1,030,246.34	$331,280.52 Inc.
Usable and re-rolled rails	842,610.97	1,258,888.83	416,277.86 Inc.
	$1,541,576.79	$2,289,135.17	$747,558.38 Inc.
Less value of old rails and other items	1,191,307.88	1,956,070.34	764,762.46 Inc.
Net charge for rails	$350,268.91	$333,064.83	$17,204.08 Dec.
COST OF TIES	1,547,651.05	2,198,949.95	651,298.90 Inc.
COST OF BALLAST	117,254.77	97,782.89	19,471.88 Dec.
COST OF OTHER TRACK MATERIAL	375,613.88	490,433.54	114,819.66 Inc.
ROADWAY AND TRACK LABOR AND OTHER EXPENSES	4,486,656.40	4,873,440.87	386,784.47 Inc.
Total Charges for Roadway and Track	$6,877,445.01	$7,993,672.08	$1,116,227.07 Inc.
Other Charges Account Maintenance of Way and Structures were as follows:			
BRIDGES, TRESTLES AND CULVERTS	833,833.69	697,475.13	136,358.56 Dec.
ROAD CROSSINGS, FENCES, ETC.	296,673.21	349,746.42	53,073.21 Inc.
SIGNALS AND INTERLOCKERS	419,141.63	495,382.14	76,240.51 Inc.
BUILDINGS, FIXTURES AND GROUNDS	995,745.24	1,017,182.13	21,436.89 Inc.
DOCKS AND WHARVES	88,452.05	78,824.30	9,627.75 Dec.
SUPERINTENDENCE	515,022.78	526,277.47	11,254.69 Inc.
ROADWAY TOOLS AND SUPPLIES	130,502,96	179,888.94	49,385.98 Inc.

	1915	1916	Increase or Decrease
Sundry Miscellaneous Charges	293,922.88	270,197.53	23,725.35 Dec.
Total Charges Account Maintenance of Way and Structures	$10,450,739.45	$11,608,646.14	$1,157,906.69 Inc.

The above charges for Maintenance of Way and Structures for the current year amount to 18.74 per cent. of the total Operating Expenses, as compared with 18.54 per cent. for the preceding fiscal year.

MAINTENANCE OF EQUIPMENT

The charges on account of Maintenance of Equipment for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	Increase
Locomotives	$4,740,217.79	$5,369,889.08	$629,671.29 Inc.
Passenger-train Cars	1,268,877.15	1,427,374.26	158,497.11 Inc.
Freight-train Cars	5,873,407.23	6,903,028.62	1,029,621.39 Inc.
Work Equipment	156,987.57	189,427.80	32,440.23 Inc.
Shop Machinery and Tools	170,396.43	216,939.52	46,543.09 Inc.
Superintendence	354,854.54	373,448.71	18,594.17 Inc.
Sundry Miscellaneous Charges	84,194.47	118,668.89	34,474.42 Inc.
Total Charges Account Maintenance of Equipment	$12,648,935.18	$14,598,776.88	$1,949,841.70 Inc.

The above charges for Maintenance of Equipment for the current year amount to 23.56 per cent. of the total Operating Expenses, as compared with 22.44 per cent. for the preceding fiscal year.

RESERVE FOR ACCRUED DEPRECIATION ON EQUIPMENT.

At the close of the preceding fiscal year there was a balance to the credit of Equipment Reserve Accounts of		$8,149,419.47
During the year ending June 30, 1916, there was credited to the Equipment Reserve Accounts on account of depreciation charges to Operating Expenses		2,536,813.01
		$10,686,232.48
And there was charged during the year against the above amount the Accrued Depreciation on Equipment retired or transferred from one class of service to another		445,842.44
Leaving a balance to the credit of the Equipment Reserve Accounts on June 30, 1916, of		$10,240,390.04

TRANSPORTATION EXPENSES

The Transportation Expenses of the Company for the year ending June 30, 1916, were $32,119,222.84, or 51.85 per cent. of the total Operating Expenses. Of this amount $20,799,544.55, or 64.76 per cent., was charged for labor; $6,405,078.70, or 19.94 per cent., was charged for fuel for locomotives; and $4,914,599.59, or 15.30 per cent., was charged for supplies and miscellaneous items. The increase in the Transportation Expenses for the year ending June 30, 1916, as compared with the preceding fiscal year, was $2,365,778.78, or 7.95 per cent., distributed as follows:

Increase in amount charged for labor	$1,530,904.19
Increase in amount charged for fuel for locomotives	562,507.06
Increase in amount charged for supplies and miscellaneous items	272,367.53
	$2,365,778.78

CAPITAL STOCK

There was no change during the year in the Capital Stock and Scrip of the Company.

Special stock to the par value of $65,000.00, issued in 1873, has, in accordance with the rules of the Interstate Commerce Commission and as a matter of record, been brought upon the books of the Company. This stock being considered of merely nominal value has not heretofore been shown.

The Company's authorized Capital Stock is Two Hundred Million Dollars ($200,000,000.00), of which the following has been issued to June 30, 1916:

Outstanding:		
Common Stock and Scrip	$130,117,028.82	
Preferred Stock and Scrip	22,395,120.00	
Special Stock	65,000.00	
Total Stock and Scrip Outstanding		$152,577,148.82
Owned by the Company:		
Common Stock and Scrip	$2,338,502.15	
Preferred Stock and Scrip	3,834.56	
Total Stock and Scrip Owned by the Company		2,342,336.71
Total Capital Stock and Scrip, June 30, 1916		$154,919,485.53

FUNDED DEBT

At the close of the preceding fiscal year the amount of Funded Debt, exclusive of Bonds in the Treasury and Due from Trustee, was		$210,581,000.00
The above amount has been decreased during the year ending June 30, 1916, by Bonds and Equipment Trust Certificates redeemed, as follows:		
C. R. & M. R. R. R. Third Division First Mortgage, 7%, Redeemed	$2,332,000.00	
North Western Union Ry. First Mortgage, 7%, Redeemed	65,000.00	
M. L. S. & W. Ry. Extension and Improvement Sinking Fund Mortgage, 5%, redeemed	65,000.00	
C. & N. W. Ry. Sinking Fund of 1879, 5%, redeemed	187,000.00	
C. & N. W. Ry. Sinking Fund Debentures of 1933, 5%, redeemed	269,000.00	
C. & N. W. Ry. Equipment Trust Certificates of 1912, 4½%, redeemed, viz.:		
Series A	$300,000.00	
Series B	300,000.00	
Series C	400,000.00	
	1,000,000.00	
Total Funded Debt Redeemed		3,918,000.00
		$206,663,000.00
And the above amount has been increased by Bonds sold during the year, as follows:		
C. & N. W. Ry. General Mortgage Gold Bonds of 1987, 5% sold to reimburse the Company for past expenditures made for construction and in redeeming matured bonds		7,972,000.00
Total, June 30, 1916		$214,635,000.00
Net Increase during the year		$ 4,054,000.00

BONDS IN THE TREASURY AND DUE FROM TRUSTEE

At the close of the preceding fiscal year the amount of the Company's Bonds in the Treasury and due from Trustee was		$ 7,908,000.00
The above amount has been increased during the year ending June 30, 1916, as follows:		
C. & N. W. Ry. Consolidated Sinking Fund Currency of 1915, 7%, Redeemed	$ 163,000.00	
C. R. & M. R. R. R. Third Division First Mortgage, 7%, Redeemed	2,332,000.00	
North Western Union Ry. First Mortgage, 7%, Redeemed	65,000.00	
M. L. S. & W. Ry. Extension and Improvement Sinking Fund Mortgage, 5%, Redeemed	65,000.00	
C. & N. W. Ry. Sinking Fund of 1879, 5%, Redeemed	188,000.00	
C. & N. W. Ry. Sinking Fund Debentures of 1933, 5%, Redeemed	269,000.00	
C. & N. W. Ry. General Mortgage Gold Bonds of 1987, 5%, Received on Account of Construction Expenditures made during the year.	1,000,000.00	
		4,082,000.00
		$11,990,000.00
The Bonds on hand and due from Trustee have been decreased during the year, as follows:		
C. & N. W. Ry. General Mortgage Gold Bonds of 1987, 5%, Sold to Reimburse the Company for Past Expenditures made for Construction and in Redeeming Matured Bonds	$7,972,000.00	
C. & N. W. Ry. Equipment Trust Certificates of 1913, 4½%, Retired	400,000.00	
		8,372,000.00
Total, June 30, 1916		$ 3,618,000.00
Net Decrease during the year		$ 4,290,000.00

In addition to the foregoing transactions, the following Treasury Bonds were exchanged for an equal amount of C. & N. W. Ry. General Mortgage Gold Bonds of 1987, 5%, viz.:

C. & N. W. Ry. Consolidated Sinking Fund Currency, 7%	$ 163,000.00
C. R. & M. R. R. R. Third Division First Mortgage Bonds, 7%	2,332,000.00
M. L. S. & W. Ry. Extension and Improvement Sinking Fund Mortgage, 5%	40,000.00
C. & N. W. Ry. Sinking Fund Bonds of 1879, 5%	136,000.00
C. & N. W. Ry. Sinking Fund Debentures, 1933, 5%	200,000.00
	$2,871,000.00

CONSTRUCTION

The construction charges for the year ending June 30, 1916, were as follows:

On Account of Additional Main Tracks, viz.:	Miles		
Second Track. Otis to Cedar Rapids, Iowa	3.43	$ 71,293.46	
Second Track, Cedar Rapids to Beverly, Iowa	4.80	30,300.18	
			$ 101,593.64
On Account of Extensions, viz.:			
Kingston Extension, Wisconsin	15.54	$ 214,124.08	
Koepenick Extension, Wisconsin	8.73	5,408.10	
			219,532.18
On Account of Elevating Tracks, viz.:			
Greenfield Avenue north, Milwaukee, Wis			267,076.45
Sundry Construction:			
Land for Transportation Purposes		$ 744,783.36	
Buildings and Fixtures		642,814.48	
Bridges, Trestles and Culverts		618,500.15	
New Sidings, Yard Tracks and Spurs to Industries		287,369.39	
Crossings and Signs		127,785.08	
Signals and Interlockers		88,742.62	
Betterment of Roadway and Track		1,206,163.15	
Shop Machinery		53,125.81	
Extension of Ore Docks, Ashland, Wis		315,696.39	
Calumet Terminal Elevator, Chicago, Illinois		806,310.83	
Kinnickinnic Elevator, Milwaukee, Wis		691,417.05	
Miscellaneous Construction, including Fences, Wharves and Docks, and other items		169,806.16	
			5,752,514.47
Equipment:			
35 Steam Locomotives, 2,800 Freight-train Cars, 50 Passenger-train Cars, and 6 Work Equipment Cars		$3,413,143.41	
Improvement of Equipment		464,409.92	
		$3,877,553.33	
Less Original Cost of Equipment Retired, as follows:			
28 Locomotives		$ 217,451.31	
3,928 Freight-train Cars		1,983,080.30	
14 Passenger-train Cars		55,237.20	
338 Work Equipment Cars		58,847.67	
Other Items		88,043.09	
		2,402,659.57	
			1,474,893.76
			$7,815,610.50

LANDS

During the year ending June 30, 1916, 3,417.69 acres and 71 town lots of the Company's Land Grant lands were sold for the total consideration of $107,525.92. The number of acres remaining in the several Grants June 30, 1916, amounted to 314,448.61 acres, of which 9,125.68 acres were under contract for sale, leaving unsold 305,322.93 acres.

Appended hereto may be found statements, accounts, and statistics relating to the business of the fiscal year, and the condition of the Company's affairs on June 30, 1916.

By order of the Board of Directors.

RICHARD H. AISHTON,
President.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY—THIRTY-EIGHTH ANNUAL REPORT

RICHMOND, VA., September 21, 1916.

TO THE STOCKHOLDERS:

The Thirty-eighth Annual Report of the Board of Directors, for the fiscal year ended June 30, 1916, is herewith submitted.

The average mileage operated during the year by The Chesapeake and Ohio Lines was 2,375.2 miles, an increase over the previous year of 6.0 miles. The mileage at the end of the year was 2,385.6 miles, an increase of 13.9 miles over mileage on June 30, 1915. See schedule on page 12.

RESULTS FOR THE YEAR.

Operating Revenues were	$48,239,012.10
(Increase $8,774,975.11, or 22.24%.)	
Operating Expenses were	31,789,179.22
(Increase $4,232,765.72, or 15.36%.)	
Net Operating Revenue was	$16,449,832.88
(Increase $4,542,209.39, or 38.15%.)	
Taxes were	1,587,407.08
(Increase $237,910.12, or 17.63%.)	
Operating Income, Taxes deducted, was	$14,862,425.80
(Increase $4,304,299.27, or 40.77%.)	
Miscellaneous Income was	1,181,534.42
(Increase $163,315.34, or 16.04%.)	
	$16,043,960.22
Rentals and Other Payments were	988,290.27
(Increase $173,523.14, or 21.30%.)	
Income for the year available for interest was	$15,055,669.95
(Increase $4,294,091.47, or 39.90%.)	
Interest (54.31% of amount available) amounted to	8,176,454.11
(Increase $78,412.25, or 0.95%.)	
Net Income for the year, equivalent to 10.96% on capital stock outstanding, amounted to	$6,879,215.84
(Increase $4,215,679.22, or 158.27%.)	

RETURN ON PROPERTY.

The following table shows the amount of return to your Company, from transportation operations only, upon its investment in road and equipment at the termination of each fiscal year of the five year period ended June 30, 1916:

	Property Investment.	Total Operating Income.	Percentage of Return.
Fiscal year ended June 30, 1916	$248,710,261.86	$14,410,191.96	5.79%
Fiscal year ended June 30, 1915	246,193,467.59	10,058,639.87	4.09%
Fiscal year ended June 30, 1914	243,132,472.21	9,844,660.14	4.05%
Fiscal year ended June 30, 1913	236,429,988.62	9,273,205.37	3.92%
Fiscal year ended June 30, 1912	230,650,068.20	10,532,941.88	4.57%
Yearly average for five fiscal years ended June 30, 1916	$241,023,251.70	$10,823,927.84	4.49%

FINANCIAL.

The changes in funded debt in the hands of the public during the year were as follows:

	Sold	Retired
5 per cent. Convertible Thirty-year Secured Gold Bonds	$40,180,000.00	
4½ per cent. Equipment Trust Certificates—Series "O"	3,160,000.00	
5 per cent. Five Year Secured Gold Notes		$33,000,000.00
5 per cent. Kineon Coal Company First Mortgage Bonds		200,000.00
4 per cent. Big Sandy Ry. First Mortgage Bonds		56,000.00
4 per cent. Coal River Ry. First Mortgage Bonds		34,000.00
4 per cent. Greenbrier Ry. First Mortgage Bonds		19,000.00
4 per cent. Raleigh & Southwestern Ry. First Mortgage Bonds		5,000.00
Equipment Trust Obligations		1,255,392.00
	$43,340,000.00	$34,569,392.00
Net Increase	8,770,608.00	

Other changes in obligations shown under funded debt on balance sheet of June 30, 1916, were as follows:

	Increase	Payments
5 per cent. First Lien and Improvement Mortgage Bonds	$6,995,000.00	
6 per cent. Equipment Contracts—General Equipment Co.		$9,400.00
5 per cent. Equipment Contract—Standard Steel Car Co.		612,667.01
5 per cent. Equipment Contract—Central Locomotive and Car Works		66,488.38
6 per cent. Equipment Contract—American Locomotive Co.		156,046.28
5½ per cent. Equipment Contract—Central Locomotive and Car Works	725,000.00	215,000.00
	$7,720,000.00	$1,059,601.67
Net Increase	6,660,398.33	

Five per cent. Convertible Thirty Year Secured Gold Bonds, of a face amount of $40,180,000, maturing April 1, 1946, were issued under a closed mortgage dated April 1, 1916, to Central Trust Company of New York, trustee, secured by a face amount of $45,920,000 of your company's First Lien and Improvement Mortgage Bonds and sold to provide funds for the retirement of $33,000,000 Five Year five per cent. Secured Gold Notes called for payment at a premium of 1%, June 1, 1916, and for other capital purposes.

Four and one-half per cent. Equipment Trust Certificates Series "O," amounting to $3,160,000, were issued and sold to provide funds for payment of equipment shown in table on page 19.

Five per cent. First Lien and Improvement Mortgage Bonds, of a face amount of $6,995,000 were issued during the year for additions and betterments and other capital purposes. Of the aggregate of these bonds outstanding, $1,345,000 are held in the treasury for future additions and betterments.

Your Company acquired during the year 18,496 additional shares of the capital stock of The Chesapeake and Ohio Northern Railway Company, payment for which was made out of cash derived from the sale of The Kanawha and Michigan Railway Company stock mentioned on page 7 of last year's report. Of the proceeds of the sale there is still deposited with the Trustee for future investment the sum of $2,129,000.

There were also acquired 591 shares of capital stock of the Pond Fork Railway Company, which is constructing a line of railroad from a point near Madison, W. Va., up Pond Fork of Coal River, and additional shares of capital stock of the White Sulphur Springs, Inc., and The Cincinnati Inter-Terminal Railroad Company. Additional First Mortgage Bonds of the Elkhorn and Beaver Valley Railway Company were acquired at par in reimbursement for advances for construction purposes.

Securities of The Chesapeake and Ohio Equipment Corporation, issued in respect of the cost of twenty-four Mallet locomotives, were acquired by your Company and the cost of same is included in property account.

Further shares of stock and First Mortgage Bonds of The Chesapeake and Ohio Railway Company of Indiana were issued in respect of the cost of certain additions and betterments made to that line, and were pledged under your Company's First Lien and Improvement Mortgage.

A statement of charges to property accounts will be found on page 16, showing a net addition of $2,527,411.09; that is, $1,551,837.61 was added to cost of road and $975,573.48 was added to cost of equipment.

A schedule of securities owned June 30, 1916, will be found on page 17.

During the past seven years your Company's increase in capital liabilities in hands of the public, its principal acquisition of stocks and bonds of other companies, and its expenditures for equipment, branch line construction, second track and other additions and betterments, have been as follows:

CAPITAL OBLIGATIONS ISSUED OR ASSUMED:	PAR VALUE.	
General Mortgage 4½% Bonds	$3,716,000.00	
First Consolidated Mortgage 5% Bonds	2,000,000.00	
Convertible 4½% Debentures	31,390,000.00	
Three Year 4½% Collateral Trust Notes	25,000,000.00	
One Year 5% Collateral Trust Notes	3,500,000.00	
Five Year 5% Collateral Trust Notes	33,000,000.00	
C. & O. Convertible 5% Secured Gold Bonds	40,180,000.00	
Coal River Railway Co. First Mortgage 4% Bonds	3,000,000.00	
Raleigh and Southwestern Railway Co. First Mortgage 4% Bonds	860,000.00	
Big Sandy Railway Co. First Mortgage 4% Bonds	229,000.00	
Virginia Air Line Railway Co. First Mortgage 5% Bonds	900,000.00	
Equipment Trust Certificates Series "N"	1,700,000.00	
Equipment Trust Certificates Series "O"	3,160,000.00	
Equipment Contracts, Various	4,809,390.00	
	$153,444,390.00	
Realizing		$145,428,990.92
Less: CAPITAL OBLIGATIONS PAID OR PURCHASED:		
Peninsula Division First Mortgage 6% Bonds matured January 1, 1911	$2,000,000.00	
Greenbrier and New River Railroad Co. First Mortgage 5% Bonds redeemed February 1, 1911	339,000.00	
General Funding and Improvement Mortgage 5% Bonds	7,302,000.00	
Greenbrier Railway Co. First Mortgage 4% Bonds retired November 1, 1911	2,000.00	
Three Year 4½% Collateral Trust Notes	25,000,000.00	
One Year 5% Collateral Trust Notes	3,500,000.00	
Five Year 5% Secured Gold Notes	33,000,000.00	
Kineon Coal Co. First Mortgage Bonds	200,000.00	
Equipment Trust Payments	12,027,000.00	
Through Sinking Funds:		
Big Sandy Railway Co. First Mortgage 4% Bonds	382,000.00	
Coal River Railway Co. First Mortgage 4% Bonds	191,000.00	
Greenbrier Railway Co. First Mortgage 4% Bonds	137,000.00	
Raleigh and Southwestern Railway Co. First Mortgage 4% Bonds	43,000.00	
	$84,123,000.00	
Costing		84,719,147.09
		$60,709,843.83
ACQUISITIONS:		
Stocks of:		
The C. & O. Railway Co. of Indiana	$5,998,800.00	
Elkhorn and Beaver Valley Railway Co.	30,000.00	
Gauley and Meadow River Railroad Co.	116,300.00	
The Hocking Valley Railway Co.	7,671,900.00	
The Cincinnati Inter-Terminal Railroad Co.	56,000.00	
Logan and Southern Railway Co.	292,100.00	
Levisa River Railroad Co. (of Ky.)	50,000.00	
The Levisa River Railroad Co. (of Va.)	50,000.00	
Kanawha Bridge and Terminal Co.	400,000.00	
The Silver Grove Land and Building Co.	200,000.00	
White Sulphur Springs, Incorporated	2,560,000.00	

Acquisitions (*Continued*)		
First National Bank Building Corporation (Richmond, Va.)	180,000.00	
The Chesapeake and Ohio Northern Railway Co.	1,897,500.00	
Pond Fork Railway Co.	59,100.00	
Miscellaneous	30,000.00	
	$19,592,600.00	
Costing		$20,928,771.89
Bonds of:		
The C. & O. Railway Co. of Indiana First Mortgage 5%.	$6,869,000.00	
Elkhorn and Beaver Valley Railway Co. First Mortgage 5%	1,031,000.00	
Miscellaneous	218,000.00	
	$8,118,000.00	
Costing		6,717,170.13
Properties of:		
Coal River Railway Co.	$2,304,359.88	
Raleigh and Southwestern Railway Co.	816,562.42	
Virginia Air Line Railway Co.	1,071,947.12	
Costing		4,192,869.42
Construction of:		
Extension of Branch Lines, costing	$1,595,592.15	
Second Track (176.5 miles) and Additions and Betterments, costing	16,488,838.92	
(Excluding $2,320,823.99 expended on Chicago Line to April 30, 1916, for which securities have been acquired.)		18,084,431.07
Equipment:		
Additional equipment acquired (less retirals)		19,849,327.85
(Excluding $24,586.89 expended on Chicago Line to April 30, 1916, for which securities have been acquired.)		
Costing		$69,772,570.36

GENERAL REMARKS.

The equipment inventory as of June 30, 1916, was as follows:

Locomotives owned	610	Inc.	5
Locomotives leased	217	Inc.	5
Total	827	Inc.	10
Passenger train cars owned	341	Dec.	17
Passenger train cars leased	29	....	..
Total	370	Dec.	17
Freight train and miscellaneous cars owned	23,868	Dec.	43
Freight train cars leased	20,902	Dec.	1,533
Total	44,770	Dec.	1,576

The decrease in equipment is due principally to the retiral of old equipment, in place of which your Company has contracted for 2,000 70-ton steel coal cars, 1,000 30-ton box cars and 20 passenger train cars.

The charges during the year in the accrued depreciation of equipment account were as follows:

Balance to credit of account June 30, 1915		$4,904,279.67
Amount credited during year ended June 30, 1916, by charges to:		
Operating expenses	$794,073.45	
Charges to account for:		
Accrued depreciation on equipment retired during year—		
34 locomotives, 3 passenger train cars, 4,138 freight train and work cars and 2 barges	$333,034.80	
Accrued depreciation on cars changed in class during year	7,788.69	340,823.49
		453,249.96
Balance to credit of account June 30, 1916		$5,357,529.63

	1916	1915		
Operating Revenues amounted to	$48,239,012.10	$39,464,036.99	Inc.	$8,774,975.11
Net Operating Revenue	$16,449,832.88	$11,907,623.49	Inc.	$4,542,209.39
Operating Ratio	65.9%	69.8%	Dec.	3.9%
Tons of Revenue Freight carried one mile	10,296,523,340	8,138,347,516	Inc.	2,158,175,824
Revenue train load, tons	1,003	906	Inc.	97
Revenue tons per loaded car	34.0	32.3	Inc.	1.7

Among the new local industries are the following: 26 manufactories of mineral, metal and other products, 9 manufactories of farm implements and farm products, 3 manufactories of lumber products, all giving employment to approximately 3,700 persons, with annual pay roll of approximately $2,300,000, producing approximately 8,350 car loads of inbound and outbound freight. At the close of the year, there were on your Company's lines 330 separate mines for producing coal and coke, all of which were in actual operation. Of the 1,304 coke ovens, 1,154 were in operation. Of the 14 iron furnaces, having a total daily capacity of 2,705 tons, 13, having a daily capacity of 2,605 tons, were in operation. During the year 174 new settlers were located on your Company's lines, their purchases aggregating 87,950 acres.

The construction of The Chesapeake and Ohio Northern Railway is rapidly approaching completion, and this line will doubtless be in operation in time to handle coal shipments for the Great Lakes at the opening of navigation in the spring of 1917. This line extends from Limeville, Kentucky, on your Company's main line, to the line of the Norfolk and Western Railway near Waverly, Ohio, a distance of 30.4 miles; and this will afford a short route to the lake for shipments from your Company's lines through trackage rights already arranged for over the Norfolk and Western Railway from Waverly to the Hocking Valley Railway at Valley Crossing near Columbus.

A spur track 4.7 miles in length, leaving the main line at Penniman Junction, just east of Williamsburg, Va., and extending to the plant of the E. I. du Pont de Nemours Company at Penniman, has been completed.

Extensions during the year have been completed as follows: An extension of Gauley and Rich Creek Branch 0.1 mile, Dingess Run Branch of the Guyandot Valley Line 0.8 mile, Horse Creek Branch 5.1 miles, Peter Cave Fork Branch 2.0 miles, and Beech Creek extension of the Coal River Line 1.6 miles. 3.4 miles of second track between Balcony Falls, Va., and Greenlee, Va., have been completed and 0.3 mile of track of the Raleigh and Southwestern Branch has been abandoned. The change of line at Walbridge, Ky., resulted in a decrease of 0.1 mile of track.

The revenue coal and coke tonnage was 26,979,519, an increase of 26.5 per cent; other freight tonnage was 10,640,135, an increase of 22.0 per cent. Total revenue tonnage was 37,619,654 tons, an increase of 25.2 per cent. Freight revenue was $39,079,087.19, an increase of 24.9 per cent. Freight train mileage was 10,262,082 miles, an increase of 14.3 per cent. Revenue ton miles were 10,296,523,340, an increase of 26.5 per cent. Ton mile revenue was 3.80 mills, a decrease of 1.0 per cent. Revenue per freight train mile was $3.808, an increase of 9,3 per cent. Revenue tonnage per train mile was 1,003 tons, an increase of 10.7 per cent. including Company's freight, the tonnage per train mile was 1,064 tons, an increase of 10.6 per cent. Tonnage per locomotive, including Company's freight, was 937 tons, an increase of 7.7 per cent. Revenue tonnage per loaded car was 34.0 tons, an increase of 5.3 per cent. Tons of revenue freight carried one mile per mile of road were 4,335,013, an increase of 26.2 per cent.

There were 6,804,183 passengers carried, an increase of 4.9 per cent. The number carried one mile was 281,348,788, an increase of 4.4 per cent. Passenger revenue was $5,998,043.81, an increase of 5.3 per cent. Revenue per passenger per mile was 2.132 cents, an increase of 0.8 per cent. Number of passengers carried one mile per mile of road was 118,453, an increase of 4.2 per cent. Passenger train mileage was 4,963,002, a decrease of 0.9 per cent. Passenger revenue per train mile was $1.208, an increase of 6.2 per cent; including mail and express, it was $1.425, an increase of 5.9 per cent. Passenger service train revenue per train mile was $1.463, an increase of 6.4 per cent.

There were 23,920.5 tons of new rails (1,265.3 tons 125-lb., 16,727.1 tons 100-lb., 204.5 tons 97-lb. Frictionless rail, and 5,723.6 tons 90-lb.) equal to 154.7 track miles, used in renewal of existing main tracks.

There were 1,763,343 Cross Ties used in maintaining existing tracks, an increase of 126,700.

There were 899,507 yards of ballast (507,609 stone) used in maintaining existing tracks, an increase of 314,066 yards.

The average amount expended for repairs per locomotive operated was $3,291.41; per passenger train car $1,021.40; per freight train car $106.38.

Effective January 1, 1916, Mr. E. D. Hotchkiss was promoted from General Freight Agent to the position of Freight Traffic Manager; Mr. Thornton Lewis from General Western Freight Agent, to Assistant Freight Traffic Manager; and Mr. A. P. Gilbert from Assistant General Freight Agent to General Freight Agent.

Effective July 1, 1916, the following appointments were made: Mr. E. W. Grice, Assistant to President; Mr. J. P. Stevens, General Manager; Mr. E. P. Goodwin, General Inspector of Transportation; Mr. W. L. Booth, Superintendent Freight Transportation; Mr. L. B. Allen, General Superintendent, Central General Division; Mr. E. L. Bock, Superintendent, Huntington and Big Sandy Divisions; Mr. G. J. Derbyshire, Superintendent, C. & O. Ry. of Indiana.

The thanks of the Board are tendered to the officers and employes for loyal and efficient services performed during the year.

By order of the Board of Directors.

GEO. W. STEVENS,
President.

FRANK TRUMBULL,
Chairman.

GENERAL INCOME ACCOUNT.

For Year ended June 30, 1916, and Comparison with Year ended June 30, 1915.

Table 2.

Operating Revenues:	1916.	1915.	Increase or Decrease.	Per Cent.
Freight Traffic	$39,079,087.19	$31,288,536.62	$7,790,550.57	24.9
Passenger Traffic	5,998,043.81	5,696,088.37	301,955.44	5.3
Transportation of Mails	448,571.67	438,666.73	9,904.94	2.3
Transportation of Express	627,919.43	602,911.91	25,007.52	4.1
Miscellaneous	2,085,390.00	1,437,833.36	647,556.64	45.0
Total Operating Revenues	$48,239,012.10	$39,464,036.99	$8,774,975.11	22.2
Operating Expenses:				
Maintenance of Way and Structures	$5,553,447.40	$4,694,522.17	$858,925.23	18.3
Maintenance of Equipment	10,561,093.51	8,243,170.36	2,317,823.15	28.1
Traffic	645,188.50	650,406.20	—5,217.70	1.0
Transportation	13,809,686.28	12,896,078.82	913,607.46	7.1
Miscellaneous Operations	288.847.19	232,347.26	56,499.93	24.3
General	953,684.76	873,882.70	79,802.06	9.1
Transportation for Investment Cr.	*22,768.42*	*33,994.01*	*—11,225.59*	*33.0*
Total Operating Expenses	$31,789,179.22 65.9%	$27,556,413.50 69.8%	$4,232,765.72	15.4
Net Operating Revenue	16,449,832.88	11,907,623.49	4,542,209.39	38.1
Railway Tax Accruals	1,587,407.08	1,349,496.96	237,910.12	17.6
Uncollectible Railway Revenues	20,208.19	8,212.83	11,995.36	146.1
	$1,607,615.27	$1,357,709.79	$249,905.48	18.4
Railway Operating Income	$14,842,217.61	$10,549,913.70	$4,292,303.91	40.7
Income from Other Sources:				
Hire of Equipment	$214,667.99	$77,632.04	$137,035.95	177.0
Interest from Investments and Accounts	677,319.36	635,345.97	41,973.39	6.6
Miscellaneous	289,547.07	305,241.07	—15,694.00	5.1
	$1,181,534.42	$1,018,219.08	$163,315.34	16.0
Gross Income	$16,023,752.03	$11,568,132.78	$4,455,619.25	38.5
Deductions from Gross Income:				
Interest on Debt	$8,176,454.11	$8,098,041.86	$78,412.25	1.0
Rentals Leased Roads, Joint Tracks, &c	901,505.40	860,074.09	41,431.31	4.8

Deductions from Gross Income:	1916.	1915.	Increase or Decrease.	Per Cent.
Loss on C. & O. Grain Elevator	11,723.50	Cr. 88,696.23	100,419.73	113.2
Miscellaneous	54,853.18	35,176.44	19,676.74	55.9
Total Deductions	$9,144,536.19	$8,904,596.16	$239,940.03	2.7
Net Income	$6,879,215.84	$2,663,536.62	$4,215,679.22	158.3

Amount to credit of Profit and Loss June 30, 1915		$2,947,539.83
Amount of Net Income for year ended June 30, 1916, transferred to Profit and Loss		6,879,215.84
		$9,826,755.67
Discount and Expense on Securities issued during the year ended June 30, 1916	$2,484,602.35	
Premium on Five Year Secured Gold Notes called for payment, June 1, 1916	330,202.76	
Refunds under West Virginia two cent fare law	2,654.70	
Appropriation of Surplus to Sinking and Other Reserve Funds	57,000.00	
		$2,874,459.81
		$6,952,295.86
Add Sundry adjustments		37,598.50
Balance to credit of Profit and Loss June 30, 1916		$6,989,894.36

GENERAL BALANCE SHEET JUNE 30, 1916.

ASSETS

(Excluding Stocks and Bonds owned of The C. & O. Ry. Co. of Indiana and of The C. & O. Equipment Corporation.)

Table 3.		
Property Investment.		
Cost of Road		$173,439,123.66
Cost of Equipment		50,887,476.65
		$224,326,600.31
Improvements on Leased Railway Property		3,770.14
Securities of Proprietary, Affiliated and Controlled Companies—Pledged.		
Stocks—See Schedule, page 18	$12,958,599.44	
Bonds—See Schedule, page 18	4,110,407.01	
	$17,069,006.45	
Securities—Issued or Assumed—Pledged.		
Bonds—See Schedule, page 18 (Includes First Lien and Improvement Mortgage 5% Bonds $45,920,000.00. See Contra.)	45,920,001.00	
		$62,989,007.45
Miscellaneous Investments.		
Physical Property		340,421.90
Special Funds, and Funded Debt Issued and Reserved.		
First Lien and Improvement Mortgage Bonds—Available for Additions and Betterments	$1,345,000.00	
R. & S. W. R'y Co., First Mortgage Bonds—Reserved for Construction	40,000.00	
Potts Creek Branch—Cash	44,987.59	
Special Deposits account of Construction and Equipment (Includes Cash and Note—Balance Proceeds K. & M. Ry. Co. Stock Sale)	6,158,219.39	
		7,588,206.98
		$70,917,636.33
		$295,248,006.78
Working Assets.		
Cash in Treasury	$5,903,395.30	
Cash in Transit	1,101,775.54	
	$7,005,170.84	
Cash deposits to pay Interest and Dividends	447,778.33	
Cash deposit to pay Equipment Trust Principal	112,000.00	
Cash deposits to pay Matured Bonds and Script	514,154.17	
Cash deposit to pay C. & O. Grain Elevator Insurance Claims	16,268.78	
Loans and Bills Receivable	525,110.82	
Traffic Balances	1,213,282.17	
Agents and Conductors	868,188.95	
Miscellaneous Accounts Receivable	1,202,937.94	
Other Working Assets	51,824.11	
		$11,956,716.11
Materials and Supplies		3,231,713.23
Securities in Treasury—Unpledged.		
Stocks—See Schedule, page 17	$4,829,223.45	
Bonds—See Schedule, page 17	657,551.75	
		5,486,775.20
Deferred Assets.		
Unmatured Interest, Dividends and Rents	$93,189.79	
Advances to Proprietary, Affiliated and Controlled Companies	106,417.92	
Advances, Working Funds (Fast Freight Lines, etc.)	37,466.18	
Special Deposits with Trustees, Various Mortgage Funds	35,073.81	
Cash and Securities in Sinking Funds	59,886.01	
Cash and Securities in Insurance Reserve Fund	59,319.04	
Sundry Accounts	436,259.66	
		827,612.41
		$21,502,816.95
Total		$316,750,823.73

LIABILITIES.

(Excluding Stocks and Bonds owned of The C. & O. Ry. Co. of Indiana and of The C. & O. Equipment Corporation.)

Capital Stock.			
Common		$62,792,600.00	
First Preferred		3,000.00	
Second Preferred		200.00	
			$62,795,800.00
Common—The Chesapeake and Ohio Railway Co. of Indiana			$1,200.00
			$62,797,000.00
Funded Debt.			
First Mortgage, Terminal, etc., 6% Bonds	1922	$142,000.00	
General Funding and Improvement, 5% Bonds	1929	3,698,000.00	
Convertible, 4½% Bonds	1930	31,390,000.00	
First Mortgage, R. & S. W. Railway, 4% Bonds	1936	857,000.00	
First Consolidated Mortgage, 5% Bonds	1939	29,858,000.00	
First Mortgage, Craig Valley Branch 5% Bonds	1940	650,000.00	
First Mortgage, Greenbrier Railway, 4% Bonds	1940	1,782,000.00	
First Mortgage, Warm Springs Branch, 5% Bonds	1941	400,000.00	
First Mortgage, Big Sandy Railway, 4% Bonds	1944	4,618,000.00	
First Mortgage, Paint Creek Branch, 4% Bonds	1945	539,000.00	
First Mortgage, Coal River Railway, 4% Bonds	1945	2,809,000.00	
Convertible 5% Secured Gold Bonds	1946	40,180,000.00	
First Mortgage, Potts Creek Branch, 4% Bonds	1946	600,000.00	
First Mortgage, Va. Air Line Railway, 5% Bonds	1952	900,000.00	
First Mortgage, R. & A. Division, 4% Bonds	1989	6,000,000.00	
Second Mortgage, R. & A. Division, 4% Bonds	1989	1,000,000.00	
General Mortgage, 4½% Bonds	1992	48,129,000.00	
			$173,552,000.00
Equipment Trust Obligations and Contracts			7,983,169.54
			$181,535,169.54
First Lien and Improvement Mortgage 5% Bonds (see Contra)	1930		47,265,000.00
			$291,597,169.54
Working Liabilities.			
Loans and Bills Payable		$95,000.00	
Traffic Balances		399,777.04	
Audited Vouchers and Pay Rolls		3,499,239.30	
Unpaid Wages		27,572.62	
Miscellaneous Accounts Payable		350,050.07	
Matured Interest and Dividends Unpaid		399,722.90	
Matured Mortgage and Secured Debt Unpaid		514,154.17	
Other Working Liabilities		67,960.40	
			$5,353,476.50
Deferred Liabilities.			
Unmatured Interest and Rents		$2,331,890.09	
Taxes Accrued		1,607,791.01	
Accrued Depreciation—Equipment		5,357,529.63	
Sundry Accounts		436,817.36	
			9,734,028.09
			$15,087,504.59
Appropriated Surplus.			
Additions to Property through Income since June 30, 1907		$2,984,365.23	
Reserve Invested in Sinking Funds		32,570.97	
Reserve Invested in Insurance Fund		59,319.04	
			$3,076,255.24
Profit and Loss—Balance			6,989,894.36
			$10,066,149.60
Total			$316,750,823.73

CHICAGO, SAINT PAUL, MINNEAPOLIS AND OMAHA RAILWAY COMPANY—THIRTY-FIFTH ANNUAL REPORT

To the Stockholders of the Chicago, Saint Paul, Minneapolis and Omaha Railway Company:

The Board of Directors submit herewith their report of the operations and affairs of the Chicago, Saint Paul, Minneapolis and Omaha Railway Company for the fiscal year ending June 30, 1916.

Average number of miles operated, 1,752.81.

Operating Revenues:		
Freight	$12,860,214.17	
Passenger	5,191,440.62	
Other Transportation	1,142,835.68	
Incidental	328,072.10	
Total Operating Revenues		$19,522,562.57
Operating Expenses (66.38 per cent. of Operating Revenues)		12,958,837.50
Net Revenue from Railway Operations		$6,563,725.07
Railway Tax Accruals (5.23 per cent. of Operating Revenues)	$1,022,052.69	
Uncollectible Railway Revenues	6,336.98	1,028,389.67
Railway Operating Income		$5,535,335.40
Nonoperating Income:		
Rental Income	$357,852.35	
Dividend Income	46,351.00	
Income from Funded Securities	15,224.78	
Income from Unfunded Securities and Accounts, and other items	37,151.39	
Total Nonoperating Income		456,579.52
Gross Income		$5,991,914.92
Deductions from Gross Income:		
Rental Payments	$756,783.86	
Interest on Funded Debt	2,215,377.33	
Other Deductions	16,726.93	
Total Deductions from Gross Income		2,988,888.12
Net Income		$3,003,026.80

Disposition of Net Income:		
Dividends		
7% on Preferred Stock	$788,147.50	
7% on Common Stock	1,298,969.00	
		2,087,116.50
Balance income for the year		$915,910.30

The results as compared with the preceding fiscal year were as follows:

Freight Revenue increased	$1,337,110.73	
Passenger Revenue increased	207,740.73	
Other Transportation Revenue increased	120,640.80	
Incidental Revenue increased	15,722.63	
Total Operating Revenues increased		$1,681,214.89
Operating Expenses increased	$851,239.99	
Railway Tax Accruals increased	7,024.08	
Uncollectible Railway Revenues increased	1,502.39	
		859,766.46
Railway Operating Income increased		$821,448.43

Of the Operating Expenses for the current fiscal year $7,204,098.51, or 55.59 per cent., was paid employees for labor, as compared with $6,599,357.35, or 54.51 per cent., paid during the preceding fiscal year. The increase of $604,741.16 in the amount paid is accounted for as follows:

Increase account more time worked	$513,928.22
Increase account higher rates of compensation	90,812.94
	$604,741.16

MILES OF RAILROAD.

The total number of miles of railroad owned June 30, 1916, was		1,683.22 miles
In addition to which the company operated:		
Under Trackage Rights—		
Northern Pacific Railway (Superior, Wis., to Rice's Point, Minn.)	1.59 miles	
Great Northern Railway (St. Paul to Minneapolis, Minn.)	11.40 "	
Minneapolis & St. Louis Railroad (Minneapolis to Merriam, Minn.)	27.00 "	
Illinois Central Railroad (LeMars to Sioux City, Iowa)	25.20 "	
Sioux City Bridge Company (bridge across Missouri River and tracks at Sioux City, Iowa)	3.90 "	
Chicago and North Western Railway (Sioux City to Sioux City Bridge Company's track)	.50 "	
	69.59 "	
Total miles of railroad operated June 30, 1916	1,752.81 "	

The above mileage is located as follows:

In Wisconsin	781.14 miles
In Minnesota	473.04 "
In Iowa	102.04 "
In South Dakota	88.20 "
In Nebraska	308.39 "
Total	1,752.81 "

In addition to the foregoing, the company owned and operated 183.03 miles of second track, located as follows:

In Wisconsin	157.09 miles
In Minnesota	24.23 "
In Nebraska	1.71 "
Total	183.03 "

FREIGHT TRAFFIC

The details of Freight Traffic for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	Increase Amount	Increase Per Cent.
Freight Revenue	$11,523,103.44	$12,860,214.17	$1.337,110.73	11.60

	1915	1916	Percentage of Increase or Decrease
Tons of Revenue Freight Carried	8,794,488	10,082,061	14.64 Inc.
Tons of Revenue Freight Carried One Mile	1,336,106,367	1,578,936,405	18.17 Inc.
Average Revenue Received per Ton	$1.31	$1.28	2.29 Dec.
Average Revenue Received per Ton per Mile	.86 of a cent	.81 of a cent	5.81 Dec.
Average Distance each Revenue Ton was Hauled	151.93 miles	156.61 miles	3.08 Inc.
Mileage of Freight and Mixed Trains	4,026,069	4,449,389	10.51 Inc.
Average Number of Tons of all Freight Carried per Train Mile	360.13	390.31	8.38 Inc.
Average Number of Tons of all Freight Carried per Loaded Car Mile	20.39	21.30	4.46 Inc.
Average Freight Revenue per Train Mile	$2.86	$2.89	1.05 Inc.

PASSENGER TRAFFIC

The details of Passenger Traffic for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	Increase Amount	Increase Per Cent.
Passenger Revenue	$4,983,699.89	$5,191,440.62	$207,740.73	4.17

	1915	1916	Percentage of Increase or Decrease
Passengers Carried	4,767,826	5,436,588	14.03 Inc.
Passengers Carried One Mile	252,305,000	254,754,659	.97 Inc.
Average Fare Paid per Passenger	104.53 cents	95.49 cents	3.19 Inc.
Average Rate Paid per Passenger per Mile	1.975 cents	2.038 cents	3.19 Inc.
Average Distance Traveled per Passenger	52.92 miles	46.86 miles	11.45 Dec.
Mileage of Revenue Passenger and Mixed Trains	4,349,764	4,404,103	1.25 Inc.
Average Passenger Train Revenue per Train Mile	$1.34	$1.40	4.48 Inc.

MAINTENANCE OF WAY AND STRUCTURES

The total Operating Expenses of the Company for the year ending June 30, 1916, were $12,958,837.50; of this amount $2,340,883.41 was for charges pertaining to Maintenance of Way and Structures. Included in these charges are $124,506.88 for steel rails, $350,986.75 for ties, and the cost of re-ballasting 112.11 miles with gravel and cinders, also part cost of replacing 2,664 feet of wooden bridging with permanent work.

During the year 6,424 tons of new steel rails and 8,605 tons of usable and re-rolled steel rails were laid in track, a greater portion of which replaced rails of lighter weight; 671,654 ties of all descriptions were laid in renewals.

The details of the charges to Maintenance of Way and Structures for the year, compared with the previous year, were as follows:

	1915	1916	Increase or Decrease
Cost of Rails:			
New steel rails	$362,580.63	$203,432.82	$159,147.81 Dec.
Usable and re-rolled rails	138,315.69	229,051.76	90,736.07 Inc.
Less value of old rails and other items	$500,896.32 369,953.94	$432,484.58 307,977.70	$68,411.74 Dec. 61,976.24 Dec.
Net charge for rails	$130,942.38	$124,506.88	$ 6,435.50 Dec.
Cost of Ties	229,376.56	350,986.75	121,610.19 Inc.
Cost of Ballast	20,270.06	17,970.71	2,299.35 Dec.
Cost of Other Track Material	117,233.06	122,156.44	4,923.38 Inc.
Roadway and Track Labor and Other Expenses	774,745.18	781,740.35	6,995.17 Inc.
Total Charges for Roadway and Track	$1,272,567.24	$1,397,361.13	$124,793.89 Inc.
Other Charges Account Maintenance of Way and Structures were as follows:			
Bridges, Trestles and Culverts	159,950.88	374,012.22	214,061.34 Inc.
Road Crossings, Fences, Etc.	64,003.35	73,771.69	9,768.34 Inc.
Signals and Interlocking Plants	28,082.14	24,269.38	3,812.76 Dec.
Buildings, Fixtures and Grounds	207,458.28	263,795.65	56,337.37 Inc.
Docks and Wharves	Cr. 96.30	1,523.02	1,619.32 Inc.
Superintendence	107,451.21	110,132.92	2,681.71 Inc.
Roadway Tools and Supplies	24,502.41	30,498.01	5,995.60 Inc.
Sundry Miscellaneous Charges	92,884.28	65,519.39	27,364.89 Dec.
Total Charges Account Maintenance of Way and Structures	$1,956.803.49	$2,340,883.41	$384,079.92 Inc.

The above charges for Maintenance of Way and Structures for the current year amount to 18.06 per cent. of the total Operating Expenses, as compared with 16.16 per cent. for the preceding fiscal year.

MAINTENANCE OF EQUIPMENT.

The charges on account of Maintenance of Equipment for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	Increase or Decrease
Locomotives	$975,126.79	$1,000,517.91	$ 25,391.12 Inc.
Freight-train Cars	1,061,967.59	977,559.14	84,408.45 Dec.
Passenger-train Cars	265,800.71	245,929.07	19,871.64 Dec.
Work Equipment	35,127.09	50,937.54	15,810.45 Inc.
Shop Machinery and Tools	31,300.56	32,680.20	1,379.64 Inc.
Superintendence	68,929.43	66,772.19	2,157.24 Dec.
Sundry Miscellaneous Charges	38,704.54	44,741.24	6,036.70 Inc.
Total Charges Account Maintenance of Equipment	$2,476,956.71	$2,419,137.29	$57,819.42 Dec.

The above charges for Maintenance of Equipment for the current year amount to 18.67 per cent. of the total Operating Expenses, as compared with 20.46 per cent. for the preceding fiscal year.

RESERVE FOR ACCRUED DEPRECIATION ON EQUIPMENT

At the close of the preceding fiscal year there was a balance to the credit of the Equipment Reserve Accounts of	$1,912,783.32
During the year ending June 30, 1916, there was credited to the Equipment Reserve Accounts on account of charges to Operating Expenses for Accrued Depreciation	465,420.52
	$2,378,203.84
And there was charged during the year against the above amount the Accrued Depreciation previously credited this account on Equipment retired or transferred from one class of service to another	84,336.62
Leaving a balance to the credit of the Equipment Reserve Accounts on June 30, 1916, of	$2,293,867.22

TRANSPORTATION EXPENSES

The Transportation Expenses of the Company for the year were $7,208,270.51, or 55.62 per cent. of the total Operating Expenses. Of this amount $4,019,860.36, or 55.77 per cent., was for labor; $2,157,988.19, or 29.94 per cent., was for fuel for locomotives; and $1,030,421.96, or 14.29 per cent., was for supplies and miscellaneous items.

The total increase in the charges as compared with the preceding year was $470,573.34, distributed as follows:

Increase in amount charged for labor	$380,085.51
Increase in amount charged for fuel for locomotives	235,523.54
Decrease in amount charged for supplies and miscellaneous items	145,035.71
	$470,573.34

By order the Board of Directors.

JAMES T. CLARK,
President.

Railway Age Gazette

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Train Despatchers as Officers

The letter, in another column, from a train despatcher who is *not* anxious to sign his own name to the train orders which he issues, suggests a point which is suggested by all letters on this subject, but which usually is not expressed. It is this: to regularly sign his name to the orders that he issues, makes a man more truly feel the importance of his office (as he should). He makes the order; and it is the normal thing for the real maker of a document to put his own name to it. And, supposing that it is admitted that the usual despatcher's plea is based largely on something akin to vanity; should that throw him out of court? Some wise man has observed that vanity is found in the make-up of many worthy people; and that often it is harmless. Vanity in the railroad world is not confined to the despatching forces. It is legitimate to recognize this personal feeling. If such feeling did not exist where should we look for the ambition that leads men to fit themselves for higher places? But the common practice of signing the superintendent's name promotes good system and tends to simplify the conductor's part. To use three different names in 24 hours looks like unnecessary variety. How would it do to say, on the timetable, that the despatcher's name, within his sphere, should have equal authority with that of the superintendent? That would afford an opportunity to experiment with the proposition.

Improvement in Acoustics

One phase of the operation of large passenger stations wherein there is still room for material improvement is in the announcing of trains. While train signs or bulletin boards are provided in most cases to supplement the spoken announcement and although more rigid supervision in recent years has been instrumental in securing more conscientious articulation on the part of the callers, it is still frequently difficult for travelers to grasp more than fragments of the announcements. This is, however, not entirely the fault of the speaker. In fact, the trouble lies more often in the acoustics of the great waiting room or concourse; the human voice, or the enunciators which now replace it in many cases, are made unintelligible by a confusion of echoes or reverberations. Except in the case of theatres or auditoriums, acoustics seems to be overlooked as a requirement of the design of structure, æsthetics being given much more consideration even though its relation to utility is more remote. The results as a rule are therefore indifferent or unsatisfactory. For this reason it will be of interest to those who have been confronted with these conditions to read of the results obtained in correcting the echoes and reverberation in the auditorium of the University of Illinois as described in Bulletin No. 87 of the Illinois Experiment Station. These improvements were secured entirely by a treatment of the wall surfaces of the finished building. While the requirements of this structure differ materially from those of the passenger station and although the work done was experimental rather than commercial, the data secured ought to be of value in the design of new structures or in the correction of old ones.

Quantity vs. Quality in Shop Output

The general custom is to rate a back shop according to its output, and the shop superintendent, or whoever is in charge of the shop, generally becomes greatly worried toward the end of the month if it appears that the record of the month before, or of the corresponding month last year, is not going to be met. Of course it is the duty of every shop to get the locomotives back into service as quickly as possible, but that should not mean that the repairs must be hastened to the extent that the workmanship is poor. The broad-minded mechanical officer will not think so much about the output of his shops as he will about the service rendered by the locomotives after they come out of the shop. The time saved in rushing the engines through the shop may more than be lost by holding them out of service in the roundhouse for running repairs and the ultimate cost for repairs will be greater. At the same time the transportation department will have less reliable power with which to meet the traffic demands. The cost of repairs per locomotive mile for each and every locomotive would be a more

true indication of the service rendered by the mechanical department and a better measure of its efficiency. If any comparisons are to be made between back shops, or any records are to be kept and lived up to, they should be those which include the performance of the locomotives after they leave the shop. An individual account of each and every locomotive should not be difficult to maintain, and an analysis of these accounts would locate weak shop organizations.

A RECORD CAR SHORTAGE

THE monthly statistical statement of the American Railway Association Committee on Relations Between Railroads, giving a summary of freight car surpluses and shortages as of September 30, shows a larger shortage than has appeared at a corresponding date in any of the ten years during which these statistics have been compiled. The net shortage is 61,030 cars, distributed about proportionately among all classes of cars.

The total surpluses on September 30, 1916, amounted to 26,201 cars, compared with a total of surpluses on September 1 of 45,044 cars, and with 88,341 on October 1, 1915. The total shortages on September 30, 1916, were 87,231, compared with 64,917 on September 1, and with 10,010 on October 1, 1915.

There has been a general increase throughout the country in shortages of all classes of freight car equipment. The surpluses and shortages by classes of cars are as follows:

Classes	Surpluses	Shortages	Net shortages
Box	12,863	45,879	33,016
Flat	1,687	3,655	1,968
Coal and gondola	5,640	25,512	19,872
Miscellaneous	4,811	7,446	2,635
Not classified	1,200	4,739	3,539
Total	26,201	87,231	61,030

A feature which differentiates the present shortage from those that have occurred in previous years is brought out by a comparison of the present shortage by classes of cars with the shortage of 1907 arranged in similar detail. On October 2, 1907, there was a net shortage of all classes of freight cars, and the aggregate net shortage was within 3,000 of the aggregate net shortage on September 30, 1916. In 1907, however, of a total shortage of 58,276 cars, 43,136 of the total were box cars. In 1916, the total net shortage of 61,030 cars includes only 33,016 box cars. The other principal component of the total is a net shortage of 19,872 coal cars and gondolas. The figures in detail are as follows:

CAR SHORTAGES AND SURPLUSES, OCTOBER 2, 1907

Classes	Surpluses	Shortages	Net shortages
Box	2,393	45,529	43,136
Flat	570	3,280	2,710
Coal and gondola	2,062	10,019	7,957
Miscellaneous	1,168	5,641	4,473
Total	6,193	64,469	58,276

It is a curious fact, also, that the gross shortage of box cars in each of the two years is almost exactly the same; but the net shortage of box cars in 1916 is reduced by a surplus of almost 13,000 cars.

The relatively large number of coal cars and gondolas which help to make up the net shortage in 1916, and the relatively small proportion of box cars, point out at once what is perhaps the principal cause of a shortage this year. Coal cars and gondolas have been the classes of cars principally employed in the transportation of coal and ore to the large manufacturing plants. It is probable, also, that a material part of the box car shortage is due to the demand for such cars in the transportation of manufactured products from the factories to the ports for export. The whole condition is therefore somewhat different from that which has controlled in previous years and deductions based upon the precedents furnished by previous years may go wrong.

This net shortage of 61,030 cars is worth consideration from two points of view. It is true that it is the largest net shortage reported for this date during the ten years in which the American Railway Association has compiled these figures. The figures for a substantially corresponding date in each of the preceding years, since and including 1907, are as follows:

CAR SHORTAGES AND SURPLUSES, 1907 TO 1916

October 1	Surplus	Shortage	Net shortage or surplus
1907	6,193	64,469	58,276 shortage
1908	133,792	8,114	125,678 surplus
1909	53,388	14,582	38,806 surplus
1910	42,469	17,941	24,528 surplus
1911	58,382	8,344	50,038 surplus
1912	26,754	44,547	17,793 shortage
1913	41,994	31,620	10,374 surplus
1914	133,382	2,355	131,027 surplus
1915	88,061	9,762	78,299 surplus
1916	26,201	87,231	61,030 shortage

For the reason that it is the largest net shortage at this time of the year, the greatest possible effort should be put forth in the way of cutting out unnecessary delays in movement, in seeing that cars are loaded to full capacity, and in exercising moderation in requisitioning cars for loading.

On the other hand, a certain feeling of relief may be entertained that the shortage up to date is no worse. The peak of the demand for cars ordinarily comes in October or November. In previous years the maximum net shortages were reached on these dates: October 30, 1907, 86,811 cars; November 10, 1909, 3,286 cars; November 7, 1912, 51,269 cars; and October 15, 1913, 6,048 cars. These are the only years during the life of these records when net shortages have occurred.

It is, of course, well understood that the reason for shortages occurring in October or early in November, if they occur at all, is that that month generally represents the period of heaviest grain movement. Somewhat paradoxically, this year it is the grain movement that has in part occasioned the shortage and at the same time kept the shortage from being worse than it is. On account of abnormal conditions prevailing in other countries there was a large early movement of grain by rail. There has also been a special demand for cars for other purposes, especially coal cars and gondolas. This created a demand for cars which afforded premonitions of a shortage earlier in the season than symptoms of shortage ordinarily appear. The net result of the early grain movement, however, was to afford relief for the condition of which it was a symptom. The extraordinary demands for equipment to carry other material would not have existed but for abnormal conditions abroad.

But an outgrowth of the same cause that brought about the earlier movement of grain in 1916 re-acted to slow down the movement later. The demand for grain for export coupled with a partial deficiency in the crop resulted in prices for some grains, particularly wheat, soaring to an unprecedented height. Many farmers are only now marketing their wheat at $1.50 a bushel and many of them are still holding their supply for $2.00.

On the whole, then, this incipient shortage may be regarded with mixed feelings, notwithstanding the necessity of putting forth every effort to prevent it from growing to more serious proportions. It has been said before by the *Railway Age Gazette*, that a car shortage is not all bad, because it is an unmistakable evidence of transportation prosperity. It is particularly so when by reason of unusual conditions the body of traffic that tends to cause a shortage is spread over such a period that the maximum of business may be handled with the minimum of disturbance. And under these conditions the precautions that are to be taken to prevent a threatened shortage from becoming a serious matter can be taken calmly and effectively with but little effort upon the part of each responsible individual.

THE RAILWAYS AND PRESIDENT WILSON

CLEARLY the railways are out of politics. Judge Lovett, chairman of the Union Pacific System, has prepared a statement which has been given out from Democratic campaign headquarters, indicating that in spite of the course adopted by President Wilson and Congress in dealing with the recent railway wage crisis, he intends to vote for Mr. Wilson. President Underwood of the Erie also has prepared a statement which has been issued by the Democratic committee, in which he says that he believes President Wilson "used his best judgment in the railroad negotiations for an eight-hour day."

Many, and probably a large majority, of the leading railway executives disagree with Judge Lovett and Mr. Underwood. In other words, the injection of the wage controversy into the political campaign has not been sufficient to align the heads of the railways, either as individuals or in behalf of their companies, on the side of either Mr. Wilson or Mr. Hughes.

The situation as respects the leaders of organized labor is entirely different. The president of the American Federation of Labor and the heads of the four railway labor brotherhoods, which recently "held up" Congress, have all announced themselves in favor of Mr. Wilson, and are openly working for his re-election. The heads of the brotherhoods have expressly said that they are taking this course because of the policy Mr. Wilson and the Democratic congress pursued in dealing with the wage controversy.

The contrast presented is striking. Not only does it show that the railways are out of politics, but it also illustrates how deeply the leaders of organized labor are in politics. It must be said in all fairness that in many respects President Wilson has been just and friendly to the railways. It is understood that he helped materially in securing the increases in passenger and freight rates, which the Interstate Commerce Commission has allowed within the last two years. He also recommended to Congress more than once the passage of the Newlands resolution providing for a general investigation of the entire subject of railroad regulation, and probably it was chiefly due to his influence that that resolution was passed. But the railways are confronted with other problems besides those directly growing out of the regulation of their rates and facilities. The most important and serious of these other problems is the labor problem. In no other class of industry in this country has organized labor acquired such enormous power as in the railway industry, or used it with such selfish and reckless disregard of the rights and welfare of capital, of unorganized labor and of the public. If Mr. Wilson and those who passed the Adamson law are re-elected, the result will be regarded by organized labor and by most of the public as a great victory for the labor unions, and especially for those whose members are employed on the railways. This clearly would not bring the labor problem on the railways any nearer to a solution.

Mr. Wilson has indicated that he will use his influence and that of his administration to secure any increase in freight rates that may be reasonable to offset the increase in expenses caused by the establishment of an eight-hour basic pay day in railway train service. He has also indicated that he will use his influence to secure the passage of a law to provide for compulsory investigation of labor controversies affecting train service before lockouts or strikes can occur. Finally, he has appointed a commission of most excellent personnel to investigate and report on the operation of the Adamson law.

Unfortunately, however, Mr. Wilson has made a record during his administration which renders it difficult to regard with optimism the course he may be expected to take in any case where organized labor is affected. One of his first acts as President was to appoint as Secretary of Labor William B. Wilson, a leader of union labor, who in every act of his official life has indicated that he is not concerned as to the welfare of any class of persons who do not belong to labor unions. Then Congress passed and President Wilson signed a measure prohibiting the Department of Justice from using any part of the fund for anti-trust proceedings in suits brought against labor organizations. This was followed by the passage of a provision of the Clayton act expressly exempting labor organizations from the anti-trust law.

Two years ago a controversy arose between the western railways and their engineers and firemen. The men made certain demands upon the railway companies. The railways made counter-demands. The engineers and firemen came back with still further demands. When this controversy got into the hands of President Wilson he insisted upon the railways withdrawing all of their demands and agreeing to arbitrate only the original demands of the men. Finally there came the dispute over the eight-hour basic day in train service. The employees made demands upon the railways and the railways made certain contingent proposals in reply. It was thought by railway officers that it was possible that the President might ask the roads to withdraw their contingent proposals and to arbitrate only the demands of the employees, but it was felt that it was improbable that he would do this, and that for him to do so would be most unfair. He went vastly farther than this. He insisted that the railways should concede the principal demand of the employees—that for the eight-hour basic day—on the ground that the eight-hour day was not arbitrable, and that other matters in controversy should be investigated by a commission to be appointed by himself. He did this in spite of the fact that he himself had signed the Newlands act which expressly provides for arbitration of hours of labor. When the railways declined his proposition he went to Congress with a program including the passage of an eight-hour basic pay day law and a law to provide for compulsory investigation of disputes, but he did not insist upon the latter, and the only bill finally enacted was one to increase the wages of the employees in train service.

This is President Wilson's labor record to date. He has never failed in a single instance since he has been President to yield completely to any demand which organized labor has made, however unreasonable and outrageous that demand has been. It is significant, in this connection, that although organized labor is resolutely opposed to legislation to provide for the compulsory investigation of labor disputes on railways, and although Mr. Wilson has said that he favors it, organized labor is not showing the least alarm at his attitude, and Mr. Gompers and the heads of the four railway labor brotherhoods are vigorously advocating his re-election.

The question inevitably arises as to what value any system of railway regulation can have if the government is to follow the course favored by Mr. Wilson in this railway wage dispute. There was a law for the arbitration of such disputes which Mr. Wilson himself had signed. He absolutely ignored it. The anti-trust law formerly applied to conspiracies of labor as well as to conspiracies of capital in restraint of trade and commerce. Mr. Wilson signed a bill to repeal that law as it applied to organized labor. Might he not act similarly with reference to a law for the compulsory investigation of labor disputes if the leaders of the brotherhoods did not happen to like it and threatened to strike if it were not repealed?

As to an increase in freight rates to offset the increase in operating expenses that will be caused by the operation of the Adamson law, we note that Judge Adamson, the author of that law, says that there will be no increase in expenses because the railways will merely run their trains faster and that therefore no advance in rates will be necessary. Judge Adamson is chairman of the House Committee of Interstate and Foreign Commerce. He is the man who rose in his place in the House of Representatives on July 21 and announced

that there would be no railway strike—that he had conferred with the leaders of organized labor and they assured him that they would not "stop the wheels." Mr. Adamson's logic in regard to the probable operation of the law that bears his name is just about as reliable as was the information he gave the country on July 21 as to the attitude of the labor leaders. If that kind of logic is going to prevail in Congress, as did the statement he made on July 21, those who hope for legislation to give the railways relief in respect to rates are doomed to disappointment.

As a matter of principle ought there to be any such legislation? It has never been determined whether the train service employees ought to be given the increase in wages contemplated by the Adamson law, and there is nothing in the law to require the Goethals' commission to ascertain this. If train service employees ought not to have their wages raised, then upon what ground can it be contended that special legislation ought to be passed to provide the means for paying them an increase in wages? The suggestion that Congress should take some action looking to an increase in rates to offset the increase in railway expenses which would be caused by the establishment of a basic eight-hour day originated with Mr. Wilson, and is as open to criticism as everything he did in connection with the wage controversy. It would be perfectly proper to provide by law that the Interstate Commerce Commission in regulating rates should take into consideration every wage award made by an arbitration board after due investigation. It would also be perfectly proper to provide by law that the Interstate Commerce Commission itself should arbitrate railway labor disputes, and should in its decisions in rate cases take into consideration the awards made by it in labor disputes.

The same thing cannot be said for legislation passed by Congress providing that the Interstate Commerce Commission, in the regulation of rates, shall take into consideration an advance in wages voted by Congress without investigation. The day that Congress begins to pass special legislation for the benefit of particular classes of persons and to require the Interstate Commerce Commission in the regulation of rates to take this special legislation into consideration, on that day the destruction of fair and intelligent regulation of railways in this country will begin. In many of the states the legislatures have created commissions to regulate rates and then subsequently have themselves passed laws to reduce rates. The spokesmen of the railways have denounced the legislatures for doing this. Is it any worse in principle for state legislatures to disregard the commissions that they have created and pass laws arbitrarily reducing rates, than it would be for Congress to begin passing laws practically requiring the Interstate Commerce Commission to grant increases in rates for the benefit of favored classes of railway employees? The same Congress that can pass laws to provide for increases in rates for such reasons can pass laws to provide for the reduction of rates for no reason at all.

Both Mr. Wilson's action in getting the Adamson law passed, and his further action in recommending special legislation looking to increases in rates to offset the increases in railway expenses which he foresaw would be caused by the Adamson law, tend to the destruction of the system of fair and intelligent railway regulation. Of what value will any arbitration law be if the national administration does not firmly stand for its full use and observance? Of what value will be any system of federal regulation by commission however wisely contrived if Congress and the President are going to make a practice of giving the commission detailed and special instructions as to how it shall perform its functions?

The question raised by the present administration's uniform course in dealing with organized labor, by its course in respect to the railway wage controversy and by the passage of the Adamson law raise an issue which in importance vastly transcends any issue directly affecting the railways that ever was presented for the consideration of the American people. If we are to have such regulation of railways as we have had in this instance the system of private ownership and management subject to public regulation cannot possibly endure. Such regulation will speedily deprive the opponents of government ownership of every valid argument in favor of private ownership and management. Wherever government management has been a failure its failure has been chiefly due to the injection of politics into it. There never was a case in any country where the public owns the railways in which politics was more flagrantly injected into their management than has recently been the case in this country. One of the strongest arguments against government ownership has been that when railway employees were taken into the service of the government public officials would bestow favors on the employees in return for their votes, and the employees would give public officials their votes in return for these favors. Is not that exactly what is happening right now in the United States under private ownership?

Let us not close our eyes to plain facts, or try to deceive ourselves as to their meaning. Mr. Wilson's course heretofore, where organized labor has been concerned, has been such that all reasonable hope that in future where it is concerned he will not sacrifice the rights and welfare of the American public for its benefit must be predicated upon the assumption that his future course with respect to organized labor will be directly the opposite of what his past course has been. Every step taken by him and Congress in dealing with the pending railway wage controversy has been a violation of the most fundamental principles of sound regulation of railways and the most vital principles of orderly democratic government. The leaders of organized labor evidently expect to have the same influence in the affairs of government as long as he is President as they have had heretofore. Business men, and especially railway officers, who in these circumstances can repose confidence in Mr. Wilson's wisdom and fairness, have the faith that passeth understanding.

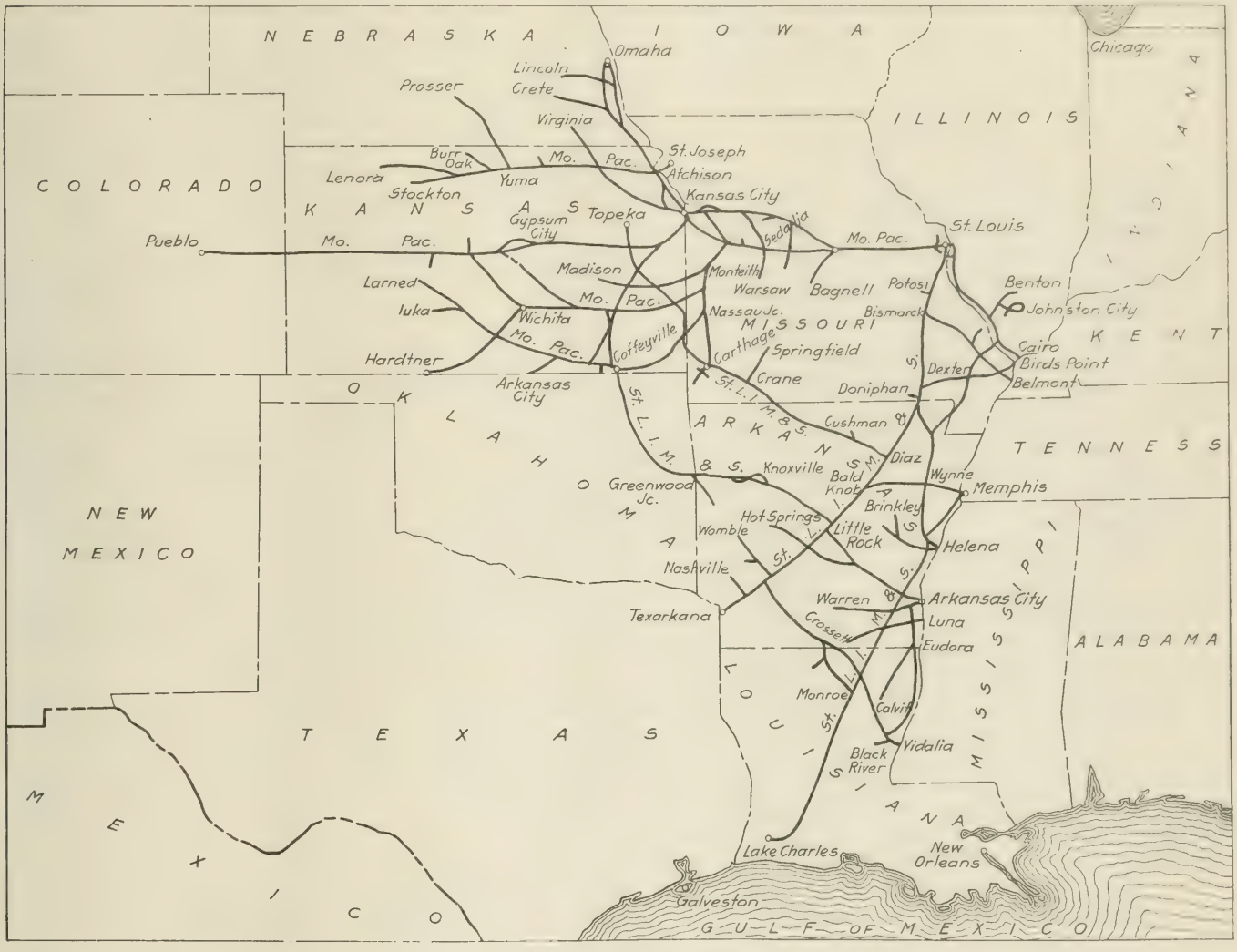
MISSOURI PACIFIC

THE deficit of the Missouri Pacific in its year of heaviest business—the fiscal year ended June 30, 1916—was even larger than in the previous year; but there is nothing surprising in this fact, nor is it any indication of economics of operation. It was purely the result of the pursuit of the policy adopted by the receiver of taking up deferred maintenance. The total number of tons carried one mile in 1916 was 7,433,000,000, an increase of 12.85 per cent, and the total number of passengers carried one mile was 502,000,000, an increase of 1.89 per cent as compared with the previous year, while transportation expenses (the out-of-pocket cost of handling freight and passenger business) amounted to $20,487,000, a decrease of about half of one per cent as compared with the previous year.

The appointment of a receiver for the Missouri Pacific took place in August, 1915. B. F. Bush, president of the company, was appointed, so that there was no change in management. A change took place, however, in the policy of the management in regard to maintenance. Maintenance of way and structures in 1915 cost $8,142,000, while in 1916 $10,589,000 was spent on this account. Maintenance of equipment in 1915 cost $10,769,000, while in 1916 $13,956,000 was spent on this account. This is an increase of over 30 per cent in expenditures for maintenance of way, and nearly 30 per cent in expenditures for maintenance of equipment. In some part the increase in maintenance of way was due to extraordinary expenses occasioned by floods in Missouri Pacific territory following the northward progress of the great Galveston storm. But this would not explain the increase in maintenance of equipment expenditures, nor would it greatly lessen the significance of some of the details of maintenance of way expenses. Roadway maintenance, which includes care of roadway, general cleaning, watching

roadway, and bank protection, was more than twice as large in 1916 as in 1915, the total in 1916 being $1,776,000, an increase of $891,000 over the previous year. There was $362,000 spent for ballast in 1916 as against $95,000 in 1915. All of the charge for ballast in maintenance of way accounts is supposed to be for renewing ballast where ballast had previously been in existence. It is pretty safe to assume that some of the maintenance of way expenses for ballast on the Missouri Pacific were for renewing ballast that was supposed to have been in existence for a long, long time.

A total of $7,018,000 was spent for repairs of freight cars in 1916 as compared with $4,805,000 in 1915, an increase of $2,214,000. A few years ago it was probably a



The Missouri Pacific System

been mentioned. The average trainload of all freight was 524 tons in 1916, an increase of 41 tons, or 8.39 per cent. There were no locomotives added in either 1916 or 1915. The operating department was helped a little, it is true, in 1916 by a little better balanced traffic, the percentage of loaded car-miles to total car-miles being 69.84 in 1916 and 67.68 in 1915. In great part, however, the saving came in a rigid holding down of every small item of expense connected with the movement of trains and a noteworthy reduction in payment for loss and damage to freight and injuries to persons. The total payments for loss and damage to freight in 1916 amounted to $556,000, a decrease of $320,000 as compared with the previous year, and for injuries to persons, to $477,000, a decrease of $150,000 as compared with the previous year.

fact, although no records were kept at that time by which it would be easy to prove it, that less than 3 per cent of freight cars in service on the Missouri Pacific had a general overhauling once a year. Under the present regime it is understood that about one-seventh of all the freight cars in service are given a thorough general overhauling each year. The great increase in 1916 as compared with 1915 may in part have been due to the interpretation of a "general overhauling" which the management permitted the car department. All that has been said in regard to maintenance may be summed up by saying that apparently the management is taking advantage of the receivership to pay back to the property deferred maintenance and to bring the standard of the property up to that of some of its competitors.

The reduction in transportation expenses, notwithstanding a considerably heavier business handled, has already

The following table shows the ratio of each class of operating expenses to total operating revenues:

	1916	1915
Maintenance of way and structures	16.45	13.99
Maintenance of equipment	21.68	18.56
Traffic expenses	2.48	2.43
Transportation expenses	31.83	35.35
General expenses	2.39	2.55
Other expenses	0.18	0.29
Total	75.01	73.11

The consolidated income account of the receiver and the old company shows a deficit in 1916 of $1,340,000. As a matter of fact, however, there was a total of $4,536,000 interest charges which were not paid by the receiver, so that no receiver's certificates were necessary, the cash taken in from earnings being a little more than sufficient to pay oper-

ating expenses, including the much heavier maintenance expenses, and interest on underlying bonds. Cash on hand at the end of the year amounted to $610,000, a decrease of $506,000 as compared with the previous year, and loans and bills payable amounted to $1,140,000, a decrease of $510,000.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	7,341	7,285
Freight revenue	$48,510,396	$43,683,712
Passenger revenue	10,838,313	9,864,626
Total operating revenues	64,372,302	58,209,306
Maintenance of way and structures	10,588,678	8,141,892
Maintenance of equipment	13,956,176	10,769,047
Traffic expenses	1,595,954	1,417,094
Transportation expenses	20,486,767	20,576,420
General expenses	1,538,413	1,484,807
Total operating expenses	48,284,016	42,559,670
Taxes	2,852,480	2,552,429
Operating income	13,176,761	13,053,640
Gross income	14,574,110	14,156,814
Net deficit	1,340,222*	1,240,546

*This is after the bookkeeping deduction of $4,536,492 interest charges which were not actually paid by the receiver.

WESTERN MARYLAND

THE Western Maryland board of directors is actively considering a readjustment of the company's financial affairs so as to end what is really, although not technically, a friendly receivership. The Western Maryland has $10,000,000 secured and $6,000,000 unsecured notes now outstanding which are in default as to interest since January 1, 1915, and as to principal since July 1, 1915. The greater part of these notes are owned or controlled by the same interests which control the board of directors of the Western Maryland and technically no receivership has taken place. It ought not to be a very difficult matter to make the necessary readjustment on a basis which will be satisfactory to security-holders. Very wisely, it would seem, the Western Maryland has set its operating house in order before undertaking financial readjustment. So far as can be seen now the splendid showing which was made in the fiscal year ended June 30, 1916, is but the beginning of what may be expected.

In this last fiscal year the company, operating 689 miles of road, earned $10,930,000. This is an increase over the previous year of $2,247,000. There was an increase of only $782,000 in operating expenses, about half of which was in transportation expenses and half in maintenance, leaving an operating income of $3,542,000, an increase over the previous year of $1,422,000. There was a surplus after interest charges, including the unpaid interest charges on the defaulted notes, of $540,000, as contrasted with a deficit in 1915 of $908,000. With its present facilities the Western Maryland ought to be capable of earning over $20,000 a mile—earnings in 1916 were at the rate of $16,165, and in 1915, $13,132. Not only are the facilities adequate for a much larger business, but active steps are being taken to secure it.

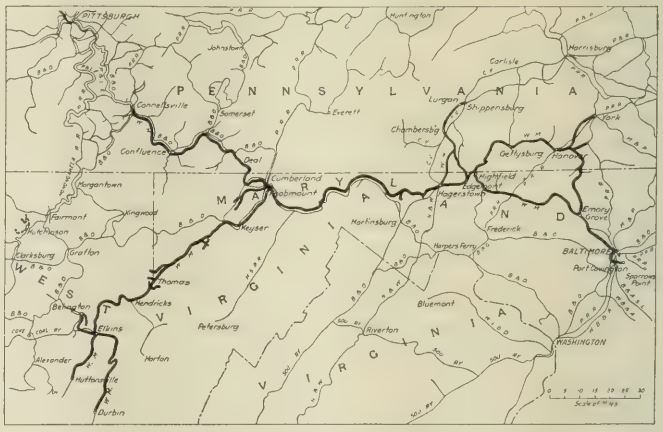
One of the most important of these steps is the development of terminal facilities at Baltimore and Port Covington. At Port Covington the company now has a grain elevator with a capacity of 1,900,000 bushels, and at Baltimore and at Port Covington the railroad company has secured connection with industries, some of them affiliated with the Standard Oil interests, which should give it a very considerable westbound business; and that is what the Western Maryland needs badly to be used in bargaining with the Pittsburgh & Lake Erie for eastbound business at Connellsville, Pa.

The Western Maryland is controlled by the same interests that now control the Consolidation Coal Company, and by the construction of new lines and negotiation of new agreements the Western Maryland is providing for what ought to be a large permanent increase in its coal traffic. The management is demonstrating in a quite conclusive way its ability to handle increased traffic on an increasingly economical basis. All of these things are important factors in the success which ought to attend the reorganization of the company's finances.

The total tonnage of freight handled by the Western Maryland in 1916 was 15,378,000, comparing with 12,205,000 tons handled in 1915. In 1916 bituminous coal furnished 8,820,000 tons of traffic and in 1915, 7,412,000 tons. It will be noted that the proportion of coal tonnage to total tonnage was less in 1916 than in 1915. On the other hand, the total tonnage of manufactures carried in 1916 was 2,238,000, which was 14.55 per cent of the total tonnage carried and compares with 1,525,000 tonnage of manufactures in 1915, which was 12.49 per cent of the total tonnage in that year.

Notwithstanding the fact that the new grain elevator went into operation only in December, 1915, and the addition to it, which increased its capacity by 1,000,000 bushels, was not completed until September, 1916 (after the close of the fiscal year), the tonnage of grain handled by the Western Maryland in 1916 was 450,000, as compared with 77,000 handled in 1915. In the six and a half months during which the elevator was in operation 14,966,000 bushels of grain were received, representing 10,448 carloads and 33 small bay boats. There were loaded at the elevator during the year 127 vessels.

The average revenue trainload of freight in 1916 was 837



The Western Maryland

tons, an increase of 102 tons. This very remarkable increase in trainloading has been previously quite fully discussed in these columns. The average receipts per ton per mile in 1916 were 5.01 mills and in 1915, 5.24 mills. The average length of haul was 122 miles in 1916 and 116 miles in the year 1915.

The passenger business of the Western Maryland is not profitable. Average passenger-train earnings, including not only passenger fares but incidental earnings from passenger trains, is less than one dollar per mile, being 94.126 cents in 1916 as against 93.289 cents in 1915. The West Virginia authorities gave the Western Maryland permission to raise its intrastate rates from two to two and a half cents, but something further will have to be done if this branch of the service is not to continue to be a parasite.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	676	661
Freight revenue	$9,386,082	$7,326,471
Passenger revenue	952,741	948,777
Total operating revenues	10,930,369	8,683,459
Maintenance of way and structures	1,269,245	1,204,048
Maintenance of equipment	1,736,704	1,479,331
Traffic expenses	257,528	260,136
Transportation expenses	3,452,852	3,056,078
General expenses	245,436	229,063
Total operating expenses	7,039,608	6,257,412
Taxes	349,161	306,859
Operating income	3,541,670	2,118,258
Gross income	3,854,563	2,387,124
Net income	539,693	907,905*

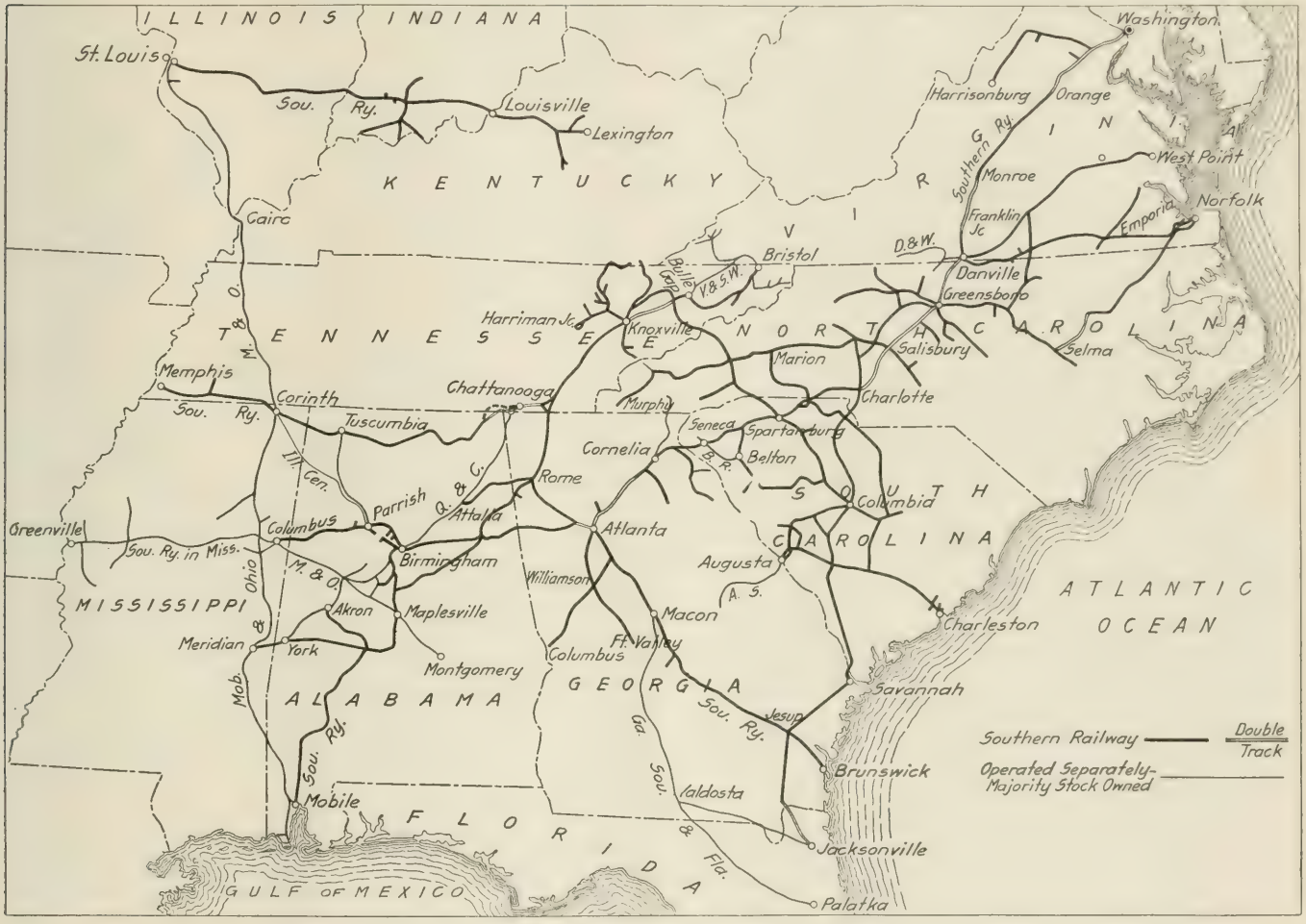
*Deficit.

SOUTHERN RAILWAY

WHEN as much can be accomplished by the application of the fundamental principles of good railroading as has been accomplished on the Southern Railway in the last two years, no large railroad in this growing country seems hopeless. Expenses, cut drastically enough to meet an emergency such as was presented by the conditions in the South during the first year of the European war and the consequent demoralization of cotton prices, were, with the return of prosperity and with a freight traffic the greatest in the history of the Southern Railway cut still further, and the directors with a surplus of over nine million dollars refused to resume dividends on the preferred stock.

Total operating revenues in the fiscal year ended June 30, 1916, were $69,998,000, an increase of $7,798,000 over 1915, and only slightly less than the operating revenues of 1914 ($70,751,000), which were the greatest in the history of the company. Operating expenses in 1916 amounted to $46,041,000, or $134,000 less than in 1915, and $5,720,000 less than in 1914. The reduction in expenses was the result of a saving of $267,000 in the amount spent for maintenance of way and $206,000 in the cost of solicitation of the traffic and a slight reduction in transportation expenses. There was an increase of $492,000 in the amount spent for maintenance of equipment. The reduction in maintenance of way expenses and transportation expenses is truly remarkable. It is a fact, of course, that the Southern Railway management was not stampeded into making any uneconomically drastic cut in maintenance of way appropriations even in the fiscal year ended June 30, 1915, but a considerable reduction was made in 1915 as compared with 1914, and the still further reduction in 1916 was notwithstanding quite extraordinary expenses necessitated by a very severe flood in North Carolina in July. In all, 686 miles of railroad in North and South Carolina and Tennessee were put out of service by the storm and it was over a month and a half before the most badly damaged line—that between Asheville, N. C., and Salisbury—was in shape for the resumption of service.

The additional charges for operating trains under flood conditions should be borne in mind in comparing transportation expenses in 1916 and in 1915. The total ton mileage of all freight in 1916 was 6,298,000,000 an increase of 19.30 per cent over the previous year, and the passenger mileage was 783,140,000, an increase of 3.19 per cent. To handle this great increase in business there was an increase of only 3.44 per cent in freight train mileage and a decrease of 6.30 per cent in passenger train mileage. The average trainload of all freight was 442 tons in 1916, an increase of 15.52 per cent over 1915, and nearly double the average trainload in 1908.



The Southern Railway

penditures on loss and damage to freight and injuries to persons. Loss and damage to freight cost $845,000 in 1916, a reduction as compared with the previous year of $117,000, and injuries to persons cost $642,000, a decrease of $230,000 as compared with the previous year.

The gain in trainloading was helped by a smaller percentage of empty car-miles, the increase in loaded car mileage being 15.16 per cent and the decrease in empty car mileage, 7.30 per cent, but was not the result of any additions to the number of locomotives available. No new equipment was bought and received by the Southern in 1916, although contracts were made for 45 locomotives, 3,335 freight cars and 60 passenger-train cars. Maintenance of equipment expenses in 1916 amounted to $11,184,000, an increase as compared with 1915 of $492,000. At the beginning of the year the percentage of bad order freight cars to all freight cars owned was 11.65 per cent; at the end of the year it was 1.58 per cent. This latter figure is remarkably low and was the result both of a comprehensive program of repairing cars that needed repairs and of scrapping cars that were not economical to repair. It so happened that because of the high price of scrap, retirement charges were less in 1916 than in 1915, notwithstanding the fact that 1,259 more units of equipment were retired in 1916 than in 1915.

There was $6,369,000 spent for additions and betterments to lines other than the Atlanta & Charlotte Air Line, on which $2,556,000 was spent during the year for double track. This is part of the double track of the main line from Washington to Atlanta for which funds are being raised by the sale of first mortgage bonds of the Atlanta & Charlotte Air Line Railway Company. There was $7,000,000 of these bonds sold during the year.

In this year's annual report of the Southern there is a table showing revenue and net revenue per mile of road on each of the ten main lines which, as President Harrison says, "constitute the backbone of the system." The Washington-Atlanta line, 663 miles long, the greater part of which has now been double tracked and grades reduced to five-tenths of one per cent and curves to a maximum of four degrees, earned in 1916 $25,896 per mile and had an operating ratio of 57.33 per cent. The ratio of transportation expenses to revenue was 26.95 per cent. The main line from Atlanta to Birmingham—171 miles long—is typical of the old Southern Railway—1 per cent grades, 6 deg. curves, and with very little tangent or level line, all single track. In 1916 this line earned $12,207 per mile; its operating ratio was 83.58 per cent, and its ratio of transportation expenses to revenue, 40.70 per cent. A careful study of further details of this table bears out irrefutably the wisdom of the expenditures for making a modern double-track railroad out of the Southern's main line from Washington to Atlanta.

The total tonnage of freight was 30,272,000 in 1916, an increase over the previous year of 4,376,000 tons. The large increase came in the tonnage of bituminous coal, which tonnage in 1916 amounted to 8,659,000, an increase of 1,224,000 tons. Of the total tonnage carried in 1916 only 11.86 per cent was furnished by products of agriculture as against 13.80 per cent in 1915, and of the total tonnage in 1916, 16.90 per cent was products of forests, and in 1915, 15.52 per cent. As President Harrison points out in his report, "It is a common fallacy to assume that the success of a railroad in the South depends upon the tonnage of raw cotton carried." Cotton is the cash crop of the South and the total price received for it is a measure of the prosperity of the territory. The earnings of the Southern Railway reflect actually and closely the prosperity of the region served. "Fifteen cent cotton" is what the South wants, with an expansion of its manufacturing and cotton raising industries.

In 1916 there were 684 new plants completed along the lines of the Southern Railway, representing an investment of $35,245,000, which was in addition to a further investment of $16,889,000 in already established manufacturing plants.

It is interesting to note that the basing point system of rates which has been such a fundamental characteristic of the Southeast is being abolished under the direction of the Interstate Commerce Commission, and President Harrison says that "there is no evidence, after a trial of more than six months, of injury to any industrial or commercial interest. It is believed that with the completion of this work of reconstruction our people as a whole will be better satisfied than ever before with our system of rates." Every stockholder of the Southern Railway and every business man in the territory served by the Southern Railway ought to read President Harrison's letter of transmittal which accompanies this year's annual report. It is a frank, intensely interesting, perfectly simple rendering of an account of the management's stewardship of the property, with a free and inspiring expression of the hopes for the future of the Southern Railway and the people of the South that is absolutely unique in "financial" literature.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	7,023	7,031
Freight revenue	$47,020,482	$40,458,858
Passenger revenue	16,615,857	16,175,674
Total operating revenues	69,997,675	62,199,510
Maintenance of way and structures	8,175,411	8,452,119
Maintenance of equipment	11,183,701	10,691,267
Traffic expenses	1,904,129	2,110,467
Transportation expenses	22,751,698	22,757,597
General expenses	2,038,702	2,019,621
Total operating expenses	46,041,116	46,174,711
Taxes	2,916,427	2,595,828
Operating income	21,004,005	13,400,055
Gross income	24,426,031	16,638,972
Net income	9,333,899	1,600,557

BOSTON & MAINE

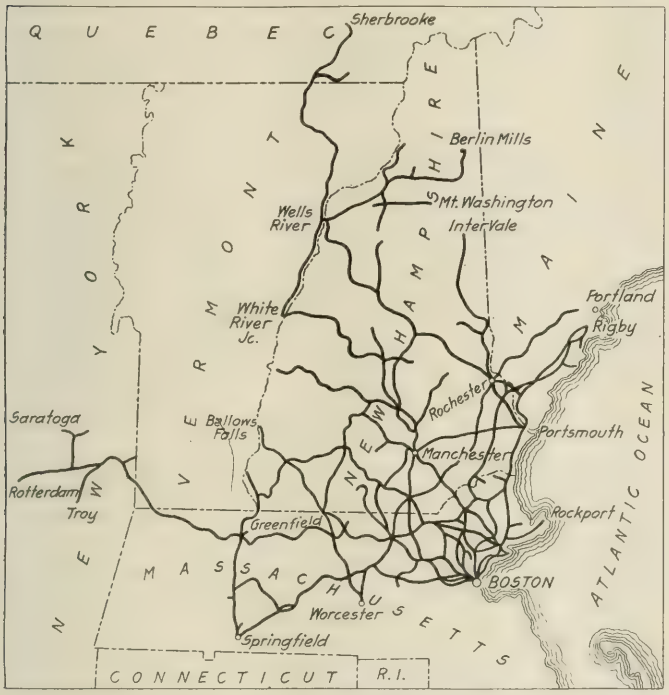
CONDITIONS affecting railroad operation were abnormal in New England in the fiscal year ended June 30, 1916, which accounts for the fact that the Boston & Maine in that year earned a surplus, after paying interest and rental charges, equal to nearly 10 per cent on its total stock outstanding. Since the close of the fiscal year the company voluntarily submitted to a temporary receivership. It has been recognized for more than two years that some readjustment of the Boston & Maine's finances was a necessity. If there was any hope that earnings would continue indefinitely in the future at as high a rate for the Boston & Maine as in 1916, it might be comparatively easy to make a readjustment which would be fairly satisfactory to everyone concerned; but even the most optimistic of Boston & Maine securityholders can hardly believe that the present rate of manufacture in New England and general prosperity can be counted on to continue year after year.

The total mileage of railroad operated by the Boston & Maine is 2,252, but of this only 708 miles is owned and the remaining 1,544 miles is leased. Interest on funded debt of the Boston & Maine amounts only to $1,755,000 a year, but rent for leased lines amounts to $5,626,000 a year. A considerable part of this rental is paid in the form of guaranteed dividends on stock of non-operating companies. The proposed reorganization plan would give the holders of this guaranteed stock Boston & Maine securities yielding the same rate of interest which they are now getting, but by making the property of these roads now leased a part of the assets of the Boston & Maine it would be possible to work out a scheme of permanent financing. It was the failure of all the interests involved, and especially of minority interests among the leased lines stockholders to agree to this plan, that made the temporary receivership necessary.

Total operating revenues for the Boston & Maine in 1916 were $50,599,000, an increase as compared with the previous year of 11.22 per cent. Expenses increased by less than 1 per cent, so that after paying taxes the Boston & Maine had $13,889,000 operating income, an increase of $5,109,000 as com-

pared with the previous year. The interesting feature about the success with which the operating expenses were held down lies in the fact that although maintenance of way expenses were decreased by $1,210,000 because of particular circumstances, the company was able to hold transportation expenses down to $21,743,000, or only 7.84 per cent more than in the previous year while doing a freight business 22.12 per cent greater in 1916 than in 1915 and handling this business under quite extraordinarily difficult operating conditions.

The total tonnage of revenue freight carried in 1916 amounted to 26,497,000, an increase as compared with the previous year of 3,819,000 tons. Each class of commodities showed an increased tonnage, but the largest increases came in the tonnage of bituminous coal and of manufactures. The total tonnage of manufactures carried in 1916 was 5,970,000, or 22.5 per cent of the total of all tonnage carried. This is an increase of 1,273,000 tons over 1915, the 1915 tonnage of manufactures being 20.7 per cent of the total tonnage carried in that year. The tonnage of bituminous coal carried in 1916 was 3,232,000, or 12.2 per cent of the total tonnage carried. This was an increase of 528,000 tons over 1915. The tonnage of bituminous coal in 1915 formed 11.9 per cent of the



The Boston & Maine

total tonnage carried in that year. The average length of haul was 112 miles in 1916, an increase of a little over 5 miles as compared with the previous year. The average ton-mile rate was 1.079 cents, a decrease of 0.035 cent as compared with the previous year. Trainloading was probably helped some by the smaller proportion of empty cars. The average number of loaded cars per train in 1916 was 21.34, an increase of 1.04 per cent, and the average number of empty cars, 7.83, a decrease of 2.49 per cent. What help there was, however, from this source was probably more than offset by the difficulties due to congestion. Notwithstanding these difficulties the average trainload of all freight in 1916 was 381 tons, an increase of a little over 29 tons, or 8.32 per cent.

The Boston & Maine's passenger business is not profitable, and while the service has to be maintained—the passenger-train mileage in 1916 was 11,244,000, an increase of 1.52 per cent as compared with the previous year—the business and in even greater proportion the revenue from it is falling off. Total passenger-train revenue was $17,790,000 in 1916, a decrease of about half of one per cent, and the passenger revenue from passengers only was $14,782,000, a decrease of over 3 per cent. The commutation business, as would be expected, is increasing, but it is in the local and interline business that the Boston & Maine is feeling the effects of automobile competition quite severely. The number of monthly ticket passengers carried (commuters) was 6,603,000 in 1916, an increase of 742,000, or 12.66 per cent. The number of local passengers, exclusive of monthly ticket holders, was 33,836,000, a decrease as compared with the previous year of 1,641,000. The number of interline passengers carried was 2,080,000 in 1916, a decrease of 44,000. The average revenue from monthly ticket holders per passenger-mile is but 6.53 mills. The average revenue per passenger-mile for local passengers, exclusive of monthly ticket holders, is 2.016 cents and for interline passengers, 2.248 cents. This is a decrease as compared with 1915 of 2.49 per cent for monthly ticket holders, 4.89 per cent for other local passengers, and 3.64 per cent for interline passengers. President Hustis says in his annual report:

"In the report of the Conference of Railroad Commissioners of New England, under date of November 24, 1913, in which Commissioner Prouty of the Interstate Commerce Commission concurred, the advisability of increasing passenger fares was suggested and the opinion was expressed that the statutes of the New England states which might interfere with a uniform treatment of this subject should be so modified that, if possible, some just rule applicable to all territory might be formulated. Acting upon these suggestions an effort was made to revise and standardize the passenger tariffs so as to effect a scientific rate schedule which would on the whole yield a greater revenue from that branch of the service but would involve certain reductions where the rates then in force were greater than the proposed standards. The plan as worked out, however, was, after hearings before the state commissions, modified in important details, so that the schedules as finally approved by the various commissions do not produce the expected, if indeed they produce any substantial increased revenues."

It is interesting to note that during the past three years the number of registered automobiles in the five states served by the Boston & Maine has increased on an average of 31 per cent a year. There is an automobile for every 34 persons in Massachusetts, for every 30 persons in New Hampshire, for every 39 persons in Maine, for every 32 persons in Vermont and for every 39 persons in New York.

The decrease of $1,210,000 in maintenance of way expenses is not indicative of a policy of retrenchment in maintenance expenditures on the part of the management. The management was not able to spend as much money for maintenance as it wanted to, not because of lack of money but because of lack of labor and because of a strike of section men early in May. The 1915 maintenance expenses represented really two seasons' outlay. The policy of doing maintenance work as early in the spring as weather conditions would permit was adopted during that year, so that in the fiscal year ended June 30, 1915, there was the greater part of the maintenance expenses of the summer of 1914 and also of 1915. The same policy would have been pursued in 1916, insofar as doing the maintenance of way work early, if labor had been available. The demand, however, for unskilled labor in New England during the past year has far exceeded the supply, and as usual the railway companies are the chief sufferers. The 1916 maintenance expenses, therefore, had the normal proportion of the summer of 1915 expenses under the new policy but not of the summer of 1916.

Notwithstanding the fact that the present rate of earnings on the Boston & Maine cannot be expected to continue indefinitely, the fact that the company has had these large earnings and has succeeded in saving a large sum for surplus ought to make it easier for a reorganization to take place.

At the end of 1916 the company had $8,443,000 cash. There are outstanding $13,306,000 loans and bills payable. It is the necessity for permanently financing these loans and bills payable that was the immediate cause of the receiver-

ship, although the underlying cause was the failure of the minority interests to agree to the proposed plan of reorganization.

The table below shows principal figures for 1916 and 1915:

	1916	1915
Mileage operated	2,252	2,252
Freight revenue	$31,963,489	$26,912,397
Passenger revenue	15,028,317	15,502,197
Total operating revenues	52,075,428	46,673,049
Maintenance of way and structures	5,986,603	7,197,017
Maintenance of equipment	6,588,044	6,697,311
Traffic expenses	421,797	448,090
Transportation expenses	21,742,534	20,162,572
General expenses	1,238,292	1,188,851
Total operating expenses	36,197,958	35,909,772
Taxes	1,986,267	1,978,223
Operating income	13,888,578	8,779,110
Gross income	15,059,293	9,983,584
Net income	4,065,691	334,462*

*Deficit.

HOCKING VALLEY

THE Hocking Valley is controlled by the Chesapeake & Ohio, but, except as to general policy, its operation is under the direction of its own local officers. It operates only 350 miles of road, but this 350 miles is a very busy railroad. In 1916 the freight density (revenue tons carried one mile per mile of road) was 4,210,000. Total operating revenues amounted to $7,412,000. The road runs from the coal fields in the neighborhood of Hocking, Ohio, north, through Columbus to Toledo. As explained in the comments in these columns on the Chesapeake & Ohio's annual report, the Hocking Valley will get a connection with the Chesapeake & Ohio by means of the new line—the Chesapeake & Ohio Northern—which is being built from near Portsmouth, Ky., to Waverly, Ohio, from which point the Chesapeake & Ohio has made arrangements for trackage rights over the Norfolk & Western to Valley Crossing, just south of Columbus, on the Hocking. This connection will presumably give the Hocking a very largely increased volume of coal traffic, and it is expected that it will be in operation by the opening of the navigation season on the Great Lakes.

In the fiscal year ended June 30, 1916, the Hocking Valley enjoyed its full share of the heavy business which the soft coal roads have been doing for more than a year now and handled the increased business without any increased facilities so economically as to have a net income available for dividends of $1,082,000, or more than twice the amount available from the earnings of the 1915 fiscal year.

Total operating revenues in 1916 were $7,412,000, an increase of $1,230,000, or 19.9 per cent over the previous year. Total operating expenses amounted to $4,954,000, an increase of $769,000, or 18 per cent over the previous year. All but about $100,000 of this increase in expenses was in the charges for maintenance of equipment. There was spent for repairs to freight cars in 1916 $979,000, an increase as compared with the previous year of $465,000. While there may have been some delayed maintenance to take up in 1916 in the repair of freight cars, in large part the increase this year as compared with last represents the thorough overhauling of a very considerable proportion of freight cars in service to put them in condition for handling the heavy traffic which will come with the opening of the connection with the Chesapeake & Ohio.

Transportation expenses amounted to $2,137,000 in 1916, an increase of only 5.1 per cent. This increase contrasts with an increase of 26 per cent in the ton mileage of freight handled, the total in 1916 being 1,477,000,000. The number of passengers carried in 1916 was 1,414,000, a decrease of 4.9 per cent; but the average passenger journey was 31.49 miles, an increase of 5.8 per cent, so that the passenger mileage in the two years was about the same.

It is interesting to note that the total freight car mileage in 1916 was 65,589,000, an increase of 14.5 per cent over the previous year, accounted for by an increase of 19.3 per cent in loaded car mileage and 8.6 per cent in empty car mileage, so that the percentage of empty car mileage to total was reduced to 42.2 per cent in 1916 as compared with 44.7 per cent in 1915.

The Hocking Valley gets a very low ton-mile rate on its coal, but for so short a road gets a long average haul. The ton-mile rate on coal in 1916 was 3.37 mills, a decrease of 2.6 per cent as compared with the previous year. The average ton-mile rate on all freight, including coal, was 4.06 mills, a decrease of 3.1 per cent as compared with the previous year. It is obvious that to secure an operating ratio below 70 with so low a ton-mile rate as this very large trainloads must be hauled. The average revenue trainload on the Hocking Valley in 1916 was 1,159 tons, an increase over the previous year of 124 tons, or 12 per cent. This is certainly a fine showing, more especially when we remember that there were no locomotives added during the year. There were $4,000,000 one-year 6 per cent notes refunded during the year by the issue of a like amount of two-year 5 per cent notes.

In the prosperous year 1916, with all the evidences that there are of strict economy and efficiency in operation, the total operating income was at the rate of only 6.24 per cent return on the property investment. This is not outstanding securities, it must be remembered, but actual investment in railroad property. In 1915, an unprosperous year, the return on the investment was only 3.90 per cent and the average for the past five years has been 5.57 per cent.

The table below shows principal figures for 1916 and 1915:

	1916	1915
Average mileage operated	351	352
Freight revenue	$5,996,618	$4,912,982
Passenger revenue	861,174	832,733
Total operating revenues	7,411,526	6,181,153
Maintenance of way and structures	728,178	707,207
Maintenance of equipment	1,814,110	1,158,671
Traffic expenses	99,747	110,916
Transportation expenses	2,137,472	2,033,491
General expenses	174,070	172,602
Total operating expenses	4,953,577	4,184,370
Taxes	501,752	418,522
Operating income	1,955,697	1,577,216
Gross income	2,347,709	1,839,853
Net income	1,081,766	493,402
Dividends	439,980	439,980
Surplus	641,786	53,422

NEW BOOKS

The Mechanical Handling and Storing of Materials. By George Frederick Zimmer, A. M. Inst., C. E. 744 pages. 7½ in. by 10½ in. Bound in cloth. Published by D. Van Nostrand Company, New York. Price $12.50.

It has long been accepted as a fact that labor-saving devices as an aid to human endeavor are absolutely essential to progress. At no time has this been more particularly the case than at the present because of the ever increasing scarcity of labor. The treatise which Mr. Zimmer has written on this subject covers the field in a most comprehensive manner. The contents of the volume are arranged under two general divisions: The continuous handling of material and intermittent handling. The subject of continuous handling of materials is classified under three heads: (1) appliances for lifting in a vertical direction or from one level to another, commonly called elevators; (2) appliances for moving material in a horizontal direction, commonly called conveyors; (3) appliances which combine the two, elevating and conveying the material horizontally at the same time. No attempt is made to classify the intermittent handling of material under distinctive heads. The mechanical details of the many devices are discussed in full and concrete examples are given of the many advantages and economies resulting from their use. The volume also contains many descriptive articles describing the handling plants in operation. These articles are fully illustrated and are of especial interest as they show fully what has actually been accomplished under varied conditions. Mr. Zimmer's book is interestingly written and cannot fail to be of great interest and value to all who are in any way concerned in the economical and prompt handling of materials. The chapters devoted to coal and ash handling appliances, as well as those devoted to construction, are of especial interest to men in the railroad field.

Letters to the Editor

A PLAN FOR PREVENTING STRIKES

BUFFALO, N. Y.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The appalling situation in which the railroads of the country find themselves indicates that they can expect no help from the executive or legislative branches of the government. Possibly, they can still rely on the third co-ordinate branch—the judicial.

I offer the following suggestion as a means to curb the autocratic and tyrannical control of the brotherhoods by their irresponsible leaders: In hiring new men for the train service, or, for any service, if it is desirable to go to that extreme, let the antecedents and qualifications of the candidate be inquired into, the physical and medical examination, etc., be made as usual, and then require the applicant to execute the following contract precedent to giving him employment. It is not a contract obtained under duress. The applicant for the position is at perfect liberty to refuse to sign and to look elsewhere for a job. But, if he decides to enter the service of a public service corporation, he must recognize the fact that he has enlisted in an industrial army where his services are necessary to the well being of the public, and that he can no more desert his post than a soldier:

"In consideration of one dollar lawful money, well and truly paid to me in hand, and the receipt whereof is hereby acknowledged, and in further consideration of receiving employment as..... on the.....railroad, I do hereby agree to give up my right to strike in unison with other employees, although I am to be at perfect liberty to leave the service of the company as an individual at any time. In lieu of the right to strike, I hereby agree to submit my grievances and demands to arbitration under the so-called Newlands Act.

"Given under my hand and seal this .... day of ....., 191.., in the presence of the following witnesses.

"(Signed) ....."

E

TRAIN DESPATCHERS AS OFFICERS

HAILEYVILLE, Okla.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE.

The article on the above subject which appeared in the *Railway Age Gazette* of September 8 again brings up an old, old question. The word "officer," as defined by Webster, may be interpreted in different ways by different people. A general superintendent of a railroad is an officer, yet at the same time his authority is curtailed by reason of the rules of the company and those of the general manager's office. A question might arise on which his judgment would prompt him to do one thing while the rules would force him to act in another direction. So with the train despatcher. Therefore, it does not seem reasonable to presume that the mere fact of the despatcher being invested with the authority to sign his name to train orders would give him any more prestige. The train order forms are all prescribed in the book of rules and approved by the management, and the despatcher is not allowed to deviate therefrom. His signature to the orders will not have any more effect on their being executed than if they were signed by the chief despatcher or the trainmaster. The despatcher's name on the order would not permit him to use any other forms nor could he take a single minute more of a passenger train's time.

In my opinion the train orders and all other documents issued under a superintendent's authority should be signed with the superintendent's name. The chief clerk signs that name to all office matters, some of which are as important as train orders, in a way. They would not become more effective if the chief clerk signed his own name to them.

At times, in cases of breakdowns or blockades, or something out of the ordinary, the despatcher may ask the chief despatcher or the trainmaster to give an opinion as to the handling of certain matters. If they inform him what in their judgment should be done, and he takes their advice, he would be signing his own name to something originated by the other fellow.

As far as I am personally concerned, it makes no difference whose signature is put on the orders. I can make just as good time orders and meeting points, and my brain will work just as well in deciding on some unexpected proposition regardless of whose name is signed to the orders.

In all of my experience as a trick and chief despatcher I have always been treated well by the officers. Of course, like all others, I have been associated with some minor officers who thought that the road could not run without them, but it did not take me long to work them over until they were good friends. If you run up against a "Smart Alec," whether he be an officer or what, there is a way to handle him, and make him like you; and at the same time make a permanent friend of him. Where there is discord with the trainmaster's and chief despatcher's offices the feeling extends further down the line. The trick men will take sides with this and that one, and then there is a bad humor throughout the entire force. The sooner such a condition is corrected the better for all concerned.

But the despatcher may be classed as an officer of the company, whatever name he attaches to train orders, and he should receive the same courtesies that other officers do in all directions. He should have Pullman transportation for himself and his wife over his own road and be able to secure it over other roads when going away. He should have express company franks, so that if he wants to make a few bargain purchases in the cities he won't have to pay transportation charges on them. When attending the train despatchers' annual convention he should be allowed full expenses while away, and he should be allowed to attend staff meetings occasionally, under the same arrangement. Of course, all despatchers cannot attend the same meeting, but one from each office can go, provided an arrangement is made for relief. The despatchers should also be allowed to make trips out on the road at certain intervals in order to keep up with the improvements and changes and to more fully keep in touch with road conditions. It is a good education to him to actually witness a big "saw" of freight and passenger trains at a congested station. Some few years ago while I was on the Missouri Pacific there was a rule in force that each despatcher must make a trip over his division every sixty days and make a full and complete write up of it: four copies, one for the chief despatcher, one for the trainmaster, one for the superintendent and one to be sent by the superintendent to the general superintendent's office. This gave the officers an idea of what kind of observers the despatchers were. Expenses were allowed on these trips and regular trips were compulsory.

So far as the item of transportation is concerned it is a well known fact that a large number of clerks both in and out of the general offices are provided with Pullman, steamship and almost any other kind of passes that can be mentioned. The lowest grade of traveling freight agent and most agents at large stations are furnished Pullman transportation, then why not the despatcher? If he is an officer there should be no distinction.

Every operating officer should agree with Mr. Clapp, superintendent of telegraph of the Northern Pacific, that when vacancies occur on a railroad all despatchers should have a chance at them. To a man who has been working at a small out-of-the-way place the chance to locate in a better town, or in some particular place in order to have the advantages of school for his children is a great benefit. This plan would afford the extra men a better chance to secure a regular job and would no doubt be the means of keeping

more good men on the road. As it is now, each division generally takes care of its own office. When a man is hired for a little extra work, he is let go when he is through, whereas, if the Northern Pacific system were in vogue no doubt this man could locate somewhere else on the road and eventually land a permanent job. J. L. Coss.

A PROTEST TO AMERICAN RAILROAD EXECUTIVES

Chicago, Ill.

To the Editor of The Railway Age Gazette:

The article in your issue of September 15, on "The High Cost of Expediency," should impress railroad managers with the necessity of building for future needs; future needs, I mean, as regards organization and discipline, as well as in physical structures. How many presidents have read that article? Is it overdrawn? If so, it should not go unchallenged. If not, it certainly merits at least a few "amens" from the executives. Thousands, no doubt, of the loyal unorganized men are eagerly waiting for an expression indicating that the beginning of the end (of the discrimination in favor of the brotherhoods) is in sight.

Comparatively few roads have given this matter anything like the attention it deserves. The slipshod way in which most of them have handled the matter, is not fair to the few roads that have made the proper effort. It is not fair to the men themselves.

Take, for instance, the way the seniority clause in the agreements is handled by most roads. Generally speaking, all that a fireman or a brakeman has to do to get promoted to the position of engineer or conductor, is to hold on to his position until his seniority automatically lands him there, regardless of merit. The same procedure holds good, usually, for the more important or preferred runs, local freight, passenger, etc. Inability to spell the most common words, or to write half-way plainly; even gross illiteracy, will make little or no difference on most roads today; and a really hostile attitude toward the company and its officers many times proves no obstacle.

Everybody knows how this situation has been brought about. It is by general officers overruling local officers on pressure by the grievance committees. Many times this course is taken simply to avoid meeting the grievance committee—simply getting by today, regardless of the morrow. The result is that the men have gradually grown more arrogant toward the local officers; and these officers have done what any other set of men would have done under similar circumstances; they have given up the fight, because they had everything to lose. They could foresee increased loss of respect from the men and loss of chances of promotion on account of the continual stream of grievances.

The idea that men can be handled as so many pegs in a board is too absurd to admit of argument; and yet that is just what has been attempted, all over the country, in the actual working of the seniority clause.

When the grievers put up their grand bluff the general officers, rather than dig into the facts of each case, too often have seen fit to be good fellows, overruling the superintendent, the master mechanic and the trainmaster. Each time they not only have established a precedent, but have encouraged the men to bring a bigger budget next time. This is the way all of the arbitrary allowances and outrageous rulings referred to by your correspondent were put through. The movement very often was accelerated through the appointment to official positions of men from the ranks of the brotherhoods.

Too many general officers, in handling these matters with the grievance committees, act as though their own superior knowledge in the premises, must be accepted as the last word. If they do not have that idea, why do they not always have the local officer present at all sessions with the grievance committee? In point of fact their eminence does *not* always give them a comprehensive survey of the whole field below. Their long distance glasses don't read far enough.

We seem to have all but lost sight of the fact that no man can rise to his best without the stimulation that accompanies competition. A man is not fit for promotion who does not feel that it is a reward of merit, and that he has earned it. Nothing could be more false than the prevalent idea among trainmen that a man can claim a certain job because it belongs to him; because he just happened to be there, and ready to fall into the dead man's shoes by right of succession. No man will make a decent approach to his own possibilities, who does not feel conscious at all times that his superior officer is watching him closely. It is essential that he realize that his advancement depends upon his application to duty, as well as his general conduct. The successful foreman or officer must not only command the respect of his men, in the ordinary sense; he must also be in position to command fear, sufficient to enable him to enforce this respect; and this commanding position has long since been taken away from the division heads by the general officers.

Am I putting the case too strong? I wish that could truly be said. The general officers have not only forced the local officers to continually yield to untenable and even outrageous demands, but have continued to do so themselves, until the brotherhoods have all but backed them off the board. To hold that the simple fact that the men have been given an agreement or contract presupposes such a hypothetical corollary is the most puerile superstition. The men in the ranks of the brotherhood are human, and in great measure are what we have made them. Environment counts, as everywhere else. The majority of these men will stand for a square deal, when they are given the opportunity, and are made to see that it pays. The grievance committees are all the time forcing reinstatement and other outrageous demands which the best of the men do not approve of. Not only this; these conservatives would never stand for such doings if the railroads would stand, and give them the chance to stand.

Power, as well as greatness, is best seen in perspective; the managements have shied away from the advances of the brotherhoods for so long, that their very shadow has been greatly magnified; metamorphosed into a great white ghost. What is the remedy?

General officers and executives must face the situation as it is. Make the local officer the big man that he was, generally speaking, 20 years ago (and is on a few roads now). If he hasn't the stuff in him, put in a man who has; men can be found. Be very careful in selecting men from the brotherhoods for official positions. In making promotions to the position of general superintendent or general manager, take fewer men on account of some spectacular feat, or bold front. Draw from the ranks those who, by their actual work, have proved their fidelity and all-around knowledge. This is a feature of railroad operation which is so fundamental and far reaching that it should engage the attention of the highest executive officers. May we not hope for more activity on the part of these officers as a result of their recent experience? That they have neglected the matter is evidenced by the fact that very, very seldom does one of them give expression to his views publicly on this present critical situation. That article—"The High Cost of Expediency" must arouse distressing reflections in the mind of many an ambitious, sincere officer, who realizes how the big men shy off from the subject. Won't some one speak out!

Truly, personality continues to be an offense, and for that reason my humble position forces me to simply sign this with my title. We small fish can not openly advocate a reform that evidently lacks the approval, or at least lacks the open support, of our superiors. A Superintendent.

The United States Forest Products Laboratory

This Bureau Is Co-operating with the Railways in Studies of Timber Preservation and Several Other Lines



ONE branch of the United States Government service which is carrying on a large amount of important research work for the railways and with which most railroad men are unfamiliar is the Forest Products Laboratory of the United States Department of Agriculture, which is maintained in co-operation with the University of Wisconsin at Madison, Wis. This laboratory was established about six years ago to co-operate with the producers and the consumers of wood and its products to promote the better and more economical use of timber. It has undertaken a large number of laboratory investigations, many of which have extended over several years. Several of these studies have been of direct value to the railways, while others have been of indirect but nevertheless important service to the roads during the creation of new traffic in materials formerly considered as worthless.

The laboratory occupies a large building of its own with track facilities to permit the delivery of materials at its door. It is in charge of a director with assistants in charge of the various departments. There is a total of about 100 employees.

The work of most direct interest to the railways has been that connected with the preservation of ties and the compilation of information concerning the service secured from treated and untreated timbers in tracks. The laboratory, co-operating with different railways, has installed 10 test sections of track, each about one mile in length, in different parts of the country. One new section was completed last year. These sections are laid with ties of different timbers treated with various kinds and amounts of preservations. These and other test sections installed independently by the railways are inspected annually by representatives of the laboratory and the roads interested. The laboratory is treating 200 ties each year with purely experimental materials and placing them in track for observation in the endeavor to discover substitutes for the preservative materials now in use. In these tests two new chemicals or mixtures are tried each year. Two mixtures of crude oil and creosote were employed in the ties treated last spring. Another chemical which is now receiving the attention of the laboratory in the preservation of ties is sodium fluoride. This material is available in large quantities at a present cost of 10c. per lb. as compared with 13c. for zinc chloride, while it is twice as toxic as the chloride. These prices, however, are abnormal owing to the war. While no conclusions have yet been drawn, present indications are promising.

As an example of the information which has been derived from the test sections, that installed in the main track of the Chicago & Northwestern near Janesville, Wis., may be cited. At the time this section was placed in service about eight years ago the treatment of hemlock ties was not favorably considered by the trackmen in whose divisions the experimental ties were laid. Both treated and untreated hemlock ties are laid in this section and at the present time, although all of the untreated ties have been removed, almost all of those treated at that time are still in service. As a result of this and similar information, the use of hemlock for tie timber is increasing materially.

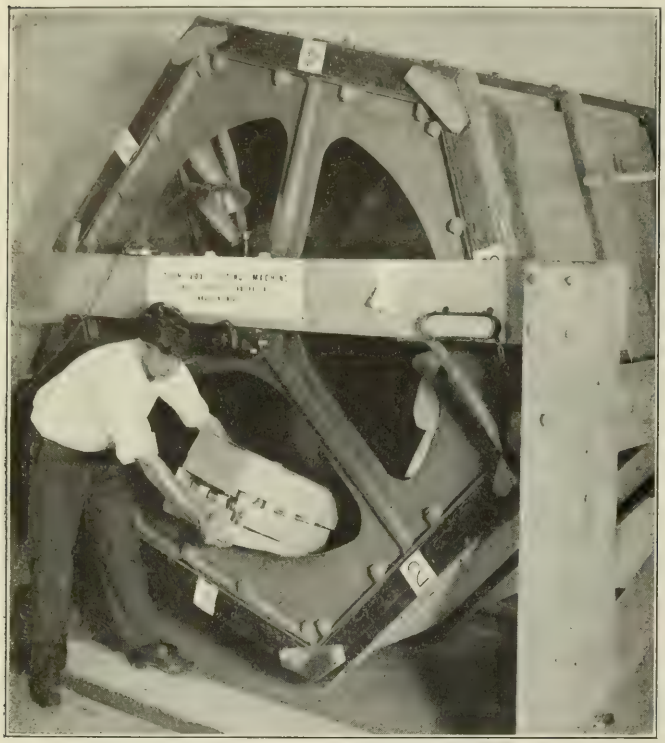
This organization is now completing a guide book on ties to assist a producer without technical knowledge of timber in the determination of the different kinds of woods and in their distinguishing characteristics. This is made possible by printed information and the liberal use of photographs. The purpose in preparing it is to furnish information scientifically correct, presented in terms with which the inspectors are familiar. This has involved investigations extending over a period of more than three years. Most of the information had to be prepared expressly for this purpose, as it was not available elsewhere. To transfer the information from the scientific terms into those intelligible to the timber inspectors, the author spent several months among these men in the field. After the manuscript was completed copies were sent to a number of representative inspectors for their criticism and suggestions. This book will be published in the near future.

The Forest Products laboratory has also conducted an extensive series of tests on long leaf pine piles. These piles have been submerged in waters infested with marine borers in the Gulf of Mexico and along the Atlantic Coast. As a result of the information secured in this way the laboratory is now in a position to draw up specifications for creosote oil for use in the treatment of piling to be placed in these waters to protect them against these insects. The creosote most suitable is that composed of the high boiling fractions mixed with from 10 per cent to 15 per cent of tar.

Experiments have also been conducted with mixtures of oil and metallic salts in an endeavor to reduce the cost of

treatment without impairing its value. The laboratory has co-operated with the Bureau of Fisheries in an extensive series of tests of piling subjected to the attacks of marine borers in the waters of the Southern Atlantic Coast. It was found in these investigations that it was entirely possible to kill these insects with the preservative when young and prevent them from entering the timber, but that when they had attained considerable size they would pass through treated timber apparently as readily as untreated. These experiments emphasize the necessity of injecting a sufficiently toxic oil into the surface of the timber to kill these borers before they attain any considerable size.

The development of standard grading rules for structural timbers has been of particular value to the railways as they are the largest users of this class of material. Co-operating with the American Society for Testing Materials, the Ameri-



The Box Testing Machine

can Railway Engineering Association and the Southern Pine Manufacturers Association, the laboratory conducted more than 130,000 tests on 113 species of American woods, as a result of which it was ascertained that the strength of this timber is proportional to the dry weight of the wood, following certain mathematical laws. This led to the preparation of grading rules for Southern pine, removing much of the uncertainty and confusion which had existed previously. Similar rules for Douglas fir are now practically completed and will soon be presented for adoption. These two woods comprise a large proportion of the materials used by the railways for structural purposes.

Experiments are also being made on the effect of treatment on the strength of Douglas fir. Early in the treatment of this material it was found that the strength was materially reduced by the ordinary process of treatment. At the present time careful consideration is being given to other methods of treatment to overcome this defect, with the result that the decrease in strength has been almost entirely overcome.

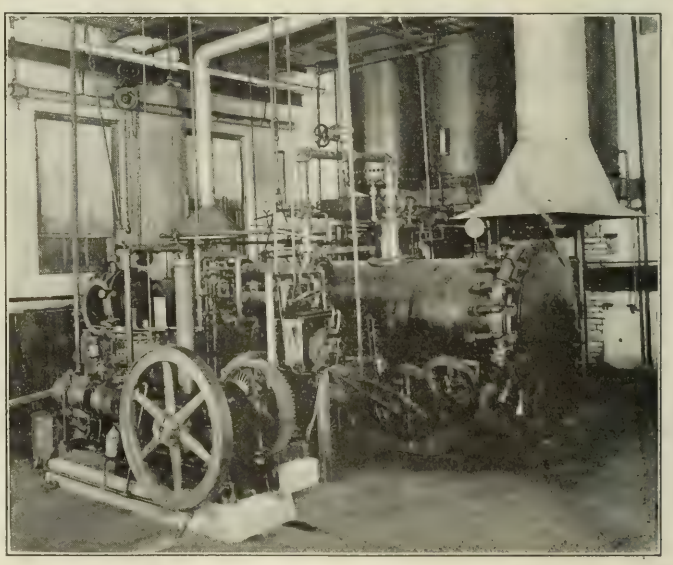
Careful investigations are being made on the kiln drying of timber. Following these investigations a kiln was installed for the drying of car lumber at the Norfolk & Western shops at Roanoke, Va., two years ago, which is working out very successfully. In this kiln all three essential conditions —temperature, humidity and circulation—are brought under direct control of the operator.

Only about 31 per cent of the volume of the materials of the forest is now used. This not only results in a very large waste of materials, but places a heavy burden upon those parts used as they must carry the entire manufacturing and overhead expenses. This has led to investigations to develop uses for the materials previously discarded. In this the laboratory works closely with the industrial departments



The Fire Investigation Laboratory

of the railways. As an instance, the European war has led to a large demand for dye materials. The laboratory found that Osage orange-wood contains valuable materials of this character and commercial tests in the use of this material in dyeing leather and woolens have given highly satisfactory results. Arrangements were therefore made with large manufacturers of extract materials in Massachusetts to undertake the manufacture of these dyes from the Osage orange-wood, which is available in large quantities in Okla-



A Portion of the Timber Preservation Laboratory

homa. At the present time over $1,000,000 worth of these dyes are now produced annually and the railways have secured the hauling of this wood as well as of the finished dyes.

At the present time Wisconsin is the seat of many of the large paper mills of this country. The timber adjacent to these mills is now largely cut-off and they are forced to go into Minnesota and Canada for their raw materials The

laboratory has made a large number of studies of other woods and found them suitable for use in paper making, particularly woods in the Northwest and hopes to make these accessible to Wisconsin manufacturers. This will create a traffic of over 200,000 cords of timber annually. This matter has already been presented to the railroads and they have been asked to make rates which will permit the materials to be moved in this way.

Over $30,000,000 is paid annually in settlement of claims for freight lost or damaged in transit. Much of this results from the poor construction of shipping containers. To cooperate in the reduction of this loss the laboratory is conducting an extensive series of experiments to ascertain the most economical form of box construction and has formulated a series of tests to determine the strength of boxes and of various woods and types of construction. Over four and one-half billion ft. of lumber, or 12 per cent of the total cut, is required annually for boxes. One of the interesting developments of these tests has been the inadequacy of the common methods of nailing boxes. For instance, it has been found that seven nails driven in the end of a box instead of five, treble its strength. It has also been shown that the addition of two more nails enables the thickness of the timber to be reduced 1/16 in. and the cost to be reduced 10 per cent.

The ultimate object of these tests is to secure information which will enable specifications for boxes to be prepared which the roads can adopt and in this way standardize containers and reduce claim bills.

MAIL PAY CONTROVERSY RENEWED

By H. F. Lane.

WASHINGTON, D. C., October 18, 1916.

The long-standing controversy between the railroads and the post office department regarding railway mail pay was transferred to the Interstate Commerce Commission last week by a dispute at the outset as to the meaning of the provisions of the new post office appropriation law. This provides for a test of the space basis of payment on certain routes to be selected by the postmaster general, with the consent of the Interstate Commerce Commission, and prescribes rates per car mile to be applied during the test, but refers to the commission the ultimate determination as to both the rates and the basis of payment.

The railways contended that the law contemplates that the test shall be made for the purpose of furnishing information to the commission and should be conducted under its supervision, while the post office department proposed to conduct the test in its own way first and let the commission investigate it afterward.

The commission heard oral arguments at Washington on Saturday, October 14, on a petition filed by attorneys for the Committee on Railway Mail Pay, asking that the commission issue orders prescribing, among other things, that the post office department shall weigh the mails before it begins the test of the space system, as well as during the tests, so that when the commission comes to investigate the relative merits of the two methods in accordance with the law, it will have some comparative data before it.

The postmaster general places so much confidence in the plan of paying the railways on the basis of car space, with the privilege of loading as much mail into the space as it will hold, that he not only proposed to install the test for an indefinite period on practically all the railway mail routes at once, but he did not think it even necessary or worth while to keep a record of the weight of the mails carried.

To the petition of the railways the post office department replied that the roads had confused the jurisdiction of the commission with the administrative authority of the post- to ascertaining the fair rates to be paid for the service.

The railways, having in mind that the commission's decision, both as to the rates and the basis of payment, is to apply from the date of the beginning of the test, urged that it would be well for the commission to know how much mail was being transported as well as the number of cars and the amount of space used. The petition points out that on August 29, on an ex parte application of the postmaster general, the commission gave its consent and approval to the installation of the space plan and rates on certain routes over which mails are transported, and that the "certain routes" covered by this application constitute those on which accrues approximately 98 per cent of the compensation paid to the railroads for the carriage of the mail. It is stated that the only purpose for which the postmaster general is authorized to install the space system before the final determination by the commission of the proper rates and basis of payment, or for which the commission is authorized to give its consent, is for the purpose of affording such test as may be necessary to secure the accumulation of information pertinent to the decision of the issues by the commission, and that the law provides and contemplates that, except to that extent and for that purpose, existing methods of payment shall continue. It is stated that the representatives of the railways were informed at a conference with the second assistant postmaster general on October 4 that the department does not intend to provide any contemporaneous weighing or to keep contemporaneously any statistics, other than a bare record of the space used for the purpose of ascertaining the compensation, until some indefinite date in the future, probably the spring of 1917. Before the installation of the space system the railways insist that there should be for a period of 30 or 35 days a daily weighing of the mails under the present method, accompanied by a record of the space occupied, the service performed and such other statistical information as the commission may require after conference with the parties, or after hearing. It is pointed out that in the New England and eastern section there has been no weighing of the mails since 1912 and 1913, since which time the principal development of the parcel post has taken place, and that in no section of the country are the last weighings taken indicative of the mails now carried.

The commission is also asked to prescribe, after hearing the parties, the period during which the space test should be applied.

Under the proposed plan of the postmaster general, the petition states, the carriers are expected to perform many services, such as carrying the mails between trains and post offices, not provided for in the space system, which the postmaster general is only authorized to install experimentally and for which no payments are provided. It is also stated that the postmaster general's plan ignores any test on closed pouch routes and is, therefore, deficient as a test of the operation of the space system.

"In order to make a complete demonstration of the results of the space system," the petition says, "it is not necessary that it should be adopted as a mode of payment to continue pending the decision and its adoption as a mode of payment is, therefore, contrary to the act."

The New York, New Haven & Hartford also filed a petition asking for a weighing of the mails on its system not later than November 1. The road had received a letter dated September 21 from the second assistant postmaster general announcing the selection of 37 of its routes to be placed on the space basis on November 1, leaving 21 routes on the weight basis. It had also received a notice from the superintendent of the railway mail service on August 30, announcing the discontinuance of the weighing of the mails in the eastern division of the first section, which includes its lines, although the last weighing in that division was taken in the fall of 1912. The railroad contends that it is entitled to a weigh-

in of its mails this fall under the plan of weighing the mails every four years.

After the railways had learned, somewhat indirectly, of the plans for installing the space system and the mail traffic managers had been informed of some of the details at a conference with Second Assistant Postmaster General Praeger on October 4, representatives of the Committee on Railway Mail Pay held a conference in the office of Commissioner McChord on October 6, at which a representative of the post office department was also present, as a result of which the petition was filed with the commission on October 10. A reply was filed on October 13 by Joseph T. Stewart. On Saturday morning F. H. Wood, representing the mail pay committee, and Mr. Stewart held another brief conference with Commissioner McChord and a hearing before the commission was arranged to be held in the afternoon.

The railways were represented at the hearing by Ralph Peters, chairman of the Railway Mail Pay Committee, the advisory committee of counsel, and by a number of mail traffic managers. F. H. Wood presented the argument, saying that the commission's consent to the adoption of the space plan was given before the commission had taken jurisdiction of the case by issuing its order instituting a proceeding of inquiry and investigation and that the railroads had thought that it should have prescribed the conditions for the test before giving its consent. He said the law contemplated that the postmaster general should file with the commission a comprehensive statement giving in detail the methods and conditions under which the mails were to be transported, which should also be served upon the railroads, and that the test should then be conducted for the information of the commission and under its supervision, thereby avoiding endless controversy between the railroads and the post office department as to the facts on which the commission's decision would rest. He pointed out that the Bourne commission had found a discrepancy of 23 per cent between the figures of the railroads and of the department as to the amount of space used and that it had accepted those of the railroads. He said that the plan proposed by the department contemplated a radical change in the method of paying the railroads, in the guise of a test, and that it also contemplated a contraction of the amount of space used by curtailing the frequency of the service and a rearrangement of routes so that mail would be taken from one railroad and routed over another. Therefore, the period during which the test should be conducted should be limited by the commission, especially as the department had stated in its answer that it proposed to limit the statistical period to 30 or 35 days. Mr. Wood argued that the postmaster general now has such control over the physical handling and routing of the mails that he could rearrange the service in any way necessary to demonstrate the efficiency of the space basis without changing the basis of pay.

Mr. Stewart began his reply by questioning the authority of the mail pay committee to speak for the roads, saying it was "unknown to the government except in a most general way" and that he knew some of the roads were in favor of the space plan. He also questioned the jurdisdiction of the Interstate Commerce Commission to interfere with the administration of the post office department, saying the law required the railroads to perform the service under the conditions prescribed by the postmaster general, while guaranteeing them fair and reasonable compensation by leaving the decision as to the rates and basis of pay to the Interstate Commerce Commission. He said that it was necessary for the department to put the new plan into effect for a time before it could properly present to the commission the comprehensive statement required, which it expected to have ready by about January 1 and which would probably be the most elaborate statement ever filed with the commission. Afterward the comparative statistics of space and weight would be taken. It would be impracticable to take them first he said, and would cost $500,000. Several of the commissioners asked how they could be expected to determine the issues unless they had comparable statistics of both space and weight taken at the beginning of the experiment. Mr. Stewart said that comparisons could be made for the "interim" period with the weights ascertained at the last weighings.

Mr. Wood asked if it were not the intention to make material changes in the service. Mr. Stewart replied that it could not be said that no changes would be made; that it was the purpose of the department to accomplish "large economies" in the conduct of the service under the new plan by a more economical use of the available space, but that the service would go on "without much change."

The information received by the railroads as to the proposed changes in the service indicates that there may be some protests from the public. Orders have been issued in a number of instances for the consolidation of the mails now handled on two trains into one car, thereby reducing the service, and also for a reduction in the amount of sorting of the mail en route in order to save space, thereby delaying the distribution of the mail.

R. Walton Moore has been added to the advisory committee of counsel representing the mail pay committee.

The Adamson Law

Although President Wilson has continued for some time to refrain from bragging of the particular "triumph of diplomacy" by which he was able to legislate an increase in wages to the highest paid working men in the country at the ultimate expense of all other working men, there have been few signs of the disappearance of the issue from the campaign which was predicted a few days ago by Senator Hughes. The Democratic orators seem to have lost some of their enthusiasm for the subject, but the non-partisan heads of the labor organizations are carrying on the work with great activity. The chief executives of the brotherhoods, who had been announced as the chief speakers at a mass-meeting of the Wilson Eight-Hour League in Washington on October 13, did not appear, but they were ably represented by Samuel Gompers, president of the American Federation of Labor, who lauded President Wilson, and the Adamson law, attacked Charles E. Hughes, and then bade his hearers to "go and vote as their consciences dictated." He said that he has always kept himself free from partisan politics and went away without even telling his audience how he proposed to vote. Newspaper reports do not quote him as replying in any great detail to the criticisms of the law made by Mr. Hughes in his speeches, nor as discussing the President's plan for completing his legislative program by securing a law to prevent strikes until after a public investigation has been held.

The Wilson Eight-Hour League was organized in this city, it was announced, "as a medium through which organized labor could express its endorsement of President Wilson's course" in keeping organized labor from bringing a great calamity upon the public. Branches are being formed in various parts of the country. The officers of this "medium" include, according to the newspaper reports, heads of government departments and other prominent officials in the Wilson administration. "Wilson Clubs" are also being organized in various parts of the country by officers of the railway brotherhoods, and the Democratic National Committee is sending out a letter by W. G. Lee, president of the Brotherhood of Railroad Trainmen, calling their attention to the legislation favorable to labor secured by the present administration. The letter says that "partisan politics should have no place in the coming November election," but that the members of the brotherhoods should "look with suspicion on the efforts of those working for Candidate Hughes," and Mr. Lee "regrets that in a few instances

members of the transportation organizations are found working for the election of those who have proven that they are opposed to labor legislation."

The railroad companies also have an example of non-partisanship in the announcement by R. S. Lovett, chairman of the Union Pacific, that he is for Wilson in spite of the mistake which he believes the President made in his handling of the strike situation. This is being given wide circulation in the bulletin of the Democratic National Committee. F. D. Underwood, president of the Erie, has also declared himself for the re-election of President Wilson.

Representative Adamson has issued a statement for the purpose of calming the fears of those who may have been afraid they would have to pay for the increases in wages in the form of higher freight and passenger rates. He asserts that the railroads will simply run their trains faster, that this will not cost anything, and that the cry of increased expense is a "mere sham and pretense urged as an excuse to try and raise freight rates." He apparently sees no reason whatever for the investigation to be made by the commission for which his law provides.

National Association of Railway Commissioners

The attitude of many of the members of the state railroad commissions toward the forthcoming investigation of government railway regulation and control is indicated by a statement made in the announcement by the National Association of Railway Commissioners of its twenty-eighth annual convention, to be held in the hearing room of the Interstate Commerce Commission at Washington on November 14. The announcement states that "this, without doubt, should be the most important meeting that we have ever had and it is confidently expected that every commission will be represented. Questions of vital concern are pending, not only to us, but to the country at large, and these demand our early and serious consideration." The announcement then quotes the resolution providing for the investigation by a joint committee of the House and Senate, adding that:

"Those who are advocating the centralization of regulation in the agencies of the Federal Government will have their views fully and ably presented to the committee by the powerful and well-organized influences that are behind this movement. Those of our membership who believe in joint federal and state regulation of railroads should discharge their grave responsibilities by presenting to the committee all the facts showing the good work which has already been done by the federal and state commissions, should unite to defeat any vicious or unwise legislation which may be proposed, and should aid in the promotion of any proposed legislation which is likely to make such regulation more efficient, and should cordially co-operate with the committee and with the Congress for the promotion of the welfare of the country."

The announcement is signed by Robert R. Prentis, president, Charles E. Elmquist, chairman of the executive committee, and William H. Connolly, secretary.

The program for the meeting includes the discussion and reports of the following committees: Executive; Express and Other Contract Carriers by Rail; Safety of Railroad Operation; Railroad Service, Accommodations, and Claims; Grade Crossings and Trespassing on Railroads; Railroad Rates; Statistics and Accounts of Railroad Companies; Car Service and Demurrage; Public Utility Companies; Statistics and Accounts of Public Utility Companies; Valuation; Capitalization and Intercorporate Relations; State and Federal Legislation; Publication of Commission's Decisions. The announcement says that it is especially important "at this time when some are arraigning public regulation before the country and the Congress, that not a single committee will fail to present a carefully prepared report and thereby contribute something of permanent value to the cause of public regulation."

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS

The sixty-first annual convention of the American Association of Passenger Traffic Officers was held at the New Willard Hotel, Washington, D. C., October 17 and 18. Alexander Hilton, passenger traffic manager of the St. Louis & San Francisco, presided and there were about 100 members in attendance. In accordance with the usual custom of the association, a gavel was presented to Mr. Hilton, the retiring president, composed of wood from the Abraham Lincoln home, from the ticket office of the Chicago & Alton at Kansas City, and from the union stations at Chicago, St. Louis and Kansas City.

Action was taken on 25 applications for membership in the association. The executive committee, L. W. Landman, general passenger agent of the Michigan Central, chairman, presented a report recommending the experimental adoption of a cipher telegraphic code for use in making reservations of Pullman accommodations. This code, which was originated by J. E. Dempsey, was considered at the meeting of the association at French Lick Springs last fall and has been carefully studied by the executive committee, which recommended it as being unusually simple and workable and stated that it should probably result in a saving of 50 per cent in the cost of these messages. The code consists of three sheets which may be placed in the hands of ticket clerks.

The standing committee on association ticket paper, C. A. Cairns, general passenger agent of the Chicago & North Western, chairman, presented a report giving details of its negotiations with the printers licensed to use association ticket paper. The extension of the general arrangements with the paper manufacturers originally made to expire December 31, 1917, or the making of a new arrangement to manufacture and furnish ticket association paper, was devolved upon the paper committee with the counsel and approval of the executive committee at the convention in San Francisco and it has seemed well to have existing arrangements continue, subject to the opening of negotiations by either party at any time when the conditions may be deemed to render it desirable.

The patents for association forms of horizontal and vertical multi-road tickets and of multi-junction tickets were secured and assignments made to the secretary of the association as trustee, as announced to members in a circular of March 17, 1916. These forms of tickets were described in the *Railway Age Gazette* of April 21, 1916. The committee was instructed to continue its efforts to secure universal use of the association ticket paper and was given power to act.

The standing committee on standard forms of inter-line tickets, E. L. Bevington, chairman Transcontinental Passenger Association, chairman, presented a report submitting a proposed standard form of one-way inter-line ticket contract designed for the purpose of simplifying the contract and reducing the size of the ticket. The salient feature of the proposed form is the elimination of a large number of conditions now printed in the ticket contract and the substitution therefor of a simple statement that the ticket is issued subject to the conditions of the published tariffs. There was considerable discussion of the advisability of making such a radical reduction in the amount of information furnished to passengers and conductors but the principle of the plan was approved and it was decided to refer the report to the territorial associations for their views and that the committee should continue its work with a view to recommending similar changes in other forms of tickets.

The committee on economical distribution of folders and advertising matter, C. A. Fox, acting chairman, reported that as the result of action taken at the meeting last fall a folder committee had been appointed in each territorial association to study the conditions as to the distribution of folders in their territories and that several of these committees have ren-

dered reports which have had good results in reducing the waste in folder distribution. These territorial association committees have been continued and it was recommended that the work be left in their hands as being better adapted to local consideration than to action by the association. There was a decided sentiment among those present in favor of discontinuing the display of folders in boxes in hotels.

Frank Trumbull, chairman of the Railway Executives' Advisory Committee, addressed the meeting on Tuesday afternoon, giving a general explanation of the work of the committee in reference to federal regulation and what it had been able to accomplish by arranging for the presentation of the views of railroad officers at hearings before congressional committees. In this connection he also outlined briefly the attitude of the railways toward the forthcoming investigation of railway regulation and control under the joint resolution adopted by Congress providing for the appointment of a joint committee of the House and Senate to study the entire problem thoroughly. It is the hope of the railways, he said, that out of this investigation will come a much-needed plan of co-ordinating and simplifying our system of regulation.

"Probably a hundred million dollars is going over the dam every year as a result of the lack of co-ordination in our methods of handling this important problem," he said, "and our present system of conflicting regulation by the federal government and by the several states. Transportation cannot be regulated by state lines." At the hearings before the Newlands committee, Mr. Trumbull said, the railroads would advocate a centralization of railroad regulation in the hands of the federal government, which, in the opinion of the railroads, can best be accomplished by federal incorporation of interstate carriers. They will also advocate a reorganization of the Interstate Commerce Commission along regional lines with subordinate district commissions or branches in order that local conditions may receive due consideration, somewhat along the lines of the organization of the federal reserve banks. They also feel that the regulation of the issuance of railroad securities should be placed in the hands of the federal government but that it should not be divided between the federal government and the states. Nineteen states are now regulating the issuance of securities.

"We can't have transportation without credit," Mr. Trumbull said, "and we can't have the credit that is necessary to the development of adequate transportation facilities if we are to continue to be subjected to the uncertainties and conflicts of our present methods of regulation." Mr. Trumbull also pointed out that although the net earnings of the railways had increased by about $300,000,000 in 1916 as compared with 1915 the return on the investment in the most prosperous year the railways ever had was considerably less than 6 per cent. He also urged the co-operation of the passenger traffic officers in promoting the dissemination of correct information regarding railway affairs and problems.

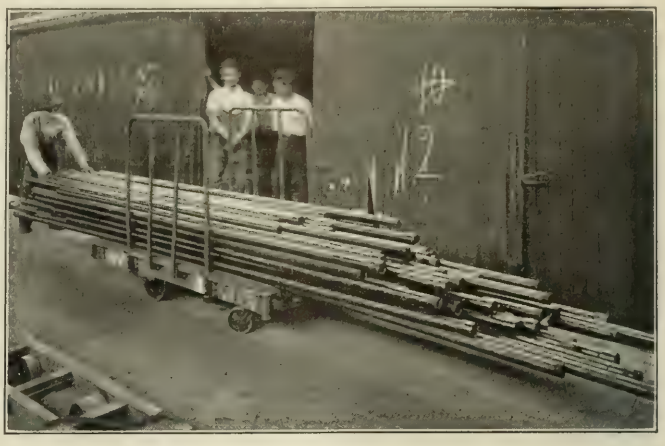
Reports were received from co-operating associations, including a letter from the Canadian Ticket Agents' Association; a paper by Harry A. Roemer, traveling passenger agent of the Chicago, Milwaukee & St. Paul, representing the American Association of Traveling Passenger Agents, on "The Get Together Spirit," and a paper by Henry R. Martin, general ticket agent of the Union Station, Indianapolis, representing the International Association of Ticket Agents, on "Prepaid Ticket Deliveries."

Officers were elected as follows: President, C. M. Burt, general passenger agent, Boston & Maine; vice-president, O. P. McCarty, passenger traffic manager, Baltimore & Ohio; secretary, W. C. Hope, general passenger agent, C. of N. J.

The entertainment program included a reception and lunch on Tuesday tendered by Washington commercial organizations, a trip for the ladies to Mt. Vernon on Tuesday afternoon, a reception and dance on Tuesday evening, an automobile trip around Washington on Wednesday afternoon and a golf tournament on Thursday.

AN EASY RUNNING PACKAGE FREIGHT TRUCK

The photographs show two applications of what is known as the Standard Improved Truck as used in the Indiana transfer freight station of the New York Central Lines at Gibson, Ind., where 200 of them have been in service for about three years. These trucks, which are intended for either hand or trailer service, have a 3 ft. by 6 ft. platform, two 11-in. main wheels and two 5½-in. caster wheels. The frame is of maple, consisting of four longitudinal sills and two end sills



A 5200-lb. Load Handled by One Man

covered with a maple floor which is protected against wear by four steel plates 3½ in. wide and extending the full length of the platform to which they are secured.

One of the features of this truck is the low platform which is only 12¾ in. above the floor, thus adapting it especially for loading heavy articles. Another feature is the use of removable racks made of 1-in. welded steel tubing. Malleable iron sockets are provided on both the ends and the



A Truck Loaded with 50 Boxes of Tobacco

sides of the truck so that the frames can be placed in either position. The advantage of this is illustrated in the photographs, one of which shows the rack in side position to facilitate the loading of long pipe and the other showing the racks at the ends of the car for a large load of small packages.

The principal gain in the use of these trucks has been brought about through the easy running qualities obtained by the use of roller bearing wheels aided to some extent by the steel runways provided in the freight house platforms. Large and heavy loads are readily handled with these trucks by one man which would have required the combined efforts of several men with the older equipment. The truck is handled by Guilford S. Wood, Chicago, Ill.

Locomotive Fuel Economy and Boiler Design*

Larger Part of Heat Losses Is Due Directly to Furnace Inefficiency; Suggestions for Improving Practice

By J. T. Anthony.
Assistant to President, American Arch Company

THE importance of the subject of fuel economy is fully realized by all mechanical and operating officers. The many angles from which it can be approached and the numerous points that bear directly on it, are more or less familiar to all.

Beginning with the specifications covering the purchase of the coal at the mines, we might enumerate: Inspection and loading at the mines, storage, weathering, handling at coal tipples, loading on tenders, firing instructions, water-level and cut-off, lubrication, drafting and front end arrangements, steam leaks, boiler washing, engine despatching, train loading, and terminal and other delays.

Other factors which tend to increase the total fuel wasted

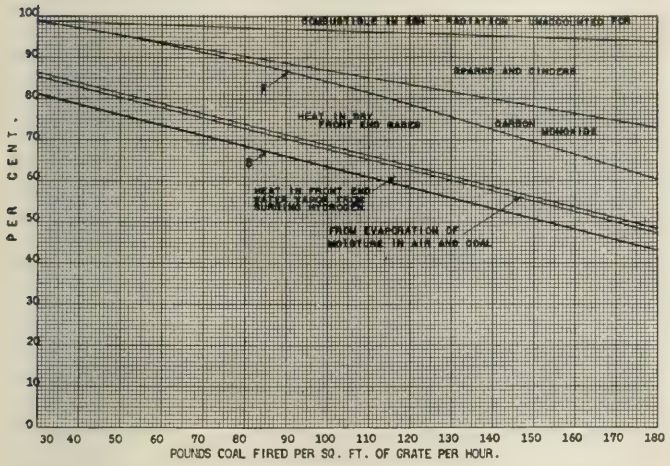


Fig. 1—Average Heat Losses in a Locomotive Boiler

might be mentioned—and the sum of these would certainly amount to an appreciable percentage of the total coal purchased by the railroads.

It is doubtful, however, if the losses enumerated above will exceed the losses directly chargeable to the boiler, despite all efforts to increase the boiler economy and efficiency by the addition of such devices as the brick arch, superheater, feedwater heater, etc. To illustrate the losses that take place in the average locomotive boiler, we will take a typical boiler, such as is used on a medium size Pacific or Mikado type locomotive. The boiler has a grate area of 54 sq. ft., 210 sq. ft. of firebox heating surface, 4,100 sq. ft. of fire tube and superheater heating surface (the tubes being 21 ft. long and 2¼ in. in diameter), air opening through the ashpan 20 per cent of grate area, and air opening through the grates 28 per cent.

Fig. 1 shows the average heat losses as the rate of combustion increases from 30 to 180 lb. of coal per square foot of grate per hour. As might be expected, the results in individual tests varied widely; but the curve as drawn will approximate average results.

The most striking losses are those due to sparks and cinders, which exceed 20 per cent at the maximum rate; carbon monoxide and incomplete combustion, which exceed 13 per cent, and heat in dry front end gases, which in some cases reaches 16 per cent. In addition, there are comparatively small losses due to combustible in ash, radiation and unaccounted for, and heat losses in evaporating moisture in air and burning hydrogen in coal.

As shown by the line *B*, the over-all boiler efficiency drops from 80 per cent at low rates of combustion to 43 per cent at the highest rate. In other words, when burning 30 lb. of coal per square foot of grate per hour, 80 per cent of the heat contained in the coal fired is put into the steam; while at the maximum rate only 43 per cent of the heat contained in the coal is transferred to the steam.

It is to be noted that the losses due to sparks and cinders and incomplete combustion increase rapidly as the rate of combustion increases; while the losses due to combustible in ash, radiation and unaccounted for also increase. Under the same conditions, the losses due to burning hydrogen and evaporating moisture in the air remain almost constant, as does the loss due to heat in front end gases.

The sparks and cinders loss is due in part to the nature of the coal; but largely to the high draft necessary at high rates of combustion and to the absence of efficient baffling and mixing devices and sufficient combustion chamber space.

The losses due to carbon monoxide and incomplete combustion are due to the lack of sufficient oxygen at the high rates of combustion, and to lack of efficient mixing devices and combustion chamber space.

The loss from combustible in ash is due partly to the

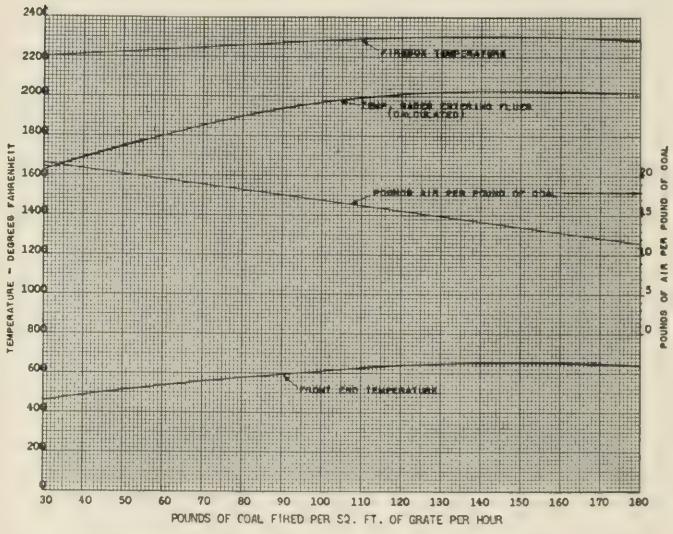


Fig. 2—Temperature and Air Supply at Different Combustion Rates

nature of the coal, but largely to the design of the grate and method of firing.

Radiation loss for a well-lagged boiler is comparatively small, though difficult to determine with any degree of accuracy.

The unaccounted-for loss is due principally to the escape of unburned hydrocarbon gases, which are not detected by the ordinary front end gas analysis.

The heat in dry front end gases is controlled by the temperature of the gases escaping at the front end and by

*From a paper read before the New England Railroad Club, Boston, October 10, 1916.

the amount of air which is used per pound of coal burned. These two factors also control the loss due to evaporating the moisture in the air, and heat loss due to the hydrogen of course depends upon the amount of hydrogen contained in the coal and the temperature of the escaping gases.

Fig. 2 shows the temperature of front end gases, temperature of firebox, and pounds of air supplied per pound of coal, at the different rates of combustion.

It is a difficult matter to get a regular curve showing the air supplied, on account of the wide variation in results given by the different gas analyses. This trouble is due not to any difficulty in making the gas analysis, but to the great difficulty of getting a fairly uniform sample of gas from analysis.

All of the heat losses shown in Fig. 1 are chargeable to the boiler. Some of them are directly chargeable to the furnace (or firebox), while others are chargeable to the heating surfaces. If we ignore the radiation losses from the barrel of the boiler and assume that all the losses under this head are chargeable to the furnace, the sum of these losses—together with those due to sparks and cinders and incomplete combustion—will be the measure of the furnace efficiency.

This is shown in Fig. 3, by curve No. 2, where the furnace efficiency is equal to the heat liberated divided by the heat in the coal. As shown, the heat loss due directly to the furnace varies from 2 per cent to 40 per cent of the entire heat in the coal; in other words, this much of the heat contained in the coal is not liberated in the firebox and is not made available for absorption by the heating surfaces.

Curve 4 shows the over-all boiler efficiency, which is measured by the ratio of heat absorbed to heat in the coal. The space between curves 2 and 4 represents heat liberated in the furnace, but not absorbed by the heating surfaces. This amounts to from 18 to 20 per cent of the heat contained in the coal, and of this large amount a relatively small proportion is available for absorption by the heating surfaces.

It is evident that the temperature of the gases flowing through the tubes cannot possibly be reduced below the temperature of the water or steam in the boiler. With a boiler pressure of 200 lb., the steam temperature is 388 deg., and all the heat required to raise the products of combustion to this temperature is unavailable for absorption by the heating surfaces and cannot be charged against them. As explained above, the amount of this unavailable heat depends principally upon the temperature of the front end gases and the air supply per pound of coal. On the chart it is represented by the space between curves 2 and 3.

The space between curves 3 and 4 represents the heat contained in dry front end gases that is available for absorption, but is not absorbed, and this heat can of course be directly charged against the boiler heating surfaces.

Curve 3, then, shows the amount of heat available for absorption and curve 4 shows the amount absorbed, and the ratio of heat absorbed to heat available becomes the measure of the heating surface efficiency. In other words, the percentages expressed by curve 4, divided by the percentages of curve 3, will give a figure which is a true indication of the heating surface efficiency.

This heating surface efficiency is shown by curve 1, which, it will be noted, ranges from about 98 per cent to 88 per cent at the highest rates, there being very little drop in the heating surface efficiency after the rate of combustion gets up to about 100 lb. of coal per square foot of grate per hour.

It was stated that curve 2 shows the true furnace efficiency, in that it represents the ratio of the heat liberated to the heat in the coal. Some authorities charge against the furnace all of the unavailable heat contained in the products of combustion, maintaining that it is the true function of the furnace to make all of the heat contained in the coal available for absorption by the boiler heating surfaces.

In this case, curve 3 would become the furnace efficiency line. This seems hardly fair, as a large part of the heat contained in the gases (even with the theoretical minimum air supply) is unavailable for absorption and should not be charged against the furnace. Disregarding these technicalities, curve 1 will represent the efficiency of the heating surfaces; curve 2 will represent the efficiency of the firebox (or furnace), and curve 4 will represent the over-all efficiency of the boiler.

Having located and grouped the heat losses, thereby determining the efficiency of the heating surfaces and the furnace, the next problem is to determine the best method of reducing or eliminating these losses and increasing the efficiencies.

As indicated in Fig. 3, the losses directly chargeable to the furnace are far greater than those chargeable to the heating surfaces, and the firebox therefore seems to offer the largest field for future improvement.

The loss due to sparks and cinders is caused principally by the high draft necessary at the high rates of combustion. By reducing the rate of combustion, we can in a measure reduce this loss. Boiler capacity, however, is of prime importance, and we cannot afford to reduce this capacity by reducing the amount of coal fired.

It becomes necessary then to reduce the rate of combustion by increasing the grate area. This will enable us to carry a

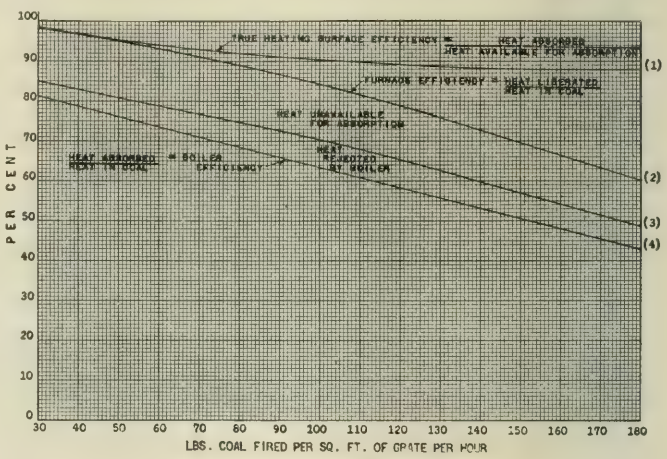


Fig. 3—Furnace Efficiency

light fire; get a more uniform supply of air through the fuel bed; reduce the lifting action of the draft upon fine particles of coal, and, if accompanied by increase in firebox volume or combustion space and efficient baffling devices, will result in a material reduction in loss due to sparks and cinders, as well as those due to incomplete combustion and escape of carbon monoxide and unburned hydrocarbon gases.

In order to burn coal completely, it is necessary to supply a sufficient amount of oxygen; to mix the oxygen with the combustibles of the coal and give them time to burn. Complete combustion cannot be obtained unless these requirements are met.

The effect of grate area upon evaporation is perhaps not well understood. Firebox heating surfaces take up practically all of their heat by radiation; that is, the heat travels from the luminous fuel bed, flames and brick work by "rays" or "waves" to the firebox heating surfaces. The amount of heat so received depends primarily upon the temperature of the radiating bodies and upon the area or extent of these radiating bodies, and not upon the extent of the firebox heating surfaces.

The amount of radiant heat transferred is influenced to a small extent by the temperature of the firebox heating surfaces; but the effect of a slight increase in temperature here is insignificant as compared with an increase in temperature

of the radiating surfaces, such as the fuel bed or the flames.

When working at ordinary capacity, with clean sheets, it is possible that the temperature of the fire side of the firebox sheets is about 440 deg. With this temperature of the firebox sheets, the amount of heat radiated by each square foot of radiating surface is shown by the curve in Fig. 4.

It will be noted that a slight increase in temperature of the radiating surfaces gives a marked increase in the amount of heat radiated, and therefore in the amount of water evaporated. Increasing the firebox temperature from 2,040 deg. to 2,540 deg. doubles the amount of heat radiated from each

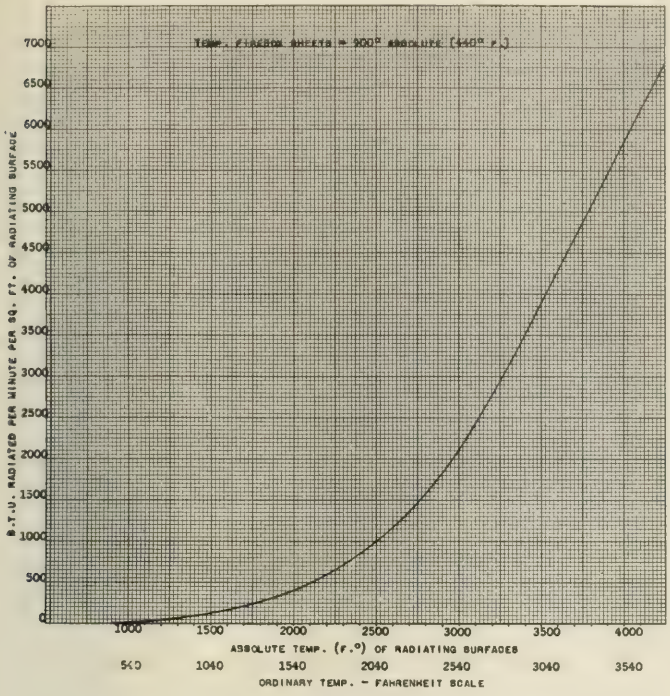


Fig. 4—Curve Showing Heat Radiation

square foot of radiating surface, and practically doubles the evaporation from the firebox heating surfaces.

This shows the vital importance of high temperatures, both in fuel bed and flames, and is suggestive of the ill effects that result from bank firing, or the placing of a lot of green coal in the firebox at one time. In order to get the maximum evaporation, it is necessary that the fuel bed be kept at a white-hot temperature all over. The bank of green coal reduces the effective heating surface, reduces the temperature of the firebox, and reduces the evaporation.

Accurate data on the question of firebox evaporation is difficult to get, as no conclusive tests have ever been made. Using the available data as a basis, however, we have platted the curves in Fig. 5, showing the possible firebox evaporation and tube evaporation. The top curve shows the actual equivalent evaporation from the boiler at the varying rates of combustion. The firebox evaporation was calculated, and the tube evaporation is of course the difference between the firebox and the total.

The firebox evaporation was calculated by using the firebox temperatures shown in Fig. 2, and adding the heat radiated by the flames to that radiated from the fuel bed, assuming in all cases that the temperatures of the flames and of the fuel bed were the same, and that the average temperature was that shown by the curve, Fig. 2.

The coal used in this particular test contained about 35 per cent volatile matter, with a heat value of 14,500 B.t.u. per pound. With a coal of this volatile content, the firebox will be completely filled with flame at moderate or high rates of combustion. If the firebox is completely filled with flame, the effective flame-radiating surfaces will be equal to the exposed firebox heating surfaces.

The firebox in question had a heating surface of 210 sq. ft. Assuming that the fuel bed covered the side sheets to a depth of one foot, we would have 180 sq. ft. exposed to the action of the flame, and if the firebox is completely filled with flame, we could safely assume that we would have 180 sq. ft. of effective flame-radiating surface.

At low rates of combustion, the amount of volatile combustible driven off would not be sufficient to completely fill the firebox with flame, and it is probable that at very low rates (around 30 or 40 lb. per square foot of grate), the firebox would only be about half filled with flame.

We worked on this assumption in making the calculations, with results shown by the curves in Fig. 5. As indicated by the curves, the firebox evaporated nearly one-half of the total at low rates, and about one-third at the highest rate. The maximum calculated evaporation from the firebox was 21,000 lb. per hour, or an equivalent evaporation of practically 100 lb. of water per square foot of heating surface.

To secure such evaporation it would be necessary to have a temperature drop of 140 deg. between the fire side and the water side of the sheets—assuming that we use sheets ⅜ in. thick, free from scale—which would give a fire side temperature of 528 deg. and which is probably well within safe working limits.

Under the same conditions, the maximum evaporation from the tube heating surfaces (including superheater) would be 10 lb. per square foot per hour; or, the firebox would be evaporating 10 times as much as the tubes per square foot of surface.

An equivalent evaporation of 100 lb. of water per square foot of firebox heating surface per hour seems abnormally

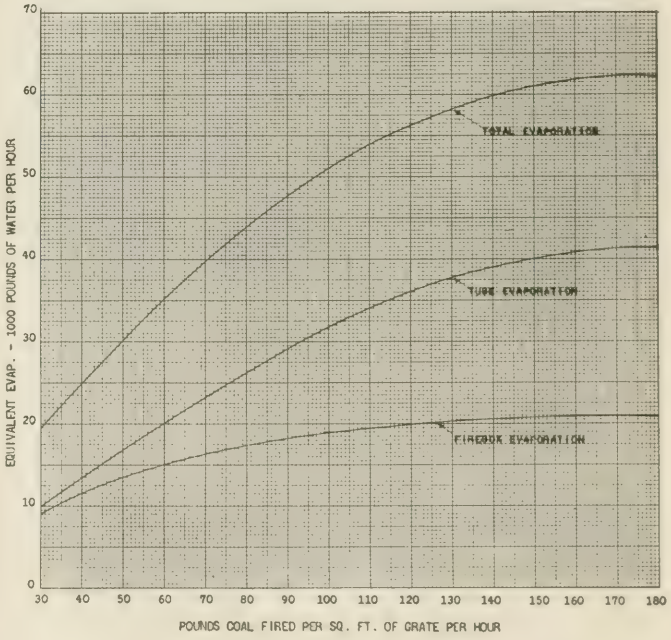


Fig. 5—Evaporation Curves

high, but there is no logical reason why such an evaporation should not be obtained. It is merely a question of getting a sufficient amount of radiating surface at a sufficiently high temperature.

Increasing the grate area increases the area of the fuel bed radiating surfaces, and increasing the firebox volume or combustion chamber space increases the flame-radiating surfaces. Increasing the grate area also means low rates of combustion, more uniform air supply, lighter fire, reduction in losses due to unburned fuel, an increase in the percentage of heat lib-

erated and an increase in firebox efficiency, both as a furnace, or heat-liberator, and as a heat-absorber.

It is possible that the value of combustion chamber space is not fully realized, for the large number of engines now being built with abnormally long boilers and tubes offers opportunities for combustion chamber installations of which advantage is not being taken.

Bituminous coal is not a homogeneous substance. It burns partly as a solid and partly as a gas. The solid part burns on the grate in the form of fixed carbon, while the volatile burns in the combustion chamber space as a gas.

The coal used in the test under consideration contained 58 per cent fixed carbon and 26 per cent volatile combustible. Therefore, one pound of the coal contained .58 lb. of carbon, which, burned on the grate, liberates 8,500 B.t.u., and .26 lb. volatile combustible, which, burned in the combustion chamber space, liberates 6,000 B.t.u.

Thus we see that more than 40 per cent of the heat is liberated by burning gas in the combustion chamber space, considering that all the fixed carbon burns on the grate. In actual practice, however, the fixed carbon is not completely burned on the grate.

The oxygen, on coming in contact with the hot coal near the grate, combines with the carbon to form carbon dioxide, and this carbon dioxide, passing up through the hot fuel bed, takes up more carbon and is partly reduced to carbon monoxide. After leaving the fuel bed, this carbon monoxide is burned in the combustion chamber space and again forms

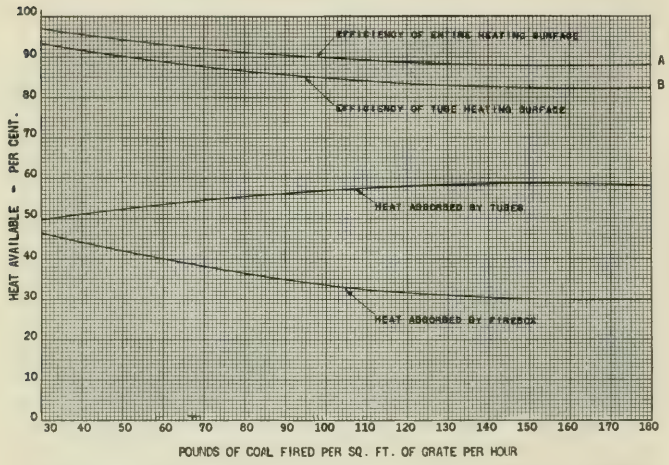


Fig. 6—Heat Absorbed by Firebox and Tube Surfaces

carbon dioxide—provided, of course, that sufficient oxygen is present and proper mixing is accomplished. The amount of carbon monoxide formed in the fuel bed depends upon the temperature of the fuel bed and its thickness.

Gas samples taken just above the fuel bed in stationary furnaces indicate that a large percentage of the fixed carbon is incompletely burned to carbon monoxide in the fuel bed. While there is no data available as to the exact percentage of carbon monoxide formed in the fuel bed of a locomotive, considering the temperatures and thickness of the fire generally carried, it is not unreasonable to suppose that the fuel bed acts principally as a gas producer and that at least four-fifths of the carbon is incompletely burned on the grate. The combustion of the carbon monoxide so formed is completed above the grate, in the combustion chamber space.

If this condition does exist, every pound of coal burned liberates 3,750 B.t.u. in the fuel bed and 10,750 B.t.u. in the combustion chamber space above the fuel bed. In other words, 26 per cent of the combustible is completely burned on the grate, and 74 per cent is burned above the grate. While these figures may not be strictly accurate, they serve to show the importance of ample combustion chamber space, and of the presence of free oxygen or air above the fuel bed.

The accompanying table shows the approximate composition, weight and volume of the gases arising from the fuel bed under the conditions mentioned above, and of the gases in the front end when the combustion is complete, the figures being based on the burning of one pound of the coal with 16.2 lb. of air (as shown in the curve in Fig. 2), at a rate of combustion of 100 lb. of coal per square foot of grate. Under these conditions, in actual practice, combustion would not be perfect, and the front end gases would show some CO and a smaller CO_2 content.

TABLE SHOWING COMPOSITION, WEIGHT AND VOLUME OF GASES ARISING FROM THE FUEL BED AND IN FRONT END AFTER COMBUSTION IS COMPLETED, WHEN 1 LB. OF COAL, CONTAINING 58 PER CENT FIXED CARBON AND 26 PER CENT VOLATILE COMBUSTIBLE, IS BURNED WITH 16.2 LB. OF AIR.

Gases		Arising from fuel bed (T. = 2,300 deg.)			In front end (T. = 615 deg.)		
Name.	Symbol.	Weight, lb.	Vol., cu. ft.	Vol., Per cent	Weight, lb.	Vol., cu. ft.	Vol., Per cent
Carbon monoxide	CO	1.08	78	6.57	.....	.....	.....
Hydrocarbons*	C_2H_6	.26	17	1.43	.....	.....	.....
Carbon dioxide	CO_2	.43	20	1.68	2.89	51.5	11.17
Sulphur dioxide	SO_2	.03	1	.08	.03	0.4	.09
Oxygen	O_2	2.75	174	14.65	1.16	28.4	6.16
Nitrogen	N_2	12.39	890	74.92	12.39	356.0	77.22
Water vapor	H_2O	.07	8	.67	.54	24.7	5.33
Totals		17.01	1,188	100.00	17.01	461.0	99.97

*Ethane (C_2H_6) assumed to represent the average composition of the hydrocarbon gases.

With a firebox temperature of 2,300 deg., every pound of coal burned produces 1,188 cu. ft. of gas. Of this large amount, 78 cu. ft. is carbon monoxide, which is combustible, and 17 cu. ft. is a rich hydrocarbon gas, the average composition of which we have taken as ethane (C_2H_6). Mixed with these combustible gases are 20 cu. ft. of carbon dioxide, 174 cu. ft. of free oxygen and 890 cu. ft. of inert nitrogen, together with traces of sulphur dioxide and water vapor; or, we have 95 cu. ft. of combustible gases mixed with 174 cu. ft. of free oxygen and more than 900 cu. ft. of inert gases.

To put it in another way: For every molecule of combustible gas there are present less than two molecules of oxygen, which are mixed with 10 molecules of inert gases. These inert gases interfere with the meeting of the combustible gases with the oxygen and tend to retard combustion.

The light combustible gases are not difficult to burn, if supplied and intimately mixed with the necessary amount of oxygen and given time to burn; but, as the figures indicate, the relatively small amount of oxygen present is mixed with such a large amount of inert gas that the probability of the combustible gas coming in contact with the oxygen within the very limited time available is greatly reduced.

The heavy hydrocarbons are driven off in a semi-fluid or pasty condition, sometimes in the form of small globules of tar, which are very difficult to burn and which for the most part escape unburned. The heat loss due to this source can be reduced only by the use of efficient mixing devices and the provision of long combustion chambers, and ample air supply above the fuel bed.

We spoke of the time required for combustion of the volatile hydrocarbons. As shown by the table, under the conditions given every pound of coal produced 1,188 cu. ft. of gas at a firebox temperature of 2,300 deg. When burning coal at the rate of 100 lb. per sq. ft. of grate per hour, there is produced 1,780 cu. ft. of gas per second. The volume of the firebox in question is 250 cu. ft.; so this firebox must discharge and be refilled with gas more than seven times per second—or, the time available for the combustion of each particle of gas is less than one-seventh of a second. As the rate of combustion decreases, this time increases, and as the rate of combustion increases, this time available decreases.

It is very apparent, however, that by increasing the firebox volume and the combustion chamber space, we increase the time available for the combustion of the volatile matter. We see, therefore, that combustion chamber space is valuable both

as a means of increasing the efficiency of combustion, and also as a means of increasing the radiating surfaces and firebox evaporation, and as we increase either of these, we increase the over-all efficiency of the boiler.

The curves in Fig. 6 show the amount of heat absorbed by the firebox and tube surfaces, and the efficiency of the entire heating surfaces as compared with the tube heating surfaces. It will be noted that at low rates of combustion the tubes absorb from 90 to 94 per cent of the heat available, while at high rates they absorb about 83 per cent of the heat available. In other words, as we increase the amount of heat to be absorbed by the tubes we decrease their efficiency. It will be noted that the efficiency line of tube heating surfaces almost parallels that showing the heat absorbed by the firebox. As the percentage of total heat absorbed by the firebox decreases, the percentage of heat to be absorbed by the tubes increases, and the tube efficiency decreases.

It will appear from this that if under any given set of conditions we can increase the firebox evaporation, the efficiency of the tubes and the over-all efficiency of the boiler will be increased. The firebox heating surfaces have an efficiency of, we might say, 100 per cent; that is, these surfaces will absorb practically all of the heat that is available—and by "available heat," in this case, we mean the radiant heat. The firebox heating surfaces absorb but very little heat by convection from the hot gases, and the heat contained in the hot gases cannot be considered as available for the firebox heating surfaces. By increasing the amount of heat given off by radiation, we decrease the amount of work to be done by the tubes.

Tubes take up heat by convection; that is, by actual contact of the hot gases against the tube heating surfaces. The amount of heat so received depends upon the temperature, density and velocity of the gases passing through. As we increase the rate of combustion, we increase the weight and volume of the gases and therefore the velocity. At the same time there is an increase in the temperature and a decrease in the density.

In order to get heat out of the gases into the tube heating surfaces, it is necessary to bring the small particles of gas into actual contact with the heating surfaces. To do this successfully it is necessary to break up the gas into small streams by the use of small tubes. As the gases pass through the tubes the molecules are vibrating rapidly in all directions, and are striking against the heating surfaces, giving up their heat. The amount of heat given off will depend not only upon the temperature of the particles of gas, but also upon the number of blows they strike against the heating surfaces. This depends partly on the density, which controls the number of molecules in a given volume of gas, but largely on the diameter of the tube.

A decrease in the diameter of the tube decreases the average distance of each particle of gas from the heating surfaces. Each particle will therefore have a smaller distance to travel in order to strike the heating surfaces, and in passing through a tube of given length it will come in contact with the surfaces oftener and will give up more heat—thus resulting in a lower front end temperature and higher boiler efficiency.

The efficiency of a tube increases as the diameter decreases and as the length increases; though tests seem to indicate that tube lengths in excess of 100 or 110 times the internal diameter are not productive of high capacity or efficiency. In other words, the tube heating surface gained by increasing the length above 110 times the internal diameter is of little benefit in reducing front end temperatures and in increasing the boiler capacity. It would seem, then, that any improvement in the efficiency of tube heating surfaces must be brought about by decreasing the diameter of the tubes, or by decreasing the amount of work to be done by the tubes.

As was indicated by Fig. 6, increasing the percentage of heat absorbed by the firebox reduces the percentage of heat to be absorbed by the tubes and increases the tube efficiency. This increase in firebox heat absorption can be obtained by increasing the grate area, combustion chamber space and, necessarily, the firebox heating surfaces.

The use of larger fireboxes and longer combustion chambers would enable us to reduce the present excessive length of tubes—and possibly to increase their efficiency, by a reduction in the diameter. The present troubles on account of tubes plugging and filling up are not due to the size of the tubes used, but are due entirely to the incomplete burning of the fuel in the firebox.

If the present furnace conditions can be remedied to the extent that approximately perfect combustion can be obtained, there is no logical reason why a tube smaller in diameter and shorter in length cannot be used effectively; but such tubes can be used only in conjunction with a firebox containing large grates, efficient baffling and gas mixing devices, large volume and long flame-way or combustion chamber space.

A comparatively small percentage of the engines in service today are equipped with combustion chambers, although this deficiency has been partly overcome on more than 30,000 locomotives by the installation of the brick arch. What has been said about the value of radiating surfaces, high firebox temperatures, complete mixing and baffling of the gases, and combustion chamber space, is sufficient to explain the benefits derived from the arch, and to account for its almost universal use.

The value of this device is thoroughly recognized. While it has done much to reduce fuel losses and increase locomotive efficiency, it cannot overcome all of the deficiencies of firebox or boiler design. It will increase the efficiency of a firebox limited in grate area or volume—but the maximum firebox efficiency cannot be obtained by the use of the arch alone. Large grates, with medium rates of combustion and long combustion chambers are necessary, and, when used in conjunction with the arch, will add materially to both the capacity and efficiency of the locomotive boiler.

To summarize briefly:

The capacity and efficiency of the locomotive boiler seem to be limited by the inability of the firebox to properly burn the coal and liberate the heat contained.

The larger part of the heat losses (particularly at high rates of combustion is due directly to the inefficiency of the furnace.

The second largest heat loss is that due to the heat escaping in the front end gases, which is unavailable for absorption by the boiler.

The amount of heat rejected by the heating surfaces is comparatively small, and the heating surface efficiencies are high, as compared with the furnace efficiency.

The efficiency of the furnace can be increased by increasing the grate area and reducing the rate of combustion, by providing effective baffles and gas mixers, and by increasing the firebox volume by making the fireboxes as deep as possible and equipping them with long combustion chambers.

The front end heat loss will be reduced as the efficiency of the furnace is increased; but there will always remain a large portion of unavailable heat, which can only be utilized by means of some auxiliary apparatus—preferably a device for pre-heating the air used in the furnace.

The efficiency of the heating surfaces can be increased by increasing the radiating surfaces. This will result in a higher firebox evaporation and reduction in the amount of heat to be absorbed by the tubes—which in turn would mean higher tube efficiency.

Increasing the size of firebox and length of combustion chamber necessarily means shortening the tubes. If the tubes are reduced in length to less than 110 times the diameter, the decrease in efficiency will be largely offset by the increase in heat absorption by the larger firebox, and can be more than

offset by decreasing the diameter of the tube to correspond with the decrease in length.

The vital part of the boiler is the firebox. It liberates and makes available the heat energy stored in the coal. A considerable portion of this energy is now being wasted, through the inability of the firebox to properly burn the coal. The highest degree of fuel economy cannot be obtained while this condition exists. Future developments in firebox design along the lines suggested should result in a still further reduction in the coal bill and an increase in the steaming qualities and efficiency of the locomotive.

BALTIMORE & OHIO SAFETY AND SANITATION RULES

The Baltimore & Ohio has recently issued to its employees a book of Safety and Sanitation Rules. The book has 27 pages and both the form of the book and the style of the rules are patterned closely after the standard code. The safety rules number 120 and are divided into: general rules; transportation department; maintenance of equipment department; and maintenance of way department. In addition to the rules there are also instructions to foremen. The sanitary rules are 13 in number.

The book itself is prefaced by the following:

STRIVE always to protect yourself and your fellow workers.
ADVISE and caution those who do not or will not take precautions.
FORGET petty trifles and keep your mind on your work.
ELIMINATE risks and hazards from your surroundings.
THINK ahead what to do and what not to do in emergencies.
YIELD to the better judgment of your superiors.

FROWN on horse play pranks as they usually hurt someone.
INTEREST yourself in the principles of first aid to the injured.
REMEMBER you must conquer Booze to be safe.
STOP, look and think before you act—don't take chances.
TAKE Safety First seriously; it is no joke to get hurt.

The following extracts afford a good example of the general character of the book:

10. Employees must not hang on moving cars or engines except when required by their duties.

11. No persons will be permitted to ride on the pilot, pilot beam or on the step attached to the pilot or pilot beam of a locomotive, except when their duties actually require them to do so.

18. Attention should be given to your work while on duty. Diversion of attention in any way, from work, often leads to serious accident. Remember to be careful under all circumstances and keep in mind at all times the necessity for care. It is by so doing that one disciplines himself, and when caution becomes a habit there will be few accidents.

37. Passenger trainmen must not move stepping boxes when passengers are about to step on them. When using stepping boxes, always say to passenger "Watch Your Step."

39. Passenger trainmen should when practicable get aboard train before it starts.

40. When riding on a train on which passengers are carried, employees (other than those engaged on the train) will alight from the side intended for passengers but must not alight while the train is in motion.

46. Sprinkling hose on an engine shall not be left in a position where it may be mistaken for a handhold.

Foremen [in shops] must show a sincere desire to prevent injury. Their attitude toward this work will be reflected in actions of the men under their direct supervision.

To employees in and around shops: The reports of injuries occurring in and around shops show that almost all of them could have been prevented by the exercise of greater care, by having used your head before using your hands; by having secured a solid footing and firm grip before you lifted.

87. [Things prohibited.] Entering a room with open flame light where gasoline, kerosene or other explosives are stored or kept.

91. Scuffling, wrestling, throwing material or playing jokes of any kind.

108. Hand cars or hand trucks must not be used at night, nor in the daytime when approaching trains cannot readily be seen by reason of fog, storm or snow, except by permission of the superintendent or if unable to communicate with the superintendent, except by proper flag protection.

[Sanitary rules.] 4. Clean sheets and pillow cases should be provided each occupant of a bed at rest houses, Y. M. C. A. buildings, etc.

5. No employee will be allowed to occupy a bed without first removing soiled outer garments.

6. Employees who would otherwise not do so should be encouraged to use shower baths.

RAILROAD SECURITIES HELD ABROAD

L. F. Loree, president of the Delaware & Hudson, has made public the results of his further inquiries as to the amount of American railroad securities held abroad.

At the time this inquiry was first undertaken it was ascertained that the securities held abroad on January 31, 1915, were of a par value of $2,704,402,364. Information was received from 144 railroad companies, being all the railroads in the United States over 100 miles in length, and 105 companies reported securities held abroad.

During the year ending July 31, 1916, there were returned to the American market securities of the par value of $807,881,666. During the six months ending July 31, 1915, there were returned securities of the par value of $480,892,135. There were held abroad on July 31, 1916, securities of the par value of $1,415,628,563 and having a market value of $1,110,099,090.

The following table shows the par value and market value of each class of securities held abroad on July 31, 1916, July 31, 1915, and January 31, 1915:

Class of security	Par value	Market value
Preferred Stock—		
July 31, 1916	$120,597,750.00	$93,816,715.00
July 31, 1915	163,129,850.00	117,863,393.01
January 31, 1915	204,394,400.00	.....
Second Preferred Stock—		
July 31, 1916	4,858,650.00	2,060,256.00
July 31, 1915	5,608,850.00	2,115,415.00
January 31, 1915	5,558,150.00	.....
Common Stock—		
July 31, 1916	336,761,704.00	234,154,103.00
July 31, 1915	511,437,356.25	342,225,958.00
January 31, 1915	573,880,393.00	.....
Notes—		
July 31, 1916	9,070,955.00	6,844,240.00
July 31, 1915	24,632,291.93	22,574,283.93
January 31, 1915	58,254,390.16	.....
Debenture Bonds—		
July 31, 1916	74,796,900.00	69,858,284.00
July 31, 1915	160,288,700.00	141,444,593.00
January 31, 1915	187,508,310.00	.....
Collateral Trust Bonds—		
July 31, 1916	85,166,470.00	66,526,692.00
July 31, 1915	180,590,850.00	136,422,185.75
January 31, 1915	282,418,415.26	.....
Mortgage Bonds—		
July 31, 1916	774,793,834.00	628,183,797.00
July 31, 1915	1,150,339,130.00	962,081,613.26
January 31, 1915	1,371,156,851.00	.....
Equipment Trust Bonds—		
July 31, 1916	7,788,300.00	7,015,683.00
July 31, 1915	25,253,201.00	24,480,410.55
January 31, 1915	20,233,455.00	.....
Car Trusts—		
July 31, 1916	836,000.00	681,320.00
July 31, 1915	29,000.00	29,060.00
January 31, 1915	.....	.....
Receivers' Certificates—		
July 31, 1916	958,000.00	958,000.00
July 31, 1915	2,201,000.00	2,201,000.00
January 31, 1915	998,000.00	.....
Total—		
July 31, 1916	$1,415,628,563.00	$1,110,099,090.00
July 31, 1915	2,223,510,229.18	1,751,437,912.50
January 31, 1915	2,704,402,364.42	.....

Meeting of Railway Real Estate Association

Papers and Discussion of Land and Tax Questions As Well As of Certain Aspects of Federal Valuation

THE second annual meeting of the Railway Real Estate Association was held at the Hotel Sherman, Chicago, on October 11, 12, and 13. President B. A. McAllaster, land commissioner of the Southern Pacific, presided.

Valuation of Right of Way

James P. Nelson, member of the valuation committee of the Chesapeake & Ohio and member of the eastern land committee of the Presidents' Conference Committee, read a paper on "Valuation of Right of Way, and Other Lands of a Common Carrier, Under the Act of March 1, 1913," of which the following is an abstract:

In no phase of the work of federal valuation has there arisen a sharper difference of opinion between the division of valuation and the representatives of the railways than as to the proper procedure in ascertaining the value of lands. The valuation act calls for the value of the physical property. Then it calls for "other values and elements of value, if any," in order to make up the entire value of the railway as a living, going, articulated entity. The foundation of this value is our right of way, and our great terminal lands—our real estate devoted to the service of the public.

The procedure of the division of valuation in ascertaining the value of our lands devoted to public service is, first, to get from the land records recent sales of lands whose sales are supposed to reflect value on our lands. Not in all cases are those lands actually adjacent to our lands. In a vague kind of a way these sales are used by the government land appraiser to enable him to form an opinion as to the naked value of the lands adjacent to, and similar to, our lands. Next the appraiser gets the opinion of various persons as to the naked value of these similar and adjacent lands. He divides our right of way along our line into "zones" of varying length, each "zone" including a stretch of right of way that is, in his opinion, of one kind, and of one value. Sometimes he gets data as to the assessment of these similar and adjacent lands for taxation purposes. This data is reported to the division of valuation at the headquarters of the valuation attorney, and, by some person, or persons, who have never seen our lands, our values are fixed. The absurdity of this procedure should condemn it.

But there is one phase of the procedure that is interesting. The land appraiser who collects the data in the field, and reports his opinions as to the value of these adjacent and similar lands, sees our lands, and often our railway, for the first time. He is, so far as I have seen these appraisers, a man seeking to be fair and just. He is intelligent. But he seeks to do that which is the work of an expert, and we know that we who are trained in the service of our real estate departments are often at a loss to say what value we should place on land with which we are familiar. We would not call into our councils men who do not know the land in question. And yet, the value of our railway lands is fixed by men who know nothing of our lands.

The division of valuation acknowledges that it is ignoring the mandates of the valuation act when it does not, as commanded by the act, ascertain "the present cost of condemnation and damages in excess of present value of lands." The division holds that its mode of procedure is justified by the decision in the "Minnesota Rate Cases," which decision nullified the mandate of the act, according to the division of valuation.

Out of the "Minnesota Rate Cases" the division of valuation has read a rule, or "formula," for the ascertainment of land values, whereas in that decision Justice Hughes said: "The ascertainment of that value is not controlled by artificial rules. It is not a matter of formulas, but there must be a reasonable judgment having its basis in a proper consideration of all relevant facts."

We recognize that the data as gotten by the government land appraisers is "relevant" in this work. But we claim that there are other and more pregnant facts. It is the "reproduction," or the "re-acquisition," of our lands that is demanded by the act, and the cost of that "reproduction," or "re-acquisition." Facts as to severance damages, and other damages; facts as to necessary cost of a strip of land, as compared with the value per unit of area of the entire tract out of which has come our rights of way, are ignored. We who have bought rights of way have learned the fundamental and proper principle that no one will sell a strip of land, or an irregularly shaped parcel of land, at the price per unit of area for which the owner would sell the entire tract out of which comes the strip or parcel. (Mr. Nelson emphasized the importance of the railways collecting data as to their actual experience in acquiring land for railroad purposes. All "relevant facts" should be gathered and placed at the disposal of their counsel.)

Pierce Butler, in his analysis of the decision in the "Minnesota Rate Cases," demonstrates that the justice was not laying down any "formula" for the valuation of lands, because, had he so done, he would have been self-contradictory. The decision was to say that in these cases the railways had failed to submit in their evidence "relevant facts" to sustain their claims. The decision is simply specific as to the cases at bar. No general doctrine was propounded. No rule or "formula" was declared.

Frank W. Stevens, valuation counsel of the New York Central Lines, and chairman of the land committee of the eastern group, has given us an able analysis of the decision. He says: "The conclusion that the language of the court means that railroad lands can never have a greater value than contiguous lands is not warranted by either specific language of the court or by its course of reasoning."

Value is a judicial question, not a legislative one, and the province of a court of proper jurisdiction is to "ascertain," not to "fix," value, and the court demands always "relevant facts" as demanded by them.

What, at last, determines the value of our right of way as such?

We acquire strips of land, and they are welded together as a continuous right of way. To say that, after this welding, the value of the continuous right of way is the sum of the prices paid for each parcel is to state an absurdity. It is a well known fact that the welding together of a number of parcels of land, making one tract of the separate parcels, does add value to the welded parcels that did not belong to them as individual parcels. Therefore our right of way as such, a continuous, long strip of land, has become land devoted to the highest use to which land can be devoted, and the use to which a thing is put, determines its value; the highest use for which a thing is adapted determines its value. This doctrine is well established by our courts of final resort. If a parcel of land has a peculiar fitness for railroad purposes, that fitness gives it a peculiar value, and the owner of a parcel is entitled to a price accordingly, even though the land be otherwise valueless.

It is held by some persons that after the right of way comes into use, *there comes also an added value, because of the use.*

The parcels that go to make up the continuous right of way are to the parcels as before they became right of way, as the refined metal is to the crude ore as it lay hidden in the earth. The land, as right of way, is doing the highest possible work, and its "present value" should be ascertained accordingly. The higher the use, the greater the worth, the greater the value. Two strips of right of way, one bearing a large traffic, the other a lighter traffic, have different values, even though the two be similar lands. But this view is not accepted as part of our platform.

Our right of way is not for sale as land at any price, unless we abandon the use of the right of way, and then, at once, it may become utterly valueless. We have destroyed its value for every other purpose except a railroad purpose. That purpose gone, the value has gone. As it were, we take a lifeless body, and by making it a right of way, we breathe into it the breath of life. If we cease to use the land as right of way, then, unless it has fitness for some other purpose, it has lost the breath of life.

To seek to value right of way by the value of adjacent lands leads us at times into an absurdity. A railway, as in the case of the Chesapeake & Ohio and other lines, lies through a canyon, along a river, at the foot of steep mountains, and, sometimes, cliffs. On one side is a rushing river, on the other steep mountain slopes, or cliffs. There is no similar land available for railroad purposes. Indeed, the right of way is hewn through the cliffs. The railway has created the right of way. How will the division of valuation apply its rule, or "formula"! It is the unanswerable logic of the "Reductio ad absurdum," and no chain is stronger than its weakest link.

Railroad Tax Assessments on Basis of Earnings

The following is an abstract of a paper by S. G. Cramp, assistant real estate agent of the Pennsylvania Lines West, on "Railroad Tax Assessments on the Basis of Earnings":

In almost every state in the union it is the practice to tax railroads either upon their earnings, or upon some fixed valuation which is determined to a greater or lesser extent from the earnings, gross or net, and sometimes taking into consideration both gross and net, as well as capitalization. The use of earnings, however, whether gross or net, as the sole basis of determining the taxation of a railroad tends to establish an unbending or universal rule, and it is a fact beyond dispute that an unbending rule or law will always do injustice and injury to someone.

For state and local taxation if the basis of net earnings alone is used, then some other method must be adopted for taxing the railroad that has no net earnings or operates at a deficit.

Since the great growth of railroad and industrial corporations has become apparent, there has been almost a constant search for some mathematical formula or definite rule by which they may be assessed or taxed. I firmly believe that no such formula or rule will ever be discovered that will do entire justice in every case, for all railroads are not similar. As a general rule, the taxable value of property is its bona fide sales price, and a practical man in determining this bona fide sales price will consider practically every essential which enters into the value thereof, not only its present earning or producing value, but also its future prospects, sometimes designated as good will.

One of the theories of taxation as applied to railroads that has received considerable commendation is that advanced by Hon. Allen Ripley Foote, as follows: Assess a flat rate of 2 per cent on the gross operating revenues regardless of the margin of difference between the total revenue and the operating expenses, this rate to be paid by all whose operating expenses are 90 per cent, or more, of their operating revenues, and add a differential of 1/16 of 1 per cent for each 1 per cent of increase in the margin of difference between total revenue and total operating expenses in excess of 10 per cent. Such taxes are to be paid to the state, and all or at least part are to be apportioned by the state to each taxing district in proportion to the value for taxation of all other property within such district. This suggestion, if followed, would greatly lessen the amount of work and the expense involved by the railroads in making their tax returns as required by the various states, and would make for greater equality between the states themselves for the assessments would be made upon the same report or one somewhat similar to that now filed with the Interstate Commerce Commission, and the taxes collected would be levied at a flat rate. But it is likely that in years of abnormal business and prosperity it would result in the taxation from railroads being so much above normal, and thereby apparently so decreased in years of adversity and little business as to cause dissatisfaction on account of the fluctuating taxes received, and it is suggested that this might to a certain extent be obviated by assessing the flat rate and differential upon the average earnings or receipts for a term of probably five years or more.

It is obvious that unless a fixed rule or formula is required to be used in determining the taxation or valuation for taxation of a railroad corporation, the officer or body charged with this duty must be vested with broad discretionary powers and must be free from political influence, and should have learning and ability in this special line of work.

No doubt the interstate railroads will in the dim future operate under federal charters and be less subject to the laws and jurisdiction of the states. When this time arrives the federal government with all the information it requires before it will be in a better position to fix and determine the taxation of such corporations than are the several states today.

If it be conceded that railroads should be taxed according to their earnings, and this is now so universally the practice as to be almost conclusive, how shall such taxes be measured? Shall a flat rate be assessed upon the net earnings or upon the gross earnings or shall a system of differentials be used as suggested by Mr. Foote; or shall the net earnings or gross earnings or both be used in determining a taxable value upon which the rate or rates shall be assessed? Applying a flat rate upon the net earnings alone may not adequately tax the corporation which owns a large quantity of tangible property and has low earnings or high operating expenses. Applying a flat rate upon gross earnings may seriously overtax the railroad owning a comparatively small quantity of tangible property and having high operating expenses. It would seem preferable in the event of applying a rate upon net earnings alone without determining a valuation, to use a system of differentials something after the manner of Mr. Foote's suggestion, for in this manner we will arrive at the ability of the railroad to pay.

If, however, a valuation is determined upon which the rate is to be levied, then we should at once eliminate the constant following of a mathematical rule. My own opinion is that railroads should be taxed by a flat rate assessed against a total value to be determined to a great extent through consideration of both the actual net and gross earnings and that for such a purpose the entire railroad should be considered as a unit. This total value should undoubtedly be determined by persons chosen for their ability and experience, and never from political preferment alone. In determining such total value they should be governed by every essential which goes to make the railroad one of the means of transportation. They must remember that railroads are not monopolies to be heckled and taxed out of existence, but that they are essential to the state and stand in the same relation to it as do the veins and arteries to the human body.

Discussion.—The discussion of Mr. Cramp's paper was opened by W. L. Mattoon, real estate and tax agent of the Hocking Valley. He outlined the experience of the railways with a tax on earnings in Ohio, stating that the state tax

commission refused to reduce the taxes of a railway when its earnings fell off. He also expressed himself in favor of federal appraisement of interstate lines for purposes of taxation. H. H. Trabue, real estate agent of the Nashville, Chattanooga & St. Louis, stated that the assessment of the entire property of a railroad as a unit, commended in Mr. Cramp's paper, was the practice in Tennessee and had proved a success. In a discussion of what constituted earnings, H. H. Merrihew, land and tax agent of the Erie, stated that the only part of a railway's income which the Ohio Tax Commission had so far not included in earnings was interest on money on deposit. P. McPherson, right of way and lease agent of the Canadian Pacific, Winnipeg, stated that in Canada there were no Dominion taxes outside of an emergency tax levied during the past year. In the four western provinces the taxation powers for all purposes lie in those provinces. In Manitoba railways pay a three per cent tax on gross earnings and a frontage tax for improvements in municipalities. In British Columbia railways pay one per cent on an assessment of $10,000 per mile and one per cent on a valuation of $3,000 per mile on side-tracks in all territory outside of municipal governments. Railway property in municipal territory is subject only to municipal taxation.

Effect of Federal Valuation on Future Tax Assessments

A. J. Rooney, tax agent of the Chesapeake & Ohio, read a paper on "The Probable Effect of Federal Valuation on Future Tax Assessments of the Railways of the Eastern States." He said in part:

Only a few of the eastern states have ever attempted to formulate any scientific system of taxation. Added to, here and there, with inadequate amendments, the tax laws of many of the states are nothing but a patchwork of temporary expedients framed to meet temporary needs. The railways being the most vulnerable are usually the first to be considered when sources of additional revenue are sought. Generally, the earnings are considered, either in one way or another, and the assessments of the railways are comparatively high. From the standpoint of fairness and justice the answer to the question to be considered may readily be given: Federal valuation should have no effect on taxation, because as a rule the railways are already bearing more than their fair share of the tax burden of the states.

It is safe to say that if rates are prescribed (on the basis of federal valuation) which will prove ample in affording a reasonable return, the railways will not object to an assessment of their property at the true property investment, provided, of course, that other property is assessed at true full value. There is always attached to every commodity or concern which has any intrinsic value at all, a commercial value, and it is upon the commercial value that taxation should be based. The true method of measuring the commercial value of a railway, or any other going concern, is by its earning power—power to make legitimate returns to its owners, and there also lies its ability to pay the taxes which may be levied against it. If by reason of governmental regulation, or otherwise, it is denied the ability to make legitimate returns, its ability to pay taxes is correspondingly reduced.

F. A. Waters, general right of way and tax agent of the Los Angeles & Salt Lake, presented a paper on "The Probable Effect of Federal Valuation on Future Tax Assessments of the Railways in the Western States."

Physical and reproduction value (assuming that this is the value which the federal government is attempting to ascertain) doubtless has some relation to questions of rate making and the issuance of bonds, but for taxation purposes it is useless, and this seems to be the generally accepted theory of all who have given the matter thought.

Property other than that of carriers is valued for assessment purposes on a theoretical basis of what a seller who does not have to sell would take, and what a buyer who does not have to buy would pay; so in equity must a carrier be valued for taxation purposes. There is no doubt but that both buyer and seller of a carrier under such conditions would refer to the physical value, but first, last and all the time the commercial value—the ability of the property to produce revenue—would be the guide for both. If reference is had to the physical value of carriers the assessing body must equalize that value with the value of other property. To establish this comparison, recourse must of necessity be had to their commercial value, because the value of the other property is based upon its commercial worth under the "buyer and seller rule" generally provided by law, and it will be up to the carrier to see that proper comparison is made.

In the discussion of these two papers the consensus of opinion seemed to be that federal valuation would not affect the taxation of railroads in those states where carriers are assessed on the basis of their earnings, but that where railway real estate is assessed by local tax boards it would probably be used to the embarrassment of the railroads, should the values as determined by the government prove to be high.

H. A. Howarth, real estate agent of the Long Island, and a member of the eastern land committee of the Presidents' Conference Committee, presented a paper on the "Present Methods and Future Trend of the Interstate Commerce Commission in the Valuation of Railway Lands." Peter McPherson, right of way and lease agent of the Western Lines, Canadian Pacific, read a paper on "The Organization and Jurisdiction of the Real Estate Department of a Railway in Canada," and a paper by W. L. Lawrence, real estate agent of the Deiaware & Hudson, was presented on "The Organization and Jurisdiction of the Real Estate Departments of the Railways in America."

Other features of the program were a paper on "A Method of Numbering and Filing Deeds and Other Papers," by D. M. Taylor, assistant engineer of the Wheeling & Lake Erie; the presentation of a progress report by the Committee on Uniform Practices, and a banquet at which John W. Gorby, cashier of the Central Manufacturing District Bank, Chicago, gave an address on "National Preparedness."

Officers for the ensuing year were elected as follows: President, James P. Nelson, member of the valuation committee of the Chesapeake & Ohio, and member of the eastern land committee of the Presidents' Conference Committee, Richmond, Va.; first vice-president, Frank Taylor, right of way and lease agent, Canadian Pacific, Montreal, Que.; second vice-president, F. C. Irvine, special agent, Pennsylvania Lines, Pittsburgh, Pa.; secretary and treasurer, R. H. Morrison, assistant engineer, Chesapeake & Ohio, Richmond, Va.

The next convention of the association will be held at Duluth, Minn., beginning on the second Tuesday in October, 1917.

WHY THE INTERCOLONIAL RAILWAY IS A FAILURE

The article under this title in the *Railway Age Gazette* of October 13, 1916, page 629, stated that the Canadian Pacific operated 294 miles of railway in Nova Scotia. This statement was misleading since this mileage in Nova Scotia is represented by the Dominion Atlantic which is under lease to the Canadian Pacific for 999 years from 1911, but the results of whose operations are not included in the operating results of the Canadian Pacific.

Rail Scarcity in South Africa.—Owing to the cessation of the supply of rails by Germany, there is a scarcity of light rails and mining trucks in South Africa.

THE CONGRESSIONAL INVESTIGATION OF RAILWAY REGULATION

Plans for conducting the proposed congressional investigation of the subjects of government control and regulation of transportation and of government ownership of public utilities are being made along broad and comprehensive lines by the joint subcommittee of the House and Senate appointed in accordance with Senate joint resolution No. 60, passed at the recent session of Congress. The first hearing before the committee, which is styled the Joint Committee on Interstate Commerce, is to begin on November 20 in the Senate office building at Washington.

A statement outlining the purpose and scope of the investigation by Senator Francis G. Newlands, of Nevada, who is chairman of the committee, has just been mailed to members of the Interstate Commerce Commission and state railroad commissions, commercial, farming and banking organizations and to about 40 economists and publicists, as well as to the representatives of the railroads and their employees. The statement was issued for the purpose of inviting all who are interested in, or have any information regarding the subjects of the inquiry to express their views either by written communication or at the oral hearings, with a view to eliciting the best thought available regarding the matters to be considered by the committee.

While the resolution creating the committee calls for a report to Congress on or before the second Monday in January, it is assumed that an extension of time will be granted and tentative plans have been made for an inquiry that may require nearly two years for its completion. While no definite decision has been reached, it is expected to hold hearings in the principal cities of the country as well as at Washington and the tentative itinerary includes New York, Chicago, possibly Omaha, St. Louis, Kansas City, San Francisco, Portland, San Antonio, possibly New Orleans, and Atlanta. Probably no hearings will be held outside of Washington before the first of the year.

Senator Newlands' preliminary statement says that the subjects to be considered, as stated in general terms in the joint resolution, cover:

First, " . . . the subject of the government control and regulation of interstate and foreign transportation," including therein specifically:

(a) " . . . the efficiency of the existing system in protecting the rights of shippers and carriers and in promoting the public interest."

(b) " . . . the incorporation or control of the incorporation of carriers."

(c) " . . . and all proposed changes in the organization of the Interstate Commerce Commission and the act to regulate commerce."

Second, " . . . the subject of government ownership of all public utilities, such as telegraph, wireless, cable, telephone, express companies, and railroads engaged in interstate and foreign commerce," including specifically:

(a) " . . . the wisdom or feasibility of government ownership of such utilities."

(b) " . . . the comparative worth and efficiency of government regulation and control as compared with government ownership and operation."

Under the head of government regulation and control, without excluding other questions, attention is particularly called to the following subjects:

"(a) Whether the Interstate Commerce Commission is overloaded and whether its jurisdiction should be confined to questions of discriminations, rebates and rates; its jurisdiction over other subjects, such as valuation, safety inspection, etc., to be turned over to some other body or bureau to be created by law.

"(b) Whether it is necessary to make any change in the organization of the Interstate Commerce Commission with a view to prompt and efficient action; whether it is feasible to increase the number of commissioners and to permit them to divide into several departments for the consideration of cases, and if so whether there shall also be consideration in bank and also whether there shall be appeal from decisions in the department to the commission in bank.

"(c) Whether such departments of the Interstate Commerce Commission shall sit in Washington, or be assigned to definite traffic areas somewhat after the manner of the judicial circuits, and whether in the latter case there should be provision for their sitting in bank at Washington or for some central body in Washington with the duty of hearing appeals and directing the procedure of the departments.

"(d) Whether under the present system the credit of the common carriers is assured with a view to their securing the moneys needed for necessary improvements and extensions in the interest of the public and at reasonable rates of interest. Whether government regulation of the issue of securities is advisable, and if so whether it is to the interest of the public as well as the carriers that this regulation should be exercised by the national government and whether it should involve merely publicity or absolute control of the issue of securities. Whether concurrent jurisdiction of the nation and the states to control such issues is in the interest of the carriers and the public. What will be the field of operations for the state railroad commissions in the interest of the public if the control of securities and the control of rates is vested in the Interstate Commerce Commission. Whether and to what extent within a period of five years it will be necessary to enlarge the facilities of the common carriers in the interests of the public and whether the present system of government regulation is such as to insure the credit of the carriers with a view to their making additional necessary expenditures.

"(e) What is the effect of dual regulation on the parts of the state and the nation of the rates of carriers. What, if any, contradictions does it involve, and what, if any, discriminations does it involve as between states and localities.

"(f) Whether or not any regulation is feasible of the wages and hours of employees of common carriers, and whether or not it is advisable, in the interest of the public and with a view to maintaining uninterrupted commerce between the states, to take any further legislative action regarding the adjustment of disputes between the carriers and their employees and regarding strikes and lockouts.

"(g) Whether any national legislation is required as to the organization of carriers in interstate commerce in the nature of national incorporation, permissive or compulsory, or in the nature of national holding companies under which state corporations may be controlled and unified in their operations in the interest of interstate commerce, and what form of national legislation for the incorporation of carriers or for holding companies owning the stock of state companies, is desirable. How will national incorporation affect the police powers of the states over railroads operating within their boundaries. Will it be advisable, as in the case of national banks, for the national government to prescribe a uniform rule for the taxation by the states of railroad properties and securities."

Under the head of government ownership the following subjects are included:

"(a) The practical results of government ownership both as to efficiency and economy where actually practiced.

"(b) Whether government ownership is compatible with our system of government and what its effect will be on our governmental institutions.

"(c) Whether a system of government ownership will suit local needs.

"(d) A practical method of securing government ownership whether by purchase or condemnation of properties, or by purchase or condemnation of bond and stock issues, or otherwise."

It is stated that: "It is the desire of the committee to give ample opportunity to all interested in or having any relation to the subject matter of the proposed inquiry to express their views. But the committee would like early notice of the subjects to be discussed by the various persons appearing before it, so that the hearing can be, as far as practicable, in orderly sequence as to subjects. The purpose of the committee is to hear regarding government regulation and government ownership the opinions of economists and publicists of eminence, representatives of the Interstate Commerce Commission, the National Association of State Railroad Commissioners, state railroad and public utility commissions, representatives of the railroad executives and labor organizations, representatives of farming organizations, and farmers, shippers, and bankers, representatives of chambers of commerce, and other important business and industrial organizations.

"The views of all who are interested or have information regarding the foregoing questions are invited by the committee, either by written communication or at the oral hearings.

"It is suggested that with a view to maintaining a logical sequence in the hearings those participating therein classify their remarks according to the foregoing subheads as far as practicable."

Senator Newlands in his statement points out that the initiative of the proceeding was taken by President Wilson in his message to Congress on December 7, 1915, in which he said in part:

"The transportation problem is an exceedingly serious and pressing one in this country. There has from time to time of late been reason to fear that our railroads would not much longer be able to cope with it successfully, as at present equipped and coordinated. I suggest that it would be wise to provide for a commission of inquiry to ascertain by a thorough canvass of the whole question whether our laws as at present framed and administered are as serviceable as they might be in the solution of the problem. It is obviously a problem that lies at the very foundation of our efficiency as a people. Such an inquiry ought to draw out every circumstance and opinion worth considering, and we need to know all sides of the matter if we mean to do anything in the field of federal legislation."

The resolution was introduced in the Senate and, after amendment by including the investigation of government ownership, was adopted by both houses of Congress and was approved by the President on July 20. The following members of the Interstate Commerce Committee of the Senate and of the House Committee on Interstate and Foreign Commerce were appointed members of the subcommittee: Senate, Francis G. Newlands, Nevada; Joseph T. Robinson, Arkansas; Oscar W. Underwood, Alabama; Albert B. Cummins, Iowa; Frank B. Brandegee, Connecticut; House, William C. Adamson, Georgia; Thetus W. Sims, Tennessee; William A. Cullop, Indiana; John J. Esch, Wisconsin; Edward L. Hamilton, Michigan.

The committee held a meeting on September 6 and organized by selecting Senator Newlands as chairman and Representative William C. Adamson, who is chairman of the House Committee on Interstate and Foreign Commerce, as vice-chairman. The committee is empowered to summon witnesses and to require the various departments, commissions and other government agencies of the United States to furnish such information and render such assistance as may in its judgment be desirable. The sum of $24,000 has been appropriated for its expenses.

GERMAN ELECTRIC RAILWAY SYSTEMS.—Aix-la-Chapelle has the third largest electric railway system in Germany. Greater Berlin leads with a total of 408 miles, Hamburg ranks second with 117 miles, while Aix-la-Chapelle has 112 miles.

CONVENTION OF MAINTENANCE OF WAY MASTER PAINTERS

The thirteenth annual convention of the Maintenance of Way Master Painters' Association of the United States and Canada was held at the Hotel Walton, Philadelphia, October 17 to 19 inclusive with an attendance of about 40 members together with representatives of a number of paint manufacturers. The meetings showed a marked improvement over last year's convention both as to the attendance and the scope of the program.

Thomas B. Smith, mayor of Philadelphia, and Charles E. Tryon, representing the Philadelphia Chamber of Commerce, gave addresses of welcome. In his address as president, F. C. Rieboldt, master painter, Chicago, Milwaukee & St. Paul, recommended certain changes in the constitution and by-laws, which would expedite the business of the association. He also referred to a movement on foot to bring about an amalgamation with the American Railway Bridge and Building Association. This matter was referred to a special committee for consideration and report.

L. P. Nemzek (John Lucas & Company) presented a paper on "Preservative Coatings for Iron and Steel," in which he recommended and gave reasons for the advantages of basic lead chromate in place of the commonly used oxide, red lead. H. A. Gardner (Institute of Industrial Research) gave an illustrated lecture on "Physical Characteristics of Pigments and Paints," which included reference to the possibilities of kukin oil, the oil of the soya bean and perilla and china wood oils. Pigments were considered from the standpoint of hiding power, oil absorption, opaqueness, suspension, etc. He prefers red lead containing 15 per cent of litharge. In commenting on this, A. H. Sabin (National Lead Company) stated that this amount of litharge was an advantage in a paint to resist water because the film was necessarily thicker. H. B. Wilson (B. & L. E.) raised an objection to this ingredient in that it had a tendency to settle in the pot and required constant stirring.

Three papers were presented which covered the subject of fire resisting properties of paint, one by W. A. Clapp (Clapp Fire Resisting Paint Company) on "Fire Resisting Paints," another by G. F. Johnston (Pyroline Products Company), entitled "Reducing Fire Losses." A third is abstracted in another column. In discussion of these papers, H. A. Gardner expressed the view that any good paint containing a mineral pigment has fire resisting properties, since after the oil is driven off by the heat the surface is covered with a coating of purely mineral substances. E. H. Brown (Painters' Magazine) stated that he had found a heavy coat of lime whitewash, when protected from the weather, to be a good resistant. A number of the members spoke of their experience with various formulae containing white wash as the principal ingredient.

The position of the master painter in relation to his men and to the railroad was discussed at some length following an outline presented by H. E. Conrad (P. R. R.).

Papers were also presented on the following subjects: "What the Association Has Done for the Railroads," by A. B. Phelps (N. Y. C.); "The Influence of Pigments on Paint Permanency," by Malcolm McNaughton (Joseph Dixon Crucible Company), and "Sanitary Value of Paints," by E. W. Lutes (Sherwin-Williams Company). Three other papers are given in abstract below.

ADMINISTRATION OF THE MAINTENANCE PAINTING OF BRIDGES

By W. S. Lacher

Assistant Engineering Editor, *Railway Age Gazette*

The length of the intervals between the repaintings of bridges is governed by no definite law. One road reports the interval as one, two or four years; another as 8 to 10 years;

and a third as 5 to 15 years. Climatic conditions have a large influence. Another factor is the variation in the amount of attention given the bridges. On some roads, unfortunately, they are not repainted until the previous coat has almost disappeared. On other lines, the complete repainting is deferred at a material saving by the systematic touching up from time to time of the parts subject to the quickest deterioration. On the Santa Fe it is the practice to repaint or retouch a bridge whenever the weather coat has deteriorated sufficiently to expose the body coat underneath, the idea being to avoid if possible the removal of the body coat. The expense of cleaning off rust is thus very largely avoided.

The decision to repaint a bridge is determined almost universally by the condition of the structure rather than by the interval since the last painting, the condition being determined by inspections as carried out according to various schedules. These inspections are usually made individually or jointly by master carpenters, engineers maintenance of way, bridge inspectors, or bridge engineers, at least once each year. On the Canadian Pacific the division superintendents and the division engineers inspect all bridges in the fall, while the resident engineers and the master carpenters give all truss bridges and high viaducts an additional inspection in the spring. On the Chicago & North Western, independent inspections and recommendations are made by the general bridge inspector or his assistants, and the division maintenance officers, the two sets of recommendations being checked against each other in determining the work to be authorized. On the Burlington, all steel bridges of any importance are inspected personally by the bridge engineer.

As a rule the repainting of a bridge is authorized as a part of the annual bridge maintenance budget, which gives authority in detail for the individual structures. A less common practice is to provide a sum for bridge painting by divisions, leaving the detailed distribution to the division engineer maintenance of way or the master carpenter.

Most roads do maintenance bridge painting with company forces, generally under the direction of the division master painter. The work is usually done by a division paint gang, which paints all classes of structures, as there is rarely enough work within the limits of the district ordinarily covered by a single division organization to keep a gang of bridge painters constantly at work on steel bridges. There are several disadvantages to this plan. House painters do not like bridge painting, particularly the work of cleaning off rust. They are not as skillful as the regular bridge painters in swinging, staging or moving around on high structures. To obtain the latter class of men, some roads organize temporary bridge painting gangs every season, a reliable experienced man usually being kept on the permanent force to hire the men and supervise the work.

On the Chicago & Alton, a combination of the two schemes is used, a special steel paint gang being organized only when there is a considerable amount of this work to be done. The Michigan Central maintains two permanent bridge painting gangs, one working in the United States and the other in Canada. The New York Central has general paint gangs on branches where the bridge and building work is under the direction of a single supervisor, and separate steel paint gangs on main lines where the bridges and buildings are generally handled by separate supervisors.

Whenever repair work is done on steel bridges, it is common to have the iron bridge men do any touching up or spot painting that may be necessary. The Chicago & North Western has used iron bridge men successfully on complete repainting jobs. These men are more agile and skillful in moving about in high places and are said to work faster. The Baltimore & Ohio lays particular emphasis on these qualifications in the selection of bridge painters.

Several roads contract all or a part of their maintenance bridge painting. This does away with the need of an organization for that purpose, the nucleus of which must be held over during the slack season. The same influences have been felt on this work which have caused the tendency towards contract work in other branches of the maintenance of way department, chief among which is the greater latitude allowed a contractor in the payment and selection of his men.

The Chicago & North Western has a large part of the bridge painting done by contract, the contracts being let by the engineer maintenance of way in units of a season's work for one division. The division engineer appoints an inspector, who is kept on the work constantly and the work is also given considerable attention by the division engineer and the master carpenter. This arrangement has proved satisfactory. The contractor furnishes the labor and equipment and the railroad company supplies the paint.

The Chicago Great Western has had a contract in effect for some time which is to be continued indefinitely until cancelled at the option of the railroad or the contractor. Under this arrangement the contractor is required to paint any steel structure whenever the repainting is authorized, at an established price, which is on a tonnage basis for bridges and on a square foot basis for sheet metal work, such as coaling stations. The price includes a guarantee to maintain the paint on each structure for a period of 10 years from the date of painting it.

SAFETY FIRST

By M. F. Ebel
Master Painter, Cincinnati, Hamilton & Dayton, Hamilton, Ohio

In painting the interior of water softener tanks, care should be taken to provide ventilation so that all fumes from the paint can escape. Steel water tanks should be treated in the same way. Open lights or torches should be kept away from any material of a volatile nature. This applies also to cars containing paint materials and where possible a keg of sand should be kept in a convenient place, with a scoop that can be used readily to cover a fire with the sand.

All ropes, hooks, planks and ladders should be inspected from time to time, particularly at the time of taking them from the car. There is always a chance that something may have been injured, cracked or broken in moving it from the preceding job.

In washing interior walls and woodwork in station or other buildings that are wired for electric light, it is always well to turn off the current before starting the work, especially around sockets or connections. The use of a wet sponge in such a place may give a man a sufficient shock to throw him off a scaffold.

As in the case of all other railway employees, caution must be exercised in the use of hand, motor or push cars on the main tracks. Whenever there is any question as to the safety of the use of the car, as when handling a loaded push car, it must be protected both front and rear by flags.

APPLICATION OF FIRE RESISTING PAINT

By H. J. Barkley
Master Painter, Illinois Central, Carbondale, Ill.

Generally speaking, fire resisting paints are divided into two general classes, one with a coal tar base and the other with a linseed oil base. A class by itself is the so-called "water glass" and common white wash which was for years put on the insides of covered wooden bridges, a type of bridge that has almost ceased to exist.

The St. Louis division of the Illinois Central has a large number of open deck wooden trestles on branch lines, which we started to coat with fire resisting paint in 1913. Both types of paint have been used since, and not a single dollar has since been lost by fire on any of the structures so treated.

Previous to that time fires on such structures were frequent, causing a loss in time, traffic and money.

We found the best tool to be a half worn four-inch wall brush made into a hatchet brush with a diagonal handle about four feet long. The coal tar product has to be heated, which is done in a 50-gal. iron kettle on the bank at the end of the bridge. Only the top and two sides of the guard rail and ties, the tops of stringers, caps and sub-sills where they are not covered with sheet metal, are coated. After a three years' trial we find that both types of paint have their advantages both as to covering capacity, permanency, and to actual fire resisting qualities, for which we have tested them both in several ways.

Generally speaking, one gallon is figured for every four lineal feet of bridge. The temperature will affect the amount of material to some extent, as will also the size of the ties and whether they are surfaced or not.

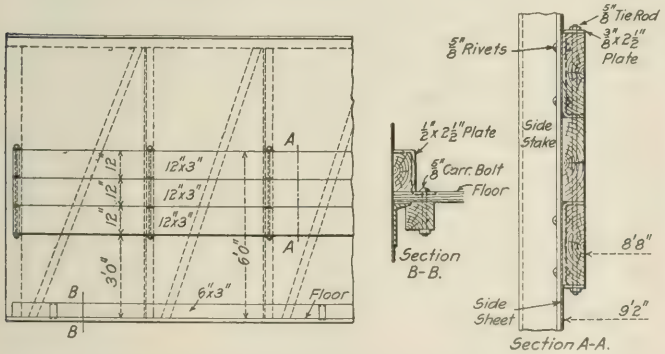
The term "fire resisting" is often misused. A government report says that "There is no known way of making wood absolutely fire proof," but it is a fact that we can reduce the fire hazard to a great extent, as has been proved by demonstrations and by actual use. We know absolutely that coals of fire from a locomotive ash pan have caused countless fires and we also know that we can stop that kind of loss. A heavy timber structure in flames is another matter, but is a condition seldom encountered. In other words, fire resisting paints seem to be a preventive rather than a cure.

It is my prediction that a greater amount of fire resisting paints will be used in the future on timber bridges, coal chutes and like structures, not only on railroads but in factories and the home.

BELT RAIL APPLIED TO UNION PACIFIC ALL-STEEL AUTOMOBILE CARS

The Union Pacific has 600 all-steel automobile cars which were built with the sheathing inside the frame. They were provided with no means of securing shoring for the lading other than the wooden floor, no provision being made for nailing wooden blocks to the side walls on the interior of the car.

A thorough investigation was made of the various methods

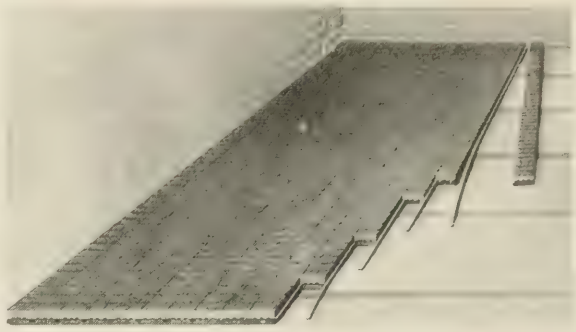


Wooden Belt Rail and Floor Stringer for Union Pacific All-Steel Automobile Cars

employed by automobile shippers for applying double deck loads. It was found that each automobile shipper has his own system of double decking, all of which provide for the making up and carrying in stock of certain sizes of timbers and blocks suitable for application to any wood lined automobile car. When the shipper wishes to double deck a car he picks out the several pieces which enter into the construction of the deck, all cut to size, and secures them to the interior of the car by nailing to the sides. The all-steel automobile cars did not afford nailing facilities on account of the steel lining and the wooden belt rail and floor stringer shown in the drawing were designed and applied to a car. This was passed upon by the shippers and was found to be satisfactory from the standpoint of automobile loading. It is also an advantage in loading other commodities, as it provides means for blocking bulky freight. The arrangement is now being applied to the rest of these cars.

A NEW FLOORING

"Bloxonend" is the name of a new wood block floor that carries its own base. Small wood blocks, 1½ in. by 3½ in. in section, are set on end and dovetailed to a base board. Bloxonend comes in strips, about eight feet long, and is manufactured in several standard combinations. The "two over one" section is a combination of 2-in. blocks on a 1-in. base board. It can be made in special sizes with thicker base if required for floors carrying extra heavy weight, built for heavy trucking. For mill constructions it comes in laminated

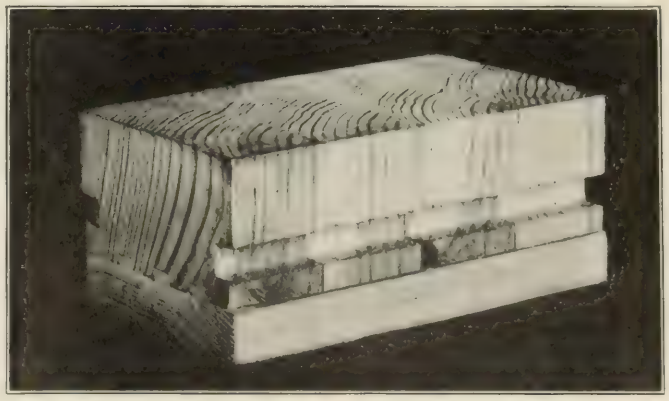


Method of Laying the Floor

flooring up to 16 ft. with the blocks on the top edge, thus doing away with the necessity of laying a hardwood floor on top.

This new flooring can be laid exactly like ordinary wood flooring. It can be laid directly on joists or over old floors; no special foundation is required. The sections are grooved for splines and can be easily and tightly joined.

The purpose of this flooring is to combine the rapid laying advantage of the tongue and groove type with the good qualities of a wook block flooring as to durability, smoothness,



A Section of the Flooring

quietness and resilience. It is contended that it is suitable for a variety of purposes, applying in the case of railway installation to freight houses, station platforms, baggage rooms, shops, etc. Bloxonend is the invention of C. J. Carter, and is manufactured by the C. J. Carter Lumber Company. Marsh & Turman Lumber Company, Chicago, Ill., are sales agents.

General News Department

Postmaster General Burleson has announced that he will give to anyone who is willing to take the chance, and furnish proper equipment, opportunity to start an aeroplane mail route.

A special committee was called by the Chicago council committee on railway terminals on October 16, to bring representatives of the railroads, contractors and labor unions together in an effort to settle the strike which has tied up work on the new union station in Chicago.

The Interstate Commerce Commission has announced a further hearing and oral argument at its office in Washington on October 30 on the commission's order requiring the equipment of locomotives with high power headlights, the effective date of which was recently postponed until January 1.

The Marietta, Columbus & Cleveland has sent out a circular announcing the permanent suspension of operation. By order of the court of common pleas of Washington County, Ohio, passenger, mail and express service were ordered suspended after October 10, and freight service after October 31.

Several men were killed and a number seriously injured when a train of the Chicago, Burlington & Quincy collided with a caboose of a stock train on the same road near Elwood, Neb., on October 15. The trains in question were sections of a stock train and lack of lights and warning signals are given as the cause of the accident.

The coach, cab and tender shop of the Pittsburgh & Lake Erie at McKees Rocks, Pa., was seriously damaged by fire early in the morning of October 13. Several baggage and caboose cars, which were in the shop undergoing repairs, were totally destroyed and a number of machines were damaged. The total loss is estimated at $50,000.

In the Federal Court at Philadelphia, October 12, the Bulah Coal Company was awarded $49,711 as a penalty to be paid by the Pennsylvania Railroad for discrimination in furnishing cars to the coal company. The Interstate Commerce Commission had awarded the coal company, $65,184, but the railroad company contended that the amount was excessive; and the present verdict is the result of its suit against the coal company in the District Court.

Associate Justice Stafford of the Supreme Court of the District of Columbia on October 12 issued an order in conformity with his decision reported in last week's issue directing Milton H. Smith, president; Addison R. Smith, vice-president, and George W. Jones, attorney of the Louisville & Nashville, to answer questions of the Interstate Commerce Commission regarding expenditures of the road for political purposes. Counsel for the Louisville & Nashville have notified the commission that they will appeal from the decision to the United States Supreme Court.

A. O. Wharton, St. Louis representative of the American Federation of Labor, has given out a statement to the effect that the majority of shop employees of six different unions, working on 26 railroads in the west, have voted to refuse the compromise offer of the roads to the men's demands for an increase of five cents an hour and an eight-hour day. The roads propose to increase wages by two and one-half cents an hour and to grant the eight-hour day to men on stationary work. Negotiations, it is said, will be continued by the organized employees and the companies involved.

Chicago Switchmen's Controversy

The 14 midwestern roads centering in Chicago and the Switchmen's Union of North America have agreed to arbitrate on the switchmen's demands for increased wages and shorter hours. The roads have appointed as arbitrators E. F. Potter, assistant to the general manager of the Minneapolis, St. Paul & Sault Ste. Marie, and T. W. Evans, assistant general manager of the New York Central. The switchmen have chosen J. B. Connors, their assistant to president, and W. A. Titus, their vice-president, as representatives. The four were to meet and elect two neutrals, but these last two are not yet named. Should these four fail to elect two neutrals the United States Board of Mediation and Conciliation will appoint them, and then these six will constitute a board to settle the dispute. W. L. Chambers, of the United States Board of Arbitration and Conciliation, suggested the election of the two neutrals.

More About the Car Situation

In the editorial on this subject in the *Railway Age Gazette* of October 13, 1916, page 622, the statement concerning the exports for the first seven months of this year should have read as follows: "Our exports for the first seven months of 1916 amounted to $2,926,000,000, as compared with $1,970,000,000 for 1915 and $1,201,000,000 for 1914."

Conference on the Adamson Law

Warren S. Stone, A. B. Garretson, W. G. Lee and W. S. Carter, who recently asked the railroads to arrange a conference to determine how the Adamson law shall be applied, received an answer a few days ago from Elisha Lee, chairman of the railroads' conference committee of managers, in which Mr. Lee said:

"We are still in considerable doubt as to the meaning of the law, and are endeavoring to solve various questions that have arisen in connection therewith. As soon as we determine the meaning of the law we will call a meeting of the railroad officials and put your request before them."

Texas Railroads Reply to Attorney General

Attorneys for the Texas railroads have filed in the district court at Austin, Tex., a replication to the answer filed by the attorney general of Texas in the case in which the roads have sought an injunction against the order of the Texas Railroad Commission withdrawing advances in intrastate rates which it had previously allowed. The replication is filed for the purpose of denying a number of charges made by the attorney general, one of which was that since the railroads have received land grants from the state they are estopped to question the power of the state to regulate their rates. It is pointed out that no act of the Texas legislature was ever passed or could be legally passed to deprive them of the right of compliance with orders of the Interstate Commerce Commission made under an act of Congress or of the right to assert that any order of the Texas Railroad Commission is unjust, unreasonable, unfair or confiscatory. It is also pointed out that while land grants were made to some railroads at a time when the lands were of but little value (and on certain conditions—that the company should survey two sections, the alternate section to belong to the state and that each railway should construct a given mileage of line) that all roads receiving such grants have fully complied with the terms thereof; that all such lands have long since been alienated and that none of the carriers, party to the suit, now own such lands.

In reply to a statement that under a law passed in 1853 the state has the right to acquire properties of the railways, it is contended that the act has been repealed by the revised statutes of 1879, 1895, 1911 and expressly repealed by the act of January 26, 1860. Denial is emphatically made that rate divisions between Texas lines and so-called parent corporations are unfair to Texas companies. In reply to the charge made by the attorney general that the issuance of free passes has dissipated their revenues, it is pointed out that substantially 69.1 per cent of the total free transportation represents travel by employees and their families, 24.3 per cent represents exchange transportation issued to representatives of other railroads, 1.7 per cent represents mileage traveled by public officers, 0.4 per cent mileage traveled by public officers of the United States, postal employees and others,

1 per cent represents transportation in exchange for advertising and 2.4 per cent transportation legally permissible under the head of charity, religion and similar purposes.

Advisory Commission on National Defense Appointed

President Wilson has announced the appointment of the advisory commission to be associated with the Council of National Defense for which a provision was included in the army appropriation bill recently passed by Congress, as noted in the *Railway Age Gazette* of September 15, page 452. The members of the commission are Daniel Willard, president of the Baltimore & Ohio; Samuel Gompers, president of the American Federation of Labor; Dr. Franklin H. Martin, of Chicago; Howard E. Coffin, of Detroit; Bernard Baruch, of New York; Dr. Hollis Godfrey, of Philadelphia, and Julius Rosenwald, of Chicago.

The Council of National Defense consists of the secretaries of war, navy, interior, agriculture, commerce and labor, and was created "for the co-ordination of industries and resources for the national security and welfare." The act provides that the council should nominate for appointment by the President an advisory commission of not more than seven persons "each of whom shall have special knowledge of some industry, public utility or the development of some national resource or be otherwise specially qualified." The duties of the council are, in part, "to supervise and direct investigations and make recommendations to the President and the heads of executive departments as to the location of railroads with reference to the frontier of the United States, so as to render possible expeditious concentration of troops and supplies to points of defense; the co-ordination of military, commercial and industrial purposes in the location of extensive highways and branch lines of railroad."

In announcing the appointment President Wilson said:

"The personnel of the council's advisory members, appointed without regard to party, marks the entrance of the nonpartisan engineer and professional man into American governmental affairs on a wider scale than ever before. It is responsive to the increased demand for and need of business organization in public matters and for the presence thereof of the best specialists in their respective fields. In the present instance, the time of some of the members of the advisory board could not be purchased. They serve the government without remuneration, efficiency being their sole object and Americanism their only motive."

Railway Workers Attack Eight-Hour Law

The Railway Workers' Non-Partisan Association, which is said to have 16,000 members, on October 17 announced its opposition to the Adamson eight-hour law. Through its national chairman, W. J. Pinkerton, of Chicago, a letter was sent to W. G. Lee, president of the Brotherhood of Railroad Trainmen, in which the law is described as "the death knell of the economic organizations, the railroad brotherhoods," and a demand is made that it be repealed and a convention called to make an investigation.

Mr. Pinkerton is a member of Lodge 752 of the Trainmen's Brotherhood at Chicago. As leader of the anti-Lee faction in the brotherhood, he came very near defeating Lee for president three years ago. The Railway Workers' Non-Partisan Association, of which he is president, was formed four years ago to oppose the Bradley Federal compensation law which failed to pass.

The letter, in addition to bringing out the points mentioned above, says that the brotherhood representatives in accepting the Adamson law from Congress traded certainty for uncertainty. The letter further points out that through the machinations of Eugene V. Debs, the old American Railway Union was changed into a political machine. The letter then says:

"I now ask this question, Why did the brotherhood representatives, with over a 90 per cent strike vote, permit their grievances to become congressional matter without giving the membership an opportunity to investigate the facts, as in the case of the compensation law, by applying each section of the proposed law to existing schedules and rights?

"Our representatives accepted a law. Why? The answer is, I must assume, because the railroad managers called their hand, and with a 90 per cent strike vote they lacked the courage to accept the challenge and in seeking a way to escape handed our union affairs over to politicians."

Argument in the Coal Suits

Arguments were presented in the Supreme Court last week in the suits of the government against the Reading Company and affiliated companies and the Lehigh Valley and affiliated companies on charges of attempted monopolization of the anthracite coal business in violation of the anti-trust law and of violations of the commodities clause of the Interstate Commerce law. Both cases were appealed from decisions of the lower courts, which had partially sustained and partially dismissed the charges in the Reading case and had dismissed the Lehigh Valley case. The government was represented by Solicitor General J. W. Davis and Assistant Attorney General G. C. Todd. Arguments in the Reading case were begun on October 10 and in the Lehigh Valley case on October 12. In the Reading case the government charges that the Reading Company by its control of the Philadelphia & Reading Railway, the Central Railroad of New Jersey, the Philadelphia & Reading Coal & Iron Company, the Lehigh & Wilkes-Barre Coal Company and the Lehigh Coal & Navigation Company monopolizes the production, transportation and sale of anthracite coal from mines in the Schuylkill region tributary to its lines, and that the combination controls 63 per cent of the entire anthracite deposits, with the result of destroying every motive for competition between the railroads and the coal companies in the transportation and sale of coal. In time, it was argued, this combination, if not dissolved, will own or control every ton of commercially available coal known to exist, because the deposit supply will outlast many years that of any other producer. The railway is charged with extorting excessive freight rates from shippers and with granting preferences and rebates to the Reading Coal Company. The government asks that the several coal companies and railroads constituting the combination be completely separated from each other and be erected into independent units. The lower court had upheld the government to the extent that it ordered the separation of the Philadelphia & Reading Coal & Iron Company and the Lehigh & Wilkes-Barre Coal Company by requiring the Central Railroad of New Jersey to dispose of its securities of the Wilkes-Barre Coal Company.

In the second case the government contends that the Lehigh Valley Railroad, through the Lehigh Valley Coal Company and other subsidiary coal companies whose stock it owns, has monopolized the production, transportation and sale of anthracite coal from points located along its lines, by rebates and other preferences to the coal companies by the preferential extension of credit, by the charging of extortionate freight rates to independent shippers and in other various ways. It is contended by the government that the Lehigh Valley Coal Sales Company is a mere device designed to circumvent the commodity clause. The court is asked to compel the railroad company to dispose of the stocks of the coal companies to persons who are in no way under its control or influence, and that the contract between the railroad and the coal sales company be annulled.

The Reading interests were represented by Jackson E. Reynolds, Charles Heebner and John G. Johnson and the Central of New Jersey by Charles E. Miller and Robert W. De Forest. The attorneys for the Reading in their argument denied the charge that the company has monopolized the production, transportation or sale of anthracite coal, pointing out that there have been practically no additions to their coal properties since the passage of the anti-trust law, that eight powerful railroads entirely independent of Reading influence still serve the anthracite regions, that the company, while employing its powers for the legitimate purpose of conserving its own property, has done so with no intention to do wrong to the general public or to restrict the rights of individuals and at the same time has promoted and developed commerce and trade; that the public would be injured by the disruption of the alliance between the Reading and the Central of New Jersey, which, it is argued, it is clearly in the public interest to foster as a strong and active competitor for the Pennsylvania and other trunk lines. The government's statements as to the percentage of the unmined coal which the company controls are ridiculed and it is asserted that the profits from the sale of coal have averaged only 18½ cents a ton. It is denied that the Reading Company has restrained trade by its ownership of stock in one corporation engaging in the production and sale of coal and the stock in another engaged in its transportation, for the two industries are not in competition and the Reading Company has merely co-ordinated

two complementary enterprises, thereby promoting and stimulating trade and commerce. It is declared that the Reading Company's indirect influence over the Lehigh & Wilkes-Barre Coal Company is only incidental and a negligible consequence of the acquisition of the majority of the shares of the Central of New Jersey, that the consolidation of two such mining corporations as the Philadelphia & Reading Coal & Iron Company and the Lehigh & Wilkes-Barre Coal Company would not be contrary to public policy, that the autonomy of the two coal companies has been preserved and their competition with one another and other coal producers has continued unrestrained. It is asserted that the Reading and Central of New Jersey are not and never have been in competition for the same passengers or the same shipments from the same points of origin to the same destinations, but that they are complementary the one to the other, and finally, that, in view of the entire autonomy of the three Reading companies, there is no predicate for contention that the railway company is transporting coal mined or produced by it or in which it has any interest, direct or indirect.

The Lehigh Valley companies were represented by E. H. Boles, F. W. Wheaton and J. G. Johnson.

Car Foremen's Association of Chicago

The Car Foreman's Association of Chicago held its annual meeting at the Hotel La Salle, Chicago, October 10, at which the officers were elected for the ensuing year, and an entertainment program was provided for the members and their guests. During the past year the association has had an average attendance of 169 members. During the year 921 new members were enrolled in the organization, making a total membership of 2,535, which makes this association the largest body of car men in the country. Of the 921 new members, 535 were brought in by 29 members, and one member brought in 63 new members. The entertainment was in charge of the entertainment committee of which W. E. Sharp, president of the Grip Nut Company was chairman. It was especially unique and interesting, consisting of a one-ring circus of 10 acts, in which real animals and circus men were the performers, a sleight-of-hand artist and dancing. There was such a large number in attendance at the meeting, there being about 1,500 present, that it was necessary to give two performances of the circus to accommodate all of the number, each performance lasting one hour. The following officers were elected for the ensuing year: President, A. L. Bardsley, division master mechanic of the Atchison, Topeka & Santa Fe, Chicago; first vice-president, H. H. Estep, general foreman of the car department, Chicago & Eastern Illinois; second vice-president, E. G. Chenoweth, mechanical engineer for the car department, Chicago, Rock Island & Pacific; treasurer, M. F. Covert, assistant master car builder, Swift Car Lines, and secretary, Aaron Kline, 841 Lawler avenue, Chicago.

Smoke Prevention Association

At the eleventh annual convention of the Smoke Prevention Association, which was held at the Planters Hotel, St. Louis, September 26 to 29, the following officers were elected for the ensuing year: President, W. H. Reed, chief smoke inspector, City of Chicago; first vice-president, Marten Rooney, chief smoke inspector, City of Nashville, Nashville, Tenn.; second vice-president, W. L. Robinson, supervisor fuel consumption, Baltimore & Ohio; secretary-treasurer, A. A. Chambers, of the Smoke Inspection Bureau, City of Chicago. Columbus, Ohio, was chosen as the next convention city.

Bridge and Building Association

The annual convention of the American Railway Bridge and Building Association was held in New Orleans October 17-21. At the election on Thursday morning C. E. Smith, consulting engineer, St. Louis, Mo., was elected president. One hundred and fifty members were present and 30 supply firms had exhibits. A full report will be published in next week's issue.

Association of Manufacturers of Chilled Car Wheels

At the annual meeting of this association, in New York, on October 17, the following officers were elected: George W. Lyndon, president and treasurer; E. F. Carry, Haskell & Barker Car Company, vice-president; J. A. Kilpatrick, Albany Car Wheel Company, vice-president; Geo. F. Griffin, secretary, and F. K. Vial, Griffin Wheel Company, consulting engineer.

International Railway Fuel Association

The ninth annual convention of the International Railway Fuel Association will be held at the Hotel Sherman, Chicago, May 14, 15, 16 and 17, 1917.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21 New Orleans, La.

American Railway Association.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Brown Palace Hotel, Denver, Colo.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

Association of Transportation and Car Accounting Officers.—G. P. Conard, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 30 Church St., New York. Next annual meeting, December. 1916, Waldorf-Astoria Hotel, New York.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

Railway Development Association.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next meeting, November 9-10, La Salle Hotel, Chicago.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Society of Railway Financial Officers.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Hotel Raleigh, Washington, D. C.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga., Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Annual convention, October 24-27, Hotel Sherman, Chicago.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Association of Short Line Railroads.—Clarence M. Oddie, Mills Bldg., San Francisco. Annual meeting, November 15, Brown Palace Hotel, Denver, Colo.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

Twenty members of the freight traffic department of the Wabash were in New York last week inspecting terminal facilities and methods of handling freight in New York and vicinity.

J. W. Terry, general attorney of the Gulf, Colorado & Santa Fe, and H. M. Garwood, general attorney of the Sunset Central lines, have addressed a letter to H. H. Haines, traffic manager of the Galveston Commercial Association, stating that a committee of the traffic officers of Texas railroads and the attorneys would be glad to meet a committee of representatives of the shippers appointed by the Texas Industrial Traffic League to discuss the proposal by the committee that the railroads join with it in attempting to formulate some compromise with a view to preventing continued litigation in the Shreveport rate case. The suggestion is made, however, that before an attempt is made to mediate the differences between the Texas Railroad Commission and the carriers, the shippers and commercial organizations reach an agreement on some plan as an appropriate basis.

Conferences were held at Little Rock, Ark., early in the week between railroad representatives and members of the Arkansas Railroad Commission in an attempt to reach an agreement with reference to standard distance tariffs recently put into effect by the railroads. The tariffs which will apply to lumber, logs and rough rice were filed by the railroads claiming authority under a decision of the Interstate Commerce Commission affecting rates between Arkansas points and Memphis, Tenn., and are higher than the tariffs covering the same commodities authorized by the Arkansas commission. The Chicago, Rock Island & Pacific and the St. Louis, Iron Mountain & Southern, which are the roads affected, filed a suit in the United States District Court last week to enjoin the commission from enforcing the rates it approved. If an agreement was not reached in the conference, the case will be fought out in the courts.

Traffic officers representing the principal transcontinental railways had an informal conference with members of the fourth section board of the Interstate Commerce Commission at Washington last week for the purpose of obtaining a better understanding of the commission's ideas as to the adjustment of transcontinental freight rates. The new tariffs filed with the railways to become effective on September 1 in accordance with the commission's order rescinding the relief granted under the fourth section on account of the reduction of water competition via the Panama Canal, have been suspended by the commission until December 31. Meanwhile the railways have been trying to come to an understanding with the shippers which will narrow the issues to be passed on by the commission. The railways are also anxious to expedite the proceedings as much as possible, and it is expected that the commission will fix a date for a hearing at an early date.

Studying Georgia Freight Rates

The Georgia State Railroad Commission, in its studies of the freight rates of the state, preparatory to formulating an opinion on the application of the railways for authority to make advances, appears to have laid out a program covering several months. Hearings were begun several weeks ago, and many sessions are yet to be held. The last announcement calls for hearings this week on special commodity rates, subjects 28 to 42, as follows:

Monday—28, fruits and vegetables; 29, watermelons.

Tuesday—30, trees and shrubs; 31, agricultural cultivating implements; 32, agricultural implements, farm wagons, etc.

Wednesday—33, agricultural implements and vehicle material; 34, roofing material; 35, roofing slate; 36, Sea Island cotton, c. l. and l. c. l.; 37, cotton seed.

Thursday—38, cotton seed oil; 39, cotton seed hulls; 40, cotton linters and regins.

Friday—41, fertilizers and fertilizer materials; 42, phosphate rock.

The present branch of the hearing will, it is estimated, extend into November, after which the commission will take a recess of about 30 days on the rate case, so as to attend to other duties.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has further suspended until April 13, 1917, proposed increases in lumber rates to New York via Southern Pacific Atlantic Steamship Lines.

The commission has further suspended from October 29 to April 29 proposed increased rates on hogs in carloads from St. Paul and points taking the same rates to Chicago.

The Interstate Commerce Commission has suspended, from October 7 to February 4, 1917, the provisions in a tariff filed by F. A. Leland making changes in the carload minimum weights on grain and wheat flour.

The commission has suspended from October 13 and 23 to February 10, 1917, tariffs providing for the withdrawal of class rates on vegetables from points in Georgia to Oklahoma City and other destinations west of the Mississippi river.

The commission has further suspended from October 18 until April 18, 1917, tariffs providing for increased charges on fresh meats and packing house products forwarded in peddler cars between points in Central Freight Association territory.

The Interstate Commerce Commission has further suspended from October 13 until April 13, 1917, tariffs providing for increased switching charges between industries located on the Johnstown & Stony Creek and points of interchange with the Pennsylvania and Baltimore & Ohio.

Application has been filed with the commission by the officers of the Marietta, Columbus & Cleveland which has a line from Marietta to Palos, Ohio, 44 miles, for permission to cancel its tariffs, in accordance with a court order requiring the sale of the property and the discontinuance of its service.

The commission has further suspended from October 13 to April 13, 1917, tariffs providing for a proposed increase in rates on lumber in carloads from Troy, Tell City, Cannelton, Rock Hill and Rockport, Ind., to points in Central Freight Association territory located west of the Indiana-Illinois state line.

The commission has announced a hearing to be held at Washington on October 23 on the petition of the express companies for an order authorizing the maintenance of express rates dependent upon the value declared in writing by the shipper, or agreed upon in writing as the released value of the property.

The commission has suspended from October 15 until February 12, 1917, the operation of an item in supplement to the Western Classification which would have the effect of increasing from class E to class B the carload rate on digester tankage, blood meal, meat meal and blood flour between points in Western Classification territory.

The Interstate Commerce Commission has reopened proceedings on the application of the Yazoo & Mississippi Valley for permission to maintain the same rates from Memphis, Cairo and other points north thereof to Jackson, Miss., that are maintained by the direct line of the Illinois Central while publishing higher rates to intermediate points. A hearing will be held at Washington on October 21.

The commission has suspended from October 15 until February 12, 1917, certain items in tariffs filed by the Pennsylvania lines providing for the withdrawal of an export commodity rate on grain from Chicago to Newport News and Norfolk, Va., in connection with the Chesapeake & Ohio and the Norfolk & Western. The present rate is 12.2 cents per 100 lb. and the proposed domestic rate is 13.8 cents.

The Interstate Commerce Commission has reopened the case of the Charleston & Norfolk Steamship Company against the Chesapeake & Ohio and other railroads, recently dismissed on the ground that the steamship company was not a common carrier. The action carries out the request made in a resolution adopted by the Senate. The steamship company seeks proportional rates from Cincinnati, Louisville and other cities to Nor-

folk and Newport News on traffic destined to Charleston which are now applied by the railroad companies in connection with rail lines leading into the same territory.

The National Live Stock Exchange, Chicago, has filed a complaint with the commission involving all the rates, rules and regulations covering the shipment of live stock throughout Official Classification territory, asking for a restoration of the rates in effect on January 1, 1916, with a reduction of the carload minimum weights and the establishment of rates of stock cattle, sheep and hogs not in excess of 75 per cent of the rates on fat cattle, sheep and hogs.

A large number of briefs have been filed with the commission in connection with its investigation of bills of lading by railroads, shippers' organizations and a number of state commissions, in anticipation of the hearing before the commission to be held at Washington on October 20 and 21. The investigation has been in progress since May, 1912, having been reopened as a result of the Cummins amendment. One of the principal briefs on behalf of the shippers has been filed by the National Industrial Traffic League; and a brief on behalf of the carriers has been filed by committees of counsel for the Official Classification Committee, the Uniform Bill of Lading Committee, the Western Classification Committee and the Southern Classification Committee.

Wool from California

Opinion by Commissioner Hall.

A proposed tariff rule, providing that shipments of wool in grease, in bales, from California points to eastern destinations must be compressed to a density of 15 lb. per cubic foot, is found justified as to sheared wool, but not as to "pulled" wool, for which the density prescribed should not exceed 12 lb. per cubic foot.

To avoid undue preference shippers of wool in grease from Utah and Nevada should be required to compress their bales to a definite density. (41 I. C. C. 314.)

Shreveport Rate Case

New tariffs filed by the Texas railways in compliance with the orders of the Interstate Commerce Commission in the Shreveport rate case, increasing rates between points in Texas above the rates allowed by the Texas Railroad Commission, have aroused a storm of protest among the shippers of the State, and the Interstate Commerce Commission has been asked to suspend the tariffs before they become effective on November 1. Protests against the new tariffs have been filed with the commission by the attorney general of Texas, the Texas Industrial Traffic League, the Texas Cattle Raisers' Association and various other shippers' organizations, and, as a result, the commission has announced an informal hearing for Thursday, October 19, respecting any rates, rules or regulations contained in the tariffs filed which are "alleged to be in contravention of the commission's order." Several meetings of shippers have been held in Texas, conferences have been held with the attorney general, and it is reported that plans have been made to raise a fund of $25,000 to $30,000 to carry on the fight. It was also decided to appoint a committee representing the shippers to handle negotiations between the shipping interests, the Interstate Commerce Commission, the Texas Railroad Commission and the carriers. The new tariffs filed by the commission are based on the commission's order in the Shreveport rate case, in which it prescribed a scale of rates applicable to points in Texas to prevent discrimination against the Louisiana shippers who were dependent on the interstate rates. The shippers complain that in the new tariffs the railroads have left out rates which were reduced by the Interstate Commerce Commission and that some of the advances are greater in amount than those allowed by the commission.

PERSONNEL OF COMMISSIONS

Charles H. Hurdleston, recently appointed a member of the Texas State Railroad Commission, to fill out the remainder of the term of William D. Williams, deceased, sat with the commission for the first time on October 10.

Alfred Craven, chief engineer of the New York Public Service Commission, First district, has been appointed consulting engineer. Daniel L. Turner, deputy engineer of subway construction, has been appointed acting chief engineer.

COURT NEWS

Excessive Damages

The California Supreme Court has set aside as excessive a $10,000 verdict for the wrongful death of a farmer 78 years old, with a life expectancy of 4.8 years, and earning $700 a year.—Dickinson v. Southern Pacific (Cal.), 158 Pac., 183.

Fires from Sparks—Evidence

In an action against a railroad for fire set by sparks, the Alabama Supreme Court holds that evidence of several witnesses merely that a locomotive passing shortly before the fire about noon emitted volumes of smoke and steam, without any evidence as to sparks, justified a charge for the defendant. This was negative evidence that the engine was not emitting sparks.—Turner v. Atlanta & St. Andrews Bay (Ala.), 72 So., 388.

Establishment of Special Rates

The Alabama Supreme Court holds that the statute of 1907, giving the Railroad Commission authority to permit common carriers to establish special rates for the transportation of specific commodities from specified points or within specified zones, does not authorize the commission of its own motive to establish special rates or require the continuance of a special rate, but only to approve special rates submitted by a carrier, who may withdraw them at will.—State v. L. & N. (Ala.), 72 So., 494.

Failure to Stop, Look and Listen

The Alabama Supreme Court holds that the fact that a train approached a crossing over which several hundred people and vehicles passed daily, at a speed of three or four miles an hour, without actual knowledge of the approach of an automobile and without any signal, did not make the engineer guilty of wantonly and intentionally striking the automobile. Even though the railroad had been guilty of simple negligence, the failure of the chauffeur of the automobile to stop his car and look and listen before attempting to cross the main track was, as a matter of law, contributory negligence, barring recovery for damages to the car.—Bailey v. Southern (Ala.), 72 So., 67.

Powers of New York Public Service Commissions

The New York State Court of Appeals in the case of the New York and Queens Gas Company appealing from an order of the Public Service Commission, directing it to extend its mains to Douglaston, decides that the courts cannot review the facts. The company declined to obey the commission's order because the extension to so sparsely settled a region would not yield more than 2½ per cent, and it began suit in the Supreme Court, Appellate Division, to have the order of the commission declared unreasonable. On March 8, 1916, the Appellate Division has unanimously reversed the decision of the commission; now the Court of Appeals has unanimously reversed the Appellate Division. In deciding against the commission the Appellate Division asserted a right to say "whether the extension ordered was a reasonable extension." The Court of Appeals holds that this assertion was erroneous because, "the court has no power to substitute its own judgment of what is reasonable in place of the determination of the Public Service Commission; it can only annul the order of the commission for the violation of some rule of law."

As to why the judgment of the commission should predominate over that of the court, the Court of Appeals points out that the commission was created to perform important functions in the community with reference to the regulation of utilities, and that the commissioners are expected to have peculiar capacity for dealing with the complex problems presented by the activities of public service corporations.

The present decision says:

"This decision (of the Appellate Division) if allowed to stand will seriously hamper the commissions in the discharge of their duties and go far toward defeating the efforts of the Legislature to establish agencies to regulate the great public service corporations."

Railway Officers

Executive, Financial, Legal and Accounting

T. D. Alden has been appointed assistant auditor of freight accounts of the Atchison, Topeka & Santa Fe, with office at Topeka, Kan.

J. W. Orr, controller of the Pennsylvania Lines, has also been elected vice-president of the Lorain, Ashland & Southern, recently acquired by the Pennsylvania.

L. W. Baldwin, general manager of the Central of Georgia at Savannah, Ga., has been elected vice-president and general manager, with headquarters at Savannah.

T. D. Tilden, chief clerk in the freight auditor's office of the Atchison, Topeka & Santa Fe, at Topeka, Kans., has been appointed assistant auditor of freight accounts, with the same headquarters.

J. E. Baker, of San Francisco, Cal., chief statistician of the Southern Pacific, whose appointment as adviser to the Chinese Ministry of Communications was recently announced, has just sailed to China to assume his new duties. The department in which he will serve has charge of all mail, telephone, telegraph and railway systems throughout the Chinese Republic. He was recommended for this post by the Interstate Commerce Commission, of which he was formerly statistician. In 1906 he was field agent for the Wisconsin Tax Commission and later became instructor of economics and transportation at George Washington University, at Washington, D. C. He was then made special agent of the United States Census Bureau, resigning to become consulting statistician for the Brotherhood of Locomotive Firemen and Enginemen. In 1911, he was appointed assistant statistician of the Southern Pacific and later promoted to statistician. He will have his headquarters at Pekin, China.



J. E. Baker

J. A. Shepherd, superintendent of terminals of the Missouri Pacific at Kansas City, Mo., has been elected president and general manager of the Trans-Mississippi Terminal Corporation, with office at New Orleans, La.

E. B. Taylor, second vice-president of the Pennsylvania Lines, has been also elected president of the Lorain, Ashland & Southern, recently taken over by the former road. He succeeds the late Joseph Ramsey, builder and owner of the road.

I. M. Hunt has been elected secretary and treasurer of the Crosbyton-South Plains, succeeding R. M. Bassett. The name of the Crosbyton-South Plains Railroad has been changed to South Plains & Sante Fe, and the general offices have been moved from Crosbyton, Tex., to Lubbock, Tex.

Roy W. Smith, assistant auditor of receipts for the Nashville, Chattanooga & St. Louis, with office at Nashville, Tenn., has been appointed auditor of receipts, succeeding Charles W. Stevenson, recently deceased. William P. Kerrigan has been appointed assistant auditor of receipts.

Frank A. Walsh, secretary, treasurer and auditor of the Lorain, Ashland & Southern, recently acquired by the Pennsylvania, has been retained as secretary and treasurer, with office at Lorain, Ohio. S. H. Church, secretary of the Pennsylvania Lines, has also been elected assistant secretary of the Lorain, Ashland & Southern.

Richard A. Jackson, vice-president and general counsel of the Great Northern, with office at St. Paul, Minn., has tendered his resignation, effective November 1, and E. C. Lindley, general solicitor of the Great Northern, with office at St. Paul, Minn., has been elected vice-president and general counsel with the same headquarters, succeeding Mr. Jackson.

Operating

Frank Eberhart, trainmaster of the Erie at Marion, Ohio, has been appointed trainmaster of the Marion division, with office at Huntington, Ind., relieving Carl Bucholtz, promoted.

John A. Streyer, traffic manager of the Macon, Dublin & Savannah, at Macon, Ga., has been appointed general manager succeeding H. B. Grimshaw, resigned to go to another company.

A. W. Woodruff, assistant superintendent of the Union Pacific at Omaha, Neb., has been made trainmaster at Ogden, Utah, succeeding A. W. McDuffie, appointed assistant superintendent at Omaha.

T. G. Jamieson, general yardmaster on the Oregon Short Line at Salt Lake City, Utah, has been appointed trainmaster of the Utah division with same headquarters, succeeding O. E. Smith, assigned to other duties.

J. A. Cook, terminal trainmaster of the Wabash at Moberly, Mo., has been appointed assistant superintendent in charge of the Detroit terminals with office at Delray, Mich., the former position having been abolished.

M. H. Cahill, who has been appointed general superintendent of the Baltimore & Ohio, with headquarters at Pittsburgh, Pa., was born on November 19, 1872, at Lexington, Richmond county, Ohio, and was educated in the public schools. He began railroad work in November, 1886, as a messenger on the Baltimore & Ohio. From 1887 to 1892 he served as a telegraph operator, and then to 1905 as despatcher and chief despatcher. He became division operator in 1905, remaining in that place until 1910, when he was appointed trainmaster. From January to August, 1912, he served as assistant superintendent, and then to the following November as superintendent, at which time he left the service of the Baltimore & Ohio to become division superintendent of the Delaware, Lackawanna & Western. In May, 1913, he returned to the service of the Baltimore & Ohio as assistant superintendent of the Cumberland division at Keyser, W. Va. He subsequently served as superintendent of the New Castle division at New Castle, Pa., until January, 1915, when he was appointed superintendent of the Cumberland division, with headquarters at Cumberland, Va., which position he held at the time of his recent appointment as general superintendent of the same road, as above noted.



M. H. Cahill

C. H. Priest, assistant superintendent of the Portland Terminal Company, at Portland, Ore., has been appointed superintendent, succeeding S. E. Sanborn. The office of assistant superintendent has been abolished.

E. Phenneger, agent of the Missouri Pacific, with office at Cornell, Kans., has been appointed special assistant to the superintendent of transportation of the Missouri Pacific at St. Louis, Mo., succeeding D. O. Ouellet, promoted.

W. E. Brooks, superintendent of the eastern division of the Missouri Pacific, with office at Jefferson City, Mo., has been transferred to Kansas City, Mo., as superintendent of terminals there, succeeding J. A. Shepherd, promoted; C. B. Wildman, superintendent of the Central division of the Missouri Pacific at Van Buren, Ark., has been appointed

superintendent of the Eastern division, with office at Jefferson City, Mo., succeeding W. E. Brooks, transferred, and W. C. Morse, superintendent of the Memphis division, with office at Wynne, Ark., has been transferred to Van Buren, Ark., in succession of C. B. Wildman, transferred.

E. R. Gassmann, recently resigned as assistant superintendent of the Trinity & Brazos Valley, with office at Teague, Texas, has been appointed to a position in the Department of Agriculture, at Washington, D. C., in connection with the distribution of perishable fruit and vegetables.

V. W. Lankey has been appointed trainmaster of the Mackinaw division and branches of the Michigan Central, and M. T. Wright has been appointed trainmaster of the Saginaw division and Bay City yard, both with headquarters at Bay City, Mich.; L. H. Johnston has been appointed assistant trainmaster of the North Mackinaw division and branches, with headquarters at Grayling, Mich.

R. S. Marshall, superintendent of the Virginia division of the Seaboard Air Line at Richmond, Va., has been appointed to the new position of assistant general manager; G. R. Carlton, superintendent of the Georgia division at Atlanta, Ga., has been appointed superintendent of the Virginia division, vice Mr. Marshall, and H. B. Grimshaw, general manager of the Macon, Dublin & Savannah at Macon, Ga., has been appointed superintendent of the Georgia division, vice Mr. Carlton.

The resignations of J. F. Maguire, general manager, and C. W. Kinney, superintendent of transportation, of the Lehigh Valley, have been accepted with regret, to take effect October 23. The position of general manager has been abolished, and Charles T. O'Neal, now superintendent of the Buffalo division and the lake lines, has been appointed general superintendent. In the future the general superintendent, superintendent of motive power, engineer maintenance of way and superintendent of telegraph will all report direct to F. L. Blendinger, vice-president, at New York.

Traffic

R. G. Holmes, chief of tariff bureau, Western lines of the Canadian Pacific, at Winnipeg, Can., has been appointed assistant general freight agent, Western lines, with same headquarters, W. G. Arnold being appointed chief of tariff bureau, with same headquarters.

A Commissioner for Official Classification Territory

George F. Randolph, for the past 12 years vice-president of the Baltimore & Ohio, in charge of the traffic department, has been appointed commissioner of (a) the Trunk Line Association, (b) the Central Freight Association, (c) the Central Passenger Association and (d) the New England Freight Association, with office in New York City. He will resign his position on the Baltimore & Ohio and and will take up his new duties November 1. This is a new office, and Mr. Randolph's functions will have to do with a larger territory than has been assigned to a single permanent officer or committee since the dissolution of the Joint Traffic Association nearly 20 years ago. The officers at the head of the present associations, C. C. McCain, chairman of the Trunk Line Association; L. H. Kentfield, chairman of the New England Freight Association; E. Morris, chairman of the Central Freight Association, and F. C. Donald, commissioner of the Central Passenger Association, will continue as at present, and the authority of the new officer will take in the whole of the territories represented.



G. F. Randolph

These several associations, though not frequently mentioned in the newspapers, and less in the public eye than in former years, are still important organizations. Conferences between the officers of the dozens of roads interested in the traffic of each of the different territories are a constant feature of the activities of the traffic departments, and the new office will be no sinecure.

George F. Randolph was born June 29, 1856, at Norwalk, O. His first railroad service was on the Cincinnati, Sandusky & Cleveland, in 1873, where he was telegrapher and clerk. In 1875 he went to the St. Louis & San Francisco, and for four years he was paymaster on that road. In 1879 he returned to the Cincinnati, Sandusky & Cleveland. In 1881 he left the railway service and went to France for the Equitable Life Insurance Company. He was soon back in America, and was traveling auditor on the Missouri Pacific. In 1883, he was in the general superintendent's office of the Missouri, Kansas & Texas, at Sedalia, Mo. From there he went to the West Shore and for about two years he was in the general office of that road at New York City. Then for four years he was general freight and passenger agent of the Elmira, Cortland & Northern, which now is a part of the Lehigh Valley; and in January, 1890, he went to the New York & New England as general freight agent. Two years later he went to the Philadelphia & Reading, but soon returned to the New York & New England, where he was appointed general traffic manager.

Mr. Randolph first went to the Baltimore & Ohio in 1896, having been appointed, in March, that year, general traffic manager of the Baltimore & Ohio Southwestern. He represented the Baltimore & Ohio on the Board of Managers of the Joint Traffic Association from October 1, 1897, to October 4, 1899. For four years—1899 to 1903—he was the chief officer of the Baltimore & Ohio at New York City; and on January 13, 1904, was made first vice-president. When the Baltimore & Ohio acquired control of the Cincinnati, Hamilton & Dayton, he was made vice-president of that company also.

Engineering and Rolling Stock

B. J. Farr has been appointed master mechanic of the Grand Trunk, western lines, with headquarters at Battle Creek, Mich., in place of W. H. Sample, transferred.

Purchasing

Harry P. Spann, has been appointed division storekeeper of the Atchison, Topeka & Santa Fe, at River Bank, Cal., succeeding G. O. Hixon, transferred to Gallup, New Mex., relieving C. M. Rouse, resigned.

OBITUARY

Virgil Gay Bogue, a well known civil engineer, and formerly, from November, 1886, to 1891, chief engineer of the Union Pacific System, died October 14 on the steamship Esperanda, on which he was returning from Mexico. He was born on July 20, 1846, at Norfolk, St. Lawrence county, New York, and was educated at the school of General William H. Russell of New Haven, Conn., and at Rensselaer Polytechnic Institute at Troy, N. Y., graduating from that institute with the degree of C. E. in 1868. One year after leaving college, he went to Peru, South America, where for some years he was engaged in railway construction. He then became manager of the Trujilio Railway in northern Peru, which position he held until active hostilities between Peru and Chile broke out, when he returned to the United States and was until November, 1886, engaged on the surveys and construction of



V. G. Bogue

the Northern Pacific across Idaho and Washington; he discovered and named Stampede Pass, and supervised the construction of the road to the Pacific Coast. From November, 1886, to 1891 he was chief engineer of the Union Pacific System, retiring in the latter year to open an office in New York as consulting engineer, which he maintained until the time of his death. He was a member of the commission appointed by President Harrison, to investigate methods for improving the navigation of the Columbia river, and afterwards was consulting engineer for the governor of New Zealand, for a period of about three years, on the route of the proposed railway across the South Island. He was also, for some time, consulting engineer of the Department of Public Works of New York, and was a member of the commission appointed by Mayor Strong of New York to determine the feasibility of operating surface cars on the Brooklyn bridge. He later served as consulting engineer of the Western Maryland, and from 1905 to 1909 as vice-president and chief engineer of the Western Pacific during the four years of its construction.

Captain C. L. Harris, who was one of the builders of the Gulf & Ship Island and for many years its general manager, died at his home in St. Louis, Mo., October 9, age 76.

Edward Sawyer, formerly secretary and treasurer of the Great Northern, died at his home in St. Paul, Minn., October 9, after an illness of little more than a week. He was 80 years old, having been born on February 8, 1836, at Dover, New Hampshire. He received his early education in the common and high schools in this community and shortly thereafter entered the employ of the Northwestern Packet Company at Dubuque, Iowa, as a cashier. A year later, in 1865, he became cashier of the Davidson Packet Line at St. Paul, Minn. In 1871 he was appointed secretary of the land department of the St. Paul and Sioux City and in May, 1879, he went to the St. Paul, Minneapolis & Manitoba as secretary and assistant treasurer, holding this position for about 10 years. In 1889 he was appointed secretary and treasurer of the Great Northern, from which office he retired on January 1, 1912. In connection with his duties on the Great Northern he was also secretary and treasurer of the Eastern Railway of Minnesota, treasurer of the Montana Central and secretary and treasurer of the Minneapolis Union, ceasing his activities with these last named companies at the time his resignation from the Great Northern became effective.

Charles W. Stevenson, auditor of receipts for the Nashville, Chattanooga & St. Louis, with office at Nashville, Tenn., died at his home in that city on Sunday, October 8, after an unsuccessful operation for stomach trouble. Mr. Stevenson was born in June, 1867, in a village near Nashville, now a part of the city proper, where he received his early education. Upon leaving school he at once entered railway service with the Nashville, Chattanooga & St. Louis as a clerk in the local freight office, since which time he has been continuously in the employ of this one company, working up through the various clerical grades until about nine years ago when he was elected auditor of receipts, with headquarters at Nashville, Tenn., the office he held at the time of his death.



C. W. Stevenson

Iron and Steel Exports from Germany.—Export of iron and steel goods from Barmen, Germany, to the United States, which during the first six months of the year 1914 amounted to $679,031, totalled only $30,302 for the year ended December 31, 1915. There is an embargo on nearly all iron and steel goods.

Equipment and Supplies

LOCOMOTIVES

The Arizona & New Mexico is about to buy 2 locomotives.

The Union Pacific is inquiring for 2 Decapod locomotives.

The Marshall & East Texas is inquiring for 3 Consolidation locomotives.

The Minnesota Steel Company is in the market for one eight-wheel switching locomotive.

The British War Office has ordered 100 locomotives from the American Locomotive Company.

John Marsch, Chicago, Ill., has ordered 6 six-wheel switching locomotives from the Baldwin Locomotive Works.

The Compagnia Espana Colonisation has given the American Locomotive Company an order for 6 locomotives.

The Finland State Railways have placed an order with the American Locomotive Company for 20 locomotives.

The Orleans Railway (France) has ordered 50 Mikado locomotives from the American Locomotive Company.

The American Rolling Mill Company, Middletown, Ohio, is in the market for 5 six-wheel and four-wheel switching locomotives.

The Chicago, St. Paul, Minneapolis & Omaha is about to purchase a number of Mikado and six-wheel switching locomotives.

The Standard Steel Works Company, Burnham, Pa., has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

The Mark Manufacturing Company, South Chicago, Ill., has ordered one four-wheel switching locomotive and one six-wheel switching locomotive from the Baldwin Locomotive Works.

FREIGHT CARS

The Baltimore & Ohio is inquiring for 1,000 freight cars.

The Atlantic Coast Line is in the market for 1,000 cars.

The Northern Pacific is building 500 box cars in its own shops.

The Pere Marquette has revived inquiries for 1,500 40-ton wooden box cars.

Gillespie Brothers, New York, are inquiring for 100 20-ton and 200 30-ton flat cars.

The Utah Copper Company has ordered 150 ore cars from the Pressed Steel Car Company

The Missouri Pacific has ordered 1,500 general service cars from the American Car & Foundry Company.

The Carnegie Steel Company is expected to place orders shortly for 156 gondola and 119 70-ton hopper cars.

The Union Tank Line has arranged for the construction of of 2,250 cars, some of which will be built in company shops and some by merchant builders.

The Duluth, South Shore & Atlantic has ordered 200 40-ton flat cars, 200 40-ton box cars, 100 50-ton hopper and 10 40-ton refrigerator cars from the Haskell & Barker Car Company.

The Chicago & North Western has ordered 500 ore cars from the Pullman Company. It remains in the market for 1,700 50-ton composite gondola cars and 1,500 30-ton wooden box cars.

The Chicago, Milwaukee & St. Paul is enquiring for specialties for 1,000 box cars to be built in its shops after a present lot of 1,000 cars, reported in the *Railway Age Gazette* of September 15, is completed.

The Louisville & Nashville has ordered 1,000 gondola and 500 hopper cars from the Pressed Steel Car Company and will soon place orders for 750 underframes for box cars and 750 underframes for gondola cars.

The Chesapeake & Ohio, reported in the *Railway Age Gazette* of October 6 as inquiring for 1,000 50-ton hopper cars, has ordered 1,000 50-ton hopper cars from the Standard Steel Car Company, 500 from the Pressed Steel Car Company and 500 from the Ralston Steel Car Company. These orders are in addition to 1,000 70-ton hopper cars ordered from the Pressed Steel Car Company and reported in the *Railway Age Gazette* of September 29.

PASSENGER CARS

The Great Northern has ordered 15 postal cars from the Pressed Steel Car Company.

The Chesapeake & Ohio has ordered 10 coaches, 1 dining and 2 parlor cars from the Pullman Company.

The Louisville & Nashville has ordered 6 coaches, 4 horse and baggage cars and 4 baggage and mail cars from the American Car & Foundry Company.

The Long Island's order for passenger cars placed with the Pressed Steel Car Company, as noted in last week's issue, included 15 P54 B coaches and 45 P54 trailer cars.

IRON AND STEEL

The New York, Chicago & St. Louis has ordered 5,000 tons of rails from the Lackawanna Steel Company for 1917 delivery.

The Pullman Company has ordered 1,284 tons of steel from the Kenwood Bridge Company for a machine shop and section of a yard crane runway.

The Chicago & North Western has ordered 1,076 tons of steel for ore spouts for No. 3 dock at Ashland, Wis., from the American Bridge Company.

The Baltimore & Ohio has ordered 700 tons of bridge steel from the Fort Bridge Steel Works, 100 tons from the Toledo-Massillon Bridge Company and 550 tons from other shops.

MISCELLANEOUS

The Great Northern is in the market for 3 65,000-gal. steel tanks with 30 ft. steel towers, 1 28,500-gal. steel tank with a 13 ft. steel tower and 2 10,000-gal. steel tanks.

SIGNALING

The Alabama & Vicksburg is to install automatic block signals on 23 miles of its line; 28 style "S" double-case upper-quadrant three-position signals. Keystone insulated rail joints will be used. The apparatus is to be furnished by the Union Switch & Signal Company and installed by the railroad company's forces.

The Solvay Process Company has awarded the Union Switch & Signal Company a contract for installing an interlocking plant at the crossing of its track with the Detroit, Monroe & Toledo Short Line, at Sibley, Mich. The machine will be a Stevens with six working levers and two spare spaces. All signals will be equipped for electric lighting.

The Queen & Crescent has ordered from the Union Switch & Signal Co. the materials for automatic signals between Science Hill and U. S. Junction, requiring twenty-eight "T-2" top post signals. The relays for controlling these signals will be two element model 12 U. S. & S. Co. polyphase type having 110 volt local and 0.2 volt track winding. The work of installing will be done by the railroad company's men.

The Louisville & Nashville is to install an electro-mechanical interlocking plant at Christiansburg, Ky., the junction of the Lexington branch and Shelby cut-off. The mechanical section will consist of a 24-lever Saxby & Farmer frame with 14 working levers. The electro section will be a style "S-7" machine with four operating levers and three spare spaces. The material will be supplied by the Union Switch & Signal Co.

Supply Trade News

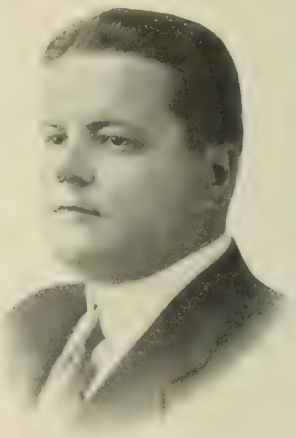
The American Car & Foundry Company has received an order from the Navy Department of the United States for 300,000 3-in. shells valued at about $945,000.

Henry Splitdorf, one of the "grand old men" of telegraphy and the inventor of many important electrical devices, died at his home in New York on October 16, aged 82 years.

The Harrison Railway Specialties Company has recently closed an order for 2,000 rotary ring steel dust guards for the Western Maryland, and an order for 500 wooden dust guards from the New York, Chicago & St. Louis.

Marvin A. Neeland, assistant to vice-president, and chief engineer of the United States Steel Corporation, has resigned to accept the position of consulting engineer of the American International Corporation, with headquarters at 120 Broadway, New York. John Hulst, chief engineer of the Carnegie Steel Company, has been appointed to succeed him.

H. W. Finnell, general manager of the Henry Giessel Company, Chicago, has been elected vice-president of Templeton, Kenly & Co., Ltd., Chicago, manufacturers of Simplex jacks. He will be in charge of sales and assumed his new position on October 1. Mr. Finnell started his business career in the rolling mills of the National Tube Company at McKeesport, Pa., in 1899. He worked his way into the sales department, but left the company in 1901 to enter the service of the Wheeling Steel & Iron Company. In 1904 he left the position of assistant sales manager of that company and tried his luck in the oil business in Indian Territory but without success. In 1906 he joined the sales department of the Chicago Railway Equipment Company, but in 1909 he became assistant sales manager of the Carbon Steel Company, later being sales manager and then assistant to the president and at the same time president of the Mosher Water Tube Boiler Company. Prior to October 1, he was general manager of the Henry Giessel Company, Chicago. He still retains his interest in that company.



H. W. Finnell

The committee composed of Gates W. McGarrah, Otis H. Cutler and Robert J. Davidson has issued a notice to holders of certificates of deposit issued by the Bankers Trust Company of New York for the preferred and common stock of the American Brake Shoe & Foundry Company, announcing that the plan providing for the organization of a new corporation under the laws of Delaware of the same name as the New Jersey corporation has been declared operative.

George L. Lord, who was for many years manager of the railroad and steamship departments of the West Disinfecting Company, New York, died at his home in New York, on August 17. Mr. Lord had a genial temperament and business aptitude that made for him a host of friends in all parts of the country. Although in his seventieth year few of his friends supposed he was more than of middle age, and while he had felt the enervating effect of the heat during August no illness preceded his death, the end coming suddenly.

The Willard Storage Battery Company, Cleveland, Ohio, announces the following appointments: Lester B. Knight, eastern

representative, railway department, with headquarters at New York; E. L. Myers, western representative of railway department, with headquarters at Chicago, with jurisdiction over all territory west of the Ohio and Mississippi rivers, and I. R. Wentworth, representative of railway department at Chicago. Mr. Knight was prior to September, 1915, chief electrician of electric car lighting on the Boston & Albany. Mr. Myers has been in the service of the Willard Storage Battery Company since December 1, 1913. From 1909 to 1913 he was chief electrician of the National Railways of Mexico.

J. P. Landreth, formerly Chicago manager of the Garlock Packing Company, Palmyra, N. Y., has been appointed western sales manager of the Anchor Packing Company, Philadelphia, Pa., with headquarters at Chicago. Mr. Landreth was born at Beloit, Kan., on August 11, 1883, and attended the public schools and a business college at Joplin, Mo., and the Missouri Military Academy at Mexico, Mo. His first business connection was with the Joplin (Mo.) Water Works Company as collector and inspector of accounts. Later he was employed as car clerk on the Denver & Rio Grande, at Salida, Colo., and in 1902 took a position with the English Iron Works, at Kansas City, Mo., where he gained a knowledge of steam railway specialties which qualified him for a sales position in this line in St. Louis. In the spring of 1904, he became associated with the Garlock Packing Company as traveling salesman and on January 1, 1905, was transferred to St. Louis, Mo., as city salesman. In the fall of 1906, he took charge of the Kansas City office of the same company, and in May, 1908, he was made Chicago manager, which position he held until July, 1916.



J. P. Landreth

Harry A. Pike has recently been appointed assistant to the president of the Call Switch Company, Inc., New York. Mr. Pike graduated from the common schools and began his railroad work in 1880 as general storekeeper of the Lake Erie & Western, at Lima, Ohio, now a part of the New York Central Railroad. In 1883 he was appointed chief clerk in the motive power department of the Chicago & Atlantic Railroad, now the Chicago division of the Erie. In 1885 he was made a representative of the American Brake Company, at St. Louis, and three years later went to the U. S. Metallic Packing Company in the same capacity, with offices in Chicago. In 1893 he was appointed representative of the Chicago Pneumatic Tool Company, and in 1904 was made eastern sales agent of the Flannery Bolt Company, with offices in New York City. Soon after leaving this company in 1912 he was made secretary of the Clifton Porcelain Tile Company, Inc., Newark, N. J., manufacturers of fireproof floor and wall tile. Mr. Pike retains this position in addition to his work with the Call Switch Company. The executive offices of the Call Switch Company, Inc., which have been located at Denver, Colo., for a number of years, will hereafter be located in the Singer building, 149 Broadway, New York.



H. A. Pike

G. A. White, formerly metallurgist of the American Sheet & Tin Plate Company, has become associated with the Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., in the same capacity. Mr. White's long experience in the manufacture of sheet steels makes him a valuable addition to the metallurgical force of the Titanium company. Prior to his connection with the American Sheet & Tin Plate Company, Mr. White was for a considerable time with the Rock Island and also with the Eastern Steel Company, Pottsville, Pa., where he was engaged in the manufacture of structural material. It is, however, in the manufacture and treatment of sheet steel that Mr. White has done his most notable work.

According to E. J. Buffington and G. G. Thorpe, presidents respectively of the Illinois Steel Company and the Indiana Steel Company, five additional blast furnaces are to be erected at the Gary, Ind., plant. This will make 17 stacks in all, the largest single group in America. New construction now under way at the plant will cost between $15,000,000 and $20,000,000, and employment will be given to several thousand men on its completion next year. The National Tube Company plans call for four blast furnaces, several ore docks, a Bessemer mill and auxiliary facilities. Plans are also under way for the American Locomotive Company's new plant, and for that of the American Car & Foundry Company, both of which are to be located at Gary.

Edward Wray, business manager of the Railway Electrical Engineer, has resigned to accept the position of assistant to R. C. Lanphier, general manager of the Sangamo Electric Company, with headquarters at Springfield, Ill. Mr. Wray was born in Janesville, Wis., in 1884 and was graduated from the University of Wisconsin in 1905 from the course in electro-chemistry. After finishing the regular four-year course, he took another year of post graduate work and received the degree of electrical engineer. During the year of post graduate work he had charge of a series of tests on railway car lighting equipment which was participated in by ten senior students of the university. The report of this investigation was published by the university as one of its official bulletins under the title of "Methods of Train Lighting." After leaving school Mr. Wray went with J. G. White & Company, of New York, where he spent the first six months on inspection and design of electric power plants. He was then sent to Porto Rico in connection with the Caguas Railway extension, where he remained until April, 1908. During this time he held the position of rodman, levelman, transitman, topographer and assistant engineer. Upon returning to New York he entered the employ of D. C. & William D. Jackson, engineers, of Boston, and was engaged in the work of appraising the New England Telephone Companies' properties until November, 1908. He then returned home and until May, 1909, was engaged as assistant manager of the Janesville (Wis.) Electric Company. About this time, he got in touch with L. B. McKenzie, who was then publisher of The Signal Engineer. Mr. McKenzie explained to Mr. Wray that the Association of Railway Electrical Engineers had requested him to start a new magazine devoted exclusively to the interests of electricity on railroads, and Mr. Wray was offered the editorship on the new paper, which he immediately accepted. That was the beginning of the Railway Electrical Engineer. One year later when The Signal Engineer was purchased by the Simmons-Boardman Publishing Company, publishers of the *Railway Age Gazette*, Mr. Wray organized the Wray Publishing Company and purchased the Railway Electrical Engineer from the McKenzie Publishing Company. The Railway



E. Wray

Electrical Engineer was again sold to the Simmons-Boardman Publishing Company in October, 1915, and was moved to New York, Mr. Wray coming with it as business manager.

Oliver J. Smith, whose appointment as manager of the Lima Locomotive Corporation has just been announced, was born January 20, 1883, at South Dayton, N. Y. After an elementary education in the public schools of his native town he entered the high school at Jamestown, N. Y. In July, 1899, he took employment with the American Locomotive Company as an apprentice, remaining with this company until 1906 when he went to the Lake Shore & Michigan Southern shops at Collinwood, Ohio, as an expert machinist. In 1907 he returned to the American Locomotive Company's plant at Dunkirk, N. Y. In 1910 he was promoted and transferred to the New York office of this same company as piece work supervisor, which position he held until August 1 of this present year, when his appointment as manager of the Lima Locomotive Corporation became effective.

J. E. Buker, general sales manager of the Chicago Car Heating Company, Chicago, Ill., has been elected vice-president, effective October 15. He was born in Jefferson County, New York, where he received his early education. Upon leaving school, he entered the mechanical department of the Michigan Central, where he remained about twelve years. Seeing a chance to acquire some very special mechanical experience with another company he obtained employment with the Atchison, Topeka & Santa Fe. Two years later he accepted a position with the Hicks Stock Car Company, as general manager, with which concern he was connected nine years. He then became assistant superintendent of machinery of the Illinois Central, holding this position for eleven years. Following his resignation from this company in 1910, he became associated with the Chicago Car Heating Company.

William W. Weller has become associated with the Vulcan Steel Products Company, 120 Broadway, New York, and now is acting as its representative in France. Mr. Weller has had an experience of 15 years in the steel industry and served for several years of that time as sales manager for a large pipe manufacturer. Others who have become affiliated with the Vulcan Company include: F. G. Belsito, who has had considerable selling experience in Cuba, Panama and Italy and who has been made the company's representative in Italy; George W. Blen, now on a business mission to England, who previously had served in the operating department of the Carnegie Steel Company and other companies; Fred M. Cole, formerly of the manufacturing department of the Cambria Steel Company, who has been placed in charge of the purchasing department; Warren M. Maule, formerly assistant in the comptroller's office of the Cambria Steel Company, who has been made secretary and head of the accounting department, and H. D. Mills, formerly head of the foreign shipping division of the American Express Company and previous to that time with various railroads, who has been placed at the head of the traffic department.

The Colorado Fuel and Iron Company

The following extracts are from the annual report of President J. F. Welborn to the stockholders of the Colorado Fuel & Iron Company:

"Gross earnings from operation were $25,626,605, an increase of $9,048,566, or 54.7 per cent over the previous year. Operating expenses were $21,280,520, an increase of $6,467,538, or 43.7 per cent. The net earnings from operation were $4,346,086, an increase of $2,581,027. Income from sources other than operation amounted to $624,991, making the total net income $4,971,076, compared with $2,261,101 in the previous year. After deducting bond interest, taxes, sinking funds, equipment renewal fund, and cost of personal injuries under the workmen's compensation law, all amounting to $2,769,906, there remained a surplus of $2,201,171, as compared with a deficit for the preceding year of $334,661. A dividend of 30 per cent, amounting to $600,000, was declared on the preferred stock, being one-half of the deferred dividends on that stock, leaving $1,601,171 carried to the credit of profit and loss.

"The improvement in the business and earnings has made possible a program of new construction and additions to equipment, essential to the most profitable operation of the business. A by-product coke plant of 120 ovens is to be built at the Minnequa Steel Works and other additions and improvements at various points have been authorized during the year. The estimated cost of these authorizations, all of which are chargeable to capital account, is $3,300,000. The total amount unexpended on all authorized improvements at June 30, 1916, was $3,220,000. It is estimated that about 75 per cent of this amount, which will be taken from accumulated earnings, will be expended during the current fiscal year. . . .

"Heavy rails represent more than 50 per cent of the output of our steel plant and as wage advances added materially to their cost, with no increase in the selling price, the average earnings per ton on all steel sold were not such as might have been anticipated in view of the high prices prevailing for certain steel products. In normal times our steel plant is dependent primarily upon railroad business and it is the view of the management that, as has been our practice, every effort should be made to take care of the requirements of our regular railroad customers during the period of abnormal demand in other lines, rather than force our railroad friends to reduce their purchases with us in order that we might take a greater amount of other business.

"On February 1, 1916, an increase of approximately 10 per cent was made in wages of our steel plant and iron mine workers. At the rate of subsequent operations this amounted to from $40,000 to $45,000 per month. On May 1 another increase, also approximating 10 per cent and amounting to from $45,000 to $50,000 per month, was made to the same class of employees. The first increase effective for five months and the second for two months, of the fiscal year, amounted in the aggregate to over $300,000. On September 1, 1916, an increase of about 5 per cent was made in the wages of coal mine employees. At the present operating rate these various wage advances involve an annual increase in the payroll of about $1,250,000."

The balance sheet follows:

ASSETS

	June 30, 1916.
Property	$62,801,090
Cash on hand	4,237,278
Stocks and bonds (inter company)	15,445,170
Accounts and bills receivable	4,162,139
Subsidiary companies	203,135
Cash in hands of trustees	4,425
Reserve fund—taxes	98,341
Manufactured stocks and supplies	3,761,528
Dividends and interest—accrued	131,233
Royalties on leased lands paid in advance	64,938
Total	$90,909,277

LIABILITIES

Common stock	$34,235,500
Preferred stock	2,000,000
Funded debt	45,005,000
Accounts and bills payable	1,028,011
Hospital	19,557
Accrued bond interest—not due	826,995
Fund for payment of taxes	100,000
Unpaid dividend—preferred stock	600,000
Sinking fund—real estate	1,841,038
Miscellaneous funds	331,049
Profit and loss	4,922,127
Total	$90,909,277

TRADE PUBLICATIONS

OIL ENGINES.—Bulletin No. 154 recently issued by the De La Vergne Machine Company, New York, describes the De La Vergne type "FH" crude oil engine.

PORTABLE TOOLS.—Bulletin E-44, recently issued by the Chicago Pneumatic Tool Company, describes the Duntley electric sensitive drilling stand and electric drills to fit sensitive drilling stands.

AIR COMPRESSORS.—Bulletin 34-Z, recently issued by the Chicago Pneumatic Tool Company, deals with the company's steam driven single compressors with balanced steam valve and automatic flywheel governor.

STEEL POLES.—The Bates Expanded Steel Truss Company, Chicago, has issued a 48-page pamphlet describing the one-piece steel poles manufactured by that company. An exposition is given of the method by which these poles are formed by shearing and expanding special steel I-sections which are rolled to five different sizes. The book also gives complete data on the properties of these poles and the methods by which they are installed and the various fittings used with them, such as crossarms, lamp and trolley wire brackets, caps, etc. Several pages are devoted to handbook data particularly applicable to this product.

Railway Construction

Chesapeake & Ohio.—A contract has been given to Ballard, Herring & Severs, Inc., Yancy Mills, Va., to build a line from Man, W. Va., south along Guyan river to Gilbert, 13 miles. The maximum grade will be .5 per cent against east or empty traffic, with no adverse grade against westward or loaded traffic; the maximum curvature will be 12 deg. The work will be difficult, and involves handling about 36,000 cu. yd. to the mile. There will be one deck plate girder bridge. The company expects to develop a traffic in coal and timber on the new line.

The report of the Chesapeake & Ohio for the year ended June 30, 1916, shows that the construction of the Chesapeake & Ohio Northern is rapidly nearing completion, and the line will probably be placed in operation in time to handle coal shipments to the Great Lakes at the opening of navigation in the spring of 1917. This line extends from Limeville, Ky., on the C. & O. main line to the Norfolk & Western, near Waverly, Ohio, 30.4 miles. A spur track, 4.7 miles long, from the main line at Penniman Junction east of Williamsburg, Va., to the plant of the E. I. du Pont de Nemours Company, at Penniman, has been completed. During the year the following extensions were completed; Gauley & Rich Creek branch, 0.1 mile; Dingess Run branch of the Guyandot Valley line, 0.8 mile; Horse Creek branch, 5.1 miles; Peter Cave Fork branch, 2 miles, and Beech Creek extension of the Coal River line, 1.6 miles. There was also completed 3.4 miles of second track between Balcony Falls, Va., and Greenlee.

Chesapeake & Ohio Northern.—See Chesapeake & Ohio.

Deep Creek Railroad.—Incorporated in Utah with $450,000 capital, to build from Wendover, Utah, on the Western Pacific, to Gold Hill, 43 miles. A contract is reported let to the Utah Construction Company to build the line. Duncan MacVichie, president; T. J. Wyche, vice-president, and Edwin T. Jones, secretary.

Dover, Millersburg & Western (Electric).—This company is planning the construction of about 35 miles of single track from Canal Dover, Ohio, to Millersburg, Ohio. While contracts for this undertaking have not yet been awarded it is expected that actual construction will begin at once. There will be four small bridges; the maximum grade is about three per cent and the maximum curvature 10 deg. Plans for a power house and several small substations along the right of way have been made. D. F. A. Wheelock, Woodward building, Warren, Pa., is the engineer in charge.

Fairmont Helen's Run Railway.—See Western Maryland.

Kansas City, Kaw Valley & Western (Electric).—This company plans an extension of its line from Lawrence, Kans., to Topeka, Kans. It has not yet been definitely decided whether the extension will parallel the Union Pacific on the north side of the Kansas river or the Atchison, Topeka & Santa Fe on the south side of the river. O. K. Williamson, chief engineer, Bonner Springs, Kans.

Knoxville, Sevierville & Eastern.—Construction work is to be started at once, it is said, on a 26-mile extension of this road in Sevier county, Tenn. (See Pigeon River Railroad, August 25, page 349.)

Lehigh & New England.—According to press reports this company is planning to build an extension southwest to Pottsville, Pa.

Niagara & Eastern.—The New York Public Service Commission, Second district, refused o grant permission to this company to construct the proposed line to connect the Buffalo, Lockport & Rochester with the Niagara frontier, at a point where it is proposed to build a new international bridge. It is understood that an application for permission to build part of the line to connect the Buffalo, Lockport & Rochester with the International & Erie at Hinman would be granted.

Northern Pacific.—This company contemplates building a line from Laurel, Mont., extending west into the Lake Basin district, a distance of about 35 miles. Bids will not be called for until about November 1.

Oregon Trunk.—Farmers in the neighborhood of Prineville, Ore., have subscribed sufficient funds to construct a new line from that point to connect with the Oregon Trunk, a distance of about 21 miles. Except that the undertaking itself is a certainty no definite plans as to time of construction or type of motive power has yet been adopted.

Philadelphia, Baltimore & Washington.—Work is now under way on the Delaware division double-tracking the sections from Greenwood, Del., to Harrington, 7.44 miles; Greenwood to Bridgeville, 6.05 miles, and Seaford to Broad Creek, 3.34 miles.

Philadelphia Roads.—The department of city transit of Philadelphia, Pa., announces that in order to allow ample time for preparation of proposals for Contract No. 102, Broad Street subway, City Hall station (north section), the opening of bids on this contract has been postponed from November 2, to December 7. (October 13, p. 667.)

Southern Railway.—The report of this company for the year ended June 30, 1916, shows that the double track construction work on the main line north of Charlotte, N. C., together with improved alinement and the elimination of heavy grades, was completed during the year on 75 miles of the 115 miles of main line between Washington and Charlotte. Work of the remaining 40 miles is rapidly nearing completion, and it is expected that the entire main line north of Charlotte will be in operation as double track line on revised grades early in 1917. On the line between Charlotte and Atlanta double track work is nearing completion on the 56 miles between Spartanburg, S. C., and Central, and on the 23 miles between Cornelia, Ga., and New Holland. Work is also progressing on the 50 miles between Central and Cornelia, and on the existing single track gauntlet of 5.5 miles between Suwanee, Ga., and Duluth. At the close of the year there was 491.42 miles of double track in operation, and 60.84 additional miles completed, but not in actual operation.

Texas Roads.—R. H. Phillips and C. E. Honon, St. Louis, Mo., and C. R. Wild, Cincinnati, Ohio, are promoting the construction of a railroad between Eagle Pass, Tex., and Rockport, on the Gulf coast, a distance of about three hundred miles. The promoters recently made a trip over the proposed route and inaugurated the work of securing the right of way. Large bonuses of money and lands are also being raised along the route in aid of the project. The promoters have obtained an option to purchase the Asherton & Gulf which runs between Asherton and Artesia Wells, 32 miles, and it will be used as a part of the through line.

Virginian Railway.—This company is building a coal branch, to be known as the Piney Creek branch, from Pemberton, W. Va., south to Fireco about 7.4 miles; about 4 miles of track has already been laid, and the company expects to have the work completed by January 1, 1917. The company is also building a branch to be known as the Stone Coal Branch from Stone Coal Junction, northeast to the Lillybrook Coal Company's lands on Stone Coal creek, 8.7 miles, on which track has been laid on 6.3 miles. A spur line has been graded from the latter branch to the East Gulf Coal Company's land up Riffes branch, and another to the Mead-Tolliver Coal Company' operation on Farley branch, 1.53 miles.

Western Maryland.—Work has been completed on the Fairmont Helen's Run Railway, from a connection with the Baltimore & Ohio, at Chiefton, Marion county, W. Va., in a generally northern direction, crossing West Fork river, thence up Helen's Run to Ida May mine, with a spur line up Martin's Run to Carolina mine, in all about 9.75 miles. The work included building two steel bridges and two timber trestles, also a four-stall enginehouse, turntable, ashpit and coaling station.

RAILWAY STRUCTURES

Attalla, Ala.—The Alabama Railroad Commission has issued an order, it is said, to the four railroads entering Attalla to build a union passenger station.

Baltimore, Md.—The Western Maryland has given a contract to the Price Concrete Construction Co., Baltimore, Md., for

building an office building on Pt. Covington street, Baltimore. The proposed structure will be two stories high, 40 ft. wide and 76 ft. long, of brick construction with slag roof, and will cost about $12,500.

Grand Rapids, Mich.—Plans for a terminal station here for the Michigan Railway are under way. It is proposed to erect a seven-story modern combination office and station building. H. D. Sanderson, chief engineer, Jackson, Mich.

Holsopple, Pa.—The Baltimore & Ohio is building with its own forces a B. & O. standard combination freight and passenger station at Holsopple.

Lima, Ohio.—The Lake Erie & Western contemplates increasing the size of its yard here as well as constructing a new roundhouse and some shop buildings. As yet, however, no definite plans have been formulated nor any estimates called for. J. J. Connor, chief engineer, Indianapolis, Ind.

Lineville, Ala.—The Atlanta, Birmingham & Atlantic will build a new station, it is said, at Lineville.

Lockport, N. Y.—The New York Central will carry out improvements, including a new freight house and yard at Lockport, to be located at a point about one mile west of the present freight house. The new freight house will be 40 ft. wide and 400 ft. long and at the east end of the freight house there will be a two-story office building, 40 ft. wide and 60 ft. long. It will have concrete foundation, brick walls, wood roof and built-up roofing. The contract has been let to Manion Brothers.

Morrisville, Pa.—The Pennsylvania Railroad will enlarge its yard at Morrisville. The cost of the improvements will be $650,000.

Waterville, Maine.—The report of the Maine Central for the year ended June 30, 1916, shows that an addition was made during the year to the locomotive repair shops at Waterville, also a new, modern locomotive coaling plant, including machinery, chutes and service tracks, was constructed. At Portland, Maine, an extension to the general office building was constructed consisting of a three-story brick building, with three connections to the original building. At the Sheepscot river bridge a change in alinement with grade revision was made on each side and across Sheepscot river east of Wiscasset, and a new through riveted, steel bridge, Scherzer rolling lift drawbridge, is now being built across the river in a new location. In order to avoid the rebuilding of the Waterville bridge at its present location across the Kennebec river, the construction of a connecting link has been authorized between Fairfield and West Benton, including a new double track steel deck bridge across the Kennebec river, and the construction of a second track, including grade revision between Waterville shops and Clinton. On the completion of these improvements, the present bridge over the Kennebec river, above Waterville, and the railroad between Waterville shops and West Benton, will be abandoned. Arrangements have been made for the construction of a modern brick passenger station at Bates street, Lewiston, Maine, to replace the structure destroyed by fire. The yard tracks at Lewiston Upper Station will also be rearranged in order to increase the facilities, and it is expected that these improvements will be completed and in use early in 1917. Work is now under way to abolish a highway grade crossing at Bath, Maine, by the construction of a railroad bridge and abutments, and the relocation of the highway, so that it will pass under the railroad. The cost of this work will be divided as follows: Maine Central 65 per cent, State of Maine 25 per cent, and City of Bath 10 per cent. Work is now underway to abolish two highway grade crossings, one west of and one east of Guildhall station, Vt., by relocating the highways and building one underpass to serve both highways. The railroad is to pay 67 per cent of the cost, the state of Vermont 25 per cent, and the Town of Guildhall 8 per cent.

Philippine Railway Company Report.—The report of the operation of the Philippine Railway Company's lines in the Philippine Islands for the year ended December 31, 1915, shows a total revenue of $362,407 as against $361,219 in 1914. Total expenses for 1915 were $243,035, against $232,795 in the previous year. The net operating revenue was $119,372, as compared with $128,424 in 1914, a decrease of 7.05 per cent. for 1915.

Railway Financial News

Chicago, Rock Island & Pacific.—James Speyer, Seward Prosser and James Alexander, all of New York, and S. Davies Warfield, of Baltimore, have been elected to fill the four vacancies of the Chicago, Rock Island & Pacific directorate.

One of the men actively interested in the reorganization plans of the Chicago, Rock Island & Pacific is quoted in the Wall Street Journal as follows:

"The Peabody Committee has filed a foreclosure bill and no answer has been filed to date. There are some things to be said in favor of a foreclosure provided it can be accomplished without protest. There is every reason to expect concerted protest, however. The Peabody committee did not get a large proportion of the refunding bonds when it called for deposits and that is a weak point in this committee's argument.

"Of principal importance, however, is the fact that the present and prospective earnings of the Rock Island system do not warrant a foreclosure. A foreclosure case would have no more weight in court than foreclosure of the International Mercantile Marine Company would have had. The Peabody committee saw the trend of events and suggested that it might be willing to recede from its stand under certain conditions. These conditions involve the rate of assessment and this matter has not been settled. Some believe that $30,000,000 will suffice for the present and others want $40,000,000 and even $50,000,000.

"It is premature to say that everything has been settled amicably, but there is every indication that harmony will result."

Great Northern.—F. E. Weyerhauser, son of the late Frederick Weyerhauser, has been elected a director of the Great Northern, succeeding the late James J. Hill.

Missouri Pacific.—The Kansas & Colorado Pacific first refunding 6 per cent bondholders' committee, of which R. Fulton Cutting is chairman, has approved of the modified plan of reorganization by which bondholders may either exchange their bonds for an equal amount of 5 per cent preferred stock or for new general mortgage 4 per cent bonds, with a cash adjustment to cover interest from August 1, 1915, to August 1, 1916, and until the new general mortgage bonds are issued and begin to draw interest.

New York, New Haven & Hartford.—On the application of the directors of the estate of the late J. P. Morgan in the suit brought by Edwin Adams in behalf of certain minority stockholders for an accounting and restitution of money claimed to have been misspent or misapplied by the directors of the New York, New Haven & Hartford, the time for answering the suit has been extended to November 1, 1916.

New York Central.—It is understood that the directors are considering the possibility of offering to stockholders for subscription at par $25,000,000 new stock. The company has available about $50,000,000 of authorized but unissued stock. New York Central stock was selling on the New York Stock Exchange this week at about 109.

Pere Marquette.—The balance of the defaulted equipment notes, which, with interest, amount to $321,338, are being paid by the receivers, and current maturities, amounting with interest for the year to $585,200, are being paid as they mature. The floating debt for materials and supplies has now been paid in full and there now remains to be taken care of $5,015,000 receiver's certificates.

St. Louis & San Francisco.—The Kansas railway commission has given its approval to the proposed reorganization plan of the St. Louis & San Francisco.

Strike on Paraguayan Railways.—The Paraguayan Railways have suspended operations because of serious strike disorders. Strikers and their sympathizers attacked a number of trains and burned several bridges.

ANNUAL REPORTS

SOUTHERN RAILWAY COMPANY—TWENTY-SECOND ANNUAL REPORT

RICHMOND, VA., October 10, 1916.

To the

Stockholders of Southern Railway Company:

The Board of Directors submits the following report of the affairs of the Company for the year ended June 30, 1916:

The industrial characteristics of the year in the South have been revival and expansion. The march of progress, which was interrupted at the outbreak of the European war by the depression in the price of cotton, the South's chief staple, has been resumed. This fact is reflected in the revenues of Southern Railway Company. During the months of July, August and September, 1915, those revenues continued to be on the footing of the conditions which obtained during the previous year, but beginning with October they swelled progressively until they reached a volume greater than at any similar period in the history of the Company. The result was that for the entire year the revenues amounted to $69,997,675.24, or only slightly less than in the year ended June 30, 1914, which still marks the high record on that side of the annual account. On the other side of the account this year there are reflected the lessons of experience learned during the previous year of depression. Expenses were so controlled that in the aggregate they were actually less than in the previous year, to the great advantage of the income over all charges, which grew to $9,245,703.58, or $2,215.738.89 more than in 1913, the last previous record in that respect. While this is a gratifying achievement, it must be noted also that the net operating income ($21,004,005.09), which is the basis of the results secured this year, is the equivalent of a return of only 5.31 per cent. on the investment ($395,722,785.06) in the railroad and equipment which produced it. It may perhaps be said that there is no industry except a railroad in which so large a capital is risked for such a return in its most successful year.

These results, and the financial condition of the Company at the close of the year, appear in detail in the Income Statement and the General Balance Sheet, as well as in the other tables which are part of this report.

OPERATING CONDITIONS.

There was a marked increase in efficieny in all the physical operations. With an increase of revenues of 12.54 per cent., and an increase of revenue ton miles of 20.16 per cent., showing the larger volume of business done this year as compared with last, revenue train miles decreased 1.89 per cent., and transporation expenses decreased .03 per cent. Transportation costs per dollar of revenue were 32.50 cents, or 11.18 per cent. less than in 1915, and 10.57 per cent. less than in 1914. This was accomplished in various ways, but "not without dust and heat." Great attention was given to increased loading of trains, and the average loading attained was 441.66 tons as compared with 382.33 tons in 1915, 339.21 tons in 1914 and 228.24 tons in 1908. In considering these figures the map of the Southern, and the characteristics of its traffic, should not be forgotten. The relatively large proportion of branch line mileage operated, on which an arbitrary service must be maintained, and the amount of high class merchandise and perishables carried, are constant limitations of average tonnage. This point may be illustrated by the following comparative statement of the operating results of the several main lines which constitute the back-bone of the system:

	Average Miles Operated.	Per Mile of Road. Gross Revenue.	Operating Income.	Freight Revenue.	Revenue Tons.	Per Train Mile. Freight Revenue.	Total Tons.	Transportation Costs per $1.00 Revenue.	Operating Costs per $1.00 Revenue.
System—This Year	7,022.92	$9,967	$2,991	$6,695	719,571	$3.30	442	32.50c	69.99c
Main Lines	2,272.61	18,880	7,666	12,542	1,407,910	3.46	500	27.53c	59.40c
Washington-Atlanta	662.78	25,896	11,049	15,524	1,633,675	3.52	461	26.95c	57.33c
Atlanta-Birmingham	170.69	12,207	2,004	7,268	918,308	2.55	482	40.70c	83.58c
Greensboro-Pinners Point	270.19	13,195	7,209	10,931	1,147,981	4.24	476	18.91c	45.37c
Bristol-Chattanooga	246.13	22,005	9,720	14,679	1,758,588	3.77	560	24.77c	55.83c
Morristown-Asheville	88.37	26,630	13,102	22,613	2,556,552	3.67	709	20.95c	50.80c
Asheville-Salisbury	143.00	18,553	5,394	14,127	1,500,892	2.65	477	33.49c	70.93c
Asheville-Spartanburg	69.51	14,615	4,925	9,241	1,078,185	2.44	412	29.82c	66.30c
Spartanburg Columbia	96.70	10,990	4,933	7,458	917,526	5.46	881	23.93c	55.12c
Chattanooga-Memphis	315.07	10,937	4,197	6,988	827,067	3.34	434	29.51c	61.62c
Chattanooga-Macon	259.16	16,006	5,149	10,857	1,359,334	3.51	508	32.99c	67.60c

To state the operating efficiency results in another way: the unit cost for freight enginemen, trainmen and fuel per ton mile decreased 10.25 per cent. as compared with the previous year. The mileage of loaded freight cars increased 15.16 per cent., or, to state it differently, with an increase of 16.22 per cent. in freight revenue, the total freight-train car miles, loaded and empty, increased only 8.40 per cent., due to the fact that there was a decrease of empty freight car miles of 7.30 per cent. Freight locomotive fuel costs per 100 ton miles decreased 10.42 per cent. as compared with 1915, and 19.81 per cent. as compared with 1914, while pounds of coal consumed per 100 ton miles were 6.32 per cent. less in 1916 than in 1915 and 14.18 per cent. less than in 1914.

The problem of operating economy, and the method of solving it, are both reflected in the following comparative statistics:

	Freight Earnings.	Tractive Power of Freight Engines.	Freight Locomotive Miles.	Net Tons per Locomotive Mile.
1908	$34,171,329.17	34,900	17,622,105	219.46
1916	47,020,481.81	38,112	14,366,475	414.84
Increase	37.60%	9.2%		89.03%
Decrease			*18.47%*	

Another important item of true economy has been the progressive control of charges for losses, damages and injuries, as illustrated by the following figures:

CHARGES FOR LOSSES, DAMAGES AND INJURIES, YEARS ENDED JUNE 30.

	1916.	1915.	1914.
Injuries to Persons	$766,252	$1,046,183	$1,293,502
Loss and Damage—Freight	844,965	962,070	1,072,628
Loss and Damage—Baggage	6,248	5,926	10,617
Damage to Stock on Right of Way	128,889	155,164	159,186
Damage to Property	121,463	113,623	114,159
Totals	$1,867,817	$2,282,966	$2,650,092

DECREASES:

1916 vs. 1915	$415,149
1916 vs. 1914	$782,275

These few figures are here cited, not only because they are striking, but because they indicate what has been accomplished by the intelligent work of the operating officers, plus the intelligent investment of capital in facilities for economical operation. Other examples of similar tendencies will be found elsewhere in this report. They are at once a source of pride and of stimulus to the management. They contain also one of two reasons for hope in the present parlous condition of the railway industry. The other reason is the progressive development of the volume of freight traffic, demonstrating what may be expected from what has been experienced.

MAINTENANCE:

The property has been well maintained, and its actual condition at the close of the year was better than ever it was. During the depression of last year a substantial item of retrenchment was the postponement of maintenance of freight-train cars which were then idle. On June 30, 1915, 11.65 per cent. of the freight-train cars owned by the Company were in bad order. During this year they were repaired, or, when found to be in such condition, due to age or damage, as not to warrant repair, were retired and charged off the books through the maintenance accounts. On June 30, 1916, there were only 1.58 per cent. of the freight-train cars owned by the Company in bad order.

TAXES:

There was a large increase in taxes. Of every dollar of revenue 4.17 cents went this year to taxes, as compared with 3.79 cents in 1914, when the revenues were substantially the same. It may be of interest to compare this tendency with that of another item of transportation cost over which earnest effort on the part of management can effect some control. This year all station expenses consumed 6 cents of each dollar of freight and passenger revenues as compared with 6.20 cents in 1914. Doubtless time was when the taxes assessed upon railroad property were, in fact, a contribution by railroad stockholders to government, as many taxing authorities believe they still are, but the fact is that, under regulation, railroad transportation has assumed such a public nature that to-day taxes have become only one of the costs of transportation service, and so are a tax upon commerce to be distributed among all those who use the railroads, directly or indirectly. It is almost as if a court-house was taxed for the support of the court.

GENERAL EXPENSES:

The cost, assigned by government authority, to this Company of the Federal valuation of railroads now in progress added $172,751.62 to the general expenses during the year, an increase of $74.560.30 over the previous year, making the total of this cost to June 30, 1916, $308,985.92. If this item of the technical account "General Expenses" is deducted, it will be found that the actual cost of administration of the property and traffic solicitation has been reduced six and one-half per cent. this year, as compared with last, and in greater proportion as compared with previous years.

CHARACTERISTICS OF TRAFFIC DURING A YEAR OF EXPANSION.

FREIGHT:

The forecast in the last annual report respecting freight traffic is happily sustained by the gross freight revenue increase for the year of $6,561,623.96, equal to 16.22 per cent. Compared with the previous maximum, obtained in 1914, the increase in freight revenue is $1,388,274.69, equal to 3.04 per cent. The total revenue producing tonnage of 30,272,132 tons exceeds that of the previous year by 4,375,720 tons (16.90 per cent.), and is 621,676 tons in excess of the previous maximum, obtained in 1914.

It is a common fallacy to assume that the success of a railroad in the South depends upon the *tonnage* of raw cotton carried. In the case of the Southern Railway this year the tonnage of cotton, and cotton seed and its products, actually decreased 239,416 tons (14.5 per cent.). due to the short crop, while the tonnage of all revenue freight increased 4,375,720 tons (16.9 per cent.).

Bituminous coal and coke tonnage was substantially the same as in 1914,

and included 1,760,189 tons passing over the new tipple at Charleston, which was put in operation September 2, 1915. But for the scarcity of vessels, and consequent high cost of ocean transportation, it is believed that this new business would have been of much larger volume. The present outlook warrants the belief that our bituminous coal traffic, both domestic and foreign, will rapidly expand, but the percentage of manufactured products handled may be expected always to exceed the coal tonnage. This is one of the characteristics of the Southern Railway which is also part of its operating problem, as already stated.

While we have not, in a large way, shared in the movement of munitions and supplies for the nations at war, we have handled a substantial tonnage of raw materials for the manufacture of munitions as well as some of the munitions.

The following condensed tonnage statement is an illustration of the traffic as well as the operating problem, and, in its balance between raw material, manufactured products and coal, indicates also the strength of the Company's claim to serve the South, and not merely any part or class of it.

	Per Cent. of Total Tonnage.
Manufactures and Miscellaneous	20.43
Bituminous Coal	28.60
Other Products of Mines	12.10
Products of Forests	16.90
Products of Agriculture	11.86
Products of Animals	1.11

A reconstruction of freight charges in the South, in conformity to the amended long and short haul requirement of the federal law, is in progress, under the direction of the Interstate Commerce Commission. The first tariffs, containing revised inbound rates, effective January 1, 1916, virtually eliminated the so-called "basing-point" system, under which some of the more important commercial centers of the interior South enjoyed lower rates from primary markets than were charged to the more numerous, but smaller, intermediate communities. While some of the larger communities which had enjoyed the benefit of the depressed rates feared the effects of the revision, there is no evidence, after a trial of more than six months, of injury to any industrial or commercial interest. It is believed that with the completion of this work of reconstruction, our people, as a whole, will be better satisfied than ever before with our system of rates.

Prospects are favorable for a healthy growth in all lines of freight traffic during the year 1917. The South has had a prosperous year, and intends to have another. As this report is written, there is apparent, throughout the South, that feeling of industrial and commercial exhilaration which comes to every Southern man, whether or not he owns any of the staple, with the exultant repetition of the phrase "fifteen-cent cotton."

PASSENGER:

The passenger revenues began showing gains in November, which have since continued, month by month, in amount more than sufficient to recover the losses in revenue occurring during the preceding four months of the year. While the passenger revenues have not yet returned to the highest record, which was made in the year 1914, it is expected that this may be accomplished within the year 1917.

As population multiplies in the territory served, so also do passenger revenues increase, but in greater proportion. For the period 1900 to 1910, the population of the States served by the Southern Railway increased 14.31 per cent. For the period 1910 to 1916, the population of those States increased 7.87 per cent. In the same periods our passenger revenue per mile of road increased 69.23 per cent. and 13.94 per cent., respectively.

The decrease in passenger train mileage this year, as compared with last, was due to rearranging service and taking off trains that did not pay the cost of operation.

As part of the consideration of passenger traffic, attention is called to the statement published this year for the first time, showing a division of expenses between freight and passenger traffic. From this it will appear that, while passenger trains earned an average of $1.28 per mile run, the revenue from passengers, was substantially $1.04 per train mile, and the cost to run a passenger train one mile was $1.13, or approximately 9 cents per mile greater than the revenue derived from passengers. The prevailing passenger rates are not sufficient adequately to support the character of passenger service furnished to the public.

INDUSTRIAL AND AGRICULTURAL DEVELOPMENT OF THE TERRITORY SERVED.

MANUFACTURING:

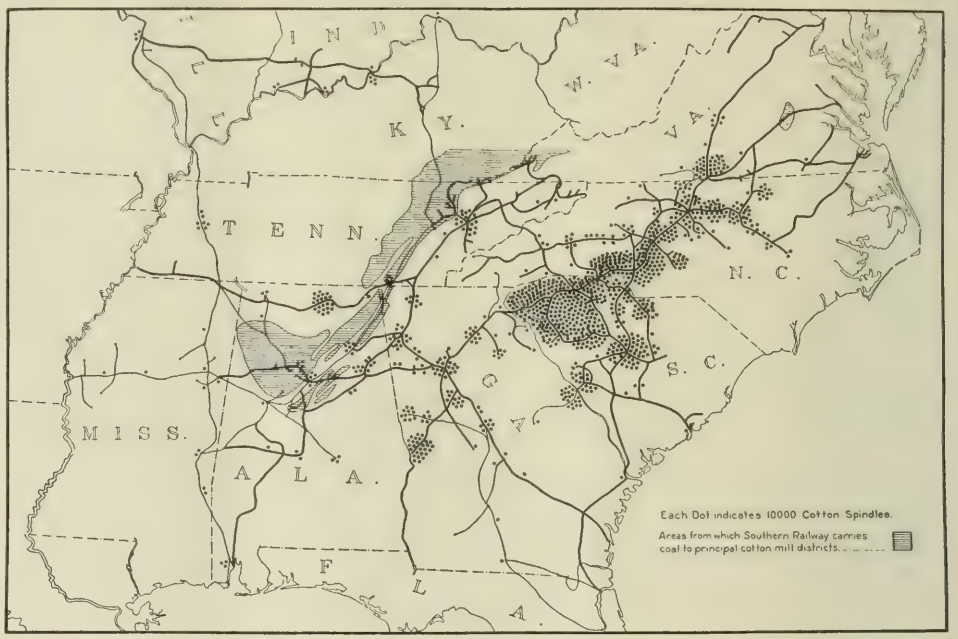
There has been, during the year, a steady growth in the number of manufacturing establishments in the territory served by our lines, and many additions have been made to previously existing plants. The development of the year has been through the continued healthy growth of those industries for which the South offers best opportunities. New plants completed during the year were as follows:

Brick, Tile, etc.	16
Canneries	9
Cheese Factories	8
Chemicals	14
Cotton Seed Products, Ginneries, etc.	21
Creameries	6
Fertilizer	5
Flour and Feed	108
Furniture	12
Iron Products	24
Lumber	122
Power Developments	13
Stone, Coal, Mineral, etc.	61
Tanneries	7
Textile, Clothing, etc.	30
Woodworking	24
Miscellaneous	204
Total	684

The capital invested in these new industries is $35,244,550. During the year there were additions made to 320 previously established manufacturing establishments, at a reported cost of $16,888,950. Plants reported under construction on June 30, 1916, were eighty in number, with a capital of $16,327,700. General improvements, consisting of new buildings of all kinds (except those used in manufacturing), public utilities, etc., cost $67,548,640.

The United States census of manufacturing in 1914, the figures for which have recently been completed, shows that, in the five-year period covered by the census, the value of the products of manufacturing in the Southern States traversed by our lines increased 18.44 per cent., as compared with an increase of 17.20 per cent. in all other States.

A notable feature of Southern manufacturing development is the rate at which the consumption of cotton, one of the principal raw materials of the South, has increased in Southern mills. United States Census figures show that in the twelve months ended July 31, 1916, the mills of the South consumed 3,526,787 bales, as compared with 3,026,969 bales last year, an increase of 499,818 bales, or 16.51 per cent. The mills of all other States consumed 2,869,185 bales in the twelve months this year, as compared with 2,570,393 bales last year, an increase of 298,792 bales, or 11.62 per cent. Fully seventy-five per cent. of the cotton spindles of the South are in mills along the lines of Southern Railway Company and its associated companies. This important fact, and the actual number of spindles so located, are graphically illustrated by the following map of our lines:



AGRICULTURE:

As the opportunities for profitable farming in the South become better known, numbers of substantial farmers are attracted to locations along our lines, and our reports show 862 sales of farm lands on the Southern Railway during the year, of which 447 were sales to buyers from the North and West. These figures do not represent the total movement of northern and western farmers into the territory, but only those as to whom definite reports are available.

While fully maintaining their production of cotton, which must ever be the leading cash crop of a large part of the South, and their production of tobacco, which is the principal cash crop of some localities, Southern farmers are rapidly adopting systems of diversified farming and crop rotation with the raising of live stock, tending to increase the aggregate net income of the farm and to make the farmer more independent of the fluctuations in the market price of a single commodity. By the extensive growing of soil-building legumes, and by giving more attention to live stock, the productivity of Southern soils is being increased, with corresponding increases in the average yields per acre of cotton and other staple crops.

The outstanding feature of present-day agricultural development in the South is the growth of the live stock industry and the improvement in the quality of Southern farm animals. The longer grazing seasons of the South, and the great variety of forage crops that can be produced, give the South distinct advantages over all other parts of the United States for the production of meats and dairy products. The extent of these advantages is indicated by experiments made by the United States Department of Agriculture in the cost of raising beef cattle in the corn belt, in Pennsylvania, and in Alabama. It was found that the average cost per hundred pounds of raising a calf to the age of twelve to fifteen months was $11.79 in the corn belt, $7.24 in Pennsylvania, $4.41 in North Alabama, and $4.69 in West Alabama. The conditions under which the Alabama experiments were conducted are similar to those prevailing in a large part of the territory traversed by our lines. The rate at which the quality of Southern farm animals is being improved is indicated by the fact that 5,836 pure-bred cattle were placed on farms along our lines during the year. In the same period 1,243 silos were built along our lines.

Our reports show the planting of 2,886,000 apple, peach, Satsuma orange and other fruit trees along the Company's lines during the fiscal year.

During the year we continued our policy of co-operation with the State and Federal governments, agricultural colleges and Southern farmers for the development of agriculture along our lines. Active demonstration work was done on 1,075 demonstration fields, and our agricultural agents addressed 453 meetings of farmers during the year, with an attendance of 46,981. This Company was a pioneer in the South in work of that character; now, happily, the duty and the opportunity of such practical education have been largely assumed by federal authority, supplemented by many volunteer private agencies. Governmental agricultural demonstration has recently been extended, under the so-called "Smith-Lever Act," into most of the counties traversed by our lines. The turning of Southern farmers to diversification has, meanwhile, introduced serious market problems for the individual farmer. For these considerations, our organization engaged

TABLE 3. GENERAL BALANCE SHEET, JUNE 30, 1916, COMPARED WITH JUNE 30, 1915.

ASSETS.

	June 30, 1916.	June 30, 1915.	Increase or Decrease.
Investments:			
Investment in Road	$330,204,269.48	$323,835,721.06	$6,368,548.42
Investment in Equipment	65,518,515.58	68,656,135.26	—3,137,619.68
Total Investment in Road and Equipment	$395,722,785.06	$392,491,856.32	$3,230,928.74
Cash Deposited in Lieu of Mortgaged Property Sold	.....	$2,112,590.04	—$2,112,590.04
Physical Property—Rails and Fixtures leased to others	$524,304.70	$503,161.93	$21,142.77
Investments in Affiliated Companies:			
Stocks	$26,736,304.49	$26,704,106.32	$32,198.17
Bonds	28,021,459.04	28,015,459.04	6,000.00
Notes	2,237,573.57	1,865,080.94	372,492.63
Advances	1,999,719.29	2,163,429.30	—163,710.01
Miscellaneous (Matured interest coupons)	51,455.00	51,455.00	
Total Investments in Affiliated Companies.	$59,046,511.39	$58,799,530.60	$246,980.79
Other Investments:			
Stocks	$1,695,693.58	$996,879.79	$698,813.79
Bonds	5,169,380.03	5,158,913.45	10,466.58
Notes	63,909.42	52,625.82	11,283.60
Advances for purchase of Additional Equipment.	5,633,029.65	.....	5,633,029.65
Total Other Investments	$12,562,012.68	$6,208,419.06	$6,353,593.62
Total Investments	$467,855,613.83	$460,115,557.95	$7,740,055.88
Current Assets:			
Cash	$7,127,172.20	$3,075,178.83	$4,051,993.37
Time Deposit	1,906,448.05	2,126,700.63	—220,252.58
Special Deposits	3,028,298.45	2,932,371.45	95,927.00
Loans and Bills Receivable	570,260.54	1,517,048.80	—946,788.26
Traffic and Car Service Balances Receivable	1,298,226.89	884,055.85	414,171.04
Balances due from Agents and Conductors	145,419.51	191,527.39	—46,107.88
Miscellaneous Accounts Receivable	4,533,206.69	3,207,412.32	1,325,794.37
Material and Supplies	6,813,172.27	4,530,946.24	2,282,226.03
Interest and Dividends Receivable	667,411.94	612,433.51	54,978.43
Other Current Assets	276,625.18	170,327.67	106,297.51
Total Current Assets	$26,366,241.72	$19,248,002.69	$7,118,239.03
Deferred Assets:			
Working Funds Advanced to Agents and Officers	$241,776.27	$146,360.90	$95,415.37
Cash and Securities in Insurance Fund	1,133,469.42	954,979.63	178,489.79
Other Deferred Assets	183,992.19	235,228.19	—51,236.00
Total Deferred Assets.	$1,559,237.88	$1,336,568.72	$222,669.16
Unadjusted Debits:			
Insurance Premiums and Rents paid in advance	$13,243.96	$11,809.10	$1,434.86
Unextinguished Discount on Funded Debt (Proportion chargeable to Additions and Betterments to be made)	120,655.96	162,047.57	—41,391.61
Additions and Betterments Expenditures in Suspense; Freight Claims in Suspense; Foreign Mileage Suspense and Sundry Items	2,848,803.56	2,283,665.64	565,137.92
Total Unadjusted Debits	$2,982,703.48	$2,457,522.31	$525,181.17
Securities of the Company held by it:	1916	1915	
Unpledged	$13,403,200.00	$16,108,200.00	
Pledged	27,267,000.00	18,667,000.00	
Totals	$40,670,200.00	$34,775,200.00	
Grand Totals	$498,763,796.91	$483,157,651.67	$15,606,145.24

LIABILITIES.

	June 30, 1916.	June 30, 1915.	Increase or Decrease.
Capital Stock:			
Common	$120,000,000.00	$120,000,000.00	
Preferred	60,000,000.00	60,000,000.00	
Total Southern Railway Company Stock.	$180,000,000.00	$180,000,000.00	
Southern Ry.-Mobile & Ohio Stock Trust Certificates.	5,650,200.00	5,650,200.00	
Total Stock	$185,650,200.00	$185,650,200.00	
Long Term Debt:			
Funded Debt	$226,850,500.00	$226,844,500.00	$6,000.00
Equipment Trust Obligations	17,435,000.00	15,191,000.00	2,244,000.00
Total Long Term Debt.	$244,285,500.00	$242,035,500.00	$2,250,000.00
Total Capital Liabilities.	$429,935,700.00	$427,685,700.00	$2,250,000.00
Governmental Grants:			
Grants since July 1, 1914, in aid of Construction	$31,668.16	$13,378.25	$18,289.91
Current Liabilities:			
Loans and Bills Payable	$455,000.00	$455,000.00	
Traffic and Car Service Balances	1,580,388.41	1,156,567.52	$423,820.89
Audited Accounts and Wages	6,150,180.05	5,415,499.79	734,680.26
Miscellaneous Accounts	719,561.36	633,395.38	86,165.98
Interest Matured, including interest due July 1	2,818,680.65	2,740,952.65	77,728.00
Funded Debt Matured—Unpaid	40,773.80	22,673.80	18,100.00
Dividends Accrued—Unmatured	56,502.00	56,502.00	
Interest Accrued — Unmatured	1,572,760.05	1,578,496.72	—5,736.67
Rents Accrued—Unmatured	203,404.12	249,266.09	—45,861.97
Expenses Accrued not vouchered	647,908.80	564,335.45	83,573.35
Other Current Liabilities	1,470,638.10	376,357.87	1,094,280.23
Total Current Liabilities	$15,715,797.34	$13,249,047.27	$2,466,750.07
Deferred Liabilities:			
Equipment of Leased Lines Retired; Deferred Payments Account Reconstruction Rogersville Branch; Contractors' Per Cents Retained and Sundry Items	$1,449,254.66	$1,385,586.66	$63,668.00
Unadjusted Credits:			
Taxes	$1,051,619.99	$1,011,687.22	$39,932.77
Insurance Reserve	1,133,469.42	954,979.63	178,489.79
Operating Reserves	3,289,779.83	1,898,431.28	1,391,348.55
Car and Ticket Mileage Suspense	700,219.12	557,821.07	142,398.05
Depreciation accrued on:			
Rail Leased to Other Companies	81,819.37	74,151.18	7,668.19
Equipment Owned	15,472,168.77	15,333,948.50	138,220.27
Equipment Leased from Other Companies	244,196.99	255,061.24	—10,864.25
Sundry Items	559,276.05	144,607.81	414,668.24
Total Unadjusted Credits	$22,532,549.54	$20,230,687.93	$2,301,861.61
Corporate Surplus:			
Additions to Property, since June 30, 1907, through Income and Surplus	$790,020.62	$577,519.68	$212,500.94
Appropriated Surplus not Specifically Invested	60,211.81	263,970.15	—203,758.34
Total Appropriated Surplus	$850,232.43	$841,489.83	$8,742.60
Profit and Loss Balance.	28,248,594.78	19,751,761.73	8,496,833.05
Grand Totals	$498,763,796.91	$483,157,651.67	$15,606,145.24

in co-operative farm development work was, at the beginning of the present fiscal year, converted into an agency for finding profitable markets for farm products and for bringing producers and purchasers together. A special feature of this work, which is being carried on in co-operation with the Bureau of Markets and Rural Organization in the United States Agricultural Department, and with the agricultural agencies of the States, is the promoting of the organization of associations of small producers to sell together on a co-operative basis.

GOOD ROADS:

Incomplete returns to the United States Office of Public Roads show that, during the calendar year 1915, 12,156 miles of improved country roads were built in counties traversed by Southern Railway lines, and that those counties issued bonds for road construction during the year aggregating $9,070,000. The road and bridge taxes paid by this Company are a substantial contribution to this progress. For the calendar year 1915 such taxes amounted to $485,524.35, equivalent to interest on $8,092,000 of six per cent. county road bonds.

THE ADDITIONS TO CAPITAL ACCOUNT AND TO PROPERTY INVESTMENT.

No new railroad has been built or acquired. While the South undoubtedly needs additional railroads for its full development, there is now small public inducement held out to private initiative to assume the permanent responsibility of operation of a new railroad in territory where traffic must be created. Our use of new capital has been, for some years, devoted to a steady effort to control operating costs on our existing lines, and so, at once, to assure our security holders a return on the capital they have at risk, and to make our lines better instruments to serve the needs and the convenience of the people of the South. The results of this policy are beginning to be apparent in the control of expenses this year.

The investment in road increased $6,368,548.42, representing net additions made during the year, exclusive of expenditures, amounting to $2,556,361.67, for double track on the Atlanta and Charlotte Air Line Railway. This investment represents, as stated, betterments for greater economy and efficiency of operation. The investment in equipment account shows a decrease of $3,137,619.68, brought about by the retirement of old freight cars which were in bad order and unprofitable to repair. The new equipment, to cost $5,633,029.65, contracted for, but not delivered, during the year, is not yet included in this investment account. Further substantial additions to equipment should be made, during the coming year, to take care of an expanding traffic and to balance the hire of equipment account.

There was no increase in Mortgage Bonds outstanding. Equipment Trust Obligations increased $2,244,000.

First Consolidated Mortgage five per cent. bonds in the amount of $3,025,000 were sold and the proceeds applied to the redemption of $1,925,000 of Columbia & Greenville First Mortgage six per cent. bonds, which matured on January 1, 1916, and $1,100,000 Serial Mortgage six per cent. bonds of Virginia Midland Railway Company, which matured on March 1, 1916. These transactions resulted in no increase in the funded debt, while the difference in the interest rates borne by the old bonds and the new means a reduction of $30,250 in the annual interest charges.

There were drawn and taken into the treasury, $5,895,000 Development and General Mortgage four per cent. bonds. Of these bonds, $5,000,000 were drawn, under the terms of the mortgage, for additions and betterments, and the remaining $895,000 were drawn for the proportion charged to capital of certain equipment trust obligations paid during the year. The total amount of Development and General Mortgage four per cent. bonds available for disposition on June 30, 1916, was $38,474,000, of which $25,267,000 are pledged as collateral for notes, leaving $13,207,000 of such bonds in the treasury.

There were issued $5,000,000 one-year five and one-half per cent. notes, dated February 1, 1916, and the proceeds therefrom applied to the payment of the like amount of three-year five per cent. notes which matured February 1, 1916.

DOUBLE TRACK:

The double-track construction work on the main line north of Charlotte, N. C., carrying with it improved alignment and elimination of heavy grades, was completed during the year on 75 miles of the 115 miles of main line between Washington and Charlotte operated as single track at the beginning of the past fiscal year. The work on the remaining 40 miles is rapidly approaching completion, and the entire main line north of Charlotte should be in operation, as a double track railroad on revised grades, early in 1917. On the line between Charlotte and Atlanta, the double track work is nearing completion on the 56 miles between Spartanburg and Central, S. C., and on the 23 miles between Cornelia and New Holland, Ga., and is progressing on the 50 miles between Central and Cornelia and on the existing single track gauntlet of 5.5 miles between Suwanee and Duluth, Ga. Additional funds were made available for carrying on this work through the sale, in March, 1916, of $7,000,000 First Mortgage thirty-year five per cent. bonds of The Atlanta and Charlotte Air Line Railway Company. The justification of the policy of double tracking the main line from Washington to Atlanta is seen in the fact that the entire 649 miles of this line earned this year well over $25,000 a mile in revenue.

There were 491.42 miles of double track in operation at the close of the year, and 60.84 additional miles then completed but not in actual operation.

SERVICE OF EMPLOYEES.

During the year the organization of the officers and employees was knit closer than ever before. The confident claim that it is now an efficient organization, working smoothly and heartily together for a common purpose, seems to be justified.

Demands made on behalf of a comparatively small portion of the entire industrial army, in a nation-wide wage movement of train service employees, were apparently supported but half-heartedly, if at all, by our older men. What they would have done in case of a strike it is unnecessary now to conjecture, but it is apparent that they are greatly relieved that no decision was necessary, for, as good citizens, they felt keenly the many pronounced private and public manifestations of disapprobation of the attitude into which the leaders of their brotherhoods had put them. They are, and of right ought to be, a well paid, prosperous and contented class of hard working, self respecting, manly and efficient public servants. They are in no need of humanitarian sympathy, and they have the respect and esteem of their officers.

STORM DAMAGE IN JULY, 1916.

The property suffered severely from flood and storm at the beginning of the new fiscal year. On July 5th and 6th a tropical hurricane swept over the Gulf Coast region of Alabama. High winds along the coast reached a maximum of 107 miles per hour at Mobile, on the 5th, and for four days were followed by torrential rains over a large part of the State. Southern Railway water-front property at Mobile was badly damaged by wind and water, and traffic on our lines in Alabama, south and west of Birmingham, was interrupted by the washing out of trestles and fills. Repair work was commenced at once, and on July 13th operation was resumed on the last line on which service had been so interrupted.

In the meantime, a second tropical storm developed in the Caribbean Sea and passed over Charleston during the morning of July 14th, causing some local damage. Moving northwest, it reached the Blue Ridge and there recurved to the northeast, passing up into Virginia with rapidly decreasing intensity. The full force of the storm was felt on the watershed in western North Carolina, where, at Alta Pass, on the border between McDowell and Mitchell counties, there was a rainfall of 22.22 inches in the 24 hours between 2 P. M. Saturday, July 15th and 2 P. M. Sunday, July 16th. This is the greatest 24-hour rainfall recorded in the United States. The streams, already bank-full from previous rains, were converted into floods, carrying down trees, houses, bridges and wreckage of all kinds, filling railroad cuts and washing out embankments, trestles and bridges. The Catawba River, draining east into the coastal plain, did the chief damage, sweeping away nine railroad and all of the highway bridges which spanned it. Among these were four principal main line bridges of this Company on the radiating Asheville, Charlotte, Columbia and Charleston divisions. The Yadkin River, also draining east, destroyed our North Wilkesboro line for 61 miles through the narrow valley traversed by its upper waters. The French Broad River, draining west through Asheville, wrought devastation upon the roadbed of our Asheville-Morristown main line, which follows that river, but fortunately, our new concrete bridge at Asheville dammed the debris and held, thus protecting the several steel bridges lower down the river. In the western North Carolina mountains successive avalanches of the water soaked forest soil, facilitated by its large content of mica, swept away the roadbed, obliterating cuts and fills on both our principal trans-mountain lines. In all, 686 miles of our railroad in North Carolina, South Carolina and Tennessee were put out of service by this storm.

Never was the efficiency of the Southern Railway organization so strikingly demonstrated as in dealing with this emergency. Even before the extent of the damage was known, and while the rains were still falling, materials for repairs were gathered and despatched. Work went on night and day. Temporary crossings of the Catawba River were promptly effected, and the repair of roadway followed progressively. The last line to be opened was that between Asheville and Salisbury, where the damage was greatest, but even there through service was resumed on September 5th. Without taking into account the loss of traffic, and the cost of detouring trains, the total loss to the Company, on account of storm damage during the month of July, is estimated at approximately $1,250,000.

DIVIDENDS.

The income return for the year has led many stockholders to expect an immediate resumption of dividends upon the preferred stock. Mindful of the just claims of the stockholders to share in the Company's prosperity as they have been compelled to suffer in the periods of its adversity, and fully conscious of the fact that the preferred stock dividends are not cumulative, the Board deems it proper to express a firm and deliberate conviction that the interests of the stockholders will be best served by continuing at this time the policy of conservation of the resources of the Company. When, through the strengthening of those resources and the solution of the problem of permanent financing of existing and future capital requirements, the payment of dividends can be once again confidently resumed, such distribution should reasonably be expected to continue without interruption by periods of temporary business depression. The Board believes that assurance of stability of income is of more real importance to the stockholders than a dividend at this time.

ACCOUNTS AND STATISTICS.

The accounts have been examined, as usual, by independent auditors and accountants, Messrs. Patterson, Teelé & Dennis, and their certificate is made a part of this report.

Respectfully submitted, by order of the Board.

FAIRFAX HARRISON,
President.

TABLE 1.

INCOME STATEMENT FOR YEAR ENDED JUNE 30, 1916, COMPARED WITH YEAR ENDED JUNE 30, 1915.

	Year Ended June 30, 1916.	1915.	Increase or Decrease.
OPERATING REVENUES:			
Freight	$47,020,481.81	$40,458,857.85	$6,561,623.96
Passenger	16,615,857.10	16,175,673.75	440,183.35
Miscellaneous Passenger-Train	368,411.29	353,842.55	14,568.74
Mail	1,458,879.37	1,459,883.47	—1,004.10
Express	2,037,282.86	1,688,471.19	348,811.67
Other Transportation	1,085,998.62	931,630.35	154,368.27
Incidental	1,055,146.52	884,531.81	170,614.71
Joint Facility	355,617.67	246,618.56	108,999.11
TOTAL OPERATING REVENUES.	$69,997,675.24	$62,199,509.53	$7,798,165.71
OPERATING EXPENSES:			
Maintenance of Way and Structures	$8,175,411.13	$8,452,119.17	—$276,708.04
Maintenance of Equipment	11,183,701.34	10,691,267.40	492,433.94
Traffic	1,904,129.24	2,110,466.58	—206,337.34
Transportation	22,751,698.00	22,757,597.47	—5,899.47
Miscellaneous Operations	404,167.81	388,228.83	15,938.98
General	2,038,702.18	2,019,621.01	19,081.17
Transportation for Investment —*Credit*	*416,693.58*	*244,589.87*	*172,103.71*
TOTAL OPERATING EXPENSES.	$46,041,116.12	$46,174,710.59	—$133,594.47
NET REVENUE FROM OPERATIONS.	$23,956,559.12	$16,024,798.94	$7,931,760.18
TAXES	2,916,426.65	2,595,828.27	320,598.38
UNCOLLECTIBLE REVENUES	36,127.38	28,916.09	7,211.29
TOTAL OPERATING INCOME	$21,004,005.09	$13,400,054.58	$7,603,950.51

TABLE 1 (CONTINUED).

INCOME STATEMENT FOR YEAR ENDED JUNE 30, 1916, COMPARED WITH YEAR ENDED JUNE 30, 1915.

	Year Ended June 30, 1916.	Year Ended June 30, 1915.	Increase or Decrease.
NON-OPERATING INCOME:			
Joint Facility Rent Income	$290,695.07	$284,477.24	$6,217.83
Income from Lease of Road	67,338.24	65,880.00	1,458.24
Miscellaneous Rent Income	136,225.82	124,440.58	11,785.24
Net Income from Rail Leased	24,077.44	23,280.85	796.59
Dividend Income	1,271,256.09	1,080,243.89	191,012.20
Income from Funded Securities	1,106,342.69	1,071,544.35	34,798.34
Income from Unfunded Securities and Accounts	479,746.72	504,761.05	-25,014.33
Miscellaneous Income	46,344.02	84,289.79	- 37,945.77
TOTAL NON-OPERATING INCOME	$3,422,026.09	$3,238,917.75	$183,108.34
TOTAL GROSS INCOME	$24,426,031.18	$16,638,972.33	$7,787,058.85
DEDUCTIONS FROM TOTAL GROSS INCOME:			
Hire of Equipment—Balance	$679,354.69	$837,616.06	—$158,261.37
Joint Facility Rents	1,054,240.57	1,046,522.17	7,718.40
Rent for Leased Roads	1,778,527.90	1,621,040.59	157,487.31
Miscellaneous Rents	40,663.98	40,837.36	—173.38
Separately Operated Properties	189,317.85	183,608.84	5,709.01
Interest on Unfunded Debt	623.59	2,294.52	—1,670.93
Miscellaneous Income Charges	143,175.16	154,681.56	—11,506.40
TOTAL DEDUCTIONS OF THIS CLASS	$3,885,903.74	$3,886,601.10	—$697.36
TOTAL AVAILABLE INCOME	$20,540,127.44	$12,752,371.23	$7,787,756.21
INTEREST ACCRUED ON FUNDED DEBT	$10,329,591.67	$10,188,021.65	$141,570.02
INTEREST ACCRUED ON EQUIPMENT OBLIGATIONS	650,629.16	737,784.54	-87,155.38
DIVIDENDS ACCRUED ON SOUTHERN RAILWAY—MOBILE AND OHIO STOCK TRUST CERTIFICATES	226,008.00	226,008.00	
TOTAL DEDUCTIONS OF THIS CLASS	$11,206,228.83	$11,151,814.19	$54,414.64
BALANCE OF INCOME OVER CHARGES	$9,333,898.61	$1,600,557.04	$7,733,341.57
APPROPRIATION OF INCOME FOR ADDITIONS AND BETTERMENTS	88,195.03	77,187.72	11,007.31
BALANCE CARRIED TO CREDIT OF PROFIT AND LOSS	$9,245,703.58	$1,523,369.32	$7,722,334.26

TABLE 2.

PROFIT AND LOSS, YEAR ENDED JUNE 30, 1916.

Credit Balance June 30, 1915		$19,751,761.73
Add:		
Credit Balance of Income for the Year		9,245,703.58
Net Miscellaneous Credits		318,249.92
		$29,315,715.23
Deduct:		
Discount on Securities charged off during the year	$168,496.77	
Property Abandoned and not Replaced	45,609.68	
Advances to Proprietary Companies written down	853,014.00	
		1,067,120.45
Credit Balance June 30, 1916		$28,248,594.78

THE HOCKING VALLEY RAILWAY COMPANY—SEVENTEENTH ANNUAL REPORT

COLUMBUS, Ohio, September 21, 1916.

TO THE STOCKHOLDERS:

The Seventeenth Annual Report of the Board of Directors, for the fiscal year ended June 30, 1916, is herewith submitted.

The average mileage operated during the year was 350.7 miles, a decrease over the previous year of 1.0 miles. The mileage at the end of the year was 350.2 miles. See schedule on page 8.

RESULTS FOR THE YEAR.

Operating Revenues were		$7,411,526.35
(Increase $1,230,373.38 or 19.91%.)		
Operating Expenses were		4,953,576.89
(Increase $769,206.89 or 18.38%.)		
Net Operating Revenue was		$2,457,949.46
(Increase $461,166.49 or 23.10%.)		
Taxes were		501,751.60
(Increase $83,229.45 or 19.89%.)		
Operating Income, Taxes deducted, was		$1,956,197.86
(Increase $377,937.04 or 23.95%.)		
Miscellaneous Income was		962,440.54
(Increase $669,549.76 or 228.60%.)		
		$2,918,638.40
Rentals and Other Payments were		570,929.29
(Increase $539,630.95.)		
Income for the year available for interest was		$2,347,709.11
(Increase $507,855.85 or 27.60%.)		
Interest (53.92% of amount available) amounted to		1,265,943.42
(Decrease $80,507.46 or 5.98%.)		
Net Income for the year amounted to		$1,081,765.69
(Increase $588,363.31 or 119.25%.)		
Dividends paid during the year:		
Two dividends of 2% each, aggregating		439,980.00
Remainder		$ 641,785.69

RETURN ON PROPERTY.

The following table shows the amount of return to your Company, from transportation operations only, upon its investment in road and equipment at the termination of each fiscal year of the five year period ended June 30, 1916:

Year ended June 30:	Property Investment.	Total Operating Income.	Per Cent. of Return.
1916	$44,960,442.81	$2,806,638.19	6.24
1915	44,660,137.33	1,741,552.16	3.90
1914	44,441,150.66	1,926,037.53	4.33
1913	41,412,617.88	2,817,692.68	6.80
1912	40,541,201.96	2,739,094.06	6.76
Average	$43,191,110.13	$2,406,202.92	5.57

FINANCIAL.

The changes in funded debt shown by balance sheet of June 30, 1916, as compared with June 30, 1915, consisted in the retirement of $5,000 par amount of The Hocking Valley Railway Company First Consolidated Mortgage 4½% Bonds through the sinking fund, in the annual payments of $496,000 on equipment trusts, in the retirement of $4,000,000 face amount one-year 6% gold notes by the issue and sale of $4,000,000 face amount two-year 5% gold notes maturing November 1, 1917, and by the addition of $220,000 face amount of equipment obligations in respect of two hundred 50-ton coal cars acquired.

An analysis of the property accounts will be found on pages 12 and 13, by reference to which it will be seen that additions and betterments were made during the year to the net amount of $364,993.88, of which $93,493.22 was added to cost of road, and $271,500.66 was added to cost of equipment.

During the past seven years your Company's net addition to property accounts has been as follows:

Equipment	$4,034,509.56
Additions and Betterments	2,685,656.04
	$6,720,165.60

GENERAL REMARKS.

The equipment in service June 30, 1916, consisted of:

Locomotives owned	136	Decrease	12
Locomotives leased under equipment trusts	8	No change	
Total locomotives	144	Decrease	12
Passenger train cars owned	81	Decrease	5
Freight train and miscellaneous cars owned	9,744	Increase	64
Freight train cars leased under equipment trusts	5,541	Increase	195
Freight train cars under special trust	47	No change	
Total freight train and miscellaneous cars	15,332	Increase	259

The changes during the year in accrued depreciation of equipment account were as follows:

Balance to credit of account June 30, 1915		$1,227,429.08
Amount credited during year ended June 30, 1916, by charges to operating expenses	$218,330.31	
Amount credited by adjustment of charges in 1909	6,538.25	
	$224,868.56	
Charges to account for:		
Accrued depreciation on equipment retired during year—		
12 locomotives	$21,415.61	
48 freight and work cars	4,202.03	
5 passenger cars	1,289.30	
Accrued depreciation on cars changed in class during year	974.93	
	27,881.87	
		196,986.69
Balance to credit of account June 30, 1916		$1,424,415.77

The business of your Company has not reached its previous record but has been good during the year as the facts given below indicate:

	1916.	1915.	Increase.
Operating revenues	$7,411,526.35	$6,181,152.97	$1,230,373.38
Net operating revenue	$2,457,949.46	$1,996,782.97	$461,166.49
Operating ratio	66.8%	67.7%	.9%*
Tons of revenue freight carried one mile	1,476,563,174	1,171,899,998	304,663,176
Revenue train load, tons	1,159	1,035	124
Revenue tons per loaded car	39.1	37.0	2.1

*Decrease.

The construction of five additional 100-car tracks, and a 15-stall engine-house with other shop facilities, including shop tracks, in Parsons Yard at South Columbus is well under way, in order to provide necessary facilities for new business to be received from The Chesapeake and Ohio Northern Railway upon its completion. The capacity of the Toledo Dock Yard is being increased by the construction of twelve additional storage tracks. The light double track girder bridges over the Hocking River north of Lancaster and south of Sugar Grove were replaced by modern heavy bridges.

The revenue coal and coke tonnage was 8,351,853 tons, an increase of 33.2%; other revenue freight tonnage was 3,406,798 tons, an increase of 19.9%. Total revenue tonnage was 11,758,651 tons, an increase of 29%. Freight revenue was $5,996,618.27, an increase of 22.1%. Freight train mileage was 1,273,552 miles, an increase of 12.5%. Revenue ton miles were 1,476,563,174, an increase of 26%. Ton mile revenue was 4.06 mills, a decrease of 3.1%. Revenue per freight train mile was $4.709, an increase of 8.5%. Revenue tonnage per train mile was 1,159 tons, an increase of 12%; including Company's freight, the tonnage per train mile was 1,194 tons, an increase of 11.8%. Tonnage per locomotive, including Company's freight, was 1,016 tons, an increase of 10.2%. Revenue tonnage per loaded car was 39.1 tons, an increase of 5.7%. Tons of revenue freight carried one mile per mile of road were 4,210,331, an increase of 26.4%.

There were 1,785,343 passengers carried, a decrease of 1.4%. The number of passengers carried one mile was 44,537,880, an increase of .6%. Passenger revenue was $861,174.21, an increase of 3.4%. Revenue per passenger per mile was 1,891 cents, an increase of 2.5%. The number of passengers carried one mile per mile of road was 126,997, an increase of .9%. Passenger train mileage was 705,252, a decrease of .5%. Passenger revenue per train mile was $1.194, an increase of 3.6%; including mail and express it was $1.364, an increase of 4%. Passenger service train revenue per train mile was $1.428, an increase of 4.2%.

There were 2,143 tons of new 100-lb. rails, equal to 13.64 track miles, and 2,381 tons of new 90-lb. rails, equal to 16.84 track miles, used in the renewal of existing main tracks.

The average amount expended for repairs per locomotive was $2,429.92; per passenger train car $737.57; per freight train car $66.36.

Appreciative acknowledgment is hereby made of efficient services during the year of officers and employees.

By order of the Board of Directors.

GEO. W. STEVENS,
President.

FRANK TRUMBULL,
Chairman.

TABLE 3. GENERAL BALANCE SHEET, JUNE 30, 1916.

ASSETS.

Property Investment.			
Cost of Road	$29,012,080.74		
Cost of Equipment	14,741,228.11		
		$43,753,308.85	
Securities of Proprietary, Affiliated and Controlled Companies—Pledged.			
Stocks	$108,088.66		
Bonds	300,000.00		
		408,088.66	
Securities of Proprietary, Affiliated and Controlled Companies—Unpledged.			
Bonds	$150,000.00		
Miscellaneous	37,752.00		
		187,752.00	
Other Investments.			
Miscellaneous Investments—Securities—Pledged		1,928,950.00	
			$46,278,099.51
Working Assets.			
Cash	$948,309.47		
Loans and Bills Receivable	77,315.36		
Traffic Balances	74,736.33		
Agents and Conductors	610,741.78		
Miscellaneous Accounts Receivable	350,894.07		
Other Working Assets	35,246.46		
		$2,097,243.47	
Materials and Supplies		1,033,852.27	
Securities in Treasury—Unpledged.			
Stocks		501.00	
Deferred Assets.			
Advances to Proprietary, Affiliated and Controlled Companies	$55,548.51		
Advances, Working Funds	1,161.15		
Insurance paid in advance	1,436.67		
Cash and Securities in Sinking and Redemption Funds	15.72		
Cash and Securities in Insurance Reserve Fund	40,083.80		
Other Deferred Debit Items	31,034.58		
		129,280.43	
			3,260,877.17
Total			$49,538,976.68

LIABILITIES.

Capital Stock			$11,000,000.00
Funded Debt.			
First Consolidated Mortgage 4½% Bonds, 1999	$16,025,000.00		
First Mortgage C. & H. V. R. R. 4% Bonds, 1948	1,401,000.00		
First Mortgage Cols. & Tol. R. R. 4% Bonds, 1955	2,441,000.00		
Two Year 5% Gold Notes, 1917	4,000,000.00		
		$23,867,000.00	
Equipment Trust Obligations		2,051,000.00	
			25,918,000.00
			$36,918,000.00
Working Liabilities.			
Loans and Bills Payable	$1,035,786.52		
Traffic Balances	662,296.71		
Audited Vouchers and Wages Unpaid	909,070.41		
Miscellaneous Accounts Payable	81,873.00		
Matured Interest, Dividends and Rents Unpaid	370,588.00		
Other Working Liabilities	37,329.85		
		$3,096,944.49	
Deferred Liabilities.			
Unmatured Interest, Dividends and Rents Payable	$132,776.96		
Taxes Accrued	296,104.90		
Operating Reserves	23,319.78		
Accrued Depreciation—Equipment	1,424,415.77		
Other Deferred Credit Items	144,142.28		
		2,020,759.69	
			5,117,704.18
Appropriated Surplus.			
Additions to Property through Income since June 30, 1907	$181,409.11		
Funded Debt Retired through Income and Surplus	131,331.90		
Reserve Invested in Sinking Fund	817.52		
Reserve Invested in Insurance Fund	40,083.80		
Appropriated surplus against contingent liability for freight claims	120,000.00		
		$473,642.33	
Profit and Loss—Balance		7,029,630.17	
			7,503,272.50
Total			$49,538,976.68

This Company and The Toledo & Ohio Central Railway Company severally endorsed, in 1901, upon 5% First Mortgage Bonds of the Kanawha & Hocking Coal & Coke Company due 1951 ($2,842,000 outstanding) and, in 1902, upon 5% First Mortgage Bonds of the Continental Coal Company due 1952 ($1,569,000 outstanding) purported guaranties thereof. In *quo warranto* litigation in Ohio, to which the bondholders were not parties, the purported guaranties of this company upon the bonds last mentioned have been declared *ultra vires* and the performance of the contracts pursuant to which both guaranties were made has been enjoined by the Federal Court in that State. The enforceability of these alleged guaranties by the bondholders is now in litigation.

WESTERN MARYLAND—SEVENTH ANNUAL REPORT

BALTIMORE, MD., October 18, 1916.

TO THE STOCKHOLDERS OF

THE WESTERN MARYLAND RAILWAY COMPANY:

The Seventh Annual Report of the operations of your Company, embracing the fiscal year ended June 30, 1916, is herewith respectfully submitted.

The results of the operations for the year is reflected in the following condensed comparative statement:

	1916.	1915.	Increase.
Miles Operated	688.59	661.23	27.36
Railway Operating Revenues	$10,930,369.09	$8,683,458.96	$2,246,910.13
Railway Operating Expenses	7,039,608.19	6,257,412.21	782,195.98
Net Operating Revenue	$3,890,760.90	$2,426,046.75	$1,464,714.15
Railway Tax Accruals	$348,740.00	$306,000.00	$42,740.00
Uncollectible Railway Revenue	420.51	858.59	Dec. 438.08
Operating Income	$3,541,600.39	$2,119,188.16	$1,422,412.23
Miscellaneous Operations	70.02	Loss 930.31	1,000.33
Total Operating Income	$3,541,670.41	$2,118,257.85	$1,423,412.56
Other Income	312,892.64	268,865.97	44,026.67
Gross Income	$3,854,563.05	$2,387,123.82	$1,467,439.23
Deductions from Gross Income	3,314,869.62	3,295,029.17	19,840.45
Net Income	$539,693.43	Def.$907,905.35	$1,447,598.78
Operating Ratio	64.40%	72.06%	Dec. 7.66%

In connection with the above, the following remarks explain the increases and decreases:

MILEAGE:

Increase of miles operated from 661.23 to 688.59, or 27.36 miles, is in the following:

Nessle Branch—Charlton, Md., to connection with W. N. & M. Ry.	2.84
Williamsport, Nessle & Martinsburg Ry.—Connection with Charlton Branch to near Nessle. W. Va.	.91
Somerset Coal Ry.—Coal Junction, Pa., to Gray, Pa.	2.20
Rockwood Junction, Pa., to Coal Junction, Pa.—Trackage Rights over Baltimore & Ohio R. R.	21.70
	27.65
Less Adjustments	.29
	27.36

OPERATING REVENUES:

Total Operating Revenues amounted to $10,930,369.09, as compared with $8,683,458.96 last year, an increase of $2,246,910.13, or 25.88%. Of this increase $827,271.01 resulted from coal shipments and $1,232,339.83 from miscellaneous freight, or increases of 20.48% and 37.48%, respectively. Passenger revenue increased $3,963.57, or 0.42%, and other revenue from passenger trains increased $14,356.81, or 4.93%; a total increase of $18,320.38, or 1.48%.

The increase in freight revenue to some extent reflects the prosperous condition of the country, but is likewise due to realization upon new constructions, which came into service during the year. The freight revenue accruing to this Company from the more important of the latter is as follows:

Port Covington Grain Elevator	$413,923.10
Somerset Coal Railway	63,615.78
Nessle Branch	70,849.66
Total	$548,388.54

Passenger revenue, which shows only a slight increase, following a decrease of $73,038.21 in the preceding fiscal year, is still unsatisfactory, notwithstanding the fact that with permission of the West Virginia authorities, an increase from two to two and one-half cents per mile was authorized, approximating $35,000.00 per annum. In the new fiscal year the passenger business is showing a gratifying increase.

OPERATING EXPENSES:

Total Operating Expenses amounted to $7,039,608.19, compared with $6,257,412.51 last year, an increase of $782,195.98, or 12.50%.

Maintenance of Way Expenses amounted to $1,269,244.85, compared with $1,204,048.00, an increase of $65,196.85, or 5.41%.

Improvement in track conditions continue, and the present maintenance program will insure a steady advance. Both ballast and new rail are being liberally applied.

Maintenance of Equipment Expenses amounted to $1,736,704.49, compared with $1,479,331.49, an increase of $259,373.00, or 17.53%.

Locomotive mileage for the year increased 882,268, or 17.42%, and freight car mileage increased 19,611,323, or 26.72%.

Both locomotive and car repair conditions are normal.

Obsolete Equipment, consisting of 266 freight cars, 11 passenger coaches, 22 locomotives and 36 work cars, all of light capacity and not justifying repairs, were charged off during the year, resulting in a charge to Operating Expenses of $109,451.15.

Traffic Expenses amounted to $257,528.39, compared with $260,135.68 last year, a decrease of $2,607.29, or 1%.

Transportation Expenses amounted to $3,452,852.33, compared with $3,056,078.13 last year, an increase of $396,744.20, or 12.98%. The transportation ratio was 31.59%, compared with 35.19% last year, a decrease of 3.60%. The revenue per freight train mile was $4.20 compared with $3.85 last year, an increase of $0.35.

Constant attention is being paid to the important question of train loading, an additional advance from 735 to 837 revenue tons per freight train mile having been accomplished.

Miscellaneous Operations amounted to $85,434.81, compared with $38,045.95 last year, an increase of $47,388.86, or 124.56%. The increase is due mainly to the operation of the Port Covington Grain Elevator, for which there was no corresponding item last year.

General Expenses amounted to $245,436.29, compared with $229,062.93 last year, an increase of $16,373.36, or 7.15%.

The increase was principally occasioned by putting on office force to properly care for the increase in business, and the ever increasing requirements and demands of the Interstate and State Commissions.

The following important work, constituting additions, improvements and permanent betterments to the property, has been completed during the year:

Baltimore:
- Track facilities for U. S. Asphalt & Refining Company and the Prudential Oil Company at Curtis Bay.

Port Covington:
- Grain elevator.
- Fire protection system for coal pier.
- Strengthening transfer bridge.
- Storage and train tracks, 3.5 miles.

Green Spring:
- Connection with Pennsylvania Railroad.

Emory Grove:
- Rest room and additional bunks.

Westminster:
- Paving driveway to freight station.

Baltimore to Hagerstown:
- Strengthening bridges for operation of new mallet locomotives.
- Telephone line.

Big Pool to Emory Grove:
- Automatic block signals.

Parkhead:
- Overhead highway crossing.

North Junction to Lurgan:
- Anti-creepers.

Hagerstown:
- Wagon scales.
- Excavating cut and track improvements west of Antietam street.
- Paving on McPherson street.

Shops:
- Additions to steam piping in power house.
- Alligator shears for cutting scrap.
- Electric magnet separator.
- Concrete storage building.

Charlton:
- Track scales.

Pearre:
- Bunk house.

Maryland Junction:
- Car repair yards.
- Office building.
- Rest room.

Cumberland:
- Sidewalk on Market street.
- Overhead track crane.

Glenville:
- Freight house.

Fowblesburg:
- Crossing bell.

Hanover:
- Crossing bell.

York:
- Overhead track crane.

Tunnels:
- Guard rails through all tunnels.

Rockwood Junction:
- Connection with Baltimore and Ohio Railroad.

Westernport:
- Connection and interchange yard with Cumberland and Pennsylvania Railroad.

Davis:
- Sidings for Mine No. 29.

Elkins:
- Paving on Eleventh street.

Commercial and industrial tracks were constructed at the following points:

Asbestos,	Parkhead,	Ohiopyle,
Smithsburg,	Oldtown,	Stewarton,
Hagerstown,	Sloan,	Shaw,
York,	Lonaconing,	Wallman.
	Woodmont,	

TIE PLATES:

During the year 210,467 heavy tie plates were applied, at a cost for material and labor of $34,506.10.

RAIL:

29.4 miles of new 90-pound rail were laid to replace worn rail and to provide relay rail for coal extensions and sidings.

BALLAST:

103,607 cubic yards of crushed rock ballast were renewed during the year.

AUTOMATIC BLOCK SIGNALS:

During the year automatic electric block signals were installed between Emory Grove, Md., and Hagerstown, Md., via Westminster; between Williamsport, Md., and Big Pool, Md., and between Colmar, Pa., and Connellsville, Pa., a total distance of 146 miles.

All single track on the main line, through Westminster, between Baltimore, Md., and Connellsville, Pa., is now protected by these signals.

NEW CONSTRUCTION:

Somerset Coal Railway Company.—This line from Coal Junction, Pa., was completed October 1, 1915, to Mine 123 of the Consolidation Coal Company, a distance of 2.2 miles, and is being extended to Mine 125, an additional distance of 2.4 miles.

Mine 123 is being developed, and has encountered some difficulties, which are being overcome, and which account for the light production of 61,896 net tons to June 30, 1916.

Mine 125 has three openings and will develop more rapidly. The tracks to this mine were completed in September, 1916.

Fairmont Helen's Run Railway Company.—The line has been completed from Chiefton, W. Va., to Idamay, a distance of 4.85 miles, with a branch, 1.86 miles in length, to Carolina, at each of which places the Consolidation Coal Company has installed thoroughly modern steel tipples with concrete lined shafts. Coal produced will be of the best grade of Fairmont gas coal. These two mines will ultimately have an annual capacity of 1,000,000 tons. Their output during development and for the calendar year 1917 should be from 250,000 to 300,000 tons.

Fairmont Bingamon Railway Company.—This line, 8.0 miles in length, is under construction and the grading should be completed by January 1, 1917. There will be some delay in securing the material for the steel bridges, but it is hoped to have the road in operation early in 1917.

This branch will serve three openings at Wyatt, W. Va., belonging to the Consolidation Coal Company, which will deliver their output through one tipple, permitting a very economical switching operation. These will be slope openings on the outcrop, and will permit of rapid development. The output should reasonably reach 300,000 tons in 1917, and when fully developed will produce 1,500,000 tons per annum.

Nessle Branch.—Mention was made in the last annual report of the completion of this branch from Charlton to the south bank of the Potomac River, 2.84 miles, and which was opened for operation July 7, 1915. At this point connection is made with the Williamsport, Nessle & Martinsburg Railway, from which, during the year under review, 212,284 net tons of limestone have been received for delivery to furnaces in the Pittsburgh District.

Double Track.—The very large increase in business, and the hopeful prospect of a continuance, has emphasized the necessity for additional double track, particularly in the territory between Big Pool and Highfield. Work under progress at the close of the fiscal year, providing a second track from Edgemont to Pen Mar, a distance of 3.52 miles, was completed and put in operation October 1, 1916. The construction of a second track from the Hagerstown passenger station to Security, 2.4 miles, and from Big Pool to Clearspring, 5.62 miles, is now under way, and these additional facilities should be available by January 1, 1917.

FINANCES:

Floating indebtedness amounting to $1,200,000 represented by notes of $400,000, $300,000 and $500,000, due September 1, 1916, December 1, 1916, and March 1, 1917, respectively, was added to the Company's liabilities

during the year. This amount was applied: to the construction of grain elevator at Port Covington $681,228.59; to Additions and Betterments Railway Properties $483,246.78; Coal Properties $35,524.63.

Equipment Trust obligations amounting to $249,205 were paid during the year, leaving $203,500 unpaid of said obligations, outstanding at June 30, 1916. There was issued during the year $450,000 of 5% notes to cover purchase of 15 mallet compound locomotives and $2,003,638.14 of 5% notes (interest included in notes) to partially cover purchase of 2,000 all-steel Hopper Cars.

The obligations for installation of block signals between Cumberland, Md., and Big Pool, Md., amounting to $120,000, were paid off. For installation of block signals between Colmar, Pa., and Greenwood, Pa., obligations were incurred amounting to $67,088, payable in 60 monthly installments.

FINANCIAL READJUSTMENT:

Your Board has had under consideration, during the year, plans for the readjustment of the Company's finances. The interest upon the $10,000,000 of secured notes and $6,000,000 unsecured notes has remained unpaid since January 1, 1915, and the principal of these notes, due July 1, 1915, also remains unpaid, although the interest has been accrued and charged to Income in the Company's accounts.

The improvement of the Company's affairs, reflected in the last year's operation will, it is hoped, facilitate the consummation of a plan, at a reasonably early date, to which the assent of the Noteholders' Committee can be secured.

GENERAL:

The Port Covington Grain Elevator was opened for operation December 15, 1915. The amount of grain handled and the resulting traffic has been very encouraging. To enable your Company to handle an increased grain business, an addition to the elevator was constructed, which increased the capacity from 900,000 bushels to 1,900,000 bushels. The additional facilities were available September 20th, 1916. In the six and one-half months of the past fiscal year during which the elevator was in operation 14,965,740 bushels of grain were received, representing the contents of 10,448 cars and 33 small bay boats. 127 vessels were loaded at an average of 112,248 bushels per vessel.

CONCLUSIONS:

The progress of your Company during the past year has been consistent, and it is pleasing to report that even a higher level of earnings is being returned in the new fiscal year.

The results attained have been through the loyal co-operation and efficiency of the officers and employees of your Company, which the Board gratefully acknowledges.

By order of the Board of Directors.

CARL R. GRAY,
President.

STATEMENT NO. 2.

COMPARATIVE INCOME ACCOUNT FOR THE YEARS ENDED JUNE 30, 1916, AND 1915.

	1916.	1915.	Increase.
RAILWAY OPERATING INCOME:			
Rail Operations:			
Operating Revenues	$10,930,369.09	$8,683,458.96	$2,246,910.13
Operating Expenses	7,039,608.19	6,257,412.21	782,195.98
Net Operating Revenue	$3,890,760.90	$2,426,046.75	$1,464,714.15
Tax Accruals	$348,740.00	$306,000.00	$42,740.00
Uncollectible Railway Revenues	420.51	858.59 Dec.	438.08
Total Tax Accruals, etc.	$349,160.51	$306,858.59	$42,301.92
Operating Income	$3,541,600.39	$2,119,188.16	$1,422,412.23
Miscellaneous Operations	70.02	*930.31**	1,000.33
Total Operating Income.	$3,541,670.41	$2,118,257.85	$1,423,412.56

* — Loss.

OTHER INCOME:	1916.	1915.	Increase.
Joint Facility Rents	$12,929.99	$19,795.23	$3,134.76
Miscellaneous Rents	14,356.43	19,454.14 Dec.	5,097.71
Miscellaneous Nonoperating Physical Property	573.20	864.34 Dec.	291.14
Net Income from Coal Companies and Miscellaneous Properties	205,145.35	192,421.28	12,724.07
Income from Funded Securities	47,100.00	8,091.67	39,008.33
Income from Unfunded Securities and Accounts	11,092.20	10,228.60	863.60
Income from Sinking Fund	1,696.22	593.76	1,096.46
Interest on Advances to Subsidiary Companies:			
For Construction	9,970.25	6,518.74	3,451.51
For Expenditures for Additions and Betterments		10,898.21 Dec.	10,898.21
Miscellaneous Income	35.00		35.00
Total Other Income	$312,892.64	$268,865.97	$44,026.67
Gross Income	$3,854,563.05	$2,387,123.82	$1,467,439.23
DEDUCTIONS FROM GROSS INCOME:			
Hire of Equipment	$74,831.08	$144,363.00 Dec.	$69,531.92
Joint Facility Rents	82,870.05	79,466.68	3,403.37
Rent for Leased Roads	121,566.50	121,566.50	
Miscellaneous Rents	21,343.88	3,358.21	17,985.67
Interest on Funded Debt	2,685,514.10	2,677,871.30	7,642.80
Interest on Unfunded Debt	304,254.41	186,337.52	117,916.89
Amortization of Discount and Commission on Funded and Unfunded Debt	17,074.91	74,970.48 Dec.	57,895.57
Miscellaneous Income Charges	7,414.69	7,095.48	319.21
Total Deductions	$3,314,869.62	$3,295,029.17	$19,840.45
Surplus for Year	$539,693.43		$1,447,598.78
Deficit for Year		$907,905.35	

STATEMENT NO. 3.

SYSTEM PROFIT AND LOSS ACCOUNT FOR THE YEAR ENDED JUNE 30, 1916.

DEBIT BALANCE JUNE 30, 1915			$3,148,064.28
CREDIT BALANCE TRANSFERRED FROM INCOME ACCOUNT		$539,693.43	
UNREFUNDABLE OVERCHARGES		642.15	
UNCLAIMED VOUCHERS AND PAY CHECKS.		2,436.06	
MISCELLANEOUS CREDITS		2,137.78	
SURPLUS OF PROPRIETARY AND CONTROLLED COMPANIES:			
Sinking Fund Accretions:			
The Baltimore & Harrisburg Railway Co. (Western Extension)	$2,005.67		
Baltimore & Cumberland Valley Railway Company	1,837.77		
The Baltimore & Cumberland Valley Rail Road Company	899.91		
		4,743.35	
		$549,652.77	
LESS:			
LOSS ON RETIRED ROAD AND EQUIPMENT	$6,916.76		
ACCOUNTS WRITTEN OFF	223.19		
MISCELLANEOUS DEBITS	466.46		
		7,606.41	
			542,046.36
DEBIT BALANCE JUNE 30, 1916			$2,606,017.92

STATEMENT NO. 4.

SYSTEM BALANCE SHEET AT JUNE 30, 1916.

ASSETS.

PROPERTY INVESTMENT:		
Cost of Properties Owned, including Coal and Other Properties	$115,821,685.39	
Securities of Other Companies—pledged	400,000.00	
		$116,221,685.39
CURRENT ASSETS:		
Cash	$729,220.16	
Loans and Bills Receivable	1,572.04	
Traffic and Car Service Balances Receivable	980,342.75	
Net Balance Receivable from Agents and Conductors	161,055.63	
Miscellaneous Accounts Receivable	668,542.53	
Material and Supplies	1,025,724.10	
Other Current Assets	17,815.76	
		3,584,272.97
DEFERRED ASSETS:		
Working Fund Advances		3,095.25
UNADJUSTED DEBITS:		
Insurance Premiums Paid in Advance	$14,991.38	
Unextinguished Discount on Securities:		
Discount on Capital Stock $12,734,835.00		
Discount on Funded Debt 562,515.43		
	13,297,350.43	
Other Unadjusted Debits	651,163.95	
		13,963,505.76
PROFIT AND LOSS		2,606,017.92
Total		$136,378,577.29

LIABILITIES.

CAPITAL STOCK:		
Common	$49,429,198.40	
Preferred	10,028,000.00	
		$59,457,198.40
MORTGAGE, BONDED AND SECURED DEBT:		
Funded Debt	$50,293,700.00	
Collateral Trust and Other Notes	13,000,000.00	
Equipment Trust Obligations	2,657,138.14	
Automatic Block Signal Obligations	67,087.80	
		66,017,925.94
CURRENT LIABILITIES:		
Loans and Bills Payable	$4,985,000.00	
Traffic and Car Service Balances Payable	388,228.30	
Audited Accounts and Wages Payable	1,169,329.10	
Miscellaneous Accounts Payable	105,664.83	
Interest Matured Unpaid	1,853,725.00	
Funded Debt Matured Unpaid	8,000.00	
Unmatured Interest Accrued	498,347.97	
Unmatured Rents Accrued	3,677.39	
Other Current Liabilities	22,641.96	
		9,034,614.55
DEFERRED LIABILITIES		28,124.75
UNADJUSTED CREDITS:		
Tax Liability	$279,354.64	
Operating Reserve	108,968.17	
Accrued Depreciation—Equipment	1,059,637.03	
Other Unadjusted Credits	208,762.14	
		1,656,721.98
APPROPRIATED SURPLUS:		
Additions and Betterments to Property Through Income		183,991.67
Total		$136,378,577.29

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The Fixed Price for a Product

Archer Wall Douglas, writing in the New York Tribune on "The Farmer's New Vision," says: "The farmer is the only producer who has really nothing to say about the selling price of his products and that is what is troubling him now." Surely transportation may be classed as a product, and certainly the producers of railroad transportation have really nothing to say about the selling price of this product. Mr. Douglas goes on to say: "The price of everything that he [the farmer] raises is determined principally by competition, local, national and world-wide, and by marketing facilities or the lack of them." What would Mr. Douglas say if farmers' prices had been reduced over a series of years by competition and then the department of agriculture had stepped in and without correcting upward any of the inequalities which the vagaries of competition had created, had clamped the lid down on any attempt of the farmers to increase the selling price of their product where changed competitive conditions would permit it. It is such an old story now, this taking out of the hands of the managers of railroads any say as to what the selling price of their products shall be, that writers on economic problems are in danger of forgetting it entirely. It is worth while, therefore, occasionally to point out the facts, especially when there is some unintentional evidence, such as this of Mr. Douglas', as to how the other fellow would feel were he in like position.

Society of Railway Financial Officers

Men who deal directly with the cash of large corporations, railroads or industrials, are of necessity exact and exacting. The duties of treasurers of different railroads vary somewhat, but one important part of the work of all of them is the settlement of balances or of accounts as between different railroad companies. An immense amount of friction can be avoided in such settlements if there is a sympathetic understanding between the officers of different roads. An association such as the Society of Railway Financial Officers can perform two very important functions. By bringing the treasury officers of the different roads together at least once a year it can establish a basis of understanding and of co-operation in the settlement of accounts which could not possibly be obtained without personal acquaintanceship. It can also be the medium through which reforms in practice can be accomplished. The first object is comparatively quickly attained, and good results are apparent to every member. The other object is far slower of attainment. Especially is this true where some radical and far-reaching reform is aimed at, such as the clearing house plan for the settlement of inter-railroad balances, which has been advocated by T. H. B. McKnight, of the Pennsylvania Lines West, who was president of the Society of Railway Financial Officers during the past year. Slow, however, as the adoption of new methods may be, the fact that they are discussed formally in meetings of the society or informally among the members of the society at the annual meeting place, shows progress is being made.

Reasons for Car Shortage

A shortage of cars is but one of many reasons for the present car shortage, according to the report of two inspectors for the Interstate Commerce Commission detailed to investigate complaints regarding the conditions in Nebraska. The report is noted elsewhere. The inspectors found plenty of evidence of car shortage; in fact, they reported that the conditions would probably get worse instead of better; but they also found a shortage of terminal facilities, of elevator capacity, of loading and unloading facilities and such a shortage of warehouse capacities that consignees are holding freight cars out of service and using them for storage. In other words, they did not try to place all the blame for the conditions on the railroads; they found that while the facilities of the railroads are inadequate for the unprecedented volume of traffic now moving, the shippers who are so loudly complaining about the railroads have also failed to provide themselves with the facilities necessary to handle their business. They not only failed to find evidence to substantiate the charges that the railroads are discriminating against the shippers of Nebraska, but they found that the railroads are doing the best they can and succeeding remarkably well under the circumstances; and

they even go so far as to suggest that if it were possible for the railroads to furnish more equipment, the business could not be handled as satisfactorily as it is being handled, because of the congestion that would result. The report says nothing about some of the reasons that might be mentioned as to why the railroads have not been able to increase their equipment and other facilities, but it gives an interesting recapitulation of the other reasons for the acuteness of the present situation, most of which are attributable to the great prosperity this country is experiencing as a result of the necessities of the warring countries of Europe. Probably most of those who are complaining about the car shortage would complain still more if conditions were such that the railroads had more cars than they needed at this season of the year, or if they were asked to pay freight rates high enough to enable the railroads to supply all the cars everybody wanted during the rush period. Shippers in many other states are charging the railroads with discriminating against their states in the distribution of cars. It might be interesting if the commission's inspectors should render a similar report of investigations in the states surrounding Nebraska.

THE STEEL MARKET

WHEN the railroads went into the iron and steel market for their 1916 requirements they were confronted with prices and delivery conditions so entirely different from those obtaining during the two preceding years that it seemed inconceivable to most railway men that such conditions could continue indefinitely. The steel manufacturers on the other hand predicted further advances and it is now well established that there can be little improvement in the steel market from the standpoint of the purchaser for some time to come.

While prices in general have not experienced any repetition of the rapid advance of the previous year, the steel market during 1916 has been characterized by marked stability accompanied by small but steady increases. Structural shapes advanced between March, 1915, and March, 1916, from $1.15 per 100 lb. to $2.25, and the price at present is in the neighborhood of $2.75. Track spikes, which were worth $1.35 in March, 1915, and had advanced to $2.50 in March, 1916, now cost from $2.65 to $2.90. Similarly carbon steel track bolts advanced from $1.85 to $2.50, and are now quoted at from $3.25 to $3.50.

The present prosperity of the steel industry is by no means dependent upon the orders for strictly war materials. Activity in ship building and the requirements of the railways both here and abroad have an important influence. It is true that at the present time the unfilled orders for the United States Steel Corporation aggregate 350,000 tons less than the maximum of 9,870,334 tons on the books in May, 1916, but the present figure is so much in excess of normal conditions before the war that the recent decrease is insignificant.

In the case of two commodities largely used by railroads the conditions differ somewhat from those prevailing as to the other steel products. In the case of rails the question was one of delivery only for a considerable time after the general advance in the prices of all other steel products and it was supposed that the steel manufacturers, in order to sustain the logic of their position as to a fixed price on this commodity entirely independent of variations in the prices of other steel products, would continue to maintain the existing price. The railroads were doomed to disappointment, however, for in May, 1916, the cost of rails was advanced $5 per ton. Since that time the difficulty as to delivery continues. Roads which failed to arrange for their rail requirements much earlier than was their usual custom are now in serious straits. One line which recently found it necessary to place an order for 25,000 tons was required to accept Bessemer rails in order to obtain delivery in the second half of 1917. The Canadian mills, which, after the passage of the Underwood tariff law, gave the American roads an alternative market, have been of no avail in recent months because of their almost complete diversion to the war manufactures.

In the case of fabricated structural steel the trouble has arisen not from increased activity of the fabricating shops but from the difficulty which these shops have experienced in obtaining delivery of the plain materials required, structural steel projects have been affected much less by the abnormal war prosperity than by the high prices. As a result the shops are not working to capacity, although they have about as much to do as the labor conditions and deliveries will permit. Orders in the hands of the fabricators at the present time are materially short of the shop capacities.

Because of extremely high prices and the long delay in obtaining delivery many railroads have abandoned or postponed such construction projects as could well be deferred. However, unless these improvements can be delayed indefinitely or deferred until a date which will presumably place them beyond the end of the present war, the orders for the iron and steel supplies which they involve may as well be placed now, for there is every indication that present prices will be at some advantage over those obtaining a few months hence. The labor market is of course also another factor in all these projects and must be taken into consideration.

"THE HIGH COST OF EXPEDIENCY"

THIS paper recently has published three remarkable letters on the railway labor situation, written by men who have been in the closest touch with it at first hand. The letters referred to and the issues in which they were published are as follows: "The High Cost of Expediency" by "An Ex-Trainmaster," September 15, page 443; "Times Are Rotten Ripe for a Change" by "A Former Yardmaster," October 6, page 587; "A Protest to American Railroad Executives" by "A Superintendent," October 20, page 688. These letters are significant and important because of the array of facts regarding the labor situation which they present in vigorous and telling fashion. They are even more significant and important because of the state of mind and attitude of many officers of the ranks of superintendent, trainmaster, yardmaster, master mechanic, road foreman of engines, etc., which they indicate.

Let us first glance at the facts and conditions to which they refer. Certain classes of the employees of the railways of the United States have been raised to a favored caste. These include engineers, firemen, conductors, brakemen, flagmen, and, to some extent, machinists and other shop men. They have formed unions. These unions constantly have grown in power. Year by year they have made demands upon the railway managements, first reasonable and then unreasonable. They have steadily backed up these demands with the threat of strikes. The executive officers, feeling deeply their responsibility, have often permitted appeals to be made by the men from the superintendent to the general superintendent, to the general manager, to the vice-president in charge of operation, and even to the president, and in many cases have yielded to them merely to keep peace. By the exercise of constant pressure the employees belonging to the train service brotherhoods have succeeded in securing arrangements in respect to discipline, promotion, and conditions of work and wages which are unparalleled in all industry. They get more money in proportion to the arduousness and the value of the services they render than any other class of men in the world who work with their hands. There are, to be sure, not a few men in these crafts who work long hours for compensation which cannot be considered large, but, taking the members of these crafts as a whole, they are truly the "aristocrats of labor."

On the other hand, we have that large majority of railway

employees which are not organized, or who at least have not profited by organization to anything approaching the extent to which the employees in train service have profited by it. Just above the employees in general we have quite a large body of men who exercise direct supervision over the work of employees. Some of these are regarded as employees, others are officers. It is very difficult to say with precision whether certain men are employees or officers. This is true, for example, of the section foremen and shop foremen. It is incorrect and unfair to say, as sometimes it has been said, that the unorganized employees and the officers in the lower ranks have not for a period of years received any increases in their wages. The average wage of the 80 per cent of railway employees not engaged in train service increased 35 per cent between 1906 and 1914. But the wages received by these employees are much less than those paid to the employees in train service, and the increases in them have been relatively much less than those in the wages of the men in train service. As to the officers, from superintendents down, their compensation in many cases is less than that of engineers and conductors, and in many cases less even than that of some firemen or brakemen.

The unorganized employees average more days' work per month, and probably average more hours' work per day, than the men in train service. This is even more true of officers, such as superintendents, trainmasters, and road foremen of engines, and of foremen, such as those having charge of shops and track, who may be said to be always on duty.

The subordinate officers and the unorganized employees have for years watched with growing discontent the increasing discrimination between themselves and the employees in train service. They have felt, and justly felt, that they are more loyal and render relatively better service to the companies than the men in train service, that they stay at home and work while the men in train service are engaged in lobbying for legislation to increase the burdens carried by the railways and to reduce the efficiency of their operation, and that the managements ought, therefore, to show more consideration for them and to resist more vigorously the unreasonable course taken by the men in train service. This feeling has long existed and became acute while the recent wage movement of the train service employees was in progress. It is not, perhaps, due so much to a belief on the part of the unorganized employees that they are underpaid as to the belief that a discrimination is practiced against them and in favor of the train service employees. The man or paper that calls attention to this situation may be accused of stirring up discontent among the unorganized employees. The fact is, that the discontent exists already, as is clearly shown by such letters as those we have recently published, and by other expressions which have come to us; and it is worse than idle to say that those who refer to it are "stirring it up."

The Adamson law is merely an act to raise the wages of the men in train service. In other words, it is an act greatly to increase the disparity already existing between the wages of 20 per cent of the employees on the one hand and 80 per cent on the other, including in the latter the officers of the lower ranks. If this law is permitted to go into effect either because the railway companies do not fight it in the courts or because the courts uphold it, the effect must inevitably be greatly to aggravate the labor situation on the railways. This fact is, from a purely railway standpoint, the main reason why the managements of the railways should spare no effort to either get the law repealed or to get it nullified. If the wage advance sought to be given by this law to train service employees is given, how are the managements going to deal with the rest of the people on the payroll? That is the most serious question raised by this outrageous piece of legislation.

It would seem that there is only one course which the railway managements can follow, if they are not going to allow the labor situation to become so acute as to cause far more serious trouble than they have ever previously encountered. This course is by some means or other to reduce the discrimination in wages and conditions of work between the various classes of employees. In order to do this they must prepare themselves to offer far more courageous and determined resistance to the demands of the men in train service than they have ever offered before. If this finally leads to a strike, then the strike should be allowed to come. The time always arrives in the handling of matters of such importance when the "cost of expediency" becomes much higher than the cost of standing for sound principles. At the same time the managements of the railways should devote more time and more effort to improving the condition of those classes of their employees which are unorganized. Both considerations of expediency and of sound principle demand this. If the executive and operating officer would devote one-half the time to studying the needs and to working out improvements in the conditions of employment and in the wages of the unorganized employees that the labor unions force them to devote to studying and to working out improvements in the conditions of work and of wages of the organized employees the labor situation on the railways would soon present a much more favorable aspect.

A short-sighted, opportunist expediency has influenced the railway managements too much, and sound principles have influenced them too little in the past in dealing with the labor situation. In the long run adherence to sound principles is the truest expediency. If this had been recognized throughout the last 20 years conditions on the railways would be much more satisfactory now than they actually are.

NEW YORK, NEW HAVEN & HARTFORD

EVERYONE knows that the only way to operate a big terminal yard economically is to avoid congestion, even if to do so means placing embargoes or greatly adding to the facilities. The New York, New Haven & Hartford, and more especially the eastern end of the system, is like a vast terminal yard, complicated to the n'th degree by the passenger service which has to be performed in addition to the freight service. In the fiscal year ended June 30, 1916, the New Haven was taxed far beyond its capacity. At one time there was 57,000 freight cars on the New Haven and the Central New England, which is really the gateway to the New Haven from the Poughkeepsie bridge, and it is estimated that this was at least 12,000 more cars than could be handled satisfactorily.

Embargoes were placed, but not in time to prevent severe congestion. Naturally the New York, New Haven & Hartford management is exceedingly desirous of giving satisfactory service to its shippers with the hope of convincing them that if mistakes were made by a former management the present one is doing its best to rectify them. The pressure, therefore, that could be brought to bear on the management to make it put off placing embargoes longer than operating conditions justified was unbearably heavy. The small manufacturer who saw huge profits dangling before his eyes was going to get his fuel coal, if it was humanly possible, regardless of what the railroad company's agent told him about the difficulties of operation. In too many cases panic or selfish greed led to ordering more fuel or more raw materials than the manufacturer actually needed or had any possibility of unloading from the cars. At times the thankless task of trying to discriminate between real needs of shippers and greedy demands was thrust on the railroad, with the unavoidable result that there were innumerable cases where somebody thought they had a grievance.

Not only did the manufacturers of New England have to have coal in very largely increased quantities, but the New York, New Haven & Hartford itself had to buy increased quantities of coal at increased prices. All the New Haven's

fuel coal has added to its cost at the mouth of the mine the freight rate charged by some other road, whereas a road like the New York Central or the Pennsylvania gets nearly all of its fuel coal on its own line and on much of this includes in fuel cost no freight charge on the coal.

Labor was in demand in New England as at no time in the last decade. Railroad employees naturally felt a desire to go into other businesses when they heard of the wages being paid by munition plants and other manufactories. The New Haven had to deal with 57 strikes during the year at a time when business was overcrowding physical facilities and manufacturers were desperately clamoring for the movement of their goods. Superimposed on all this there was a series of very severe storms in December, 1915, which for days absolutely tied up freight business and for a while stopped even passenger business.

The New York, New Haven & Hartford's earnings in the fiscal year ended June 30, 1916, were the greatest in its history, amounting to $76,312,000, an increase over the previous year of 16.72 per cent and comparing with the largest previous earnings, $68,614,000 in 1913. For the first five months of the fiscal year the New Haven was handling its increased business economically and there were prospects of a fine showing for net. The storms of December were the first blow, and congestion once fastened on the system could not be cast off. Maintenance expenses were increased by the difficulty of getting labor, in maintenance of way by the storms and in maintenance of equipment by the necessity for using light locomotives and pressing into service every available car. Maintenance of way cost $8,779,000 in 1916, an increase of $1,050,000 over the previous year. As a matter of fact, however, there was included in this and in the maintenance of equipment charges a total of $1,066,000 which was not actually spent because of the inability of the company to get materials and labor, and this amount is being carried forward into the present fiscal year as a reserve. Maintenance of equipment cost $10,860,000, an increase of $1,079,000 over the previous year.

Far more serious, however, than the increased maintenance expenses was the increase in transportation expenses. These expenses amounted to $28,424,000 in 1916, an increase of $4,465,000, or 18.64 per cent. Besides the increases in transportation expenses caused by congestion there was $2,701,000 spent for hire of locomotives and passenger and freight equipment, an increase over the previous year of $2,103,000.

Notwithstanding all its difficulties, the New Haven had a net income of $4,316,000 for the fiscal year ended June 30, 1916, an increase over the previous year of $2,008,000, and an increase over 1914 of over $4,000,000. To revert, however, for a moment to operating conditions before discussing the financial affairs of the company. There were 34 locomotives retired during the year and 28 added, leaving the company with 1,159 locomotives, of which 77 per cent were in good condition, 7 per cent in fair condition, 12 per cent in shops and 4 per cent awaiting repairs. The total number of locomotives which received general overhauling and heavy repairs was 657, a smaller number than the New Haven would probably have put through the shops if it could have gotten labor and materials. The freight car situation was apparently better than the motive power situation. At the end of the year there was only 3.73 per cent of total freight cars owned in need of repairs.



The New York, New Haven & Hartford and Its Subsidiary the Central New England

The average trainload in 1916 was 352 tons, an increase of only one ton over the previous year. The average loading per loaded car was 16.27 tons, an increase of 0.68 tons. The storms had something to do with the inability to show heavier train loading, and congestion was also a factor. The much larger proportion of l.c.l. freight carried makes it surprising that any increase in the average loading per loaded car should be shown at all. The total tonnage of all freight carried in 1916 was 28,285,000, or 4,433,000 tons more than in 1915. Of the 1916 tonnage, 17.35 per cent was furnished by merchandise (l.c.l. freight), the total being 4,907,000 tons, and the increase as compared with the previous year, 1,188,000 tons. The bituminous coal carried totaled 4,237,000 tons in 1916, or 14.98 per cent of the total

carried, and was greater by 700,000 tons than the bituminous coal tonnage in 1915. The tonnage of manufactures in 1916 was 6,578,000, or 23.25 per cent of the total tonnage of all commodities, and an increase over the previous year of 1,272,000 tons.

Passenger business showed a remarkably large increase. Total passenger revenue amounted to $29,621,000, an increase of $2,610,000, or 9.66 per cent. Passenger density on the New Haven in 1916 was 797,000, and the average number of passengers per revenue train-mile was 102. The average receipts per passenger per mile were 1.885 cents, and the average receipts per revenue train-mile, including mixed trains, was $2.24992. President Elliott says that more than half of the passenger trains run by the company earn less than one dollar a mile, and many earn less than 25 cents a mile. This gives a very good idea of the difficulties which the New Haven has in its passenger service. Half of its trains average less than 50 passengers, many less than 12, and yet the average for all is over 100, so that the average on a great many trains must be in the neighborhood of 300. The New Haven gets it going and coming. It has to run local trains where there is no business to justify their cost and it has to handle immense crowds of travelers on its main line and at New York and Boston where it is most cramped for facilities to move its freight.

The New Haven operating problems have not been solved yet, and, as President Elliott says, "The experience of the year indicates that . . . the plant of the company must have substantial additions to it if it is to perform the present business satisfactorily and economically and to be ready to do the constantly growing business of New England." In March of this year E. J. Pearson, who had been with Mr. Elliott when he was on the Northern Pacific, was appointed assistant to the president to expedite improvement work, and President Elliott gives a list of some of the more important work that must be done as soon as money and men can be obtained. This includes the expenditure of $5,900,000 for freight terminals; $9,300,000 for equipment and shops, including 53 heavy steam freight locomotives and 60 heavy electric locomotives for both freight and passenger service; $3,400,000 for heavier bridges, including the Thames river bridge at New London, and the Connecticut river bridge at Hartford, and $2,800,000 for additional main tracks and sidings.

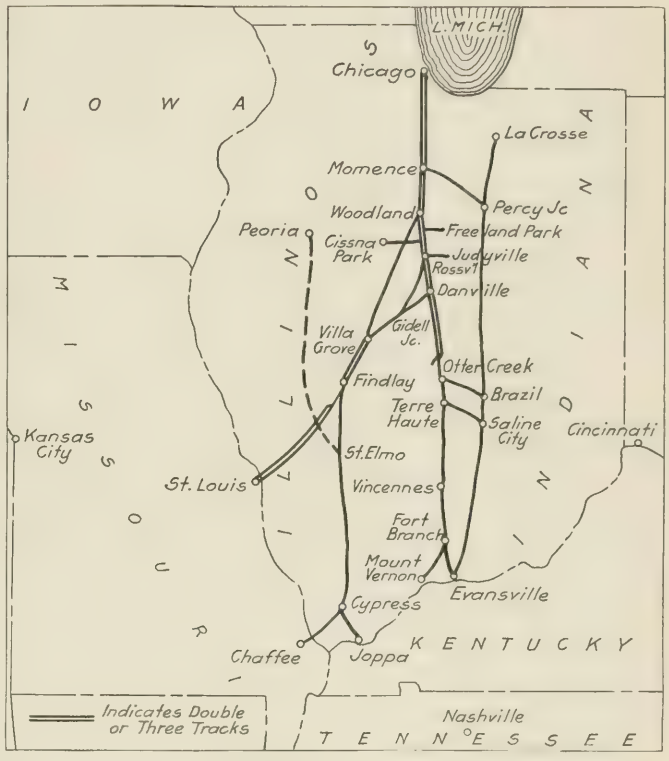
The financial difficulties of the New Haven are not all over with yet, but substantial progress along the right lines has been made. A striking indication of this is the fact that $27,000,000 5 per cent one-year notes, due May 1, 1916, were paid by a new issue of one-year 4½ per cent notes, due May 1, 1917, for $25,000,000 and $2,000,000 in cash. The loan, with interest, discount and commissions, made in 1915, cost the company 7¼ per cent. The refunding of this loan mentioned above in 1916 cost the company but 4⅞ per cent. During the year the suit brought by the New Haven against the Billard Company in connection with the profit made by that company when it temporarily took over from the New Haven a controlling interest of the Boston & Maine was settled by the Billard Company paying to the New Haven $1,250,000, and this amount was used to reduce the book value of the New Haven's investment in the Boston Railroad Holding Company, which is the company which took over the controlling stock of the Boston & Maine.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916.	1915.
Average mileage operated	2,005	2,003
Freight revenue	$37,448,021	$31,179,319
Passenger revenue	29,620,567	27,010,799
Total operating revenue	76,311,653	65,379,264
Maintenance of way and structures	8,779,166	7,729,241
Maintenance of equipment	10,859,656	9,780,330
Traffic expenses	470,278	473,368
Transportation expenses	28,423,557	23,958,702
General expenses	1,756,431	1,611,243
Total operating expenses	51,078,358	44,126,624
Taxes	2,856,255	2,743,921
Operating income	22,381,882	18,502,081
Gross income	28,841,113	24,357,133
Net income	4,315,757	2,307,971

CHICAGO & EASTERN ILLINOIS

IT seems hard to believe that the St. Louis & San Francisco was ever willing to guarantee 10 per cent on the $7,218,000 common stock of the Chicago & Eastern Illinois and 6 per cent on its $11,070,000 preferred to get and to retain control of that company. As an investment the venture was a failure. In only two years in its history did the Chicago & Eastern Illinois pay 10 per cent on its stock, and in the fiscal year ended June 30, 1916, a year of exceptional prosperity and industrial activity, the Chicago & Eastern Illinois earned only a few thousand dollars over and above interest charges. The St. Louis & San Francisco ceased to carry out the provisions of its guarantee,



The Chicago & Eastern Illinois

of course, when it went into the hands of receivers, and at the same time a receiver was appointed for the Chicago & Eastern Illinois. It was not until after the line had been operated for more than a year that many people realized that the Chicago & Eastern Illinois was not the prosperous railroad which it had generally been considered to be.

The road runs from Chicago south through Terre Haute, Ind., to Evansville, with a line also to St. Louis and to Chaffee, Mo., crossing the Mississippi at Thebes, a few miles north of Cairo. In all, the company operates 1,136 miles of railroad, of which 335 miles is double track. It is a road having a low ton-mile rate—5.3 mills in 1916, and a low passenger-mile rate—1.87 cents in 1916. There is extremely keen competition on much of the passenger business and on quite a large part of the freight business, and while the Chicago & Eastern Illinois is successful in getting more than its share of the passenger business between

Chicago and St. Louis and fully its share of competitive freight business at most points, the keenness of the competition makes for expensive operation.

The total tonnage of all revenue freight carried in 1916 was 15,287,000, an increase as compared with the previous year of 20.06 per cent. The average length of haul was almost the same in 1916 as in 1915—153 miles. Of the total tonnage carried in 1916, 61.31 per cent was products of mines, the two principal commodities under this head being bituminous coal, which furnished 52.27 per cent of the total revenue freight tonnage, and stone and sand, which furnished 7.23 per cent of this tonnage. The increase in the tonnage of bituminous coal was 21.30 per cent, but in stone and sand only 5.28 per cent. The tonnage of manufactures carried in 1916 amounted to 2,018,000, or 13.20 per cent of the total revenue tonnage. This compares with 1,387,000 tons of manufactures carried in 1915, which was 10.89 per cent of the total tonnage in that year. The increase in the year 1916 as compared with 1915 was 45.52 per cent.

Total operating revenues in 1916 amounted to $16,698,000, an increase of 18.4 per cent over 1915, the largest total operating revenue in the history of the company. Operating expenses amounted to $12,680,000, an increase over the previous year of 10.5 per cent, making the operating ratio in 1916 75.94, and in 1915, 81.40. Previous to 1913 the operating ratio of the company had been 71.63 in 1912, and prior to that less than 70.

Mileage and loading statistics for 1916 show relatively large gains and besides being good as compared with former years' operations of the same property, are good as compared with other roads doing a somewhat similar business. With an increase of over 20 per cent in ton mileage handled, there was an increase of a little over 11 per cent in freight train mileage. The average trainload was 663 tons in 1916, an increase of 56 tons as compared with the previous year. The average number of tons per loaded car was 29.01 as compared with 27.58. The proportion of loaded to empty cars was about the same in the two years. Transportation expenses in 1916 amounted to $5,721,000, an increase of 7.6 per cent. There was quite a notable saving made in payments for loss and damage to freight. These payments totaled $145,000 in 1916, a decrease as compared with the previous year of 15.5 per cent.

On maintenance of way the company spent $2,284,000 in 1916, or 3.1 per cent more than in 1915, and on maintenance of equipment the company spent $3,849,000, an increase of 22.4 per cent. Most of the items under maintenance of way show larger expenditures for 1916 than 1915, and the fact that the total is only 3 per cent greater in 1916 than in 1915 is because there was a large cutting down of expenditures for ties, the total in 1916 on this account being $439,000, or 35 per cent less than the amount spent in 1915. It is probable that in part labor shortage was the governing factor in the smaller tie renewal. In maintenance of equipment the outstanding feature is that whereas previous to 1916 the Chicago & Eastern Illinois had been charging for depreciation of its equipment only ¼ of 1 per cent, during the year 1916 the charges were at the rate of 2 per cent. Two per cent is low, and, of course, ¼ of 1 per cent was a mere nominal charge to technically comply with the rules of the Interstate Commerce Commission.

With its present rates and funded indebtedness there is little prospect of the Chicago & Eastern Illinois earning much profit for its stockholders. The road is not heavily capitalized. Its outstanding funded indebtedness is at the rate of $59,136 per mile, and its stock at the rate of $18,180 per mile. What the company needs and needs badly is higher passenger rates and higher rates on manufactures and other competitive business.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	1,234	1,234
Freight revenue	$12,471,388	$10,232,826
Passenger revenue	2,907,481	2,723,926
Total operating revenues	16,698,404	14,100,772
Maintenance of way and structures	2,284,191	2,215,871
Maintenance of equipment	3,849,471	3,146,073
Traffic expenses	302,563	279,390
Transportation expenses	5,721,359	5,315,560
General expenses	455,673	438,744
Total operating expenses	12,680,319	11,477,869
Taxes	703,457	627,200
Operating income	3,309,647	1,994,230
Gross income	4,387,149	2,584,748
Interest and rentals paid	1,463,551	2,131,948
Interest unpaid	2,837,018	2,262,096
Surplus if all charges had been paid	86,579	1,844,497*

*Deficit.

NEW BOOKS

Proceedings of the American Railway Engineering Association. 6 in. by 9 in., 1,400 pages. Illustrated. Bound in half morocco, cloth or paper. Published by the American Railway Engineering Association, Karpen Building, Chicago. Price, half morocco, $7; cloth, $6.50; paper, $6.

The volume this year contains fewer pages by 172 than last year, but owing to the larger number of inserts and the necessity for using heavy paper for a large number of plates the volume is actually thicker than the preceding one. Of the total number of pages 780 are devoted to reports, 144 to discussions and 467 to monographs. Much work was done by all of the committees but owing to the custom of continuing the studies from year to year the reports of a number of the committees were in the form of progress statements that did not indicate the true value of the investigations being made. In the case of the committee on iron and steel structures, on the other hand, the report given this year represents a digest of a study extending over a long period and for that reason constitutes one of the most valuable portions of the proceedings. Definite recommendations are made relative to secondary stresses, impact and working stresses. The most important action taken by the association in its convention last March was connected with the report of the Committee on Rules and Organization covering the standard clearances for bridges and other structures to afford safe operation for trains. The large amount of discussion which this created is particularly interesting. The report of the Committee on Rail contains the annual review of the rail failure statistics; the report on internal transverse fissures; a study of 108 rail failures by W. C. Cushing, involving a large number of illustrations; and an account of the nick and break test in the inspection of steel rails by Robert W. Hunt and C. W. Gennet, Jr. Part 2 contains a number of very comprehensive studies including "Special Steels" by W. C. Cushing; "Ballast Tampers for Railway Ties" by George W. Vaughan; "Standardizing of Maintenance of Way Work" and "Test of Track Bolts and Wrenches" by Earl Stimson; "Test of Douglas Fir Stringers" by H. B. McFarland; "Rise and Fall" by C. P. Howard; and "An Exceptional Flood" by J. L. Campbell. The book this year contains several series of unusually good illustrations, particularly those given in connection with the reports on causes of rail failures, and the nick and break test, and those with the monographs on special steel and on the testing of Douglas fir stringers.

Removing Pulleys.—Removing pulleys that have been rusted on shafts is frequently a troublesome job, but can generally be accomplished by heating the hub with a charcoal fire or some other means. The hub will expand, and the wheel can be easily removed. Care should be taken, however, not to heat the shaft, for if it expands as much as the hub nothing is gained.—*Power.*

Annual Congress of National Safety Council

Fifth Annual Review of the Work of This Clearing House of Information—Lively Interest on Many Roads

THE National Safety Council held its fifth annual Safety Congress at Hotel Statler, Detroit, Mich., October 17, 18, 19 and 20; and the meetings of the Steam Railroad Section, held on Wednesday and Thursday, morning and afternoon, were attended by about 150 representatives of the sixty railroads which belong to the Council, and of a few roads which are not members. The chairman of the Steam Railroad Section is M. A. Dow (N. Y. C.); vice-chairman, J. M. Guild (U. P.); secretary, H. J. Bell (C. & N. W.), Chicago, Ill. The sixty roads now holding membership in the Council operate about 80,000 miles of line. The representatives of the lines which are members appeal for the co-operation of all railroad companies. The essential purpose of the Council is to serve as a clearing house for the exchange of information and, obviously, the greater the number of participants, the greater the value of the information.

Chairman's Address

Chairman Dow, in his opening address, set forth the high purposes of the organization and congratulated the members on the good results thus far attained. He made an appeal for still more vigorous progress. "Let us go on and dispel the notion that a railroad man's work is necessarily hazardous. Our ideal is cultivated carefulness; and it is the duty of this body to promote the realization of that ideal!

"The American railroads today are reasonably safe to work on and to travel on. The last annual statistics show that the number of passengers killed in train accidents was only one in 11,000,000. In the streets of New York City, 500 persons are killed annually, or one in 10,000 population. The safety of railroad work is indicated by the fact, shown in the last annual statistics, that but one employee was killed in a train accident for each 100 loaded freight cars moved a distance equal to seventeen times around the world."

The question of the responsibility for railroad accidents is always under discussion. Does it rest on the rank and file? Yes; so far as the individual employee is suitably instructed; but the instruction depends on some one above him; the superintendent, the yardmaster, the foreman—these are the men to see that employees know their duty. There is much faulty training by foremen. It is the duty of the man in authority to compel carefulness. Moreover, it pays. Look at the results. Specialized safety work, including co-operation and educational work, was generally adopted on the railroads of this country about five years ago. Comparing the last five years with the five years preceding, we find the following striking decreases (years ending June 30):

	1911-15	1906-10	Increase or decrease
Employees killed, average per year	2,569	3,572	D. 28 p.c.
Trainmen killed, one in	213	155	.....
Passengers killed in train accidents, one in	355*	183*	.....
Trespassers killed, average per year	...	...	I. 108
"Other persons," not trespassing, killed; average per year (mostly at grade crossings)	1,997	994	I. 98 p.c.

*Millions of passenger miles.

In closing, Mr. Dow urged his fellow members to renewed efforts in their noble and lofty work. "May you hook your spurs in the broncho 'Determination' and ride with steady, swinging lope across the range of things that are possible of attainment. Forget your failures, if failures you have had. Look up and see the rainbow smile—that beautiful rainbow of hope, beyond which lies the realm of ultimate success, a success, which in this work, is measured not by mere financial gain, but by all that is good in life. Success that is measured by the happiness of the home . . . by the friendships that are made and maintained among men through consideration for the rights of others. And may you go forth from this Congress with an incentive for further accomplishment, inspired by that compelling slogan, 'For the sake of Humanity—Care and Thoughtfulness, with Education and Supervision to that end.' "

Review by Mr. Richards

The first regular paper was on Prevention of Accidents, by R. C. Richards (C. & N. W.). Mr. Richards is the well-known father of the railroad Safety First movement, and his paper was a thorough and careful resumé of the lessons of his experiences of the last half dozen years. He called attention to the fact that the employers' liability acts, now so prominently before the public, have not reduced accidents. He showed up the weakness of the objection, sometimes voiced by employees, that the Safety First movement is some secret scheme for the benefit of the company. "But," says Mr. Richards to the employees, "you, and not the officers, are killed and injured; you and not the stockholders are the sufferers, primarily, from bad practices; suppose a company does start this movement for the purpose of saving money; very well, it must first save life and limb."

Mr. Richards presented striking comparisons between the railroad accident records of 1910 and 1915 (years ending June 30). In the earlier year the number of passengers killed was 450; in the latter 222. Employees killed in train operation, in 1910, numbered 3,418; while in 1915 this was reduced to 1,809, or almost 50 per cent.

Turning to the question of highway crossing accidents, the speaker suggested that at busy crossings the attendant should be sworn as an officer of the law. He alluded briefly to the trespasser problem, with which the railroads cannot cope without the aid of the municipalities. In 26 years the number of trespassers killed on American railroads has reached the enormous number of 118,654; and the number of injured is larger than this. Of these victims about two-thirds were citizens of the locality where they were struck.

A rough estimate may be made of the benefit of the Safety First movement by looking at the money cost of accidents. In the middle west the average cost of all accidents is something more than $100 a case. Now, on the Chicago & North Western, in the six years, three months, to September 1 last, with a great increase in earnings and an increase of 450 miles in the length of road operated, the total number of persons killed has been reduced by 547, and the number injured by 16,941.

The one cause of accident which the safety departments have not yet considered, in a way commensurate with its importance, is the employment of unfit men. Except as the utmost care is taken in the recruiting of the forces the best efforts will always fall short of satisfactory success.

The Safety of the Passenger

G. L. Wright (C. St. P., M. & O.) read a paper on the American railroad passenger; What the railroads have done and are doing for his safety, and what he should do for his own safety. On the part of the railroads, figures cited by the speaker showed the important improvement made in the past few years, especially in the use of steel passenger cars. What has the passenger done to co-operate with the railway? Personal injuries are caused by people carrying large packages; standing on seats to reach up to the racks; opening vestibule doors; allowing children to play in cars, and other carelessness. The speaker advocated the painting

of a white safety line on station platforms to warn passengers to keep back from the track. He would have uniform notices posted in each end of each coach.

Prevention of Trespassing

The duty of the public in the prevention of trespassing on railroads was the subject of a strong paper by A. A. Krause (M. K. & T.). This is the great American evil. The railroad has no duty towards the trespasser except to refrain from wilfully harming him. Placards and posted notices have little effect on most would-be trespassers; they will yield to nothing short of force; and this the railway cannot exert without offense. The speaker recounted the extensive missionary work of his road. Thousands of signs have been posted, circulars have been put into the schools, the bulletins of the National Safety Council have been spread broadcast, and hundreds of track walkers have been personally warned. Letters have been sent to parents of children found on the tracks. Citing examples of reckless conduct by high school girls and others, and the unjust comments of local papers when such trespassers were killed, Mr. Krause related an astonishing story of a fraternal organization known as "Quo Vadis," organized in 1907 by students of universities in the mid-western states, the purpose of which is to encourage riding on railroads without paying fare. In the beginning this was a movement of students, short of money, to get to a football game; but the movement flourished and it came to be the qualification for membership to have traveled at least 1,000 miles on railroad trains without having paid fare! These educated hoboes take pride in their lawlessness. The Quo Vadis Club of the University of Missouri was disbanded, after a member met with serious accident; but other clubs are understood to be still in existence. In one city of the middle west a lawyer of ability and standing, when a candidate for the office of prosecuting attorney, openly pledged himself not to enforce the law against trespassing on railroads.

To protect the people from epidemics and plagues we have to have health boards and health officers; the people cannot be depended upon to protect themselves; why not the same rule in regard to trespassing? The health officers act with vigor regardless of politics or the fear of antagonizing voters; at the first sign of danger they become alert and active. They have ample public funds. The courts back them up. Why should not this fatal epidemic of trespassing be treated in the same way?

Discussion.—In the discussion C. F. Merrill, superintendent of the Lehigh & Hudson River, took up the problem of getting local magistrates to deal more vigorously with persons arrested for trespassing. In most states the crime is a misdemeanor and the magistrates have large discretion. Trespassers should be divided into three classes: (1) train riders, (2) railroad employees, (3) employees of factories and other citizens. With the first class the magistrate has a simple problem, though sentences are often far too mild. With the second class the problem is comparatively easy if good and convenient paths are provided for use in going to and from work. The third class is the difficult one. On Mr. Merrill's road officers have at times been stationed at important points to turn back trespassers (without arresting them). This has had some good results. At factories the road endeavors to get the co-operation of the proprietors; and at schools the teachers are appealed to. Track foremen should be instructed to report to the superintendent the names of trespassers; and where they are persistent, the foreman should be persistent in reporting. The speaker recommended a federal law against trespassing.

D. A. Klumph (Pere Marquette) spoke of the prejudice of cities, and even of magistrates, against the railways. This often is so great that the only thing to do is to make a general appeal to the public; the National Safety Council has a duty in this respect. Track foremen ought to have the power of arrest. The laws ought to provide for penalizing a prosecuting officer who does not do his duty. The speaker avowed his sympathy with the average pedestrian who, now, because of the automobile danger on the highways, takes to the railroad tracks as a measure of safety!

F. V. Whiting (N. Y. C.) told of the action of the Claim Agents' Association, and the statistics which it has gathered concerning trespassers. Members of that association desire to have a federal trespassing law. They propose to present a memorial to the American Railway Association. On motion of Mr. Whiting, the meeting voted to co-operate with the Claim Agents' committee on trespassing in the promotion of publicity.

Highway Crossing Accidents

How to reduce the number of accidents at crossings, was the subject of a paper by John S. Rockwell (B. R. & P.). For the present the crossing is a necessary evil. To abolish the crossings on the Buffalo, Rochester & Pittsburgh would cost an average of $50,000 each. It is the duty of railroads to resist to their utmost the establishment of new crossings. The railroad officer must not, too readily, assume that the blame for accidents rests wholly on the wayfarer. Trainmen need to be cautioned about backing cars over crossings. The rule not to block crossings should be strictly enforced; sometimes neglect in this matter contributes to accidents. Signs should be standardized. The attendant at the crossing should not give proceed signals to persons on the highway except, perhaps, by a motion of the hand, his flag being furled. The speaker would like to see a federal act requiring the universal use of signs to be lettered "Stop, Look and Listen." Drivers of heavy motor trucks should always have with them flags or lanterns, or whatever is necessary to stop a train if they get stuck on a crossing.

Discussion.—In the discussion on this paper, C. M. Anderson (N. C. & St. L.) endorsed the recommendation that discipline of railroad employees be more carefully attended to. Many locomotive runners are not careful to make the whistle sounds long enough or loud enough. It is second nature for an engineman, if he sees danger at a crossing, first to shut off steam and then sound the whistle; but as the damage will probably be no greater at 40 miles an hour than at half that rate, it would be better for him to sound the whistle first. It is to be hoped that the present movement for uniformity in crossing signs will make rapid progress. One city on the speaker's road requires the use of a white flag or a green light to stop trains, and red is the signal to stop street traffic and to indicate all right for trains! Mr. Anderson proposes to warn automobile drivers by means of placards which he will circulate, to be posted in garages and other places where motorists will see them.

J. C. Rose (Penn.) told of his experience with cautionary fixed signals on the highway. The West Jersey & Seashore was the first road to put up a signal of this kind. At first it was set 1,000 ft. from the track; then the distance was made 500 ft. and another was fixed 300 ft. from the track. It was found that many motorists went faster rather than slower when they saw one of these signs, and his road concluded to use the sign only at crossings protected by gates. The speaker thought, however, that if the cautionary signal were universal motorists might be trained to heed it. The State of New Jersey has ordered the establishment of these cautionary signs generally. The Long Island road has put up a large number of them.

Mr. Dow said that all crossing attendants on the New York Central lines now use the hand disks in place of the flags formerly used.

G. L. Wright (C. St. P., M. & O.)—Some of our crossing watchmen have noted the license numbers of the cars of reckless drivers, and letters are written to such drivers. Our

road has put up 400 cautionary signs; usually they are set from 300 ft. to 400 ft. from the track. These have white letters on a red ground. Excellent results have followed.

Membership of Safety Committees

"How Should the Members of Safety Committees be Selected and for What Length of Time Should They Serve," was the subject of a paper by E. R. Scoville (B. & O.) read by J. T. Broderick. Rotation in office is important. On the Baltimore & Ohio the term has been shortened to three months, with good results. The appointee is notified one month ahead and thus qualifies himself to be a useful member at his first meeting. It is not well for the retiring member to nominate his own successor; it has been found best to have the selections made by the division chairman. To find who are the useful men and who are not, it is important to get all members to express themselves on every subject that comes before the committee. Retiring members are formally thanked for their service. Many members will neglect to report bad practices because they fear the odium of the talebearer; again a man whose term extends over many months may become apathetic. Members on the general committee on the B. & O. ceased regular attendance on district meetings and have held a number of mass meetings at important points. Thousands of employees have attended these meetings. The motion picture entertainment, "The House that Jack Built" has elicited great enthusiasm; over three thousand persons saw it at one place. This show is given at noon for shopmen and at midnight for night workers. Members of the safety committees are paid regular wages for the time spent in committee work.

The benefits of the short term are that more men are educated; in three months a member has had time to report the bad practices which have come within his own knowledge; he retires while still enthusiastic; a larger number of employees are given the chance to rub elbows with the officers.

The safety specialist should do his best to keep appointing officers interested in this idea; then the officers may be expected eventually to reject a careless man as surely as they now reject liquor drinkers.

Discussion.—In the discussion on this paper A. W. Lee (O. S. L.) coincided in the view that short terms are desirable. His road has reduced the time from twelve months to three months. If a committeeman is found to be skeptical it is highly important to convert him; for when converted he becomes one of the strongest supporters.

H. A. Bullock (Brooklyn Rapid Transit Company) told of his experience in teaching safety first by the use of lantern slides. He has a catalogue of available slides, and he exchanges pictures with other companies. The secretary of the National Safety Council will catalogue the slides and films in the possession of the members of the electric railway section and these can be made available to steam roads for the asking, or at the most at the cost of reproduction. It is important to have constant novelty. The first cost of slides is rather high; but roads desiring to use this method and to have pictures of their own can have duplicates of slides made for 50 cents (colored) and 25 cents (uncolored).

G. L. Wright emphasized the importance of having the division superintendent serve as chairman of the division committee. On his road the other members are chosen by votes of their fellow employees in each department. Replying to a question, he said that 75 per cent of the men participate in this voting. On the New York Central and on the Baltimore & Ohio, the superintendent is the permanent chairman of the division committee.

Relation of the Company to the Safety First Organization

This was the subject of a paper by J. M. Guild (U. P.). Safety depends on supervision, and supervision on the officers. The lukewarm officer *must* be converted; the officer who is "too busy" to give attention to this matter will be found to be the one who has the most accidents. The first desideratum in this, as in other important affairs, is to have level headed leaders, men who are naturally adapted to leading other men. Every member will testify that his best meetings have been those where the officers took active part. The speaker outlined the qualities of the ideal officer: firm and fair, not influenced by personal considerations, able to commend without flattery and to administer discipline without humiliation.

Meetings must be guided by an officer; and he must take care to keep the most important subjects uppermost. The report that there is a hole in the station platform at X, or that a hand railing ought to be put up on Bridge 115, may be important, but these items are secondary, compared with the fact that two switchmen have just lost their feet by kicking drawbars, or that derailments have occurred because men threw switches under the cars; or that five shopmen have suffered from not wearing goggles. Education and instruction are the highest purposes of the meetings and to this end these important features must be kept at the front. "An officer coming in daily contact with his men can do more real constructive safety work and produce more results than all of the efforts along other lines combined. The very heart of the safety movement is centered in the officers. They can make it a huge success or a dismal failure, and in neither case is there any great effort required on their part. The proper relation as between them and the safety organization is most important."

Discussion.—C. T. Banks (Erie):—Speaking of what are the more important matters, there are some situations where stricter discipline would be beneficial. The man who kicks a drawbar ought to be punished by ten days, instead of having a mild talking to. The man who is responsible must be made fully to realize his responsibility. A shop foreman who had fourteen injuries in a certain month, where another shop had only three, must be told that it is his plain duty to cut his record down to three. If he is the right kind of man this arouses him to his duty. On the Erie a brakeman who breaks a plain safety rule, is required to go around with a record of his behavior and get fifty of his fellow workmen to listen to it and to sign their names. This may take him five or ten days, and the experience will burn the facts into his mind.

S. S. Morris (Illinois Central) gave a brief account of the practice on his road. Hearty co-operation prevails, and the different departments work together, even the traffic department taking an interest. Daily reports are sent to headquarters, and where there seems to be an increase in personal injuries, a letter is at once written to the superintendent of the division where special attention may be needed. If friction develops in a committee, the trouble is attacked at once.

D. A. Klumph (Pere Marquette):—The officer who investigates an accident ought to go further back; sometimes it will be found that the crew responsible for a bad practice had indulged in the same bad practice before, and that their superiors knew of it.

Injuries to Track Men and Bridge Men

The best way to eliminate the causes of these accidents was the subject of a paper by C. T. Banks (Erie). Ninety per cent of these injuries are due to the negligence of the victim or of his fellow employee. Negligence usually means ignorance. Removing this ignorance is specially troublesome at present because of the large numbers of new men not speaking English. Our best men have gone to Europe or have got better paying places at home. Of trackmen killed, the great majority are struck or run over by trains. These accidents usually occur on double track or four-track lines. The Erie employs watchmen to warn trackmen, but sometimes it seems

as though there is need of a special watchman for each laborer. A book of safety precepts has been issued, printed in several languages; and foremen, speaking the language of the workmen, have been required to see that the books are read and understood. Among bridge men the percentage of accidents is low. The main reliance must be on the foremen.

Discussion.—In the discussion on this paper, L. F. Shedd (Rock Island) called attention to the fact that many men who know enough to be careful, nevertheless fail because they do not have any fellow-feeling for their fellow employees. Even foremen often fail at this point. The foreigner is not always so ignorant as we think. The foreman must be trained. He must be made to take a personal interest; to talk with his men and to set a good example. Make him understand that he has a personal accountability for each injury among his men.

Mr. Shedd was followed by a number of members who said that the rule for trackmen on their roads was that when a train approaches, the men shall step clear of all tracks. W. C. Wilson (D. L. & W.) told of a large reduction on his road in the number of trackmen killed (struck or run over by trains) by persistent educational work with the heads of departments.

S. G. Watkins (B. & M.):—We found that in many cases trackmen struck and run over by trains had not had a good and sufficient warning. Variety in warnings is an element of danger. We ordered the adoption of one standard formula, three words—"Clear the track."

The discussion here turned to the use of whistles. In most situations on busy roads the warning by word of mouth is out of date. Moreover, the whistle should be shrill, and one single sound should be the rule. On the New York Central, where there are four main tracks, the watchman makes one sound for track No. 1, two for track No. 2, three for track No. 3 and four for track No. 4. On the Union Pacific the use of the whistle has been discontinued, because where a gang of men is scattered along a considerable length of track, and there is a strong wind, the whistle warning has sometimes been ineffective. H. S. Balliet (N. Y. C.) after six years' experience and study, had concluded that the desideratum was to have a whistle of the right quality, sufficiently shrill. The duty of providing suitable and sufficient warnings should be placed on the roadmaster or the division engineer. Mr. Balliet, like most others, has had to employ many green men in track work of late; and the education of these men in safety habits is a work that has to be constantly kept up. In the Grand Central Terminal yard, New York, much of it covered over and dark throughout the 24 hours, the management of the warnings to prevent men from being run over has become a fine art. Keeping the men free from fear, so that they will be efficient at their work, is a matter requiring constant attention. Some of the gangs have to have two whistle-men. In this terminal there are 685 pairs of switch points and the man who does the warning has to watch the points affecting his work, with constant care so as to know on which track a train movement is to be made.

Shop Accidents

This was the title of a paper by B. C. Winston, Wabash. The shopman gets used to danger and the risks of his work have to be constantly reiterated. However, Safety First has made great progress in shops. The shop foreman has the advantage of being constantly in touch with his men, and should make a good record. The speaker described the situation in the large new shops of the Wabash at Decatur, Ill. It is very desirable to have young men on the safety committees. Some of the veterans need a good deal of explanation and persuasion to get them to understand the needs of the younger element. After the safety propaganda had been well established at Decatur, foremen were brought there from other shops on the system and these carried back the gospel of safety to their own men. When a serious injury happens on the Wabash, there is a very full investigation and discussion, and all the workmen are made to understand the lesson.

Discussion.—This dealt largely with the use of goggles. Mr. Dow had visited a shop, not a railroad shop, where even visitors were required to put on goggles before entering the workrooms. Most of the members seemed incredulous as to the feasibility of enforcing such a strict rule in the railroad service.

C. T. Banks:—If a workman came into one of your shops barefooted, he would at once be reprimanded and sent back; why not be equally strict in the matter of goggles? Since May 1, last, we have had fifteen cases where goggles are known to have prevented injury to eyes. On the Erie, goggles are used by the men who draw the fires from locomotives and by boiler makers. Condensation of moisture on the glasses has made some trouble, and we have now adopted a special design where the glass stands out an inch from the man's face. For workers at electric welding we have a special mask which takes out the infra red and ultra violet rays; wearing this, the workman can use both hands at his work.

On the Union Pacific, the Pennsylvania, the Erie and the New York Central goggles in which the glasses are ground to fit defective eyes are in use. On the Rock Island, the use of goggles has not been made compulsory, but two thousand of its men are wearing them. The Pennsylvania, to conciliate objectors, allows employees to use any make of goggles which is satisfactorily protective. In the shops of the Pullman Company, the men were long allowed to make their own choice, but after considerable inconvenience the company decided to standardize three designs of frame. On the Union Pacific, a glycerine compound is used to get rid of troubles from condensation of moisture.

Non-Train Accidents

F. M. Metcalf (N. P.) read a paper on the question "How shall injuries resulting from train operation, other than collisions and derailments, be prevented?" He presented a careful enumeration of the requirements of plant and personnel necessary to provide the greatest safety. Trainmen must not close the vestibule too soon on starting away from a station. Greater care should be exercised in selecting men for crossing watchmen. Those who hug the fire in the shanty are likely not to be efficient. The watchman must understand the English language well enough to warn people on the highway and to testify intelligently at inquiries. Enginemen and firemen approaching a crossing should be on the lookout; the excuse that it was necessary just at that time to attend to the injector or the fire should not be received. Mr. Metcalf has issued a warning to automobiles, and the secretary of the state of Minnesota has agreed to circulate it with his annual licenses. A code of safety precepts issued by the Northern Pacific has been combined with a little pocket book which the employee (in the train service, engine service and yard service) uses for recording his time worked. This insures attention to the book. Mr. Metcalf would have examination on the safety rules carried out with the same care as that on train rules. Other books of the same character as the one mentioned are to be furnished for shop men and for station men.

An important element of accident prevention is to keep statistics up-to-date. The rule forbidding men to go between cars should be rigidly enforced. The Northern Pacific has a red card, 10 in. x 15 in., to be tacked on the side and on the roof of a freight car which has a loose handhold. For the safety of car repairers, Mr. Metcalf would provide (a) the blue signal, (b) a special lock for the switch leading to the repair tracks and (c) a clearance card, the card to be

issued by the repairman when he has finished his work. On the Northern Pacific, during the past three years, no man has been injured on an established repair track.

Discussion.—In the discussion on this paper, A. T. Woodruff (Virginian) read a brief paper sent by J. Berlingett, assistant general manager of the Virginian. He emphasized the importance of selecting the right kind of men. Usually the village lad is worth a carload of the so-called experienced trainmen whom the employing officer is liable to favor when he is in desperate need of additional trainmen. Hiring men in haste is a bad practice that ought to be abolished. Why not examine men for promotion when there is time to do the job properly? An overworked officer is not the man to make a good examination; the work must be done deliberately and by a man who makes it his specialty. The writer protested against the unbusiness-like character of some safety publications. These magazines and pamphlets are not the place for jokes and other miscellaneous matter.

How to Make Meetings Interesting

W. C. Wilson, claims attorney of the Delaware, Lackawanna & Western, read a short but witty paper on this subject. Some of these meetings are no pleasanter than funerals. A dead or somnolent committee cannot have a live meeting; a thoughtless committee cannot have an intelligent meeting. Enthusiasm is engendered only by men who believe in their work. The superintendent should be the leader; but if he sits at his table with a preoccupied air he is a failure. Officialism must be put into the background. The chairman must curb unprofitable discussion and yet not discourage freedom of expression. He must show that he is the best safety first man on the committee; greet the members cordially, exercise friendly tact in drawing out the best that is in each man, and for those with whom thinking and smoking are coincident he must provide cigars within easy reach. It is a good thing to have a dinner once in a while, possibly sometimes having the men bring their wives. Committee meetings do not run themselves. The secretary must be a driver. General officers should occasionally attend the division meetings as should the members of the central safety committee. Persons outside the railroad service can be invited occasionally to address the committee, especially former members.

Concrete examples from the experiences of the preceding month must always be a main topic; they always make a live topic. As a rule, men do not like to discuss the unsafe practices of their fellow employees, especially in the presence of their officers. Where necessary or desirable, employees should have an opportunity to discuss matters by themselves; sub-committees of employees may be appointed to discuss dangerous practices in their own way.

"The life-blood of the whole Safety First organization flows out from these committee meetings. Their interest must be maintained if there is to be efficiency all along the line. Its members, both officers and privates, must be made to feel the weight of responsibility which is theirs; that if they shirk that responsibility or fail to measure up to the demands of their high calling, if they are unwilling to be prophets of the new faith and to stand for a time as sentinels to point the way of Safety, then they should make way for others who have a clearer vision, warmer hearts and stronger and more willing hands for the work which is set before them."

Discussion.—H. J. Bell (C. & N. W.):—If our meetings are not satisfactory one of the reasons is that safety-first has become an old story. Every man who is not energetic must be warmed up. A man who looks on the chairman or the superintendent as the whole committee is all wrong; he must be converted to the right view. Members must remember that when in a committee meeting they are not brakemen, station agents, or shopmen; they are safety-committee-men. This is an honorable service. All employees must be made to understand that the members of such committees are to be respected. All division officers must understand that the safety department is an important department. There is no more important day in the month, on any division, than the day on which the safety committee meets. The North Western keeps up a friendly rivalry among divisions by awarding banners. Other rewards are given and vacations are granted for good work. The general safety committee should give publicity to good papers read at committee meetings. Committees of shopmen and committees of operating men should send delegates, each to the meetings of the other. On all important matters before a committee a formal vote should be taken. It is important that every member keep well posted as to all accidents that come before the committee.

R. S. Jarnagin (N. Y. C.) outlined the essentials of a meeting. Mr. Jarnagin is constantly on the road, traveling, in the interest of the safety work, from one division to another, of the New York Central lines, thus keeping all divisions well informed of what is going on elsewhere. The social feature of meetings is important. The mental attitude of the superintendent is an essential thing in the leadership. As superintendents have many other things to do they may overlook details; therefore the secretary or some other member of the committee must make committee work his first business. The most interesting topics, at times, are those which have been brought from other divisions. All employees must be encouraged to make suggestions, and even points which are not practicable must be respectfully considered, and reasons for rejection must carefully be made known.

C. T. Banks (Erie):—One of the best stimulants to good meetings is a fee. On the Erie the shop committee men receive $5.

Other speakers gave a great variety of experiences. On the New York Central one superintendent, to show his appreciation of good suggestions, proceeds at once, on the spot, to dictate the letter necessary to have the suggestions carried out. On the Chicago & North Western, the superintendents, who are chairmen, sometimes put a temporary chairman in charge of the meeting, notifying him a month in advance; this educates the men in the practice of presiding. A number of roads give annual passes to the men. On the Chicago & North Western these passes have the safety emblem on them. On the New York Central an effort is made to have, at each meeting, one paper which shall be the chief feature. Isaiah Hale (A. T. & S. F.) when he asked for papers, received an avalanche. The sifting of papers and selecting the best is an essential element. On the New York Central, the best papers are printed and sent to the 1,200 members of the sixty committees on the New York Central lines. Mr. Dow inspects the minutes of the division meetings on those lines and if he finds evidence of dullness he calls somebody to account.

The National Safety Council

G. S. Locker (D. & I. R.) read a paper on the National Safety Council; what service does it render to its members; what is it doing for the public? The speaker gave an outline of the constitution and activities of the Council and appealed to railroads to support it. Each week a bulletin is sent to its members and these help to instruct two and one-half million workmen. By this process good seed is scattered broadcast; and it is impossible to imagine the good results that will be seen in the future. Railroad men must not despise the bulletins dealing with affairs in other industries. The railroad shopman, reading of incidents and experiences on a farm, is quite likely to be broadened thereby. The Council is doing a real safety-first work in educating the public in regard to trespassing.

Mr. Locker was followed by W. H. Cameron, secretary of the Council, who told more in detail of its activities. He has an information bureau and a large library and attends

to many inquiries every month. Tons of pamphlets have been sent out. He can get an answer any day, to almost any question pertaining to the business or trade of the constituents of the Council. The dues of railroad companies for membership are graduated, according to length of line, from $10 for 100 miles to $100 for 10,000 miles. A road paying $100 receives twenty copies of each bulletin and these can be sent, if desired, to twenty different addresses.

Miscellaneous Business

Mr. Locker's paper was the last one on the program, and following its discussion there was an informal exchange of views on numerous topics. The difficulty of getting good men for workmen on the tracks or in other departments where skill is not required is now a serious question on many roads. Men who can get jobs quickly elsewhere cannot be disciplined easily. The businesslike way is to engage new men only on probation. Mr. Hale (A. T. & S. F.) described his scheme for instructing in safety habits, and in citizenship, the Mexican laborers employed on his lines in Arizona and New Mexico. He has visited every gang, even the smallest. One of his lectures has been put on a phonograph in pure Mexican language—not an Americanized Spanish—and this lecture, occupying ten minutes, has been delivered to all the Mexican workmen on 15,000 miles of line during the past year. At division terminals and other central points large audiences were gathered and they were entertained with Spanish music on the phonograph. In this way the sympathetic interest of the men was aroused in a manner otherwise impossible. The men are also treated to cigarettes.

Officers

The officers of the Steam Railroad Section of the Council for the ensuing year, elected at the close of the meeting, are as follows: Chairman, W. C. Wilson, claims attorney, Delaware, Lackawanna & Western, New York City; vice-chairman, Isaiah Hale (A. T. & S. F.); secretary, H. J. Bell (C. & N. W.), Chicago, Ill.

Exhibits

In connection with the congress there was a commercial safety device exhibit, in the Armory on Larned street, a few blocks from the hotel where the meetings were held. Among the concerns represented were the following of particular interest to railroad men:

Allen Mfg. Co., Hartford, Conn., safety set screw.
American Issue, The; Columbus, Ohio; anti-alcohol educational literature.
American Abrasive Metals Co., New York; safety stair-treads.
American Museum of Safety, New York.
Baltimore & Ohio Railroad; speed recorder used on passenger locomotives; models of freight cars fitted with safety appliances; derailer with blue target attached, for car repairers.
Chicago Eye Shield Co., Chicago, Ill.; goggles.
Commonwealth Steel Co., Granite City, Ill.
Detroit Fuse & Mfg. Co., Detroit, Mich.
Linemen Protector Co., Detroit, Mich.; insulated shoes; rubber shapes to cover cross arms and wires when men are working at the top of poles.
Macdonald, A. K., Hamilton, Ont.; night signal for highway crossing gates. This is a cage in which may be hung an ordinary hand lantern, and is arranged to show the light to persons on the highway and to hide it from enginemen on the tracks.
Madden Co., Chicago, Ill.; the Richter blue-flag derail.
National Safety Council, Steam Railroad Section; samples of safety bulletins recently issued.
New York Central Lines; extensive display of colored photographs.
Norfolk & Western Railroad; extensive display of photographs; illuminated diagram showing statistics of accidents; gage lamp.
Puro Sanitary Drinking Fountain Co., Haydenville, Mass.
Pyrene Mfg. Co., New York; fire fighting apparatus.
Strong, Kennard & Nutt Co., Cleveland, Ohio; goggles.
Surty Guard Co., Chicago; guard for band saw.
Walsh Press & Die Company, Chicago.
Window Cleaners' Improved Belts and Device Company, Chicago.

Growth of the Automobile Trade.—Statistics of the director of the census show an increase of 153.9 per cent in the manufactures of automobiles and automobile parts in the five years from 1909 to 1914. The value of these products in 1914 was $632,831,000, an increase of $383,629,000 over 1909.

WASHINGTON CORRESPONDENCE

Washington, D. C., October 24, 1916.

Transcontinental Rate Cases Reopened

The perennial controversy over the adjustment of transcontinental freight rates again demonstrated its staying qualities when the Interstate Commerce Commission on October 21 issued an order consolidating all the various transcontinental rate cases into one proceeding and reopening them for a series of further hearings before Examiner-Attorney Thurtell. This order reopens not only the recent decision increasing rates to the Pacific coast because of the abatement of water competition via the Panama Canal, but gives an opportunity for a reconsideration of the entire question of the relation of rates between the East and the Pacific coast terminals and between the East and the intermountain territory, which has been before the commission in one form or another for nearly a quarter of a century. In its order the commission says:

"It is therefore ordered, That fourth section applications Nos. 205, 342, 343, 344, 349, 350, 352 and 10336 respecting rates on commodities from eastern defined territories to Pacific coast terminal and intermediate points, and applications Nos. 9813, 10110, 10126, 10155, 10186 and 10189 respecting rates on barley, beans, canned goods, asphaltum, dried fruit and wine from California ports via rail and water through Galveston to Atlantic seaboard points be reopened for further hearing respecting changed conditions that are alleged to justify other and different orders than those entered.

"It is further ordered, That therewith fourth section applications Nos. 345, 346, 347, 348, 349 and 1575 filed by R. H. Countiss, agent, on behalf of carriers, parties to his tariffs, named in said applications, respecting rates on classes and commodities from Pacific coast points to territory east thereof, and Investigation and Suspension Docket No 909, and the rehearing of applications respecting rates on commodities from eastern defined territories to Pacific coast points and rates on barley, beans, canned goods, asphaltum, dried fruit and wine from California ports to Atlantic seaboard points be consolidated and assigned for hearing before Examiner-Attorney Thurtell at Chicago, Ill., on November 20, 1916, at Salt Lake City, Utah, November 28, 1916, at San Francisco, Cal., December 4, 1916, at Portland, Ore., December 11, 1916, and at Spokane, Wash., December 14, 1916."

The reopening of the cases is due to the questions that have been raised regarding the readjustment of the rates to meet the changed conditions with respect to water competition. After the commission's percentage zone system of rates to the intermountain territory had been sustained by the Supreme Court in 1914, and after the commission had allowed modifications of it with respect to commodities especially susceptible to water competition to meet the competition of the lines operating via the canal, the Merchants' Association of Spokane, Wash., filed a petition on March 17, 1916, asserting that on account of the slides in the canal and the increased demand for ships for conveyance of traffic between the United States and various European countries, the services by water between the Atlantic and Pacific coasts of the United States had in large part been discontinued. It was also asserted that the commission's orders of January 29 and April 30, 1915, granting in part the relief sought by the carriers, were based upon the then existing necessity for the maintenance of unusually low rates by rail from eastern territories to Pacific coast ports on account of the competition by water which no longer existed, and that the commission should reopen the case.

On June 5, 1916, the commission issued orders rescinding the special relief from the fourth section which it had previously allowed on Schedule C commodities to meet the competition by the canal and ordered the carriers to file new

tariffs effective September 1, relieving the discrimination against the intermediate points by readjusting their rates on the Schedule C commodities under the rules and restrictions which the commission had prescribed for Schedule B commodities and by readjusting the rates on barley, beans, canned good, asphaltum, dried fruit and wine from California ports to eastern seaboard points in conformity with the long and short haul clause of the fourth section. When the new tariffs were filed by the carriers effective on September 1 advancing the rates to the Pacific coast, they were met with a storm of protest from the shippers and were suspended by the commission until December 31, 1916. The order of the commission effective on September 1 was later postponed to become effective also on December 31.

On September 9 the Merchants' Association of Spokane filed a new petition alleging that there is not now and has not been since June 5, 1916, any water competition between the Atlantic and Pacific coasts and that there is now no justification for the maintenance of lower rates on any commodities from eastern territory to Pacific coast ports than to the intermediate points.

The order for a reconsideration of the case is, therefore, the direct result of this petition and marks the beginning of a new phase of the controversy regarding the extent to which the transcontinental carriers should be allowed to maintain rates which are lower for the longer than for the shorter hauls.

In 1892 the commission reduced rates from eastern points to Spokane practically to the basis of the terminal rates which were based on water competition. A later readjustment put Spokane back on its former basis of approximately the coast rates plus local back, and in 1901, in a proceeding instituted by the Business Men's League of St. Louis, the rates established by the carriers were substantially upheld. In 1907 Spokane renewed its complaint and in 1908 the commission rendered another decision reducing the rates to Spokane. This adjustment, however, was not satisfactory either to the shippers or the carriers and the commission allowed the carriers to submit a comprehensive plan of their own. In 1909 Salt Lake City filed a complaint against the adjustment by which its rates were higher than those to the coast and the entire system of transcontinental rates was brought into the controversy. In 1910 the long and short haul clause of the act was amended to give the commission authority to prescribe the extent to which the roads might depart from strict conformity with its provisions, and in 1911 the commission issued its decision authorizing higher rates to intermediate points than to the coast by various percentages from different zones. This decision was sustained by the United States Supreme Court on June 22, 1914.

After the opening of the Panama Canal the commission allowed still greater relief from the provisions of the fourth section on a special list of commodities.

Shreveport Controversy Renewed

The new tariff filed with the Interstate Commerce Commission by the Texas railways, advancing rates within the state of Texas in compliance with the commission's latest order in the Shreveport case, is no more popular with the Texas shippers than the rates made by the Texas railroad commission have been with the railroads of the state. The attorney general of Texas and representatives of the Texas Industrial Traffic League, the Texas Live Stock Shippers' Protective League, the American National Livestock Association, and a large number of commercial organizations of Texas appeared at a hearing before Commissioner Hall and the suspension board of the Interstate Commerce Commission at Washington on October 19 and 20 to ask the commission to suspend the new tariff, which applies to all classes and most of the commodities between points in the state of Texas as well as between Shreveport, La., and points in Texas. The shippers protested that the tariff is not in conformity with the order of the commission, that it contains many rates not authorized or required by the commission, and that as to the rates for intrastate traffic it is in violation of the tariffs prescribed by the Texas commission. The principal grievance seemed to be that the railroads, in removing the discrimination against Shreveport, had gone much further and taken advantage of the opportunity to advance many other rates in Texas. The same contentions are scheduled to be presented to the United States court at Marshall, Tex., on November 8 on the hearing on the application of the railroads for an injunction against an order of the Texas commission withdrawing advances in the Texas rates which it had allowed in an effort to forestall the Interstate Commerce Commission. The attorney general of Texas filed a cross bill in this proceeding asking the court to annul the Interstate Commerce Commission's order on the ground that it is an unwarranted interference with the prerogatives of the Texas commission.

The commission announced that the hearing on the application for a suspension would be confined to rates alleged to be in contravention of its order. The shippers constantly sought to broaden the issue, saying that among the most important of the matters involved is that the tariff involves a construction of the decision of the commission with respect to the jurisdiction which it would assume and the extent and limitations thereof which lie at the very foundation of the right of the carriers to prescribe the tariff at all and to absolve themselves from obedience to the Texas commission.

As an illustration of the mixed-up situation which has been created by the conflict of state and federal jurisdiction in this case, one of the shippers' representatives said he did not know whether he ought to make his complaint to the Texas commission or to the Interstate Commerce Commission. One of the principal arguments of the shippers as presented by S. H. Cowan, representing the Texas Industrial Traffic League, was that while the commission had ordered that the rates between Shreveport and Texas points should not exceed those contemporaneously applied for all distances over points in Texas, this did not require the carriers to prescribe any specific rates between points in the state of Texas, and that by basing their rates on the maximum rates prescribed by the commission the railroads had gone far beyond any requirement of the order and that they could have removed discriminations against Shreveport without advancing the rates as much as they have. It was also claimed that the new tariff had created many more discriminations against Texas points and Judge Cowan argued that as the railroads had not legally contested the Texas rates they were not at liberty to fix their own rates as a substitute.

There was also much objection to the manner in which the railroads had applied the differentials which are added to the rates of the mileage scale. It was stated that whereas under the rules of the Texas commission the differentials on Texas traffic were available only after the maximum mileage distance had been traversed, whether in common point territory or in differential territory, in the new tariff it is provided that the differentials shall be applied for the entire distance traversed by a shipment in differential territory regardless of whether the maximum distance prescribed in the mileage schedules had been traversed or whether or not the entire haul or a part of the haul was in differential territory. This resulted, it was claimed, in much higher rates between points in Texas than those prescribed to and from Shreveport.

G. Waldo, assistant general freight agent of the Sunset-Central lines, and A. C. Fonda, agent for the Texas carriers, testified in defense of the new tariff. Mr. Waldo said that the carriers had applied the differentials in the way that they understood the order required and that if they had not done so the rates would have been reduced instead of advanced. He said the carriers had not taken advantage of the opportunity to advance as many rates as possible, that in many instances they had gone far below the maximum

rates allowed by the commission and below what they considered as reasonable. Both he and Mr. Fonda explained that the tariff had been compiled in a short time and that although many exceptions had been made to the Western Classification it was recognized that it would be necessary to make many more, and that as soon as opportunity offered it was proposed to confer with the shippers and to make additional adjustments necessary to meet commercial conditions and that some inconsistencies or errors in the tariff would be corrected. In reply to questions by shippers as to whether certain advances were necessary to avoid discrimination against Shreveport, it was stated that some of the rates were so absurdly low that the carriers had felt justified in taking advantage of any opportunity to advance them. The roads are now making some additional advances from Oklahoma and Arkansas points because the cause of the low rates had been removed. The shippers also complained of many violations of the fourth section and many discriminations as to which Mr. Fonda said they had misinterpreted the tariff.

The Texas Railroad Commission was not represented at the hearing.

The attorney general of Texas has also filed a suit in a state court against 34 roads that were not parties to the injunction proceedings against the Texas commission, asking for an injunction to restrain them from putting into effect the tariff filed with the Interstate Commerce Commission. The injunction was asked on the ground that the roads had agreed upon the rates in violation of the anti-trust law and that they were in violation of the Texas commission's orders.

Shippers Favor Operation of Water Lines by Railroads

The New York, New Haven & Hartford has filed a brief of 166 pages with the Interstate Commerce Commission on its application under the Panama canal act for permission by the commission to continue the ownership and operation of its steamship lines on Long Island Sound. The number of briefs that have also been filed by representatives of the shippers in support of the New Haven's application indicates that they are not quite so much in sympathy with the idea of compelling railroads to give up their water lines as was supposed at the time of the passage of this law. The Boston and Providence chambers of commerce, 84 large manufacturing concerns in New England, 33 New England paper mills and a large number of boards of trade and other commercial organizations have submitted briefs supporting the contention that the continued operation of the New Haven's water lines in connection with its rail system is in the interest of the public and would not prevent or exclude competition. The manufacturers in their briefs say that "while they have differed bitterly on other questions, they are practically a unit in favor of the road's retention of the sound lines and the practically unanimous voice of New England shippers protests against the disjointing of a satisfactory service."

The Boston Chamber of Commerce says that a separation of the rail and water lines would probably result in congestion of the rail lines, that it would not result in any reduction of through rates and that the water routes constitute additional facilities, whose operation by the railroad is in the interest of the shippers of New England. The Providence Chamber of Commerce points out that the water lines are not in competition with the rail lines, but constitute an extension of the rail lines, which handle a different kind of traffic, and that they would carry less traffic if separated from the railway lines than if continued in connection with the railway system. The New Haven in its brief says that its contention that the service is in the interest of the public is supported by the testimony of the public service commissions of Massachusetts, Connecticut, Rhode Island and New Hampshire and by resolutions or petitions filed in the record of the case by 100 business and civic organizations and about 120 shippers and representatives of the manufacturing industries in the territory served.

Shippers used to be rather fond of complaining because the railroads had neutralized water competition by acquiring competitive boat lines. Even after the rates of the railways had been subjected to the most rigid regulation by commissions, the idea that they ought to be still further regulated by water competition wherever possible persisted to such an extent that in the Panama canal act of 1912 railroads were prohibited from owning competitive water lines except as authorized by the Interstate Commerce Commission. In accordance with its construction of that act, the commission ordered the railroads to get rid of their boat lines on the Great Lakes. When they did so, and when many of the boats instead of being promptly taken over by independent companies, were taken out of the lakes for service elsewhere, some of the shippers who had formerly protested loudly against the high rates charged by the boat lines would have been glad to have the service restored at almost any rates and many of them protested to the Interstate Commerce Commission against its decision.

Another example of this change in the attitude of the shippers was furnished at a recent hearing before the commission on the application of the Grand Trunk for a modification of the commission's order as to its operation of the Canada-Atlantic Transit Company, when the shippers were almost unanimous in supporting the road in its showing that a continuance of the ownership and operation would be for the convenience of the shipping public.

Railway Mail Pay

The Interstate Commerce Commission has acquiesced in the interpretation placed by the postmaster general on the provisions of the post office appropriation law authorizing him to make a test of the space basis of compensating the railways for carrying the mails. Under this interpretation the postmaster general proposes to begin his test on November 1 and later on, probably next spring, after he has readjusted the service, he will have a weighing of the mails and present statistics to the commission as the basis for its determination as to the rates to be paid for the service and the basis for payment. The commission, without giving any explanation of its reasons, has denied the petition of the Committee on Railway Mail Pay that the commission issue orders prescribing the conditions under which the test of the space basis shall be conducted in advance of its installation. The railroads asked the commission to prescribe the period of the test and also to require a weighing of the mails both before and during the test as well as the keeping of comparative statistics. The commission also denied the petition of the New York, New Haven & Hartford for an order requiring a weighing of the mails on its system before the test. The space basis will, therefore, go into effect on November 1 on all railway mail routes except those on which closed pouch service is performed, together with many changes in the service including a consolidation of the mails in many cases in order to reduce the amount of car space required and a redistribution of the mails between the roads. Railroads that carry the heaviest volume of mails will find their compensation reduced by the change from the weight to the space basis, while some roads that now carry a small amount of mail on many trains will probably receive an increase by being paid on the space basis. They will not profit, however, by any increment in the mail traffic which does not require an increase in the car space. After the test has been in progress for some time the postmaster general is to file with the commission a statement showing in detail the service required of the railways and a comprehensive plan for the transportation of the mails, embodying therein what he believes to be reasonable rates of compensation. The commis-

sion will then hold hearings and render its decision, the rates which it prescribes to be retroactive to the date of the experimental adoption of the space plan.

An Effort to Deliver the Labor Vote

The "non-partisan" American Federation of Labor has issued an official appeal to its membership in behalf of President Wilson's re-election, based principally on what he has done for organized labor. The circular letter is signed by President Samuel Gompers, Vice-President O'Connell and Secretary Frank Morrison as the federation's Labor Representation Committee, and urges all affiliated unions to consider the issues involved in the present political campaign at regular or special meetings of their organizations. In order to preserve its non-partisan character, the letter closes with a recommendation to members to vote as their consciences direct, but in case any of the consciences appealed to require any assistance, full directions are enclosed.

The letter says that "on November 7 a decision will be reached that will determine the future development of our country and the spirit of our national life for years to come" and that "during the present administration the organized labor movement has been able to secure recognition for the rights of human beings and opportunity for all to participate in the affairs of the nation in a degree that never has been accomplished before." Possibly as a sample of this participation in the affairs of the nation, although full credit is modestly given to the administration, it is stated that "due to the initiative of President Wilson the Congress extended the United States eight-hour law to include the workmen engaged in the operation of railroad train service of the country and a great national strike was thus averted."

I. C. C. INSPECTORS INVESTIGATE CAR SHORTAGE IN NEBRASKA

The Interstate Commerce Commission on October 21 announced that "in its endeavor to assist in relieving the present general car shortage situation, the commission has its safety appliance and boiler inspectors engaged in making investigations in respect thereto." At the same time the commission made public the report, dated October 13, of two inspectors assigned to investigate complaints brought to the attention of the commission by the Nebraska State Railroad Commission regarding conditions in that state. They had found in the files of the Nebraska commission a large amount of correspondence containing complaints from shippers alleging gross discrimination in the furnishing of cars, refusal to permit the loading of cars at points where they were made empty, a large movement of empty cars out of the state westward and furnishing shippers in other states with an excessive proportion of cars at the expense of Nebraska's grain industry.

The inspectors conducted a thorough investigation on the lines of the Union Pacific and Chicago, Burlington & Quincy, the two principal grain-carrying roads of the state, conferring with grain exchange men, shippers, railroad officers and station agents at the principal points in the state, but their report does not sustain the charges of discrimination against Nebraska. On the contrary, they say that "the carriers of Nebraska are putting forth every effort consistent with good operation and the exceptional traffic conditions to furnish cars and service to the shippers of the state as best they can," that the railroads are furnishing "all the cars they possibly can to supply the unprecedented demand," and that "if it was possible to furnish more equipment the business would and could not be handled as satisfactorily as it is at present."

The report shows that on the Union Pacific in July the average movement of system line cars was 50.8 miles per day and of all freight equipment handled 71.2 miles, while in August the averages were 59.9 and 77.5 miles, respectively. Regarding the complaint that the road is furnishing an excessive number of cars to its western lines, the report says that conditions do not show this to be a fact. It is also stated that on the Union Pacific, with the exception of the movement of empty refrigerator cars westward to be loaded, practically all empty car mileage is local and only for the purpose of equitably distributing grain cars between the different districts.

Less complete data was obtained on the Burlington, but its situation is said to be fully as good as that of the Union Pacific. On the Union Pacific it was found that a balance equal to 24 per cent of its box car equipment was due the Union Pacific on October 9 from other lines, a large part of the cars being scattered on 30 different lines east of the Missouri river, while the Burlington was short 5,000 cars on its system. Only 3.19 per cent of the Union Pacific cars were defective or in the shops and the report says that the mechanical officers of both lines are making especial efforts to keep their grain cars in service. It also says that "it is generally conceded that railroads steal cars from each other whenever and wherever they can" and that this has considerable bearing on the car shortage situation.

The report says that with a view to relieving the car shortage situation the Union Pacific equipped 114 gondola side and bottom dump cars with temporary roofs and loading doors for grain service in Nebraska, but that the elevator companies in Omaha and Council Bluffs promptly levied an arbitrary charge of $10 per car on the shippers for handling this type of cars and in some cases refused to handle them. The report says that there are approximately 300 blocked elevators in the state and that there is no immediate prospect of release. In fact, everything points to a greater shortage in the latter part of October and November when there will be a greater demand for coal and when the new crop of grain will be ready for movement.

An unusual feature contributing to the present heavy volume of traffic and having considerable effect on the car shortage is said to be the large eastbound movement of all products of the West and Northwest and that due to the inability to get shipments on the Pacific Coast. A great amount of business which under normal conditions always moves by rail and water is now being shipped by rail to eastern markets. There is also an exceptional stock movement at this time, particularly of range cattle, in advance of the regular fall movement, thereby adding to the heavy volume of business.

"Another feature contributing to the present car shortage," the report says, "is the large number of cars of all classes used for warehouse purposes by paying the demurrage charge. This includes all commodities, but particularly automobiles and contractors' and builders' materials and supplies. Recent instances are 25 cars of automobiles in Denver 15 to 35 days and 27 cars of automobiles at Green River, Wyo., 30 days. Lack of labor is particularly responsible for this condition. However, various other reasons exist for the warehousing of automobiles, principally lack of storage room and the time consumed by dealers in effecting financial arrangements that will enable them to get the bills of lading from the bank."

The report also refers to the large increase in the wheat crop as compared with 1915 and says that on account of weather and market conditions, as well as the grade of the crop, approximately 20 per cent only of the 1915 crop was moved prior to December 1, whereas this year on account of the exceptionally high grade of the 1916 crop and the high prices prevailing the farmers and grain men of Nebraska are endeavoring to move 100 per cent of the crop in one volume, regardless of the fact that their terminal facilities and elevator capacity are pretty well up to the limit of operation at this time.

"Nebraska railways at present have practically all the

business they could handle," the report says; "they are moving more tonnage per car per day than ever before, and it is the consensus of opinion of all concerned that if the inbound business was greater it would cause such a congestion at the grain terminals as to likely require an embargo on cereals and other farm commodities.

"If the present prosperity era continues, if the grain market holds up and conditions remain unchanged, the car shortage will become more acute as the weather gets colder and there is greater demand for coal. At present the coal supply is a serious question for Nebraska railroads. The amount on hand is below normal and the carriers are confiscating commercial coal. Weather conditions up to the present have been ideal for railroad train operation in the interest of all concerned; the carriers have been getting an exceptional mileage out of their locomotives, these having been in first class condition when they started to move the crops. That this high mileage cannot be maintained is admitted by carriers, because work must be done on the locomotives and with the advance of cold weather their efficiency is impaired.

"Special men have been detailed and have devoted their entire time to every feature of the car question, including the prompt movement of all cars and quick repairs to defective cars, in order to get the maximum mileage out of the equipment. Assuming that the Nebraska carriers had their full quota of freight car equipment on their own lines or equipment sufficient to supply the demand for grain cars alone, 48 hours' time would congest their grain terminals, completely blocking them and requiring an embargo.

"The cause of the car shortage in Nebraska is not by any means attributable to any single reason. Some of the contributing factors may be stated as follows: heavy volume of freight traffic in all commodities; unusual volume of Pacific Coast eastbound business, due to scarcity of ships on west coast; shortage of equipment, due to large number of cars being on foreign lines; limited grain terminal facilities; unusual high market prices for hay, grain, live stock and all other commodities; large volume of Nebraska grain moving east for export and receiving lines failing to furnish cars for their own haul; warehousing of all commodities in all types of cars; immense increase in the output of all branches of industry, as well as agricultural, without corresponding increase in equipment and facilities for handling it; all industries experiencing an abnormal increase in business without increasing their capacity, and in the majority of cases this naturally has forced the storage to be handled somewhere and somehow, eventually falling to the railroad equipment."

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS

A report of the first day's proceedings of the annual convention of the American Association of Passenger Traffic Officers held at Washington, D. C., on October 17 and 18, was published in last week's issue. Additional committee reports were presented and discussed on the following day.

The committee on economies in the operation of city ticket offices and in passenger service, S. G. Warner, general passenger agent, Kansas City Southern, chairman, submitted a report showing the progress being made in the direction of centralization of city ticket offices in many cities and recommending an extension of the work in this direction. The committee was continued with instructions to continue its investigation and its recommendations will be referred to the territorial associations.

The recommendation of the executive committee for the experimental adoption of a telegraphic cipher code for ordering Pullman accommodations was approved in a resolution instructing the secretary to obtain copies of the code to be sent to each general passenger agent. The latter will notify the secretary how many copies they desire and at what stations they will be used in order that the secretary may place the order and advise each line at what stations the new code will be in effect. Symbols indicating the stations at which the code will be effective will also be published in the Official Guide.

The committee on revision of joint tariffs, J. P. Anderson, general passenger agent, Pennsylvania Railroad, chairman, presented a report including a number of recommendations for the simplification of passenger tariffs and the reduction of their cost. The committee was instructed to continue its investigations with a view to making recommendations to the territorial associations.

The association adopted and referred to the territorial associations the following recommendation of the conference committee regarding the operation of and charges for dining cars:

"That effective January 1, 1917, the minimum charge for supplying and operating each standard dining car, cafe coach or meal car of any description, for one meal, whether such car be moved in special service or on a regular train, provided it be furnished for the exclusive use of any party, shall be $75; this amount, which represents the cost of labor, supplies and equipment, including linen, to be guaranteed before services are rendered. For each meal served in addition to the initial meal, in each standard dining car, cafe coach or meal car of any description, whether such car be moved in special service or on a regular train, provided it be furnished for the exclusive use of any party, a minimum charge of $50 will be made; with a minimum charge of $75 for each day of 24 hours or fraction thereof after the first 24 hours the car is in service, whether meals are served or not; this charge also to be guaranteed before services are rendered. The same guarantee and minimum to apply to meal stations. The above minimum charges to be exclusive of wines, liquors, mineral waters and tobacco."

The recommendation of the conference committee was also adopted providing that in all cases where a fare is to be divided on a pro-rata per rate basis the factors employed in connection therewith be stated.

The question as to whether the association shall adopt as standard the vertical or horizontal forms of the association multi-route tickets was referred to the standing ticket committee.

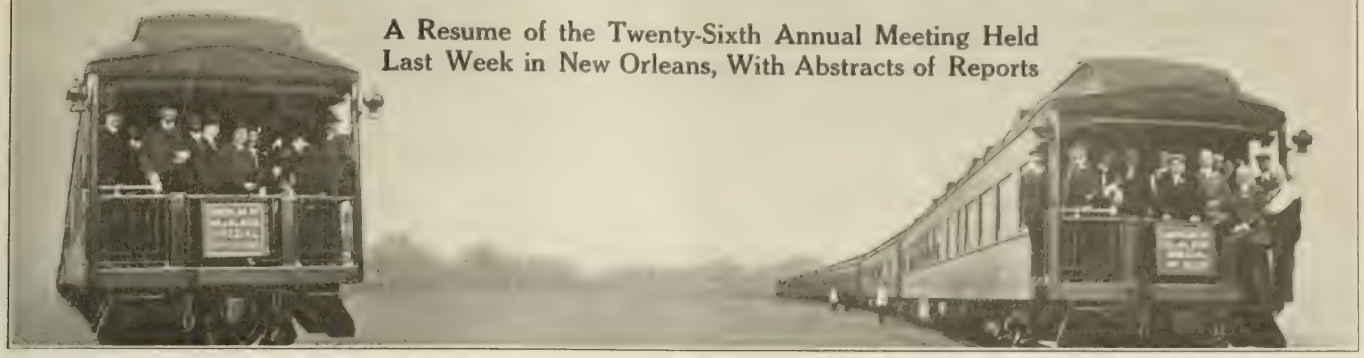
An amendment to the by-laws was adopted providing for the creation of a standing territorial committee; "to be composed of the chairman or other administrative officer of each territorial passenger association, together with three members from each local passenger association territory, and three members representing navigation lines, whose duty it shall be to present the recommendations of this association to their respective territorial associations, urge final and decisive action thereon, and report the result to the secretary of this association. The president of this association shall act as chairman when such committees meet in joint conference, and as such he may, on his own initiative or at the request of any territorial association, call such joint meetings of the standing territorial committees for the consideration of matters of interterritorial interest."

An amendment was also adopted providing for the appointment of a docket committee of three members whose duty it shall be to prepare a docket of subjects to include all subjects proposed by members for consideration at meetings of the association.

The election of officers was announced in last week's issue. The following were appointed members of the executive committee: J. W. Daly, passenger traffic manager of the New York Central; Gerrit Fort, passenger traffic manager of the Union Pacific; C. F. Bielman, passenger traffic manager of the White Star Line, and R. H. Wallace, general passenger agent of the Erie.

Bridge and Building Association Convention

A Resume of the Twenty-Sixth Annual Meeting Held Last Week in New Orleans, With Abstracts of Reports



THE twenty-sixth annual convention of the American Railway Bridge and Building Association was held at the Grunewald Hotel, New Orleans, La., October 17 to 19. It was one of the largest in point of attendance in the history of the association, over 160 members registering. With members of their families and supply men, the total attendance exceeded 375. A feature contributing to the large attendance was the operation of a special train of 11 cars from Chicago to New Orleans by the Illinois Central and the Yazoo & Mississippi Valley.

The officers for the past year were: President, Geo. W. Rear, general bridge inspector, Southern Pacific, San Francisco, Cal.; first vice president, C. E. Smith, consulting engineer, St. Louis, Mo.; second vice president, E. B. Ashby, chief engineer, Lehigh Valley, New York City; third vice president, S. C. Tanner, master carpenter, Baltimore & Ohio, Baltimore, Md.; fourth vice president, Lee Jutton, division engineer, Chicago & North Western, Madison, Wis.; secretary-treasurer, C. A. Lichty, purchasing department, Chicago & North Western, Chicago, Ill.

The convention was called to order by President Rear at 10 o'clock Tuesday morning and was opened with prayer by C. A. Lichty. In the absence of Mayor Behman, City Commissioner Newman welcomed the Association to the city on behalf of the public, while L. A. Downs, general superintendent of the Illinois Central at New Orleans, welcomed it on behalf of the railways.

In his annual address, President Rear referred to the great development which has taken place in bridge work during the quarter century the association has existed. He also referred to the growing chasm between the railways and some of their organized employees and to the contrast between the attitudes of these men and the employees of the bridge and building department.

The report of the secretary-treasurer showed a balance of $1,403.47 in the treasury. During the past year 58 new members were received.

A—INTAKES AND INTAKE LINES

The purpose of an intake is to provide an uninterrupted supply of water to the pumps. Also, if properly designed and constructed, it should prevent debris or rubbish carried by the water from entering the intake or the suction pipe and interfering with the operation of the pumps.

Where the bed of the stream and the bed load is composed of coarse sand and gravel with but little silt or mud a fine strainer such as a well screen may be buried in the stream with good results. Where silt, mud and fine sand are carried in the water it is necessary to provide the well or sump with two or more compartments where the water may be brought to rest and the heavy matter allowed to settle.

Where the water is clear and there is but little debris a foot valve with a strainer will answer the purpose, always providing the foot valve is readily accessible and of ample area. The straining area of a foot valve should be at least three times the displacement of the pump and preferably more, as with insufficient straining area the velocity of the water through the strainer is increased, and the debris accumulates more rapidly.

Where no foot valve is used the end of the suction pipe is sometimes plugged and perforated for several feet, thus forming a strainer. This method permits turning the pressure back from the tank where a by-pass is provided and flushing out the strainer. This is not desirable, however, where there is much foreign matter in the water, as it interrupts the operation of the pumps and wastes a great deal of water.

Where the water is taken direct from the source of supply without any intake sump the "twin" or "multiple" strainer is undoubtedly more effective than any other type. As the name would imply, these strainers consist of two or more compartments, any one of which may be cut out of service and cleaned without shutting down the pump.

Suction Lines

While in common practice a suction lift of 24 to 26 ft. is sometimes possible, a pump should rarely be placed more than 20 ft. above the lowest water and wherever practical just as close to the water as possible. Suction pipes should be made as short and direct as possible, avoiding all unnecessary bends or elbows. The size of the suction pipe will be controlled to a large extent by the permissible loss of suction head. If the suction line is of any considerable length it will be necessary to increase the size of the pipe to cut down the velocity and reduce the friction loss. In any event a suction line longer than 50 ft. or with more than two elbows should be at least one size larger than called for by the maximum delivery of the pump. Long suction lines and those with high lifts should be provided with vacuum chambers to take up the irregularities of flow due to the action of the pump.

B—FUELS FOR INTERNAL COMBUSTION ENGINES

The intent is to discuss only the oil fuels, particularly the heavy petroleum oils.

Three distinct grades of engine-burning oil have been developed from the crude, which are designated as light, medium and heavy distillates. The light distillates are suitable for the gasoline engine and may be burned readily through a carbureter or mixing valve. Kerosene and distillates of 39 deg. Baume and over with a flash point of 230 deg. and under, and a burning point of 280 deg. and under may be burned readily in a gasoline engine equipped with a generator for preheating the oil before it enters the cylinder. The remaining distillates of 26 deg. Baume and over may be burned readily in the hot bulb type of oil engine.

The specific gravity is of minor importance, but a certain limit of low specific gravity is necessary to get the oil through the spray and lift pumps.

The main points in purchasing fuel oil for internal combustion engines are as follows: There should be only a trace of earthy matter, such as dirt, etc., in the oil, and not more than one per cent of water. Of coke residue there should not be more than a trace, as any appreciable amount will cause trouble in the plugging of the cylinders. There should not be more than a trace of free carbon in the oil. The sulphur content should not be more than 0.8 per cent, as a greater proportion may attack the cylinder walls and tend to cause pitting. The oil should contain no free ammonia, alkalies or mineral acids because of their pitting effect on the surfaces exposed to combustion. The oil should not contain more than 0.05 per cent of non-combustible mineral matter. A paraffin content of more than 15 per cent may cause trouble as a large quantity of oxygen is necessary for complete combustion. The oil should contain not less than 10 per cent of hydrogen and should have a heating value of about 18,000 B. t. u. per pound. The tar content should not exceed 0.4 per cent. Oil containing creosote will cause incomplete combustion and gives trouble by coking.

An intelligent study of the oil engine is essential to proper operation, regardless of the oil used, and with this end in view the following discussion is given. In order to utilize the existing equipment many of the gasoline engines now in service have been converted to kerosene and distillate engines by the addition of attachments for pre-heating the oil to (or near) the flashing point before it enters the cylinder. These attachments consist of generators or mixing chambers wherein the oil is heated by the exhaust of the engine. They are made in various sizes and types, both for throttling and for hit-and-miss governors. With these attachments the engine is generally started on gasoline and is allowed to run on this fuel until the cylinder and generator are heated when the oil is cut in. On other types a retort is provided where the oil is converted into a vapor or gas by heating the retort with a blow torch. Either method requires from five to ten minutes to start an engine running on oil. Electric ignition is used as with gasoline engines. Very little carbon trouble is experienced with the use of these attachments and the lubrication required is about the same as with a gasoline engine.

The heavy oil engine is a comparatively recent development and is being extensively used in railway water stations, as well as for other service. The most popular engine of this type is the two-cycle oil engine constructed in units of 50 hp. and under using heavy oil as fuel. This type of engine is very often confused with high compression engines operating on the Diesel principle or with the converted gasoline engines using kerosene and distillates through a carburetor or mixing valve.

Though the oil engine can not yet be considered as fully developed, it has passed the experimental stage, and while it is perhaps not as reliable under all conditions as a steam engine or pump, much of the prejudice against it is undoubtedly due to lack of experience in handling. With the present imperfect knowledge of what the engine is capable of doing and of which particular oils may be burned in it, one can not speak conclusively, but there is no doubt that the future of the engine is assured.

Committee:—C. R. Knowles (I. C.), C. A. Lichty (C. & N. W.), J. Dupree (C. T. H. & S. E.), and J. J. Murphy (S. P.).

Discussion.

That part of the report relative to suction lines created a large amount of discussion, different members relating their experiences in overcoming troubles. A. Montzheimer (E. J. & E.) stated that he has secured the best results when he has lowered the pump to within 2 or 3 ft. of the surface of the water. In some instances he has permitted the water to flow directly into the pump. C. R. Knowles (I. C.) stated that this is especially true with a worn pump. It is also more economical in maintenance and in cost of operation while it will deliver more water as the suction head is decreased. G. W. Rear (S. P.) called attention to the fact that as the length of suction line and the lift are decreased, the troubles from leakage, etc., diminish.

W. M. Clark (B. & O.) emphasized the necessity of individual study and design for each local water station, and described several installations which were entirely unsuited to conditions other than those for which they were designed.

In discussing the report on fuels for internal combustion engines, C. R. Knowles stated that conditions are changing so rapidly with reference to the oil supply that data which may be entirely correct today, will probably be out of date tomorrow.

RAILROAD SHOP, ENGINE HOUSE AND FREIGHT HOUSE FLOORS

Engine Houses

Plank floors were formerly in common use but since timber has become scarce and the cheaper grades are of such poor quality it is not considered economical to use all-plank floors for the less important houses. In the middle western territory hard maple, which may yet be secured at a reasonable figure, is the best available material for a plank floor, but where a considerable amount of water is used for washing out engines, etc., the planking is liable to curl up or swell which is decidedly objectionable. Unless the planks are less than 3 or 4 in. in thickness the floors are easily damaged and require frequent repairs.

Cinders are most universally used and make a good floor for small outlying enginehouses owing to their low cost and cheap maintenance. Such floors should be well crowned and kept well rolled and tamped as they are liable to be carried away by the water released when washing out engines. An improvement over the ordinary cinder floor is to place upon a cinder bed a coating of about 5 in. of limestone screenings tamped to a smooth surface. An ordinary cinder floor costs about $0.50 per sq. yd., while one with the top of screenings costs about $0.75 per sq. yd.

Where the first cost is limited and engines are housed mainly for protection from the weather, an economical floor can be constructed of wooden blocks sawed from second hand pine or fir bridge timbers, such as ties, stringers, etc., and laid on end on a cinder cushion. Such floors are of low first cost and are easily kept in repair. Floors of this description are still in fairly good condition after 15 or 16 years of service with no repairs. The blocks should be of a uniform depth but the other dimensions may vary. Round cedar blocks have not proven satisfactory. The cost of wooden block floors as above described ranges from about $0.90 to $1.00 per sq. yd.

Concrete has been used quite extensively with varying success. A very acceptable floor is built with 6 in. of concrete with a 1 in. neat cement finish. This does not require the use of hardeners or water-proofing materials. The concrete is stopped a sufficient distance from the edge of the engine pit to admit placing a jacking plank and to permit access to the wall plates and rail plates when it becomes necessary to remove them.

Vitrified brick laid flat on a well-tamped gravel or puddled sand foundation 5 or 6 in. thick and with sand-filled joints can be laid at a cost of about $1.25 per sq. yd. Clay, loam and other such materials can be used for filling. The committee is of the opinion that a brick floor, laid on a concrete foundation, and costing $2 to $2.25 or more per sq. yd. is not to be recommended because of the cost.

Creosoted wood blocks, with the grain vertical, laid on a

2-in. sand cushion on a well-puddled and rolled gravel bed with a 4-in. crown at the center between tracks have been extensively used and have given good satisfaction. Hot sand should be used to fill the joints. The blocks may vary from 4 in. by 3 in. to 4 in. by 6 in. in size. The depth of the blocks should be uniform and from 4 in. to 8 in., the greater depths naturally holding better surface. This type of floor costs from $1.25 to $2.50 per sq. yd., depending on the thickness and local conditions. The same kind of floor laid on a 6 in. concrete foundation with asphalt filler will cost about $3.25 per sq. yd. This is an ideal engine house floor, as it is not so liable to damage as one constructed of harder materials when subject to falling objects, and it is almost impervious to water.

An asphalt mastic top 1½ in. to 2 in. thick on a concrete base has been in use for some time and as far as the committee has been able to learn has given very good results. Such a floor can be built for about the same cost as creosoted blocks on a concrete base as above described.

Machine and Boiler Shops

The materials commonly used for floors in machine and boiler shops, listed in the order of their longest use are plank, concrete, brick, creosoted blocks and mastic. The price of all of these floors runs about the same as in engine houses except that a concrete floor should be laid heavier to jack on, and should be not less than 5 in. and preferably 7 in. thick and laid on a slag or gravel foundation with a 1 in. float. The type of floor will cost about $2.50 per sq. yd.

Asphalt mastic on a concrete base is an ideal shop or engine room floor. In this case the concrete should not be less than 5 in. thick with a slip of felt saturated in asphalt next to the concrete. The asphalt mastic should be from 1½-in. to 2-in. thick, and it should be as hard as possible on account of the grease that is liable to drop on it in such buildings.

Some of the committee are of the opinion that a creosoted wood block, with the blocks 4 in. thick and with an asphalt filler on a concrete foundation, practically the same as recommended for enginehouses, is a good floor and can be used in machine or boiler shops. The blocks should be rectangular in shape, of uniform length and free from any irregularities so as to prevent unevenness, as the floor wears under constant heavy use. The committee has recommended asphalt filler entirely instead of other tar products as the others soften under different degrees of temperature.

Warehouse and Trucking Floors

The committee has knowledge of an untreated wooden floor, made of 2 in. D. & M. maple laid on 3 in. pine subplanking on sand or gravel filling that has been in use under heavy trucking for 19 years and is still good. This floor was subject to heavy freight trucking.

For certain classes of floors a concrete surface is good as it costs $0.80 to $1 per sq. yd. less than a floor with a mastic top. However, there are several objections to this class of floor for trucking purposes including dampness, dusting, and slipping on account of frost or other substances. They are also objected to by truckers, as they are cold to the feet.

It is the opinion of the committee that the best trucking floor is made with a concrete base and an asphalt mastic surface from 1½ in. to 2 in. thick; this mastic to be well troweled but not hard enough to destroy its elasticity. Particular care should be exercised in getting mastic of the consistency to withstand various changes in temperature. In the south the floors can be made very much harder than in the north. The mastic should not be so soft as to flow when subjected to the trucking load.

When these floors are properly laid the small creases which will occur on account of jams from barrels, etc., will gradually iron out to a smooth surface in the regular course of trucking over the indentations. Such a floor costs approximately $2.50 to $3.50 per sq. yd.

A wood floor is being put on the market so constructed that the wearing surface is on the ends of a 1½-in. by 3½-in. block 2 in. in depth dovetailed onto a base of either 1-in. or 2-in. plank. This floor can be laid the same as other plank floors with the wearing surface on the ends of the blocks.

Committee:—D. Rounseville (C. & N. W.), J. S. Robinson (C. & N. W.), G. A. Mitchell (G. T.), and R. M. Bowman, (L. E. & W.).

Discussion

E. C. Morrison (S. P.) described a mastic top on a concrete foundation in six freight houses 800 ft. long by 60 ft. wide in San Francisco. While this type of floor costs 15 per cent more than wood, it has required no repairs in the two years it has been in service. W. M. Clark (B. & O.) advocated the use of creosoted wood blocks on a concrete base with a ½ in. sand cushion, having secured favorable service from this form of construction. He reported difficulty with maple floors rotting from below because of poor ventilation.

J. B. Sheldon (N. Y., N. H. & H.) reported difficulty with concrete floors disintegrating in freight house service. C. H. Fake (M. R. & B. T.) has found that concrete floors will give good satisfaction in small freight houses where there is little trucking, but that they are not so satisfactory at larger stations. L. D. Hadwen (C. M. & St. P.) stated that concrete floors have been used in a number of freight houses on his road without trouble.

J. Gratto (S. P.) placed an asphalt macadam top on an untreated plank deck on a wharf at San Pedro, California, about 12 years ago. This wharf is subjected to heavy cart trucking and a timber floor lasted only a short time. The asphalt top was applied at a cost of 9½c. per sq. ft. and has given such good satisfaction that it is planned to add it on a large amount of other wharves.

METHODS OF DRIVING PILES

Track pile drivers are of two general types: turntable drivers and boom drivers. In some locomotive crane drivers these features are combined. Turntable drivers are in more common use but the boom driver has a number of advantages.

In the early days of railroad pile driving, drivers were frequently built in company shops. Today, there is less of this and machines are more commonly purchased from manufacturers. In general they are of standard all-steel construction and are equipped with air pump and brakes for operation separately or as part of a train. They are self propelled, power being supplied from the engines through shaft and gear connections to the car wheels. They can run at speeds of from 8 to 25 miles an hour and some can haul several cars. The turntable is turned or shifted and the leads raised and lowered by steam power under the control of the engineer. The leads may be battered in two or three directions, usually by hand operated mechanism, and either a steam or a drop hammer may be used in them. Idlers are required at one end when moving these cars in trains.

Some drivers have a very long reach. One that will reach a second bent ahead is a great aid in emergency driving after a fire or washout. A wide side reach is valuable on three and four-track lines and for such use those drivers which have little overhang at the rear are advantageous.

The ability to operate the turntable mechanism and raise and lower the leads by hand as well as by power is a feature of some machines. A boom supported at the foot of the leads when raised, or on the hammer, is a handy contrivance for lifting bridge timbers, and electric lights for night driving are desirable. These have been applied by the Union Pacific to one of their drivers.

Steam hammers are in use and are recommended for cer-

tain classes of work on 31 of the 52 lines answering the committee's inquiry. A decided preference is shown for medium weight steam hammers. In general, railroads are using hammers weighing from 2,800 lb. to 3,500 lb. although seven of the roads reporting to the committee are using heavier hammers for some of their work, mention being made in one case of a hammer weighing 4,500 lb.

Practice in regard to the assignment of drivers to divisions or to the whole line is not uniform. For the most part, drivers are assigned to the whole line although on some of the larger roads a driver is assigned to each division but is moved to nearby divisions if there is occasion for it. In addition to the division drivers, there are sometimes additional drivers which are assigned to the whole line and used where there is a large amount of work, or on construction jobs.

Where drivers are assigned to divisions the pile driver crew is more or less permanent, but where assigned to the whole line the more common method is for the engineer only to accompany the driver. It is claimed by some that better driving results from this arrangement—presumably local pride has an effect. On the Illinois Central, where the whole line drivers are used largely as erection cars, and on some other lines, crews are regularly assigned with the drivers.

Pile driver crews vary in size from 6 to 15 men, the average being 10 men. This does not include a night watchman. The average number of men on roads using drop hammers only is 10½ and on roads which use both steam and drop hammers, 9½. Where there is a large amount of driving to do or especial need for fast work, a separate gang for framing is usually provided and some roads always provide them, but generally the same crew drives and frames a bridge.

Records showing the total penetration are quite generally kept. Blank forms on which a variety of information is shown are used on many lines.

The water jet is in successful use under proper conditions on about 50 per cent of the railroads reporting. Some use it only with concrete piles, others for foundation piles or with a marine driver only. But one failure is reported and that is ascribed to the small size of the pump. Favorable conditions for the use of the jet are sandy soil, or gravel, and deep penetration.

In view of the large amount of attention given to the matter of safety during the last few years, an effort has been made to bring out descriptions of features which have been adopted for this reason and a list is presented which it is believed will prove interesting and profitable. Some of the suggestions have been adopted by practically everybody.

Rail clamps when driving on the side.
Cable guards to protect leads when driving on high elevations.
Steel pile cap.
Steam power for operating leads and car brakes.
Driver so constructed that no idler car is required when in a train.
Covering for all moving parts of machinery.
Stops for holding the hammer while a pile is being set in place.
Cables run along the main tension braces on a land driver and fastened to the main members to prevent the collapse of the frame in case of bolt failures.
Hand railing around the driver and tank at about the floor level.
The steam hammer.
Careful design.
Competent men.
Careful inspection of lines and keeping the driver in good repair.
Provision for throwing the propelling mechanism in and out of gear from the side of the car.
Painting white the side of the hammer nearest the engineer so that he may readily see it.
The use of a blue lantern to signal the engineer when working at night to avoid confusion with train signals.
Special precautions to insure protection by flagmen as well as by train orders.
Metallic steam hose from the boiler to the hammer.
Foot boards on the front end.
Pile and hammer cables carried under the floor of the car; two extra running sheaves are required to accomplish this.
One or two other suggestions were made but were not described in sufficient detail.

Committee:—Maro Johnson (I. C.), J. P. Canty (B. & M.), R. H. Reid (N. Y. C.), J. P. Wood (P. M.), and O. F. Dalstrom (C. & N. W.).

Discussion

A. Montzheimer (E. J. & E.) urged the importance of the keeping of full penetration records of all piles driven because of their importance in valuation matters, not only as proof of the penetration secured, but also as a means of securing data regarding the wastage from the cut-off. A. S. Markley stated that such a record which he has kept since 1881 was consulted freely by the valuation department of his road when the government forces were making their inventory. G. W. Rear (S. P.) pointed out the fact that, within reasonable limits, it costs as much to drive a pile of one length as of another and that for this reason unit costs prepared on the basis of the lineal feet of piling driven are misleading and of little real value.

L. D. Hadwen (C. M. & St. P.) referred to the increasingly common practice of using steel cables with drop hammers in place of manilla rope. E. K. Barrett (F. E. C.) stated that he has used ¾ in. wire cable for this purpose for 15 years and that he has driven as many as 1,300 piles with one cable without a break. Wire cable costs less than rope.

While discussing the relative merits of steam and drop hammers G. W. Rear stated that 50 per cent of the piles are overdriven and that a steam hammer will ordinarily secure all the penetration a pile requires, this conclusion being based on an observation of many broomed piles.

HANDLING CREOSOTED TIMBER

After going to the expense of treating timber it would appear to be self-evident that it should receive no unnecessary abuse that would tend to render the treatment ineffective. Yet largely as a result of ignorance and carelessness one sees treated timber handled with hooks and cut unnecessarily on nearly every railroad. If the character of construction is such as to warrant the use of treated timber, precautions certainly should be taken to avoid all unnecessary penetration of the protective surface. To gouge or tear this surface so as to expose the untreated timber, even at one minor point, may be sufficient to start decay within the stick and lead to early failure of the entire piece. Notwithstanding this, only two or three roads have prepared any instructions for the guidance of workmen handling treated timber. Some rely on verbal instructions, which are unreliable at best, while others seem to have given the subject almost no attention.

The problem is primarily one of education. If the injury resulting from the cutting of treated timber is pointed out to them and they are shown how to avoid this damage, most men will co-operate in eliminating this unnecessary destruction. Such measures, coupled with disciplinary action for the men who will not respond to educational measures, will eliminate a large part of the mutilation of treated timber found today.

The problem is not alone one for the men to solve, however. The timber must come to them in a condition requiring the minimum practicable amount of framing in the field. This has led to the framing of a large amount of timber before treatment, a practice which is receiving serious consideration on several roads today.

On the Philadelphia & Reading the chief engineer furnishes the creosoting plant with the details and framing instructions for all timber used on new construction work, and this timber is framed at the creosoting plant before being treated. Similarly, whenever the proper arrangements can be made, the division engineer furnishes the timber-treating plant with detailed drawings of timbers required for maintenance of way work and they are framed in a similar manner.

Even with the most careful precautions it frequently becomes necessary to bore into timber or to cut it when using it in the field. The problem then is to protect it and to duplicate the original treatment as far as possible. It is the quite general practice to fill all bored holes with hot creosote

and to apply coal tar, or, preferably, hot creosote to all cut surfaces. This treatment should be applied to all surfaces which have been cut, whether they show untreated wood or not. On one or two roads a coat of hot pitch is applied after the creosote as a seal.

Care should also be taken to avoid the use of treated and untreated material in the same structure. Instances are frequent where a workman runs short of treated material and thoughtlessly fills out with untreated timber, or applies a brush treatment to sufficient timber to complete the structure. The usual result of this action is to reduce the life of the adjoining treated timber, if not of the entire structure, almost to that of the untreated or partially treated timber.

Piling requires special treatment, according to the conditions under which they are to be used. Where they are to be used in water infested with marine borers, special attention should be given to see that they do not contain pitch knots or other blemishes which will retard the penetration of the oil. Care must also be taken to see that the surface is not injured in handling.

For the same reason that it is advisable to apply a brush coat to all cut surfaces of stringers and framed timbers, pile heads should be protected after being cut off. The Atlantic Coast Line applies a paste of coal tar and lime to the exposed tops of piles. The Southern requires the heads of the piles to be coated with hot creosote, followed by an application of coal-tar pitch of such consistency that it will remain elastic at the lowest temperatures encountered.

In addition to the avoidance of all unnecessary cutting into treated timber, care should be taken in handling it to and from cars to avoid abrasions that would penetrate the treated surface. Heavy timbers should not be thrown from a car, as this tends to split and break them. Neither should they be handled with sharp-pointed grab-hooks or peavies. A number of roads use skids to transfer such timbers from pile to pile and to and from cars. Heavy slings are also used in place of grab-hooks. While this may require some special attention at first, after such practices become standard and the men become accustomed to them, little, if any, additional time or exertion is required.

Closely allied with the adoption of methods to secure full service from treated timber is the investigation of all failures to ascertain their cause in order that similar conditions may be avoided in the future. Too frequently treated timber which has failed to give satisfactory service is removed from a structure and destroyed without an examination being made to ascertain the cause. The result of a multiplication of such instances is a prejudice against all treated material and perhaps the discontinuance of its use. Treated timber has been used successfully too long to justify its condemnation because of any isolated failures, and the road which takes such action does so to its own detriment.

Committee:—E. T. Howson (*Railway Age Gazette*), J. S. Lemond (Sou.) and F. D. Mattos (S. P.).

Discussion

There was a difference of opinion regarding the extent to which the framing of timber before treatment is practical. C. R. Knowles (I. C.) stated that he uses creosoted timber in the supports for wooden water tanks, all of which is framed in advance at the treating plant. He has found that it is rarely necessary to bore a hole in the timber after it has been treated.

PASSENGER STATIONS OF MODERATE SIZE

There is no set rule by which the size of a station suitable for any town or city may be determined. The revenue from ticket sales is an index of the passenger business originating at a station, but it may be misleading as to the kind of a station required, for some towns originate very little passenger business and yet are called upon to handle heavy traffic. The amount of transfer business must also be considered, and, where there is much of it, comfortable and commodious quarters must be provided. Many railroads have standard designs for the smaller stations, but these cannot be adhered to very closely because every location has different conditions that require modifications.

The station proper should have a general waiting room, and leading off from this a women's retiring room, with toilet, and also a men's smoking room and toilet. On the opposite side of the room there should be a ticket and telegraph office, and a baggage and express room. In addition to the ticket window there should be a window between the general waiting room and the baggage room so that passengers can check their baggage without going out of the station.

With the maintenance cost in mind, the committee recommends the use of brick, stucco or concrete, because the first cost is very little higher than that of a frame structure. If brick is used it should be re-pressed or vitrified because a soft brick will result in a damp building. Rough texture bricks are being used extensively, and are more pleasing in appearance than smooth brick. In the matter of maintenance the painting of wooden buildings amounts to considerable.

The interior of the station is usually of wood frame because it is cheaper and there is little danger of fire in a structure of this character. Brick or hollow tile makes a more substantial and fireproof interior, but the cost is not often justified. Walls are generally plastered and usually the lower five or six feet are covered with a wood wainscot in the waiting rooms, with tile in the toilet rooms. In many stations the walls are finished with a light-colored brick. This gives a finished surface that lightens the dark rooms and is very satisfactory from the standpoint of wear, but it is much more expensive than plaster.

One of the principal problems in a station is the floor surface. Wood holds and absorbs the dirt, while varnish is soon scratched and worn off by the cinders carried in by the passengers. Where wood is used it should be either maple or edge-grain pine. Composition floors are used extensively; they give a hard, impervious surface, but their wearing qualities are not altogether satisfactory. Some tile floors have given good results, but others have worn badly, because the cinders are ground into them, causing the surface to craze and discolor. Floor tile should be vitrified to wear satisfactorily. The ticket offices should have wood floors, while vitrified brick floors give the best wearing surface for baggage rooms.

Platforms should be not less than 10 ft. wide. In front of the station building they should be not less than 16 ft. wide and as much more as can be consistently allowed. Vitrified brick is quite generally used, but many roads prefer concrete. One feature in favor of a brick platform is that if settlement occurs or if any of the brick become broken they can be repaired more easily than if the platform is built of concrete.

Committee:—M. A. Long (B. & O.), E. B. Ashby (L. V.), G. W. Andrews (B. & O.), and J. B. Gaut (G. T.).

Discussion

L. D. Hadwen (C. M. & St. P.) deprecated the use of timber floors in otherwise attractive stations, favoring some type of composition floor which, although requiring expert workmanship in laying, is more sanitary. E. C. Morrison (S. P.) stated that he has placed tile or concrete floors in small stations whenever it has been necessary to remove timber floors, preferring tile floors.

In reply to a question J. S. Robinson (C. & N. W.) stated that he has used asbestos and asphalt shingles with satisfactory results, but that he has found that the asbestos shingles discolor more, particularly from the drip from wires crossing overhead. He has also found that it is difficult to keep

clean the concrete floors in the small stations which do not have janitor service unless they have been well trowled when laid.

HANDLING CONCRETE ON SMALL JOBS

It was decided that only such work should be considered as did not exceed 200 cu. yd. in volume and which would not warrant the installation of a special plant Replies to a circular letter asking for information regarding these practices were received from 41 different railroads, representing a total of 127,500 miles, and covering practically all the different railroad conditions that would be encountered in North America. A summary of the replies shows that 31 roads, representing a mileage of 100,280, handle their small concrete work with their own forces in general, while two of the roads having a mileage of 2,839 handle such work exclusively by contract. Six roads with a mileage of 24,403 use both methods, being governed by the nature of the work, its volume and the convenience in handling, the question of labor supply playing an important part in the method used. On small jobs of this character, contractors are often not in a good position to compete as the work is connected with operating features and has to be adjusted to suit them rather than to suit the convenience and economy of its conduct. The question of safety and the desire to have the company's own employees handle construction under operated tracks or in yards and shops have an important influence in eliminating contract work in many instances.

In considering the relative economy of handling work of this character by contract or by company forces, the fact that the contract price does not cover all the incidentals in connection with the work should not be overlooked. Company work is often conducted at a disadvantage from the point of economy in order to facilitate the work of other departments and delays which company's forces may experience would result on contract work in large bills of extras which do not appear in the contract price.

It would seem that the practice of using the ordinary bridge and building maintenance forces to handle concrete work, incidental to other work they may be doing at a given point, would tend to economy even though their labor is higher priced than that of the concrete men, as, in this way, the moving expense of a second crew can be eliminated and the entire work completed at one time. On the other hand, there are many small pieces of work such as the laying of sidewalks and crossings where the most economical results can be obtained by availing oneself of the services of local contractors.

In regard to organization, the preponderance of sentiment seems to be in favor of having such small work handled and supervised by the division forces. In some instances it is the practice to employ the carpenter forces to handle the smaller concrete jobs hiring additional laborers where necessary.

Of the replies received, 31 indicate that they are able to organize the work so as to admit of a regular program through the season while five are unable to do so. Three handle work of this kind by means of regular floating gangs. In most cases a program is mapped out in the spring and forces are organized to cover the season's work though it is sometimes necessary to organize to take care of individual jobs. A desirable way of taking care of such small jobs would be to have a crew organized under the district authority to take care of the work on each district or division where the volume makes this justifiable. Some roads keep a regular gang all the year handling this class of work and moving from one division to another. This method is used on the Chicago, Burlington & Quincy, floating gangs moving from one division to the other and cleaning up all work as they go. On the Chicago, Rock Island & Pacific, regular bridge gangs are used for small work.

A feature to which attention was called by the Nashville, Chattanooga & St. Louis is the use of suitable boarding cars for the crews and greater attention to this feature would tend to economy by making the conditions of the work more attractive and tending to hold men permanently. Efforts in this direction will help to solve the labor problem more than almost any other factor. The smaller jobs demand a better quality of labor than pieces of concrete work of greater magnitude where the men do not need to be as adaptable.

The outfit should be adjusted, as far as possible, to the character of work the crew will be called upon to do and the hauling of all excess equipment and surplus second hand lumber, etc., from other jobs should be avoided. Nearly all roads favor the use of a small mixer in any concrete outfit. In most cases the carpenters are required to furnish their own tools but it is economy to have a liberal supply of hammers, saws, etc., on hand in an outfit so that laborers can be pressed into service, sheeting up the forms, etc., when they would otherwise be waiting. For crews making frequent moves, a tool car will save much handling as small amounts of cement and lumber can be carried along with the outfit and only such tools as are necessary for the job in hand need be unloaded.

The size of mixer recommended shows considerable variation, evidently, larger work being considered in some instances in the replies. Only 6 prefer hand mixing for small work. Sixteen recommend mixers with from 6 to 9 cu. ft. capacity of the unmixed charge. This corresponds to a 1-sack batch mixer. Eight prefer a half yard or 2-sack batch mixer and two use ¾ yd. machines.

The opinions as to the minimum sized job on which the use of a mixer is justifiable vary widely. Four roads recommend using some form of mixer for quantities as small as 5 cu. yd. Six would use one where the quantities are from not less than 10 to 30 yd., 5 set 50 yd. as the limit and 6 consider 100 yd. a minimum. This is a matter that depends on available equipment, but there is little doubt that the small mixers now on the market make machine mixed concrete possible on almost any work no matter how small.

Committee:—L. D. Hadwen (C. M. & St. P.), J. W. Wood (P. M.), C. F. Green (S. P.), and G. H. Stewart (B. R. & P.).

Discussion.

C. E. Smith described the former practice of the Missouri Pacific of contracting all concrete work, which practice he found unsatisfactory. When organizing to handle this work with company forces, gangs were assigned to the local divisions and the quality of the work was materially improved. After the organization had been perfected and the necessary equipment secured, it was found that the number of requests for the replacement of timber bridges with concrete construction increased very rapidly. Between 1910 and 1915, 25 miles of timber bridges similar to those which had previously been renewed in kind were replaced with concrete culverts and embankments. The installation of company work enabled unit prices to be reduced 25 per cent. Up to one year ago no concrete work had been contracted for the last four years.

SMALL COALING STATIONS

There are certain general features of small coaling stations which are objectionable and which should be given careful consideration before any particular type of plant is installed. Some types require a trestle immediately over the coaling track at such a height as to just clear a high car. This condition is dangerous and objectionable, especially if the coaling is done on the main line. If that part directly over the tracks is of steel, the maintenance will be high, for the metal will be eaten away rapidly by the gases from locomotive stacks. If the overhead structure is of wood there is danger from

fire, and also the trouble from the wood decaying quickly on account of the moisture from the exhaust steam.

The use of long tracks to serve coaling stations is to be avoided wherever possible. The first cost for track construction is considerable and there is always a large amount of maintenance in connection with any track which is used continuously. One should therefore select a type of coaling station which requires the minimum amount of trackage.

With a timber structure there are always heavy maintenance charges when it gets old. The fire risk must also be considered. It is a serious matter to lose a coaling station by fire, even though it is a small one, for, owing to the location and number and character of the trains served, a small station may be just as important to the operation of a railroad as a larger one.

Air-hoist bucket plants are used on many western roads for small stations. The trackage necessary is not great and the maintenance of such a plant is not high when the small amount of coal used is considered. The frame supporting the hoist is usually built over the coaling track, but some of the railroads use an air hoist having a derrick which swings out over the coaling track and avoids placing an obstruction over the coaling track.

A number of stations on the Southern consist of a high platform built alongside the coaling track at the proper height to permit shoveling coal from the platform to the engine. Above this platform and further back from the coaling track is an elevated trestle up which cars of coal are pushed on a five per cent grade, and from which the coal is dumped to the platform. The cost of such a coaling station naturally varies, depending upon the size of the platform and the amount of track necessary to serve the plant. The cost of operation is high on account of the large amount of labor required in moving the coal. The cost of maintenance is also fairly high because so much timber is used in the construction.

The Union Pacific employs mechanical plants almost exclusively, even where the consumption is small. On the Chicago & Alton the gravity type of coal chute is used, where the cars are taken up a high trestle and the coal is dumped by gravity into bins, and thence by gravity on to the engine. This type is preferred for the larger stations, but this road is using mechanical plants at less important stations, and where the space is restricted.

On the Pennsylvania Lines West practically all plants are either of the mechanical or gravity types with pockets to receive the coal from cars and then dumping by gravity on to the locomotives. These two types are used for small as well as large stations, and the costs of maintenance and operation compare favorably with those for plants on other roads.

The Western Maryland uses a small coaling station in which the loaded cars are pushed up an inclined trestle to the proper height above the coaling track. The coal is dumped from cars about 8 or 10 ft. to the platform and is then shoveled into small narrow gage cars. These cars are then pushed out over a locomotive standing on the coaling track and dumped. This is another type of plant where the topography must be favorable in order to get the cheapest installation. It has the objectional feature of an obstruction over the main track. The operation is a little high but the maintenance is about normal.

On the Baltimore & Ohio practically every type of coaling station is used, with the mechanical plant and the locomotive crane favored more than the other types. The Hocking Valley reports a coaling station in which a locomotive crane is used to fill elevated bins. The cost of this plant and the operation and maintenance are rather high.

In the small coaling stations on the Santa Fe the coal cars are pushed up onto a trestle and the coal is shoveled into pockets alongside the trestle, from which it flows by gravity to the locomotives. On the Chicago & North Western the gravity pocket and the air hoist-bucket types are used. The gravity-pocket type used where the consumption is small is the same as that employed on the Santa Fe. For the air hoist-bucket type a derrick is erected, the coal is shoveled from cars onto a platform and then into one-half ton buckets and it is then delivered to the engine by means of the derrick the coal being dumped by opening the bottom of the buckets. Air from the locomotive is used in operating the derrick while the engine is being coaled. The derrick is also equipped for hand operation for moving the buckets around while they are being filled. The operation of these plants is rather high on account of the labor needed; the maintenance, however, is low.

A coaling station where the consumption is small should be as inexpensive as possible, that is, it is preferable to have a plant in which the cost of operation may be high rather than an expensive plant on which the operation may be comparatively low. In deciding on the construction of a coaling station the interest on the investment must be considered, and this may more than offset the higher cost of operation of a cheaper plant. Another thing to be considered is that small plants are more liable to be moved than larger ones.

Mention has been made of the growing tendency to use locomotive cranes for coaling stations. However, the cranes now in use are large machines having a capacity of from 15 to 20 tons. These cranes cost from $6,000 to $8,000, and if they are used in connection with elevated bins they result in rather expensive coaling stations. One company has worked up a design for a small crane having a capacity of 4,000 lb. at a 20-ft. radius, which will cost about $3,000. The only thing necessary to equip a small coaling station in addition to this crane is 400 or 500 ft. of trackage. The labor for operating such a plant will not require more than two men, and it will undoubtedly prove to be economical both in operation and maintenance.

Committee:—L. Jutton (C. & N. W.), W. F. Strouse (B. & O.), J. H. Nuelle (N. Y. O. & W.), and G. W. Kinney (L. A. & S. L.).

The report was accepted without discussion.

OTHER REPORTS

A comprehensive report on Paint and Its Application to Railway Structures was presented in abstract by C. E. Smith, chairman. This report reviewed the tests of paints made during recent years by the American Society for Testing Materials and the reports on painting made to the American Railway Engineering Association two years ago. It closed with a statement of the results which have been secured from the coating of a large amount of steel work with the cement gun on the Kansas City Terminal Railway.

A report on Efficient Methods of Handling Work and Men, presented by F. E. Weise (C. M. & St. P.), chairman, described the methods of handling five special problems economically.

Dr. Von Schrenk's Talk

At the session on Thursday morning, Dr. Herman Von Schrenk, consulting timber engineer, St. Louis, gave an instructive talk on timber, its uses in railway work, its failures and precautions which may be taken to avoid them. After discussing briefly the prevalent waste of timber in this country, particularly when compared with European practices, he pointed out means of securing the most economical use of timber in those places for which it is particularly suited. He described the density rule for Southern Yellow Pine which is being adopted rapidly by the railways and pointed out its advantages over previous standards. The principal part of his address was devoted to means of protecting timber from unnecessary exposure to the agents of decay and from improper handling. He pointed out those defects most com-

monly encountered, using lantern slides freely to show unfavorable conditions as well as those more satisfactory. The sanitation of lumber yards was particularly emphasized and the statement was made that one yard which has given the subject special attention recently has reduced its losses from an average of 5 to 10 per cent annually to practically nil.

SUBJECTS FOR COMMITTEE WORK

The following subjects were selected for investigation and report at the next convention:

1. Organization of the water service department. Economical delivery of water to locomotive.
2. The construction of shop buildings.
3. Erection of plate girder spans with the least interference with traffic.
4. Roof drainage of railway buildings.
5. Repairing and strengthening old masonry.
6. Hand operated devices for lifting, pulling and hoisting.
7. Paint and its application to the exterior of railway buildings.
8. Fireproofing the roofs of railway buildings.
9. Blank forms for water service records.
10. Snow sheds (an individual paper).
11. Efficient methods of handling work and men.

Closing Business

Following recent agitation by members of the American Railway Bridge & Building Association and the Maintenance of Way Master Painters Association for the consolidation of the two organizations, the former association invited the Painters Association to consolidate with it. The latter Association, however, declined the invitation, believing that the proper time for this consolidation has not yet arrived.

At the annual election of officers on Thursday morning, the following were selected: President, C. E. Smith, consulting engineer, St. Louis, Mo.; first vice-president, E. B. Ashby, chief engineer, Lehigh Valley, New York; second vice-president, S. C. Tanner, master carpenter, Baltimore & Ohio, Baltimore, Md.; third vice-president, Lee Jutton, division engineer, Chicago & North Western, Madison, Wis.; fourth vice-president, F. E. Weise, chief clerk to chief engineer, Chicago, Milwaukee & St. Paul, Chicago, Ill.; secretary-treasurer, C. A. Lichty, general inspector, purchasing department, Chicago & North Western, Chicago, Ill. D. C. Zook, master carpenter, Pennsylvania Lines, Ft. Wayne, Ind., was elected a member of the executive committee.

St. Paul, Minn., was selected as the location for the next annual convention.

Entertainment

A three-hour business session was held on Thursday evening to permit the members and their families to take an automobile ride about New Orleans on Thursday afternoon. A number of the members made an inspection tour of the docks along the river front on the same afternoon. On Friday about 275 members and guests went to Bogalusa, La., on a special train provided by the New Orleans & Northeastern and the New Orleans Great Northern railways to visit the saw mill of the Great Southern Lumber Company. Stops were made en route at the north end of the New Orleans & Northeastern trestle across Lake Pontchartrain to enable the members to examine this structure and at Slidell, La., to visit the plant of the Southern Creosoting Works.

The Bridge & Building Supplymen's Association gave a banquet to the members of the Bridge & Building Association and their families in the Grunewald hotel on Wednesday evening, about 350 being present. On Thursday evening the annual Association dinner was held in the same building.

THE SUPPLY ASSOCIATION

The Bridge and Building Supply Men's Association held an attractive exhibit in rooms adjoining the convention hall, 30 firms participating. The exhibits consisted largely of photographs, literature and samples of products.

The officers of this association for the past year were: President, D. A. Bonitz, National Roofing Company, Tonawanda, N. Y.; vice-president, J. A. Nealley, Joseph Dixon Crucible Company, Jersey City, N. J.; treasurer, L. D. Mitchell, Detroit Graphite Company, Detroit, Mich.; secretary, P. C. Jacobs, H. W. Johns-Manville Company, Chicago, Ill.

The firms exhibiting, with the character of their exhibits and the names of their representatives are given below.

American Hoist & Derrick Co., St. Paul, Minn.—Illuminated transparent photographs of railway ditchers. Represented by F. J. Johnson and W. O. Washburn.

American Tar Products Co., Chicago, Ill.—Represented by J. L. Spell.

American Valve & Meter Co., Cincinnati, Ohio.—Catalogues of the Poage automatic water column. Represented by J. T. McGarry.

Barber Asphalt Paving Co., Chicago, Ill.—Represented by Robert M. Jordan and Arthur T. Cavey.

Barrett Co., The, New York.—Built up and prepared roofing materials, coal tar products, creosote oil, iron and steel paints and the Holt roof connection. Represented by E. J. Caldwell, C. F. Ames, S. Day, G. R. McVay, W. Wamsley and E. H. Poetter.

Carey Co., Philip, Cincinnati, Ohio.—Represented by C. L. Cockrell and A. Donaldson.

Chicago Bridge & Iron Works, Chicago, Ill.—Photographs and catalogues of steel water tanks. Represented by M. J. Trees, H. C. Brown and H. B. Murphy.

Chicago Pneumatic Tool Co., Chicago, Ill.—Pneumatic tools and hose couplings. Represented by C. E. Walker, J. N. Stebbins and J. W. Lowell.

Detroit Graphite Co., Detroit, Mich.—Represented by L. D. Mitchell, J. L. Hogan and W. D. Waugh.

Dixon Crucible Co., Joseph, Jersey City, N. J.—Photographs and catalogues of graphite paints. Represented by H. A. Nealley and H. A. Van Derslice.

Fairbanks, Morse & Co., Chicago, Ill.—Represented by A. A. Taylor, D. K. Lee, L. D. Matthews, J. George Jones, C. H. Wilson and V. C. Kalar.

Grip Nut Co., Chicago, Ill.—Grip nuts. Represented by J. E. Weatherford.

Johns-Manville Co., H. W., New York.—Asbestos roofing, insulating shingles, steam traps and fire extinguishers. Represented by P. C. Jacobs, J. H Trent, L. E. E. Hassman and H. G. Newman.

Lehon Co., The, Chicago, Ill.—Roofing and insulating minerals. Represented by Tom Lehon and D. B. Wright.

C. F. Massey Co., Chicago, Ill.—Photographs, blue prints and catalogues of reinforced concrete culverts, pile trestles, portable houses, sewer pipe, etc. Represented by C. F. Massey, C. Gilman and H. E. Burns.

National Roofing Company, Tonawanda, N. Y.—Security Wide-Weld asphalt roofing and Hydroix waterproofing. Represented by D. A. Bonitz and B. A. Flanders.

Otley Paint Manufacturing Co., Chicago, Ill.—Samples of railway bridge steel, refrigerator, car and building paints. Represented by Benj. F. Otley and W. A. Otley.

Patent Vulcanite Roofing Co., Chicago, Ill.—Samples of felt, asphalt and ornamental roofing and asphalt shingles. Represented by A. J. Van Page.

Patterson-Sargent Co., St. Louis, Mo.—Represented by Jos. K. Patterson and W. H. McBride.

Pyrene Manufacturing Co., New York.—Fire fighting appliances. Represented by F. P. Murphy and E. J. Putzel.

The Q. & C. Co., New York.—Derails and tie spacers. Represented by R. B. Quincy and J. V. Wescott.

Shepherd Automatic Switch Co., The, Montgomery, Ala.—Model of the Shepherd automatic switch. Represented by M. L. Shepherd.

Simmons-Boardman Publishing Co., New York.—Copies of the *Railway Age Gazette* and the Railway Maintenance Engineer. Represented by E. T. Howson and F. H. Thompson.

T. W. Snow Construction Co., Chicago, Ill.—Represented by T. W. Snow.

Southern Pine Association, New Orleans.—Examples of the correct and incorrect treatment of ties and piling. Illustration of the United States Forest Service density rules for yellow pine. Represented by J. C. Valadie and Dr. Herman von Schrenk.

Standard Asphalt & Rubber Co., Chicago, Ill.—Photographs and catalogues of mineral rubber floors, asphalt, etc. Represented by C. V. Eades.

Texas Company, The, New York.—Ready-to-lay, overlap and built-up roofings, asphalt points and waterproofing compounds. Represented by W. E. O'Neill, J. F. Ryan and G. Musson.

U. S. Wind Engine & Pump Co., Batavia, Ill.—Catalogues of Mansfield and U. S. water columns and Curtis pumps. Represented by C. E. Ward.

At the annual election on Thursday morning the following officers were selected for the ensuing year: President, H. A. Nealley, Joseph Dixon Crucible Company, Jersey City, N. J.; vice-president, L. D. Mitchell, Detroit Graphite Company, Detroit, Mich.; treasurer, P. C. Jacobs, H. W. Johns-Manville Company, Chicago, Ill.; secretary, Tom Lehon, The Lehon Company, Chicago. Executive committee, C. E. Ward, U. S. Wind Engine & Pump Company, Batavia, Ill.; W. H. Pratt, Heath & Milligan Mfg. Company, Chicago, Ill.; M. J. Trees, Chicago Bridge & Iron Works, Chicago, Ill.; A. A. Taylor, Fairbanks, Morse & Co., Chicago, Ill.; C. H. Cockrell, Philip Carey Company, Cincinnati; C. F. Massey, C. F. Massey Company, Chicago, Ill

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Germany's Steel Output.—Germany's output of steel in August was 1,412,326 tons, compared with 1,365,641 tons in July.

Meeting of Society of Railway Financial Officers

A Successful Meeting; Papers Read by T. H. B. McKnight, W. H. Myers, G. A. Post and Frank Vanderlip

THE ninth annual meeting of the Society of Railway Financial Officers was held at the Hotel Raleigh, Washington, D. C., on October 18, 19 and 20. The meeting was called to order by the president, T. H. B. McKnight, treasurer of the Pennsylvania Lines West, and after the roll call the members and guests were welcomed to the city by Oliver P. Newman, chairman of the Commissioners of the District of Columbia.

President McKnight made the following address:

PRESIDENT'S ADDRESS

When the war began all or almost all American financiers were desperately alarmed about the dumping of American securities from abroad on our market here and the frightful effects that would follow, and the New York Stock Exchange was closed for weeks to minimize as much as possible the evil results. When the Exchange was finally opened again with fear and trembling nothing happened, and we have been cheerfully absorbing ever since all the securities that have come from Europe, and they have run into the billions. In addition we have made loan after loan to foreign governments and each went more easily than the one before, so that we have developed an appetite for foreign government securities which no one could have foreseen a few years ago.

Of course, our ability to so easily swallow and assimilate these vast amounts of foreign securities and American securities returning from abroad was due, first, to the fact that the money we thus furnished never really left the country but was used to pay for all kinds of supplies and manufactured products and munitions of war sent to Europe, and, second, to the reduced purchasing by us from foreign countries. When the war ends these conditions will no longer exist, and then what may we expect?

Immigration has nearly ceased and labor is extremely scarce and highly paid, which of course is increasing the cost of living and hence of all our manufactured goods. When the war is over will the flood of immigration be renewed and we be overwhelmed by unskilled laborers driven out of their home countries by the heavy taxes which will surely follow the war? And will the great need of money abroad upset our financial conditions here?

These questions are not merely interesting; they are vital to our life and welfare, and upon their being correctly answered in time depends to a large extent our future prosperity, for unless they are so answered we shall not know how to prepare for the future and may be taken unawares by the changed conditions.

It appears certain that the burden of taxation in all the belligerent countries and those whose military expenditures have been largely increased by mobilizations even though they are not fighting, will be very much heavier for the future and the conditions of living be very hard, so that it would be most natural that the poorer men and those who have lost their homes or their business during the time they were in the trenches will be loath to take up the struggle for existence at home when they can come to America and start under better conditions, as they must begin again anyway. But will they be allowed to leave their native lands? I think not, for each government will need them to pay the taxes, to rebuild the desolated country and restore manufactures, and the country must be repopulated, not depopulated. It seems to me then almost certain that emigration will be discouraged, if not absolutely forbidden, and that such foreign workmen as we receive will be those who escape by stealth. That means comparatively few new workmen coming to this country for years to come, and consequently a great dearth of unskilled labor and a higher manufacturing cost.

In manufacturing plants this may be to some extent offset by increased use of machinery, but how shall we keep our tracks in order except by the old-fashioned section hand, whom we have seen change from Irish to Slav and Greek, and who may be still further changed until he takes the dusky hue of our Afro-American fellow citizens, or even of our neighboring Greasers. If this reduction in emigration extends also to the women it looks as if our domestic life is also to be changed in some ways. As it becomes more and more difficult to secure men for manufacturing purposes the women may be drawn into that work as they are now in European countries, making it well nigh impossible to get domestic servants within reasonable prices. This scarcity and expense of help in the household will tend to drive out of the house the two things that remain that can go out and yet leave a home—the cooking and the washing—and we shall have apartment houses with common kitchens and dining rooms, and community dining rooms and public laundries Of course, we do not like to think of these changes, but that will not prevent their coming if conditions force them on us.

The increased cost of manufacturing due to scarcity of labor and higher cost of living will make it very doubtful if we will be able to hold much of the foreign trade for which we are scrambling so hopefully now, for the foreign manufacturers will do anything to get their old trade again and their governments will be back of them in their efforts, for they must have it if they are to rehabilitate their countries. While higher tariffs may prevent dumping foreign goods upon us at cut prices they will not help us to retain the foreign trade we are now so anxious to get.

The end of the war, then, will find us with our trade in munitions and war supplies of all kinds cut off and with the nations now at war actively trying to get back their trade with us and other nations, with the probable result that we shall have a decided falling off in manufactures and a consequent reduction in freight earnings, so that we must be prepared for another season of financial depression of uncertain severity and duration. The only cheerful thing in sight to mitigate the prospective evil is the fact that the foreign manufacturers will find themselves after the war with their plants converted into munition factories, their machinery either gone, adapted for some other use, or out of date, and their skilled workmen dead, crippled or scattered, so that the whole business will have to be built up from the foundations. It may be, too, that some of the present belligerents may find themselves bereft of their mercantile shipping which has been so potent a factor in extending their trade. Then, too, we may be called upon to furnish machinery to re-equip their factories and mills, so that the loss of a large part of our foreign trade and the consequent decrease in manufacturing may not be so marked immediately after the war, but will be progressive. When it comes, however, and finds us paying exaggerated wages and on a high scale of living and spending there must be some unpleasant readjustments.

Another thing that may make great changes in our social and industrial life is the growing feeling that we are living in a fool's paradise unless we make some reasonable and sensible provision against attack by some other nation. The cheerful optimism with which we have believed that because we had no desire or intention to attack any other nation no other nation would attack us has been shaken if not entirely

destroyed by the fate of Belgium and Serbia and France, and it certainly will be the part of wisdom for us to be prepared to defend ourselves against attack by some stronger or at least more aggressive people until some system of preventing war is devised and put into effect that will give us assurance of safety without large armies and navies.

Notwithstanding the strong feeling which many good people have against universal military service, it or at least universal military instruction on the Swiss or Australian plan, which should also include the teaching of a trade to the young men, in addition to making us safe against wanton attack might prove a solution for other problems that confront us and give us a finer, stronger people to build our future race upon. This universal military instruction, valuable as it will doubtless prove, will naturally make the young man somewhat later in getting to work and in other ways will prove a tax to be added to the ones we have now.

To us railroad treasurers one of the most interesting questions raised by the war is, "How will it affect railroad financing?" When one considers the great sums that will be required abroad for the rebuilding of the destroyed cities, farmhouses, roads, bridges and railroads, and realizes that in no other country in the world is there money to lend, one gets some idea of the demands that will be made on the resources of America. Even while the outcome of the war is undecided, billions of bonds of the belligerent countries have been sold in the United States and our people, although looking askance at the earlier issues, are now buying them freely and getting higher rates of return than our domestic securities have been yielding. When the munition business is over and our investing power is decreased we shall find that the American railroads in need of funds for construction, equipment or refunding will have to bid for the money they require against foreign governments whose needs will be so urgent that the question of the rate they have to pay will hardly be considered. There are 15 nations in the war and the few that still stand shivering on the brink, though they have not had actual fighting, have all had to mobilize their armies and keep them ready, which is almost, except for the cost of the ammunition used, as expensive as war.

Most of the foreign national financing in recent years, including the cost of the Balkan war of several years back, has been of a temporary character with the hope that later the notes may be permanently funded, but the internal resources of the different nations will not prove sufficient to digest this floating indebtedness together with the borrowings for the present war and they will eventually have to come to us for help. In addition, our own railroads have for the last 10 years not been able to finance their improvements by stock issues or even by permanent obligations, and there is floating a vast amount of temporary notes which have to be renewed from time to time at high rates. There are also many extensions and improvements which should be made to keep our properties in shape to properly handle the business offered and which would have been made before now if they could have been financed, but under existing conditions of regulation of rates continually downward and wage increases by congressional enactment, who feels like investing money in new stock? And if we borrow for all our improvements how long shall we be able to give good and sufficient security for our loans? And if we have to bid with our unattractive bonds against the government issues of foreign countries bearing high rates of interest where shall we get the money we require and what shall we have to pay for it?

Heretofore large amounts of American standard railroad bonds have been sold in Europe; the people of England, Germany, France and Holland thus furnishing capital to construct and equip our railroads, but after the war in all of these countries those who have any money left will have such opportunities to invest it at home at profitable rates that there will be none to spare for American investment, and we ourselves shall have to furnish the funds needed here for railways, roads, houses, power plants, trolleys, water plants and city improvements including school houses, parks and recreation grounds and all the various forms of beneficent and social investments which we are coming to believe are proper for the municipality to make—all of which will have to be financed on bond issues.

In addition our federal government under the realization of the necessity for preparedness to which I have referred will be putting out bond issues to pay for the enlarged navy and for new fortifications and big guns to defend our coasts.

The supply of money for investment each year is limited and consists of the savings of the people, their surplus over living expenses put away either directly or through savings banks and insurance companies. With decreased manufactures and reduced foreign trade, increased cost of living and extravagant habits of spending acquired in these days of war prosperity, it is not reasonable to suppose that we shall have spare capital enough for even our own wants during the next 10 years, certainly not enough to rebuild Europe in addition.

If I am even approximately right in thus reading our financial future it follows that to obtain the money they need the American railways will have to offer large inducements in the way of interest and even then, when the security is not of the best, may have to go without as under present conditions it is not practicable to raise money by sale of capital stock. I sincerely hope the future may not turn out as seems probable to me, but it certainly behooves us to study the question carefully so that we may be prepared for what is to come.

If we know what the conditions of our borrowing are to be a year, two years, three years in advance, we shall be able to do our present financing so as to be prepared for the difficulties, which otherwise may prove to be dangers as well. It is in studying such subjects together so that we may be prepared to wisely advise our companies that one of the great advantages of our society may be found.

ADDRESS BY GEORGE A POST

The annual banquet of the society was held at the Hotel Raleigh on Thursday evening. The following is an abstract of the address delivered by George A. Post, president of the Railway Business Association:

On November 20 next in this city hearings will be opened by a joint committee of Congress appointed "to investigate the conditions relating to interstate and foreign commerce and the necessity of further legislation relating thereto," and to report in January, 1917. The Railway Business Association, of which I have the honor to be president, has for many months studied the defects in the present system of regulating railways and advocates a number of specific measures. We have exchanged views with many other business organizations. One such body is the National Industrial Traffic League composed of traffic managers of industrial concerns and traffic bureaus of boards of trade. It has been my privilege to become agreeably acquainted with a number of the leaders in that organization and to have been a guest at their meetings. The league has performed valuable work in promoting co-operation between the shippers and the railways in governmental matters.

The Traffic League recently issued to its members and published in the press a set of questions bearing upon some of the measures which will be advocated before the joint committee of Congress next month. The desire of the league as expressed in this circular was that the members should confer with their companies or with their associations as the case might be and be prepared to express authoritatively at a subsequent meeting of the league the view of those whom they represent.

I have thought it desirable to compose a set of answers to the questions of the league which may serve to stimulate dis-

cussion. What I say is the result of official opportunities for study and conference, but is not official in the sense that every member of our association or even every member of its general executive committee has sanctioned it. I presume some of them would not be prepared at present to assent in detail to propositions which are somewhat novel to all of us and which involve difficult constitutional and legal phases. On the whole, however, I am confident that a majority of my associates concur in thinking that along the general lines indicated lies the wise and safe course for Congress to pursue.

I give the questions of the league verbatim and seriatim with the answer following each question:

1. Q. Shall the league favor exclusive federal control or regulation as opposed to the present dual system? A. Yes, except in matters which are distinctively local, such as taxation, location of stations, speed limit of trains within municipalities, fencing ordinances and grade crossing separation.

The service given in the United States enables producers to compete over a larger area than ever has been known in any other part of the world. Short-line roads of earlier days have been consolidated in long through systems. This enables buyers to obtain quick and regular deliveries and promotes concentration for cheap production while at the same time facilitating competition in the interest of the consumer. The result is that long distance traffic is much the greater part of all traffic. Shippers are able with reference to a predominant part of their output to negotiate with a few railroad systems for through cars and trains covering a territory which may embrace many states. Switching and warehouse facilities at terminals and junctions have been a great aid to rapid movement of tonnage and hence to enlargement of selling areas. Except in the east the railroad was the first institution established in every town and usually provided itself at comparatively small expense with well situated land to use for terminal purposes.

Since 1907 it has become annually clearer that some tendencies adverse to these were at work. Traffic managers for shippers have increasingly reported a reluctance of railway managers to add to operating expenses by improvement of service. The most serious result has affected terminals. Towns have grown into cities and cities into great metropolitan centers. The cost of land has risen and railways have found it more and more expensive to make their properties keep pace with the growth of business. Inquiry has elicited the explanation that expenses on the existing basis of service have steadily increased without any systematic cognizance of this situation on the revenue side by the various governmental units. The roads have feared to undertake projects in years of good business. They have apprehended that they might either have to cancel at the next recession of traffic facilities once afforded or find their balance sheet with an uncomfortably narrow margin of safety. They have preferred to avoid in many instances establishing such facilities.

A substantial proportion of the increase in operating expenses has been imposed by state authorities and involves duplication of state with federal regulation as well as duplication one state with another. Physical facilities which have been denied to shippers would have entailed an addition to capitalization. In numerous instances inquiry has disclosed that a factor in their disappointment was obstacles placed in the way of security issues by conflicting state regulations. In other cases the market for sale of securities for such purposes was said to have been practically closed because rate regulating authorities ignored the effect of rising expenses upon net income. Several states as well as Congress may in the case of a given railroad make compulsory additions to its expenses.

All of these agencies have authority over its rates. No authority anywhere has responsibility for keeping the expenses within the revenue or raising the revenue to meet the expenses.

Another obstruction to freedom of trade has been the rate policy of several states. These states so regulate tariffs as to build up their own shipping centers at the expense of centers in other states. Alleged discriminations should of course be adjudicated not by one of the parties, in this case a state, but by an impartial tribunal, obviously and necessarily federal. The revenue, moreover, of a railway is the sum of its earnings from all sources. This includes earnings on hauls wholly within a state. If it is the policy of one state to depress rates below the general average the deficit must be taken out of the pockets of people in other states.

One of the brightest chapters in American history is the pioneering which has pierced the wilderness and created new communities for the development of American life and the consumption of American products. This factor has met with a check, apparently more than temporary. Miles of line increased 1915 over 1910 7 per cent. This is no greater than the increase per cent in the years 1895 to 1900, which embraced the depths of industrial blight and painful recovery. Even 1890 to 1895, including two years of depression, showed an increase of 10 per cent; while the increase 1905 over 1900 was 12 per cent and 1910 over 1905, including a panic period, 10 per cent—all these in comparison with 7 per cent, 1915 over 1910. Moreover, the latest years show this check in the most acute degree. During 1911 the number of miles added was 5,407; during 1912, 3,614; during 1913, 3,618; during 1914, 3,077, and during 1915, 1,022.

Curtailment of growth in mileage is undoubtedly due to the same circumstances which have impeded provision of facilities on existing lines. Whatever affects the ability of the railroads to market their securities or the judgment of their managers and financial advisers as to the wisdom of new investment under current conditions has an influence upon the mileage constructed. If expenses, compelled by governments or otherwise, increase and revenues stand still or decline, managers are neither able nor willing to sell stocks and bonds. It is asserted that the attitude of some state governments has repelled construction of mileage within the borders of those states. This is an injury to shippers wherever located since it arrests the creation of new purchasing centers.

Another just complaint with the present dual system is as to the quality of routine administration for the removal of discriminations and other improprieties in rates and service. If recourse is had to state authority there is always the complication of state jealousies and discriminations against the people of other states. Three-quarters and upward of the business done by the people of any state is interstate business. Many times the rate on a service wholly within a state exerts a determining influence upon interstate rates which affect a much larger traffic. It is oppressive for the smaller fraction to control the whole.

Transportation has in the main become interstate. If its regulation were federal the prosperity thereby diffused over the whole business of the nation would prove a greater benefit even to those whose shipments are wholly interstate than any preference which they can obtain by independent state action.

2. Q. Shall the league favor exclusive federal incorporation of all common carriers and federal regulation of the issuance of securities? A. Yes.

From the point of view of the railroad corporations it is intolerable that what is exacted by one state should be prohibited by another and expensive that a road should have to incur the delay of going from one state to another for sanction of an issue which in the end may have over-stayed the market of which it was designed to take advantage. The market for securities in the exchanges of the world is curtailed because such securities can only bear the sanction of one or more states and state prestige is a vague thing abroad if not at home as well.

From the point of view of the general public federal regulation is no less essential. While Congress compels expendi-

tures and the commission regulates rates no federal authority has jurisdiction over the issue of securities which is itself an occasion both for expenditure and for charges upon the shipping public. Some states for many years refrained from giving their railroad commissioners power to order rates changed, but even these states imposed some restrictions upon the issue of securities. The public should if possible be made to feel less uneasy about alleged over-capitalization. This will never come to pass until the fullest publicity at least has been provided under the highest auspices. Stability of rates is an essential to prosperity. The rate fabric will never be stable so long as continual conflict goes on as to the honesty and reasonableness of capitalization.

If security issues are to be regulated federally incorporation should also be federal. Some members of our association while favorable to the federal tendency are not yet prepared to urge that such incorporation should be compulsory. They doubt the constitutional power of Congress in this respect and question the wisdom of exercising that power even if it exists. The greater part of the railway managers have decided to favor compulsory incorporation, even though they must relinquish the valuable privileges which many of them enjoy under state charters.

3. Q. If there is to be exclusive federal incorporation and regulation, what shall be done about taxation? Shall the state continue to tax, or shall the tax be fixed and controlled by the federal government, and then apportioned among the states traversed by the respective railroads? A. The states should continue to exercise directly the function of taxation, making whatever changes in present arrangements may be necessary in order to adjust taxation by the states to federal incorporation.

The people of this country properly regard the taxing power as a local function with which they ought never to part. Leading authorities on taxation seem to be unanimous on this point. The conviction of the people in favor of that policy is deeply rooted and I have not heard anyone advocate federal management of railway taxation. Eminent lawyers differ as to the power of Congress to establish a standard of state taxation, but public opinion should be brought to favor application of the same standards to the taxation of railway property as other property. The railways should enjoy as well as obey provisions aimed to insure equality of all before the law.

4. Q. If exclusive federal control is to be the policy, what shall be done about the police power of the state, the right to regulate hours of service, operation of trains on Sundays and legal holidays, speed limits, fencing, track elevation, etc.? A. So-called police powers should be exercised by whichever jurisdiction is naturally concerned.

Hours of service should be regulated federally. Sunday and holiday restrictions upon train operation should be federal; otherwise ordinances of one state may deny to shippers of another state free access to market for perishable commodities. Limit on speed of trains seems to be within the province of the municipality but otherwise naturally federal. Fencing is obviously a local concern. Track elevation, including all grade crossing regulations, should remain within the joint jurisdiction of the state and the municipality.

5. Q. What changes are necessary in the present act to regulate commerce? Why? A. This question is answered under subsequent headings.

6. If you favor exclusive federal control:

Q. (a) Shall such an act be administered by one commission? A. I am strongly impressed with the proposal that not all the functions now performed by the Interstate Commerce Commission should be vested in it, especially that the commission should be relieved of detection, prosecution and adjudication of infractions of the law.

Q. (b) How many members? How selected? A. The Interstate Commerce Commission has urged that the number be increased from seven to nine. It has been my observation that the commission has always manifested reluctance to recommend provisions which would involve increase in its appropriation. I would be disposed to accept their judgment on this point. I see no reason why selection of the commissioners should not continue to be through appointment by the President and confirmation by the Senate.

Q. (c) How should such a body be organized? A. I am uncertain what this question is intended to draw out. If it refers to the auxiliaries through which the commission is to operate, this is answered below under (d). If what is meant is the method of selecting the chairman and his tenure as such, I am aware of some sentiment in favor of having the President designate one of the commissioners chairman for a stated term. This would be in effect a return to the practice before the transfer of Martin A. Knapp to the judiciary, at which time the chairmanship by agreement of the commissioners was made a one year office, rotating. This question has great importance as bearing on the efficiency of the work and the continuity of policy, but I do not feel competent to pass judgment upon it. I would favor longer terms and somewhat higher salaries for the commissioners.

Q. (d) If regional, how should the regions be determined? Why? A. Enlargement of the federal scope must be accompanied by a strengthening of the federal mechanism. The commission has been attempting to administer regional routine through examiners. Such auxiliaries must be made more responsible. Our committee is much impressed with the proposal that regional commissions should be created analagous to the reserve banks. It would be our idea that Congress, having obtained the advice of the commission, should prescribe the number of districts and that the commission should define their boundaries with a view to mapping out areas which correspond to traffic movement, entirely ignoring state lines. The law might specifically invite the commission to recommend from time to time changes in the number of districts.

Q. (e) Should the power of the regional commissioners be final or subject to some central body? A. Subject to the Interstate Commerce Commission, in order to insure uniformity of policy throughout the country.

The proposal of regional commissions originates with the railways, whose representative before a committee of Congress explained it. Under that plan findings by the regional sub-commissions would be filed with the Interstate Commerce Commission and if there were exceptions by either litigant these exceptions would be argued; in the absence of exceptions within a specified time the decree from below would go into effect automatically unless otherwise ordered by the Interstate Commerce Commission.

7. If you favor the present system:

Q. (a) Shall the Interstate Commerce Commission be reorganized? Why? A. In the sense indicated I do not favor the present system. The answer to (a) has already been given.

Q. (b) If so, how? Merely by increasing its members with authority to subdivide itself in divisions for separate parts of its work, or should it be largely increased with units sitting permanently in different parts of the country? Why? A. It is learned that what the commission had in mind in asking Congress to authorize divisions of the commission to act for the whole was that various functions to be performed in the main at Washington should be assigned to divisions and not that the commissioners should have territorial divisions. The functions evidently referred to which are to be assigned to divisions of the commission are such matters as valuation, issue of securities, accounting, safety appliances and the like, concerning which the commission as a whole can lay down a policy to be administered by such divisions. Regional administration has been referred to in the answer to 6 (d) and (e).

8. Q. The league desires its members also to discuss and offer suggestions or recommendations upon any phase of this general subject that may be of interest to the member responding. A. It was thought essential before replying to your circular to ascertain authoritatively what are the proposals of the railways.

We are assured that 84 per cent of the gross railway earnings of the country is represented in the Railway Executives Advisory Committee on Federal Legislation, of which the chairman is Frank Trumbull and the general counsel A. P. Thom. Messrs. Trumbull and Thom advocate certain measures not mentioned in the replies already given. Briefly these are:

1. The period of suspension of rate advances should be reduced from a possible aggregate of 10 months under the present law to a maximum of 60 days, the increase to go into effect at the expiration of such time if not already decided, and refund to be made to the shipper if the advance shall ultimately be forbidden.

Is not 60 days a long enough time to deprive the railways of an advance if it shall ultimately be declared that they ought to have had it from the beginning? The shipper is in no way injured if refund is made in case the increase is disallowed. What good reason is there for opposing this amendment?

2. The Interstate Commerce Commission should have authority to fix minimum as well as maximum rates.

A widespread sentiment exists among shippers in favor of this amendment. It was believed by most of us when the power to fix a rate in place of a rate declared unreasonable was conferred 10 years ago that no rate ever could be too low in anybody's interest and that none of us would ever see the day when we would advocate power for the commission to order rates maintained or raised. Experience has shown the contrary. Shippers as well as railroads have reason to desire this power bestowed upon the commission. Shippers find the lack of such authority an obstacle in the adjudication of controversies between shipping centers where the main question is not the level of rates but the relation of one rate to another. What is in the interest of the shipper in that respect is also in the interest of the railroad. The railroads have found that one road of a regional group could prevent the others from adjusting a certain rate upward, possibly with the result of unduly impairing total revenue and also possibly with the effect that the commodity in question paid less than its share of the cost of transportation.

3. The law should specifically impose upon the Interstate Commerce Commission the function, in rate regulation, of considering the effect of rates upon total earnings in the light of expenses and hence the effect upon credit, to the end that the country may be assured of adequate facilities on existing lines and of healthy extension into new territory.

This seems fundamental. It is the commercial phase. It involves a fact often forgotten. Regulate railways howsoever strictly, you cannot regulate the investor and you cannot absolve a railroad from the necessity of making both ends meet. Undoubtedly the greatest defect in regulation as it has been applied since 1907 has been our failure to insist that the government should recognize in this matter the responsibility that goes with power.

In conclusion I desire to express cordial approval of the policy adopted by the league in arranging for its members to confer with their principals before expressing an opinion upon these important measures. No doubt the interchange of views suggested in their circular will tend to draw the heads of enterprises and of associations into the preliminary discussion. The shippers of the country should appear before the Newlands Joint Committee of Congress on or after November 20 upon a platform and through an organization completely representative and competent, not only as to rates and service but as to every element which has to be considered by those responsible for the management of industrial and mercantile enterprises.

On Thursday morning H. W. Myers, manager of the Kansas City Railroad Collection Bureau, read a paper on the work of his bureau, and on Friday morning Frank Vanderlip, president of the National City Bank, made an address before the society on the railroad situation today. Both of these papers will be published in next week's issue of the *Railway Age Gazette.*

Election of Officers

E. H. Alden, secretary and assistant treasurer of the Norfolk & Western, was elected president of the Society of Railway Financial Officers, succeeding T. H. B. McKnight, treasurer of the Pennsylvania Lines West; F. H. Hamilton, treasurer for the receivers of the St. Louis & San Francisco, was elected first vice-president of the society, succeeding H. E. Suckling, treasurer of the Canadian Pacific; L. S. Taylor, treasurer of the Pullman Company, was elected second vice-president, succeeding D. K. Kellogg, treasurer of the Richmond, Fredericksburg & Potomac, and L. W. Cox was re-elected secretary and treasurer.

The entertainment features of the convention consisted of automobile rides in the morning for the ladies and guests, and late in the afternoon for members, and a ride to Cabin John's Bridge as guests of the president of the Capital Traction Company of Washington. On Wednesday night a reception was held by Mr. and Mrs. H. C. Ansley.

FIRST TENTATIVE VALUATION REPORTS ISSUED

The Interstate Commerce Commission has issued the first tentative reports in accordance with the valuation act of 1913, giving the valuation as found by the Division of Valuation of the property of the Atlanta, Birmingham & Atlantic and its related companies, the Alabama Terminal Company and the Georgia Terminal Company, and of the Texas Midland, as of June 30, 1914.

The tentative valuation of the Atlanta, Birmingham & Atlantic is stated as follows:

Common Carrier Property

	Cost of reproduction of road and equipment excluding lands		Present value of lands
	New	Less depreciation	
Owned by A. B. & A.	$22,716,886	$18,071,950	$1,091,886
Leased to others	170,754	111,366	13,668
Used by A. B. & A., owned	22,546,132	17,960,584	1,078,218
Used, leased from others	1,608,866	1,448,226	1,213,195
Total used by A. B. & A.	24,154,998	19,408,810	2,291,413

The value of the property used by the Atlanta, Birmingham & Atlantic is allocated to states as follows:

	Georgia	Alabama
Cost of reproduction, new	$12,383,707	$6,852,881
Cost of reproduction, less depreciation	10,184,690	6,195,360
Present value of lands	1,545,347	746,066

The value not allocated to states, including the equipment, is placed at $4,918,410 for the cost of reproduction, new, and $3,028,760 for the cost of reproduction, less depreciation.

The valuation of non-carrier lands, present value including improvements, is stated as follows:

Georgia	$141,782
Alabama	3,421
Total	$145,203

Under the head of non-carrier property other than lands, the company owns $5,000 par value of the stock of the Atlantic Compress Company, $3,000,000 of the stock of the Alabama Terminal Company and $1,500,000 of the stock of the Georgia Terminal Company.

The book value of miscellaneous physical property is placed at $36,058.02, which consists of $42,632.02 for rails

and other track materials leased to others, less $6,574 for rails and track materials leased from others.

Aids, gifts, grants of rights of way, and donations are stated as follows: Value at time acquired, $47,181; present value, $247,875. In addition, certain counties and municipalities donated sums of money for the purchase of right of way, the deeds for which were made direct to the company, amounting to $73,060.25 in Georgia and $12,000 in Alabama.

No other values or elements of value were found to exist and the original cost of the property could not be found. Summary sheets are attached to the report showing the distribution of the above amounts by primary accounts.

The Atlanta, Birmingham & Atlantic was in the hands of receivers at the date of the report. The mileage owned at that time was 633.5 and its total outstanding capital liabilities amounted to $54,571,176.14, in addition to receivers' certificates amounting to $4,994,000. The property investment as shown by the books at that date was $53,325,751.58. The report states that exception is taken to the inclusion in the investment accounts of items aggregating $25,290,710, and to other items the money value of which cannot be determined. From the records available, it is stated, neither quantities nor costs can be assigned to specific pieces of property. In the discussion of the investment account the report says:

"The price shown to have been paid for the property of the Atlantic & Birmingham Railway is $2,303,086 in excess of the amount, $11,492,520, at which that company carried its property. The price shown to have been paid for the road constructed and equipped by the construction company (Atlantic & Birmingham Construction Company), is $19,264,445 in excess of the $16,946,758 expended on this account by the construction company, which latter amount included neither contractor's profit nor interest during construction."

In a preface to the report it is stated that for five of the companies now comprising the Atlanta, Birmingham & Atlantic no record whatever could be found and those that pertained to the other three companies were not susceptible of complete analysis.

"In the accounts of the Atlanta, Birmingham & Atlantic," the report states, "the accounting distinction between capital and maintenance was not strictly observed; freight charges on construction material transported over the company's own lines were not accurately recorded and equipment was retired or changed from one class to another without adjusting the record to correspond. These conditions, together with the fact that no record exists of the actual cost of the property purchased, make it impossible to state the original cost to date."

The report includes a discussion of the following general description of the property; physical conditions relating to construction; economic conditions relating to traffic, corporate history; development of fixed physical property; history of capital financing; increases and decreases in stocks, bonds or other securities in reorganizations; aids, gifts, grants and donations; results of corporate operations; investment in road and equipment; cost of reproduction, new, and reproduction less depreciation; improvements in leased physical property; investments in other companies; other securities owned; materials and supplies; Georgia Terminal Company and Alabama Terminal Company.

Analyses of the costs and the methods used in computing them and the division of property between the states are set forth in detail in exhibits attached to the reports.

For the Alabama Terminal Company the value of the common carrier property, which is leased to the Atlanta, Birmingham & Atlantic is stated as follows:

Road, excluding lands, cost of reproduction, new, $1,493,985; cost of reproduction, less depreciation, $1,367,411; lands, present value, $661,331; non-carrier lands, including improvements, present value, $166,438.

A similar report for the Georgia Terminal Company, whose property is leased to the Atlanta, Birmingham & Atlantic, shows the following:

Road, excluding lands, cost of reproduction, new, $903,270; less depreciation, $830,316; lands, present value, $604,459; non-carrier lands, including improvements, present value, $853,811.

The tentative valuation of the property of the Texas Midland is stated as follows:

COMMON CARRIER PROPERTY

Road and equipment, exclusive of lands:		
Road wholly owned—		
Cost of reproduction, new	$2,601,289	
Cost of reproduction, less depreciation	2,007,708	
Jointly owned—		
Cost of reproduction, new	21,951	
Cost of reproduction, less depreciation	18,208	
Equipment—		
Cost of reproduction, new	582,071	
Cost of reproduction, less depreciation	362,940	
General expenses—		
Cost of reproduction, new	176,693	
Cost of reproduction, less depreciation	138,561	
Total cost of reproduction, new		$3,382,004
Total cost of reproduction, less depreciation		2,527,417
Land:		
1,862.52 acres owned and used for transportation purposes		$236,689.65
75.87 acres not held for transportation purposes and structures thereon		8,619.40

The original cost of road could not be found. The original cost of equipment now in existence is stated as $528,874.59; of 1,369.91 acres of land purchased as $68,232.41, and of 492.61 acres donated (cost to the donors) as $43,103.75. No other values or elements of value were found to exist. The Texas Midland received aids and donations including gifts of right of way amounting to $69,885.51, not including the contributions of the late Hetty R. Green.

The capitalization of the Texas Midland on June 30, 1914, was $2,112,000 and it owned 111 miles of line.

Notices of these tentative valuations have been served on the attorney general of the United States, the governors and state commissions of the states in which the properties are located and the railroads. Each party is allowed 30 days from November 1 in which to file a protest with the commission. If no protest is made the tentative values will be considered as final. A specification shall be filed with each protest setting forth in detail the particular things against which the protest is directed. The detailed engineering, accounting and land reports have already been furnished to the railroads and the state commissions.

WHAT IS THE BASIS OF OUR PRESENT PROSPERITY?

By E. B. Leigh

President, Chicago Railway Equipment Company.

What is the basis of our present prosperity?

To what extent may it be attributed to "war business"?

And if chiefly to the latter, what will be the result of the suspension of "war business"?

"It has been clearly demonstrated that under normal conditions railway purchases measure general business prosperity." In December, 1913, the writer delivered an address on this subject before the Railway Business Association, from which it may be illuminating to quote briefly:

"Inasmuch as the railways of this country constitute its greatest industry next to that of agriculture, with but one thing to sell—transportation; the ultimate consumers of everything they buy, their purchases extending substantially throughout almost every department of business, many of them on a tremendous scale—it must be obvious how potent a factor they are in general business conditions.

"As the iron and steel industry has long been recognized

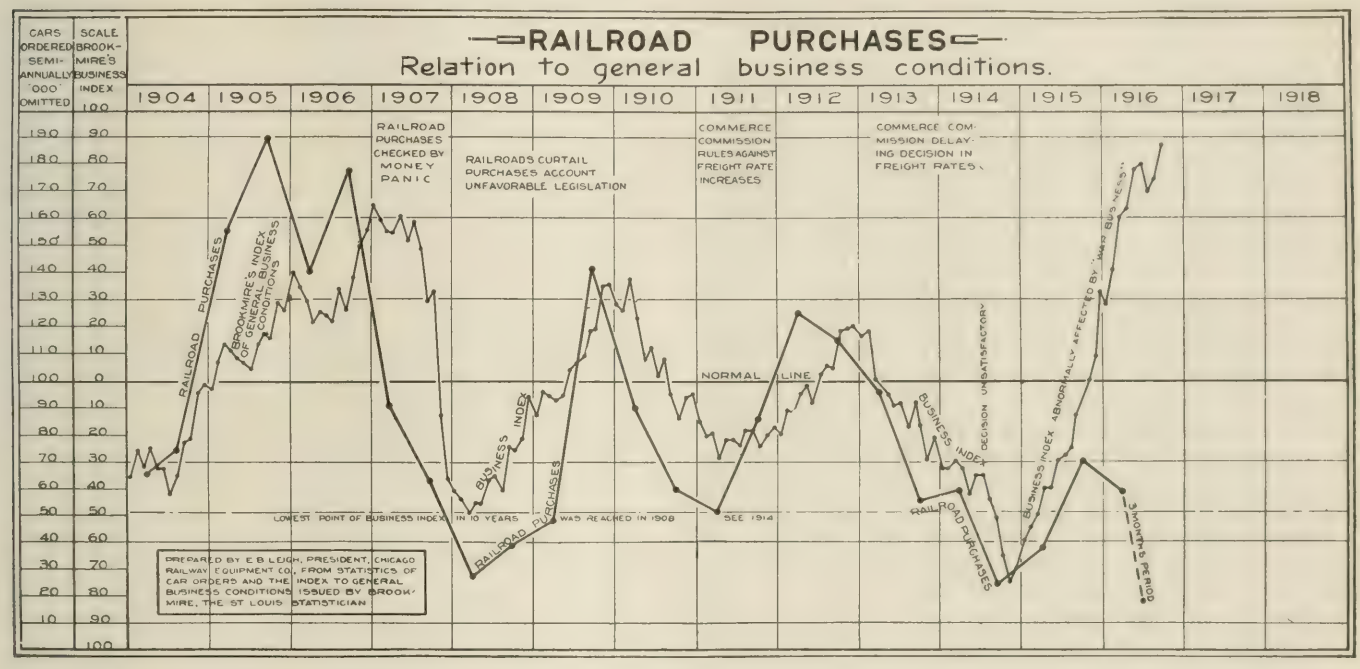
as being the truest index of general business conditions, and as the statement has been reliably made that the railways consume, directly and indirectly, between 40 and 50 per cent of the iron and steel production of the country, it is manifest that the expansion or restriction of railway consumption must vitally affect this barometer.

"The ramifications of railway purchases make it impossible to classify them in the aggregate. But of those items officially compiled, tabulated and made public, perhaps no one so clearly and typically reflects the railways' general purchasing ability as that of new equipment.

"The number of freight cars built each year taken as a unit, and termed 'railway purchases,' has been projected on the well known chart of the Brookmire Economic Service for the period, 1904 to October 1, 1914, inclusive."

This has been extended to October 1, 1916.

Examination of the accompanying chart will show the relation existing between "railway purchases" and "general business prosperity" under *normal* conditions; also wherein this logical relation of cause and effect has been sustained even in the presence of more or less *abnormal* conditions such as the money panic of 1907; legislation unfavorable to railroads in 1908-9, and the adverse freight rate decision of the Interstate Commerce Commission in 1911, these abnormal conditions thus only emphasizing the fundamental principle.



But at this time the most striking feature of the chart (extended to date) is found in the sharp divergence of the two lines "railway purchases" and "general business conditions" with the advent of the full tide of "war business."

The relation between these two lines had, broadly speaking, followed the normal course, not only up to and throughout the year 1914, but almost to the close of 1915, for it is well known that the effect of the feverish growth of the "munitions" business was not felt until the latter part of 1915.

It was then that the tremendous absorption of the iron and steel production of the country, employed in the manufacture of "munitions," etc. (a large percentage of which had heretofore been used by the railways); our vast exports of the many essentials both of peace and war which Europe could not produce; the radiating effect throughout so many lines of production—all combined to carry the volume of "general business" to an unprecedentedly high point entirely out of harmony with, or relation to, normal conditions.

That we are enjoying so great a measure of "prosperity" in the face of the fact that the railways have not been, and are not now, buying in normal quantities, is in no sense a contradiction of the doctrine that "railway purchases measure general business prosperity."

Railway purchases have been, and still are, much below normal, while the basic industry, "steel and iron," has found this new and enormous outlet for its products, thus, for the time being, completely distorting the relation of iron and steel to railway requirements, and the relation of railway purchases to general business prosperity.

With the suspension of "war business" there will be an inevitable reaction; falling of prices, curtailment of output—and with them many problems which manufacturers, merchants, business men and our people generally will have to face.

There is, however, one present-day condition which may be likened to the silver lining of the cloud. Our railways, sorely pressed for additional equipment and other necessaries which they are unable to buy because of prohibitive prices for materials or the practical impossibility of securing deliveries, may come into the market to an extent that, in some degree, should offset the otherwise disastrous effect that such a cessation of "war business" would entail. Unless the railways are encouraged by a logical revision of some of our laws affecting them, and are given the ability to finance their reasonable necessities; then the reaction is certain—modified only to the extent that we may find new outlets for our products, just as we have in the "war" condition.

THE CANTON-HANKOW RAILWAY.—The Canton-Hankow Railway, in April, 1916, was built to within about 60 miles of the Hunan border. The number of passengers carried during 1915 was 1,782,376. The freight carried amounted to 99,688 tons. The total receipts of the line were $387,250, as against $268,670 during 1914. Structural materials were bought during 1915 sufficient for about 20 new freight cars. These cars are to be made in the company's workshops at Wong Sha, Canton. During the year construction work was completed from the one hundred and thirty-second mile to the one hundred and fortieth mile from Canton, and two more stations were opened in June, one at Hsiu Chow, a city of some 60,000 people and, next to Canton, the most important station on the line.

The Training of Young Men for Promotion*

The Santa Fe Methods of Selecting and Training Recruits for Future Mechanical Department Officers

By F. W. Thomas
Supervisor of Apprentices, Atchison, Topeka & Santa Fe, Topeka, Kans.

THE training of young men for positions of responsibility involves two considerations; the foundation upon which to build and the material with which you are to build. The solution of both of these by the Santa Fe requires a little explanation of the preparation of the raw material from which we may select the stones for the building. Our apprentice system was organized nine years ago and developed along the lines promulgated by G. M. Basford. We do not claim the credit of originating the scheme. We do, however, claim the honor of having put his idea into practical effect, standing by the scheme and backing it up until the infant could stand alone, and today we are reaping some invaluable results—results you cannot measure in dollars and cents.

The Apprentice System

Briefly, our scheme for training boys for our shops, is as follows: We take a boy who has completed grammar school or better and examine him as to his mental make-up. A series of simple arithmetical problems, coupled with the manner of filling out his formal application blank, and a personal interview, give us some idea of the boy's accuracy, industry and alertness. He then goes out in the shop to run the gauntlet of our shop instructors. They find out why he wants to be a machinist instead of a lawyer, or a boiler maker instead of an editor or preacher, if some friend or parent simply sent him to us on account of the good wages paid mechanics, or if he is making application simply because his father was a machinist. We want to find out as much as possible about the boy from the boy himself. We do not ask any letters of reference. We do, however, strongly endeavor to get boys of good, honest parentage. If he passes the shop instructors he next goes to our surgeons and passes a physical examination. We are taking these young fellows in our service for life, and it is well that young men sound in body and mind should be selected.

If the doctor passes him the boy goes to the office of the superintendent of shops, filling out the regular indenture papers and minor's release, is given a letter to the shop foreman, who gives him a shop number, etc., and he is told to be on hand by the time the whistle blows in the morning. He enters the shop next morning. He is not left to wander around or to wait for someone, or to be bewildered by a sea of strange faces, or frightened by whirling belts, moving machines, or unaccustomed noises. The shop instructor meets him, a kindly hand grasps his, a kindly face is looking upon him, a kindly voice is speaking to him. Then a feeling creeps over him: "What a glorious and good world this is"—an exhilarating feeling which each of us has felt the hour we began to work for ourselves.

The apprentice in the shop is constantly under the eye of the shop instructors and is taught how to perform each operation or step of the trade he has been indentured to learn. An exact account is kept of each job performed and the time required to perform it. His shop work is correlated with useful instruction in the apprentice school room. We teach him mechanical and free hand drawing, the elements of mechanics, shop arithmetic, and some other subjects, closely related to his actual shop work. A boiler maker apprentice, for instance, will have acquired a working knowledge of plane and descriptive geometry. He will be able to give you an intelligent definition of a boiler, the correct name and function of each part. He can calculate the strength of any kind of seam, can figure out the factor of safety of a boiler or any part of it; from a flat sheet he can lay out, mathematically or geometrically, any section and develop it. He is familiar with the Federal rules as to the inspection and maintenance of boilers. He can quickly make you a sketch or a working drawing of a boiler, can lay out, flange, stay, and build a boiler. At 21 years of age he is the equal of a boiler maker of 50 years. Throughout his four years apprenticeship he is hourly watched by general and shop foremen, by shop and school instructors. His weak points are strengthened, his strong features are exercised. Personal characteristic blanks are filled out from time to time which give the supervisor's office a graphic personal record. While the boy is serving his apprenticeship we find out his particular fitness, firmly convinced that the boy, now a man, will perform his duties better when his heart is in the work; if he can be placed on a class of work which he loves, he will certainly do better than if engaged on some work which he does not like.

Recruits for Promotion

The best worker will not necessarily make the best foreman, this we have long since learned. Those who have given evidence of possessing talent for leadership are selected for development. Possibly and very probably not all deserving ones are selected, but we are pretty sure that only those are selected who have given evidence of such ability. This is our first source of supply. The second is from our special apprentices, who are graduates of engineering schools.

Special apprentices are selected only upon a personal interview. We cannot put much credence in letters of recommendation from professors or influential friends. I do not mean by this that they attempt to deceive. The trouble lies in the fact that they are not really and fully acquainted with the young fellow. There is little or no effort made by our college instructors to find out the real natural talent of the student. We require these specials to work one year on machines, and one year on erecting floor, then we decide whether or not he shall pursue our course for the development for positions of responsibility.

We now have the boy from the public schools who has served his four years journeyman apprenticeship and has become a first-class mechanic, and the college man who has engaged in practical shop work for two years; the pick of two sources for development into our future officers. They must, during their apprenticeship, have been quick to learn, industrious, prompt, honest, readily and effectively amenable to discipline, steady under fire, and popular with officers and associates, and then have some distinctive qualities of leadership.

Training for Future Responsibility

We offer each of them the following opportunity: He must serve two months in the boiler shop, familiarizing himself with tubes, stays, patches, front ends, Federal laws, etc., pursuing a course of reading and study of boilers and appurtenances. He next goes to our freight car shop and serves

*Abstract of a paper presented before the New York Railway Club, October 20, 1916.

two months on trucks, draft gears, body, doors, roof, air brakes and inspection, also pursuing a course of reading and study on car work, M. C. B. rules, etc. Then we send him to a busy roundhouse for four months. He may previously have had roundhouse work but he is now taught the operation of an engine house from the time a locomotive reaches the ash pit until it is headed out on the "ready to serve" track. Cleaning fire, fueling, watering, actually repairing, the handling and distribution of work orders or slips, dispatching, and the various reports made out by the foreman, etc. Here he reads or studies some good books on locomotives. We next find him with the travelling engineer, studying fuel economics, learning to fire, to inspect and operate the engine, to make out the usual road foreman's report, accompanied by an individual study of parts of the machinery, the construction and operation of injectors, lubricators, safety valves, air brake, valve motion, etc. He also familiarizes himself with the Federal and company rules for the inspection and care of locomotives. We next find him at the front door of our back shops or a large roundhouse, for thirty days engaged in inspecting incoming locomotives and thirty days inspecting outgoing locomotives. Once a month he has written a letter covering the work he has done, explaining the operation of certain features, offering suggestions as to shop management or methods, and criticizing local existing conditions when he can offer some remedy. In each branch of the above he must answer 150 questions bearing on the work in hand.

This is called our Special Course For Graduate Apprentices, and it keeps them terribly busy. They are the very busiest young men I know. We have so made this course that it is a trying and severe one, but it is certainly a developing one. A few break down under it or throw it up, but 80 per cent or over pursue it to the end. We do not expect that the two months in the boiler shop will make a boiler maker but we do know it gives an insight into boiler work which will be of vast benefit to the young man when he is made a roundhouse or shop foreman. We don't expect him to become a proficient car carpenter in 60 days, but he has derived sufficient knowledge of cars, car repairing and inspection, and M. C. B. rules to be not entirely dependent upon the car foreman's word or opinion, and so on through the course. It is surprising how much these bright young mechanics can pick up and assimilate of the other trades during that short period. The course of reading, study, and examination questions does not leave much time for the movies, even his best girl will suffer. But we are making men.

The Good Book tells us that God spent nearly the entire week in creating the entire animal, plant, and vegetable life of the world, before He made man. While we have spent nine years in organizing and building up our present apprentice system, it has been less than two years since we have attempted to specifically train men for our future mechanical officers.

Opportunity for Outside Training

To prevent any possibility of our growing stale, we pick a number from this list of special course men and send them east. One year ago we brought six machinists and one boiler maker to the Baldwin Locomotive Works for a period of six months, where they were made assistant department foremen. They were given as much responsibility as they could carry and were changed from one department to another every two months. They acquired a general and detailed knowledge of the plant, executive and operative, from the time the material for a locomotive was ordered and received and on through the plant until it left the works a finished locomotive. They had an opportunity to note the practices of nearly all the roads in this country and many foreign nations. They were given, through the liberality of the Baldwin Locomotive Works, an opportunity of visiting a steel mill and studying the manufacture of steel. They were likewise treated with two half days at the Master Mechanics' convention at Atlantic City. I wish publicly to express my appreciation to Mr. Vauclain and his officers for their personal interest and zeal in furthering a scheme which I believe is the best that has been advanced. Every two months the speaker was required to visit these young men in Philadelphia. It is a long way from Kansas to Philadelphia but the Santa Fe believes there is no trip too long or no work too hard, when it comes to developing young men for her service. These young men are back home again. They were not spoiled; they went back to their trade in the shop, but for a few days only. One is foreforeman of our Dallas terminal, one a roundhouse foreman in Kansas, one in Arizona, one machine foreman in Topeka, one welding engineer in charge of gas and electric welding and one machine foreman in California, all doing well. Seven more have taken their places at Baldwin's.

In like manner we sent four graduate apprentice passenger car men to the Pullman shops to catch on to the latest and best in steel car construction, two young painters to the Pullman shops to acquire the newest and best in painting, graining, and decorating steel passenger cars. Four young fellows are at the Westinghouse Air Brake Company, mastering the manufacture of air brake equipment. The same generous spirit has been shown by the Pullman and Westinghouse companies as was exercised by the Baldwin Locomotive Works. The four car men are back with us, filling positions of responsibility.

Each of the above young men was required twice a month to write me a letter giving in detail their observations and work during the past two weeks. These letters were remarkably interesting and will be of untold benefit to the young men in after years. The training this letter writing gave them could not be obtained so effectively in any other way. It required from two to five days a month for the author to thoroughly read and criticise these letters. The young fellows meet once a week and the letters are read over and discussed by them before sending. No changes are made in the original, though a postscript may be written. It gives each an opportunity of knowing what the other is doing, how he expresses himself, etc.

You may wonder at these details and they may weary you, but they are essential to the subject. You can't go out in your shop and tell your superintendent to make you a foreman in the manner or with the ease he could make an engine bolt or grease cup. You can't pick a horse from the street, send him out to the track and expect him to lead the 2:10 trotters because you have put your bet on him. You would be considered a fool for so doing. If you are going into the racing business you select a horse whose sire has a pure strain of trotting blood for generations back. You go further; you put the colt in the hands of an experienced trainer, who for days and months and years gives him the food which experts have decreed is the right kind, give him the kind of exercise that will best develop enduring wind and fleetness of foot. But you cannot do all this in a day. So we have felt that the material we wish to develop for positions of responsibility must be selected early and trained for five years.

College Scholarships

Four years ago I was advised that a Ryerson Master Mechanic scholarship vacancy existed, and the appointment would be made in a few months. We looked over the list of available boys and told two to try for it. One of these won. Last year another was awarded, upon a competitive examination, to a Santa Fe apprentice. We simply told a boy to go after it. This year we had several ready and waiting for the competitive examination and a Santa Fe boy walked away with the prize. We have more getting ready for the next one and will win that one too, so long as a competitive examination rules the selection. This is a by-

product of our apprenticeship. It is the result of knowing our boys.

The law is laid down to us that we must not go outside for a mechanical officer. We must promote those who are now in service. The prize is hanging out to them and only when they fail us will we let outsiders enter the race. With this practice in vogue it would be very short-sighted to wait until the job was open to find a man. We believe in having the man ready for the job. We can't have a man ready at a moment's notice unless we are prudent enough to go into the matter a sufficient time ahead.

Know Your Men

The weakness, or fitness, of a boy is not left to the judgment of one man. It is the result of four years of individual instruction. There is no such thing in our regular scheme as classes. There is no huddling together boys of all kinds, of all the various dispositions, capacity, and intelligence, each boy from the moment he makes application until the day we graduate him into manhood as a mechanic, is a class unto himself, is treated as a unit, and all the instruction we give him in shop and school room is individual. We go further. We have a governing body known as the apprentice board, composed of our general foreman, department foremen, gang foremen, shop and school instructors, who meet as a trial court to pass on each boy eight times during his apprenticeship. This board is as fair and honest and equally as anxious to mete out real justice as any court or body of men that ever assembled to pass judgment on a fellow man. Religion, politics, poverty, or pull never sway them one iota. If the boy is fit they pass him. If he is a misfit he goes, and no power can save him. Like our courts he may get a new trial. His case may be deferred, but justice will find him. That board is even more anxious in removing the ill-fitted and talentless boy than it is to encourage and help the genius. It is deemed a crime against the railroad, a crime against society, a crime against the boy's young life to require him to stay and attempt to learn a trade when all his talent and all his ambition lies in other channels. When a boy completes his apprenticeship we know him and his capabilities. He may not be a leader, he may not be a world beater, but we know what he *can* do and where best to use him.

We have in our apprentice regulations of 22 articles, only two don'ts for the boy. We say he must not smoke cigarettes as the tendency of this practice is towards dishonesty. We say he must not drink for who wants a booze fighter? The other 20 articles are there to safeguard the boy.

When we graduate an apprentice we continue a watchful supervision over him. If he remains at his graduating shop the local instructors keep an eye on him, helping and advising him when necessary. If we transfer him to a distant shop his "follow-up" card is sent ahead to the instructor, who aids him in getting located and in securing a good boarding place, etc., making his first hour in the new town a pleasant one. In fact, the first person a graduate calls to see when entering any of our shops, is the apprentice instructor. He will be assured of one person at that place who will be interested in him. If he leaves the road, we still follow him. It may cost us a few postage stamps but the information is worth the stamps. So we have pretty nearly a perfect record of all our graduates. The location of 150 who have left us is as follows: On adjacent or connecting roads, 57; on distant roads, 14; in Canada, 4; "Somewhere in France," 2; in Panama assisting in operating the canal, 2; in garages, 37; in contract shops, 14; in business for themselves, 12; in the navy, 8.

The first position after leaving the ranks is the most trying of the young man's life. It is here he needs counsel and advice from old heads. We are prone, when entering on a new job, to try to do too much, to turn too many things upside down, to make a record the first month. Right here is where the young man is liable to fail, and a steady, guiding hand is needed to balance him. A master mechanic who had promoted a young fellow to a roundhouse foremanship at an important terminal, told me that for one solid week he spent eight of the ten hours per day in that house. That week made the young man one of the best roundhouse foremen on the system.

An incident recently occurred at Topeka which illustrates the point I am trying to drive home, i. e., knowing your men. The writer makes a monthly report showing number and location of all apprentices, etc. In this report for August was the name of one young boiler maker leaving the service, and the cause of his leaving. Our chief mechanical officer was much perturbed, and called in the superintendent of shops, boiler foreman and his assistant, two boiler shop instructors and the supervisor of apprentices for a conference over this young graduate apprentice leaving the service. I only mention this to emphasize that when such officers can and do spend one-fourth of an entire working day finding out why one young boiler maker had quit, you will find an organization which knows its men and is building for the future.

What Apprenticeship Has Accomplished

We are expecting good results from our apprentice graduates who have won the Ryerson scholarships. These young men had about completed their apprenticeship, are thoroughly equipped in practical shop and machine operations and are thoroughly familiar with the locomotive. They are now at first-class engineering schools. Their technical knowledge will mean something to them. The application of mechanical devices and mechanical laws will all appear plain and, best of all, be useful to them.

Our scheme is not complicated, on the contrary it is simple. It has not involved any revolution of our shop management. It has, however, demanded the individual effort of the writer, the co-operation of our mechanical officers, and the moral and official backing of all our executives from the president down. Has the game been worth the candle? Let me briefly recount the benefits we have enjoyed. From our apprentice system we have graduated over 900 first-class, skilled mechanics into our shop forces, trained and educated for Santa Fe work in Santa Fe ways, who in skillfulness, in general intelligence, in resourcefulness, in loyalty, are the superior of any equal body in similar vocations from any railroad or corporation of any place or any time. The present apprenticeship system has improved the whole moral tone of our shops. It has been the means of abolishing rawhiding and mule-driving. The use of profanity by officers to men has practically ceased, and the violation of Rule G is rare.

Of the graduates 72 per cent. are in service today. When you think of the fact that the average turnover of men in the shops and manufacturing plants in the country is three and one-half years, this is a flattering showing. Of the 72 per cent who have remained with us, over 100, or 15 per cent, have been promoted to some position of responsibility and we have others ready and waiting. The past year has been one of unusual activity, the biggest year in our history: more trains moving, more cars loaded, more engines turned than any previous year; yet we have not employed a mechanic from the outside for more than 12 months, and at our principal shops, Topeka, Kansas, no skilled mechanic has been employed for over two years. These are the fruits of our recruiting and training system. Can you beat it?

Discussion

G. M. Basford (President, Locomotive Feedwater Heater Company): Several reasons are sure to be advanced to show why the Santa Fe plan will not work elsewhere. Some people think that it will not be satisfactory in a small organization. It is satisfactory in small organizations. Some will say that the labor union limitations on apprenticeship will not permit of such a plan. Is this a reason for not providing for such numbers as the unions do permit? Others will say that the Santa Fe does not have competition with ammunition

plants, and other plants. Is not this the more reason why railroads having such competition should do even more than the Santa Fe has done to hold their boys? There can be no excuse, no justification, for failure to train men for the future. God help you and your successors if you do not do as the Santa Fe has done. How can you sleep nights until you have started this work? How can you feel sure of your own position until you have done this?

Everything the railroad uses is bought on specifications. It is considered necessary in order to secure what is wanted and what is paid for. But who selects the men? Where do they come from and of what quality are they? Construction work is controlled by specifications, but who constructs your personnel and how is it done? Clerks do the best they can in selecting raw recruits, but is it safe to place this great responsibility upon a clerk? Is it wise to allow him to accept or reject the man who may one day be your president?

Lacking constructive methods of picking recruits, training them and promoting them, it is no wonder that railroad presidents have told me that they did not know where to turn to find the men they need.

In nine years the Santa Fe has laid a grand foundation for the future, but the structure itself is only beginning. In time this great plan will be extended. It will not be complete until it embraces all departments. When this is done we shall not have difficulty in pointing to a truly great, efficient and perfectly balanced organization. Thorough training of well selected recruits is not all the Santa Fe does. It is fruitless to train men unless the organization is prepared to receive the product of the training. The promotion is as carefully handled as is the training. If it had not been, the graduates would scatter promptly. The boys will not quit if they can be shown that they cannot afford to quit.

Note the record of Santa Fe boys in winning the scholarship so generously provided for 14 years by the firm of Joseph T. Ryerson & Son. They have won it three times out of five. The best college men for railroads will be those from the ranks who win scholarships. This suggests the solution, and I believe the only solution, of the problem of college men on railroads. I hope the day will soon come when both large and small railroads will offer scholarships as prizes for their apprentices—in all departments. But some railroad organizations will change their methods of promotion if they are to hold such men afterward.

The speaker omitted to state that the Santa Fe success is due to the inspired individuals who started it and who had lived with it, as John Purcell, J. W. Kendrick, W. B. Storey and F. W. Thomas have done. Its foundation was laid many years ago when John Purcell formed his apprentices at the Fort Madison shops into a class of which he was the instructor. The class met nights and the instructor personally supplied accommodations, books and drawing materials. The larger work followed a single interview with the operating vice-president, J. W. Kendrick, who found ready support from President Ripley. It acquired fresh impetus and continued able support from Mr. Storey. Mr. Thomas did the work and he did and is doing it nobly, with Mr. Purcell as leader and counsellor and personal director. Inspiration at the top of the organization is the starting point. Many failures occur for lack of this essential. When the man higher up pounds the table and says, "I must have trained men. I'll discharge any officer who will not at once begin to train his own successor"—then you are ready to begin. The next step is to find an F. W. Thomas.

The new apprenticeship has proved itself. This, however, is only the beginning. Its field is every department and every office in the organization. When this truth is known railroads will come into their own. They will have better men and will keep their best ones, and what is more, employers and employees will better understand each other.

You are not advising your own son or the son of your best friend to enter the mechanical department of a railroad for a career. Think deeply of this. It is my opinion that Mr. Thomas has the solution of the question—"What is the matter with the mechanical department?"

C. W. Cross (vice-president Equipment Improvement Company): The educating and training of young men in all departments of railway service is so tremendously important that it demands the best thought and effort of those in charge of the administration of our railroads. The Santa Fe plan, both as a whole and in its details, is excellent, but may have to be modified in some respects to meet local conditions. As is evidenced from Mr. Thomas' paper, the providing of a successful plan for apprenticeship is only a part of the task. The greatest measure of real profit to the railroad will be realized only when conditions are such as to attract and hold the graduate apprentice in service. It will be contended that the railroads cannot afford to meet the competition for skilled mechanics on the part of industries in manufacturing districts. Obviously the railroads must have a good supply of skilled mechanics if they are to operate efficiently and economically. It will be necessary to pay the graduate apprentices on the same basis as journeymen. Not only this, but the more deserving and ambitious ones must realize that they will be advanced to subordinate administrative positions if they make good. While the average boy has been accused of giving too much weight to immediate financial returns, such a statement is open to very serious question. In all probability, if conditions are made favorable and there is a spirit of enthusiasm in the organization and possibility for advancement, he will realize its importance and take it into consideration when more attractive financial inducements are offered him elsewhere.

The best results can only be obtained when such conditions confront the graduate apprentice and when the entire plan of apprenticeship is handled in a dignified, businesslike manner, with no appearance of paternalism, and with a thorough understanding that the company expects and demands expert service from those training for the work, for which it is willing to pay liberally.

Jacob H. Yoder, supervisor of apprentices, Pennsylvania Railroad, briefly outlined the Pennsylvania system of apprenticeship and emphasized the fact that it is designed primarily to provide an adequate supply of mechanics for the shop, rather than recruits for promotion. The apprentices are divided into three classes: regular, first class and special. The first class is made up of the exceptional regular apprentices, who are selected for broader training, including car work, locomotive firing, etc., these men being available for promotion to minor positions of responsbility. Members of this class are furloughed to attend college if they so desire and may return to the road as special apprentices. Special apprentices are college graduates.

E. R. Larsen, supervisor of apprentices, D. L. & W., spoke of the necessity of education in the broad sense, the methods of acquiring it, whether in college, through a correspondence school or through one's own personal efforts not being of prime importance. He stated it as his belief that the best results from college trained men may be obtained if they serve a regular apprenticeship course first and receive their college education afterwards.

In closing the discussion, Mr. Thomas stated that the entrance requirements for the regular apprenticeship course on the Santa Fe are very flexible, an applicant who has had the advantages of a high school education being examined much more rigidly than one who has not been beyond the grammar schools, the purpose being principally to discover how he has availed himself of his opportunities. He also emphasized the importance of providing ample shop instruction. This cannot be left to the foremen, who are usually too busy with other duties directly bearing on the output of the shop to give much attentiton to the work of the apprentices. Shop instructors are therefore necessary.

General News Department

The freight house of the Southern Pacific at Houston, Tex., was damaged by fire on October 21 to the amount of $12,500.

A southbound express train of the Atchison, Topeka & Santa Fe was stopped by robbers near Bliss, Okla., on the night of October 18, and an express messenger was shot and killed.

Near Buffalo, N. Y., on the night of October 19, five robbers stopped a freight train of the New York Central and, holding the trainmen at bay with revolvers, robbed a car of a large quantity of clothing, and carried it off in an automobile truck.

St. Elmo Massengale, of Atlanta, has been appointed a member of the special commission of the state of Georgia which was appointed to see about selling the Western & Atlantic Railroad, owned by the state. He takes the place of J. L. Hand, deceased.

The Grand Trunk Railway of Canada, following extensive negotiations, has increased the pay of locomotive runners. An unconfirmed statement says that the increase amounts to 15 per cent. The pay of other trainmen on that road was increased not long ago.

From a circular issued last Tuesday by the Baltimore & Ohio it appears that General George F. Randolph, who has been appointed commissioner of the railroads in Official Classification Territory, will continue to be traffic vice-president of the Baltimore & Ohio lines but, apparently, with no active duties.

Charles H. Mansfield, locomotive engineer of the express train which ran into a preceding local on the New York, New Haven & Hartford, at Bradford, R. I., April 17, last, when five persons were killed, has been tried for manslaughter and, on October 21, was acquitted. The trial lasted four weeks. The jury deliberated seven hours.

At a crossing of a much-traveled highway with the tracks of the Pacific Electric Railway, in Los Angeles, California, automobiles are compelled to come down to a low speed by the unevenness of the roadway. The city engineer has built into the pavement a series of humps for a distance of about 30 feet, approaching the railway tracks.

The Canadian Pacific is exhibiting a collection of toys and novelties at the expositions which are being held this season at Quebec, Que., Toronto and London, Ont., which were imported from Europe before the war, many of them being "made in Germany." The exhibits are intended to encourage the manufacture of these articles in Canada.

The State Department at Washington has ordered an informal investigation of conditions surrounding recent protests entered by the Japanese and Russian governments in China against plans of American capitalists for railroad and canal construction in northern China. The United States legation at Pekin has been asked to forward a report on the protests.

One of the 18 western railroads negotiating with shopmen over proposed wage increases—the Chicago & Alton—has come to an agreement with its men. It has granted an increase of 2½ cents an hour to all skilled mechanics and 2 cents an hour to apprentices, effective August 16. It has also granted a nine-hour day to all shopmen.

A coroner's jury at Detroit, Mich., has found the Grank Trunk Railway to be guilty of negligence in connection with the accident on a street crossing in that city, October 1, when a locomotive ran into an electric car and ten persons were killed. The jury declares that the gates were not closed, that the gate man at the crossing was incompetent, and that he was asleep at his post.

The Southern Railway, in connection with double track work between Orange, Va., and Central, S. C., has eliminated 93 highway grade crossings. Thirty-eight were supplanted by overhead bridges, 33 by underpasses, and 22 by changes in the route of public roads. In all construction work the fixed policy of the Southern is to separate important highway crossings wherever practicable.

The Chicago, Rock Island & Pacific also has reached an agreement with its men. It has granted an increase of 2½ cents an hour, flat, for mechanics and their helpers and helper apprentices, and 1½ cents an hour for other apprentices. The present working conditions are to continue with the exception that men engaged in rebuilding and repairing cars will work nine hours a day instead of ten.

W. M. Acworth, the English railway publicist, has been appointed a member of the Canadian Board of Inquiry, chosen to study the railway situation in that country, in place of Sir George Paish, who, because of ill health, is unable to leave England. A. H. Smith, president of the New York Central, and Sir Henry Drayton, the other two members of the Board, are now engaged in the preliminary work of the investigation.

In a formal statement issued last week, the controller of the city of St. Louis advocates the leasing of the municipal bridge to the Terminal Railroad Association of St. Louis and the acquisition of the upper deck of the Eads bridge by the city. The plan is to exact from the Terminal Association a rental sufficient to cover the interest on the $6,250,000 worth of bonds which have thus far been issued for the construction of the uncompleted "free bridge." The interest on this amount is $340,000 a year. According to the figures presented, the income of the Terminal Association from the upper deck of Eads bridge amounts to $200,000 a year.

Great Northern to Electrify

It is reported that the Great Northern is making extensive plans for the electrification of about 300 miles of its main line between Spokane, Wash., and Seattle. The power for running the electric locomotives will be supplied from a hydro-electric station probably located on the Chelan river. The problem of furnishing sufficient electric power for operating the trains over the heavy mountain grades on this section of the Great Northern involves the raising of the level of Lake Chelan so as to provide a greater head for the power plants and also to provide sufficient water storage capacity. Ralph Budd, assistant to L. W. Hill, president of the Great Northern, has announced that the company is working on the plans of the electrification, but it does not intend to start work on the project at once, as considerable time will be required to work out the details. The heavy mountain grades and the dense traffic on the 300-mile section of the Great Northern west of Spokane are the main reasons for the decision to electrify. In the opinion of the railroad officers, electrification is the only satisfactory solution to the problem.

Traveling Engineers' Association

The twenty-fourth annual convention of the Traveling Engineers' Association was held at the Hotel Sherman, Chicago, October 24 to 27, inclusive, President J. R. Scott, assistant superintendent of locomotive performance, St. Louis & San Francisco, presiding.

The following is a list of exhibitors:

American Arch Co., New York.—Represented by Le Grand Parish, S. G. Allen, W. L. Allison, H. D. Savage, J. P. Neff, A. W. Clokey, G. M. Bean, R. J. Himmelright and J. T. Anthony.

American Steel Foundries, Chicago.—Vulcan trucks, Simplex couplers, Economy draft arm, Vulcan brake, Ajax, Hercules and Vulcan brake beams and Simplex truck column, Atlas safety guard, Third Point brake beam support, Simplex reversible and adjustable complex pocket. Represented by W. A. Wallace, W. G. Wallace and J. G. Russell.

Ashton Valve Co., Boston, Mass.—Gages, safety valves, whistles and gage-testing devices. Represented by J. W. Motherwell, J. F. Gettrust and H. O. Fettinger.

Barco Brass & Joint Co., Chicago.—Barco engine and tender flexible connection for air, steam and oil, Barco automatic smoke box, blower fitting, Barco flexible joints. Represented by F. N. Bard, C. L. Mellor and L. W. Millar.

Bird-Archer Co., New York.—Boiler compounds. Represented by L. F. Wilson, J. M. Robb, C. J. McGurn, J. A McFarlane, C. A. Bird and J. Shaw.

Boss Nut Co., Chicago.—Lock nuts. Represented by J. A. MacLean, J. W. Fogg and Cliff Boumont.

Chambers Valve Co., New York.—Model. Represented by F. H. Clark, F. S. Wilcoxen and E. L. Nusz.

American Flexible Bolt Co—Flexible bolts. Represented by C. A. Seley, W. F. Heacock, R. W. Benson, L. W. Widmeier and M. M. McCallister.

Anchor Packing Co., Philadelphia, Pa.—Fibrous packing for throttles, air pump, etc. Represented by J. P. Laudreth.

Baldwin Locomotive Works.—Photographs. Represented by A. S. Goble.

Chicago Car Heating Co., Chicago.—Steam hose couplers, pressure-reducing valves, steam traps, stop valves, steam gages and end train pipe valves. Represented by E. A. Schreiber, R. P. Cooley and E. E. Smith.

Chicago Pneumatic Tool Co., Chicago.—Pneumatic tools. Represented by J. C. Campbell and C. E. Walker.

Chicago Railway & Mill Supply Co.—Economy locomotive balanced fire door. Represented by A. W. Gillespie and A. W. Birnesky.

Commonwealth Supply Co.—Lewis reverse gear. Represented by S. H. Lewis.

Dearborn Chemical Co., Chicago. Represented by J. D. Purcell, G. R. Carr, J. H. Cooper and I. H. Bowen.

Detroit Lubricator Co., Detroit, Mich.—Detroit automatic flange lubricator. Represented by A. G. Machesney.

Economy Devices Corporation, New York.—Rushton screw reverse gear. Casey-Cavin reverse gear, Ragonnet reverse gear, Universal valve chest and radial buffer and engine truck. Represented by H. F. Ball, Joseph Sinkler, J. L. Randolph and J. L. Bacon.

Edna Brass Manufacturing Co., Cincinnati, Ohio.—Injectors, lubricators, boiler checks, water gages, coal sprinklers and fire extinguishers. Represented by E. O. Corey and H. A. Glenn.

Equipment Improvement Co., New York.—Markel locomotive devices, Wine side bearings and Trojan packing. Represented by F. H. Clark, C. W. Cross and A. A. Schafer.

Flint & Chester, Inc.—National graphite lubricators, locomotive fuel weighing device and Radbore head. Represented by D. J. Lewis, C. E. Foyle and L. S. Watres.

Franklin Railway Supply Co., New York.—Franklin fire-door. Represented by C. W. F. Coffin, W. H. Coyle, R. Coburn and S. Rosenfelt.

Galena Signal Oil Co., Franklin, Pa.—Represented by J. E. Linahen, W. J. Walsh, W. Holmes, J. A. Roosevelt, G. R. McVicar, W. O. Taylor, D. L. Eubank, C. B. Royal, W. E. Brumble, M. M. Meehan, J. S. Brown, F. B. Smith, J. A. Graham, J. G. Arn and C. McNair.

Garlock Packing Co., Palmyra, N. Y.—Garlock packing. Represented by W. G. Cook and C. W. Sullivan.

Garrett-Callahan Co.—Boiler preservative. Represented by E. V. Sackett and A. H. Hawkinson.

Greene, Tweed & Co., New York.—Packings. Represented by N. B. Nickerson.

Henry Manufacturing & Grease Cup Co., Terre Haute, Ind.—Grease cups. Represented by M. Henry.

Hunt-SpillerManufacturing Corporation, Boston, Mass.—Hunt-Spiller gun iron. Represented by J. G. Platt, V. W. Ellet, J. M. Monroe, H. McB. Parker and E. J. Fuller.

Johns-Manville Co., H. W., New York.—Manual and automatic slack adjusters for brake equipment, J. M. expander rings, steam traps, packings, fire extinguishers and pipe coverings. Represented by J. E. Meek, J. C. Younglove, George Christenson and E. H. Wallard.

Kelley-Wood Safety Locomotive Side Curtain Co., Chicago.—Locomotive side curtain. Represented by W. F. Kelley.

Leslie Co., The, Lyndhurst, N. J.—Unito coupling nuts and steam heat regulators. Represented by J. S. Leslie and J. J. Cizek.

Liberty Manufacturing Co., Pittsburgh, Pa.—Locomotive arch tube cleaners. Represented by C. L. Brown and E. L. Davis.

Locomotive Feed Water Heater Co., New York.—Locomotive feed water heater. Represented by G. M. Basford.

Locomotive Pulverized Fuel Co., New York.—Represented by J. E. Muhlfeld and George Clenden.

Locomotive Stoker Co., Pittsburgh, Pa.—Photographs. Represented by W. S. Bartholomew, C. F. Street and W. G. Clark.

Locomotive Superheater Co., New York.—Model of welded superheater unit, pyrometer and grinding tools. Represented by John Bell, W. Boughton, W. A. Buckbee, G. Fogg, C. D. Hilferty, B. G. Lynch, S. MacDonald, A. C. McLachlan, J. E. Mourne, R. M. Ostermann, R. R. Porterfield, G. E. Ryder, G. E. Spangler, W. G. Tawse, C. N. Wickham, F. R. Fitzpatrick, Pat Keenan and Harry Spicer.

Long, Jr., & Co., Charles R., Louisville, Ky.—Represented by Harry Vissering, G. S. Turner and W. H. Heckman.

Manning, Maxwell & Moore, Inc., New York.—Inspirators, valves and gages. Represented by C. L. Brown and J. C. Bryan.

McCord & Co., Chicago.—Lubricators. Represented by O. H. Neal.

Mudge & Co., Chicago.—Mudge-slate front end. Represented by G. W. Bender and B. W. Mudge.

Nathan Manufacturing Co., New York.—Injectors, lubricators, boiler checks and boiler supplies. Represented by J. S. Seeley, W. R. Walsh, G. Royal, J. C. Currie and Harry Neville.

National Boiler Washington Co., Chicago.—Safety-first fire door. Represented by H. A. Varney.

National Malleable Castings Co., Cleveland, Ohio.—Miniature journal boxes, couplers, coupler pockets, hand brake mechanism. Represented by J. J. Byers.

National Tube Co., Pittsburgh.—Valves and Fittings.

National Railway Devices Co., Chicago.—Shoemaker fire door. Represented by J. G. Robinson and C. J. Gunnison.

Ohio Injector Co., Chicago.—Ohio injector, Chicago injector, Chicago flange oiler, Chicago automatic drifting valve, Chicago lubricator, Chicago water glass protector, Chicago boiler check and Chicago hose strainer. Represented by W. S. Furry, F. W. Edwards, F. B. Wipperman and A. C. Beckwith.

Okadee Co., Chicago.—Blow-off cocks, tank hose and strainer drain valve. Represented by A. G. Hollingshead, Harry Vissering, G. S. Turner and W. H. Heckman.

O'Malley-Beare Valve Co., Chicago.—Multi-plate valves. Represented by E. O'Malley and T. O'Malley, W. M. Leighton, B. C. Hooper, J. M. Gallagher and E. A. Woodworth.

Oxweld Railway Service Co., Chicago.—Represented by C. B. Moore.

Paxton-Mitchell Co., Omaha, Neb.—Metallic packing. Represented by J. T. Luscombe.

Perolin Railway Service Co., St. Louis, Mo.—Represented by C. L. Viley.

Pilliod Co., The, New York.—Baker valve gear. Represented by K. J. Eklund and F. S. Wilcoxen.

Pocket List of Railroad Officals, New York.—Represented by C. L. Dinsmore.

Pyle-National Co., Chicago.—Young locomotive valve gear and Pyle-National electric headlight. Represented by R. C. Vilas, W. Miller, J. Will Johnson, J. E. Kilker, O. W. Young, W. T. Bretherton, R. L. McIntosh and F. Kersten.

Robinson Co., Boston, Mass.—Exhaust nozzle. Represented by H. M. Parker.

Railway Review, Chicago.—Represented by C. L. Bates.

Sellers & Co. Inc., William, Philadelphia, Pa.—Injectors and boiler fittings. Represented by S. L. Kneass, G. M. Wilson, L. H. Burns and John McClintock.

Simmons-Boardman Publishing Co., New York.—Copies of *Railway Age Gazette* and Railway Mechanical Engineer. Represented by R. E. Thayer, L. B. Sherman and F. H. Thompson.

Southern Locomotive Valve Gear Co., Knoxville, Tenn.—Southern valve gear. Represented by E. L. Chollman and H. A. Kibby.

Standard Heat & Ventilation Co., New York.—Econotherm for utilizing exhaust steam from air pump for train heating. Represented by C. F. McCuen and C. C. Post.

Storrs Mica Co., Owego, N. Y.—Represented by C. P. Storrs.

Tyler, W. S., & Co., Cleveland, Ohio.—Drafton spark arrester. Represented by J. H. Jackson and A. D. Busch.

Union Draft Gear Co., Chicago.—Miniature draft gear and photographs. Represented by W. G. Krauser, J. E. Tarelton P. C. Jacobs, H. A. Waldron and W. D. Otter.

Universal Valve Co., Chicago.—Universal non-packing valves and swivel joints for locomotives. Represented by T. O. Shillinglow.

United States Metallic Packing Co, Philadelphia, Pa.—Metallic packing. Represented by M. B. Brewster and Elliott Curtiss.

Vissering & Co., Harry, Chicago.—Metallic packing and bell ringer. Represented by Harry Vissering, G. S. Turner and W. H. Heckman.

Western Railway Equipment Co., St. Louis, Mo.—Locomotive devices. Represented by Sterling Campbell.

Westinghouse Air Brake Co., Pittsburgh, Pa.—Special suction strainer for air pumps, enameled reservoirs, Parasite pump governor. Represented by L. M. Carlton, W. M. Sleet, A. K. Homeyer, J. A. O'Malley, W. V. Turner, S. J. Kidder, L. Wilcox and C. C. Farmer.

White American Locomotive Sander Co., Roanoke, Va.—Graham-White perfect sander. Represented by W. H. White.

Dining Car Superintendents

The American Association of Dining Car Superintendents held its annual convention at New Orleans, La., on October 20. E. V. Baugh, superintendent of dining cars of the Baltimore & Ohio, was elected president for the coming year, and E. H. Thayer, of the St. Louis-San Francisco, was elected vice-president. Howard Boardman, superintendent of dining car service of the Delaware, Lackawanna & Western, was re-elected secretary-treasurer. The executive committee was elected as follows: J. R. Smart, of the New York Central Lines, and retiring president, chairman; I. A. Canning, of the Erie, and C. H. Jennings, of the St. Louis Southwestern. Among the subjects discussed at the convention were the kinds of fuel best adapted for dining car use, the rising cost of food, refrigeration, sanitation, ventilation and service. The association will convene at San Francisco, Cal., in 1917.

American Railway Association

The fall session of the American Railway Association will be held at the Brown Palace Hotel, Denver, Colorado, Wednesday, November 15, 1916, at 11 a. m. Reports will be presented by the following committees: The executive committee, the committee on transportation, the committee on maintenance, the joint committee on automatic train stops, the committee on relations between railroads; the committee on the safe transportation of explosives and other dangerous articles, the committee on electrical working, the committee on legal and traffic relations, the special committee on the prevention of accidents at grade crossings, and the committee on nominations.

Railway Business Association Dinner

It is announced that the annual meeting of the Railway Business Association will be held at the Waldorf-Astoria Hotel, New York, on January 16, 1917. The sessions will include a business meeting at 11 a. m., election of officers at 1:30 p. m., and dinner at 7 p. m. promptly. The program of speakers will be announced later.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Brown Palace Hotel, Denver, Colo.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Next annual convention, October 31 to November 3, La Salle Hotel, Chicago.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement ... McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Next annual meeting, December, 1916, Waldorf-Astoria Hotel, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next meeting, November 9-10, La Salle Hotel, Chicago.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga., Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Annual convention, October 24-27, Hotel Sherman, Chicago.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco. Annual meeting, November 15, Brown Palace Hotel, Denver, Colo.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The Southern Pacific, on Monday of this week, lifted the embargo on eastbound freight by water from Galveston; and announced in San Francisco that the embargo would end at California points on October 26.

A federal grand jury at Cleveland returned indictments against the Pennsylvania Company last week charging it with violating the law by making concessions in demurrage rates to the Cambria Steel Company.

The railroad commission of Georgia, in its extended inquiry into freight rates in that state, has this week been hearing the final testimony of the railroads in support of applications for authority to make increases in rates on commodities; and next week expects to listen to financial statements from the railroads.

The Chicago & Alton put two new westbound express trains into service on October 16. The San Antonio Limited leaves Chicago at 10:15 a. m. and arrives at St. Louis at 5:59 p. m., where close connections are made with the St. Louis, Iron Mountain & Southern and the Missouri, Kansas & Texas for points in the Southwest. The Creve Coeur Special leaves Chicago at 5 p. m. daily and arrives at Peoria at 9:20 p. m.

The annual meeting of the National Industrial Traffic League will be held in the Hotel Sherman, Chicago, on Thursday and Friday, November 9 and 10. A docket of the subjects to be considered was sent out on October 25. The most important subject to be discussed will be the position to be taken by the league with reference to the investigation of railroad conditions undertaken by the Newlands committee.

Texas, like most other states, has a freight car shortage. The War Department uses large numbers of cars in shipping food stuffs and other supplies to the one hundred thousand troops on the Mexican border. The Southern Pacific alone is said to have more than 2,000 cars constantly employed in this service. The railroads leading directly to border points are having their car equipment taxed to the utmost to meet the transportation requirements of the troops.

In a hearing before the Kansas Public Utilities Commission on October 18, J. R. Koontz, general freight agent of the Atchison, Topeka & Santa Fe, at Topeka, Kan., said that the eastern railroads had failed to keep an agreement to return promptly freight cars received from western railroads, while the western railroads had lived up to the agreement until they awoke to the situation. The Kansas railroads alone lost the use of from 15,000 to 20,000 cars because of the failure of eastern railroads to return empties. Mr. Koontz appeared before the commission as a witness at a hearing on an application for an increase in demurrage charges.

There would be no car shortage, according to J. G. Woodworth, vice-president in charge of traffic of the Northern Pacific, if the railroads were not obliged to carry, in addition to their own traffic, the enormous coast-to-coast tonnage formerly carried through the Panama canal by ships. These ships have wholly deserted this trade to seek greater profits elsewhere. Ship owners of course cannot be blamed for doing this, and they might have made some increases in rates and kept their vessels in this trade had it not been that the low transcontinental railroad rates must not be raised without approval of the federal authorities. In the year ending June 30, last, the Northern Pacific showed an increase of 20 per cent in freight business and there was no suggestion of car shortage or congestion at any time in the whole year. Business now in sight does not exceed last year's volume, but an increasing proportion is going to distant points along eastern and southern lines. Wheat, flour, lumber and other commodities are being exported through New York, Baltimore and other eastern seaports instead of going direct in ships. The Northern Pacific cannot get cars from the eastern roads to carry this freight and when it furnishes its own cars they are usually lost for years.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has announced hearings in the general investigation of rates, rules and practices of the railroads and steamship companies in, to and from Alaska at Cordova on November 11, at Juneau November 23, and at Seattle on December 4, before Examiner Wilson.

The commission has further suspended until April 29 tariffs increasing rates on an extensive list of commodities from and to points in Western trunk line territory, including dairy products, building materials, agricultural implements. A hearing will be held at Kansas City December 2.

The Interstate Commerce Commission has further suspended from October 26 until April 26, 1917, a proposed new rule of the New York, New Haven & Hartford providing for the assessment of additional demurrage charges on cars held in transit or on storage tracks at destination.

The Interstate Commerce Commission has reopened for further argument orally and upon briefs the case of the Arlington Heights Fruit Exchange against the Southern Pacific and others, in which the commission reduced the rates to be charged on shipments of pre-cooled fruit.

The Interstate Commerce Commission has issued an order making the Canadian Pacific, the Humboldt Steamship Company, the Grand Trunk Pacific Coast Steamship Company and the Border Line Transportation Company parties to the proceedings in its investigation of transportation conditions in Alaska.

The Natchez (Miss.) Chamber of Commerce has filed a complaint with the Interstate Commerce Commission asking a revision of rates from Natchez to Texas points. The complaint alleges that it is charged the same or higher rates to Texas common points as Memphis, although the distance is much greater from Memphis and that the rates from St. Louis are only slightly different from those from Natchez, although the distance is about twice as great.

The Chamber of Commerce of the State of New York has filed an intervening petition with the Interstate Commerce Commission in the New Jersey lighterage case involving the question of the readjustment of the zone rate system of the trunk lines connecting the Port of New York with the West and South, in which Jersey City has asked for lower rates to and from the interior than New York rates. The petition states that "New York City early became a natural basic and distributing center through which passes commerce to and from all parts of the world. It was inevitable that in fixing the railroad rates Greater New York should be a basic point, around which territory contiguous would naturally form a zone or district. Following the American method of rate-making, very early in the history of New York's commerce, the Port of New York (including a large part of Long Island, Staten Island and New Jersey) became a zone or district, in which were generally established fixed schedules for freight carriage, including terminal service. To furnish the terminal service at all points within the district involves at some points a loss, but in general, because of the volume of business thus accommodated, results in a profit and in lower general rates. To adopt a new system based upon a separate charge for line-haul, plus a separate charge for terminal service, would demoralize the entire commercial situation, to the injury not only of Greater New York, but also of its neighbors in New Jersey and its business connections throughout the country."

Lumber to New Mexico Points

Opinion by Commissioner Meyer:

The commission finds reasonable proposed increased rates on lumber and articles taking the same rates from points in California to points in Texas and New Mexico on the El Paso & Southwestern. Fourth section applications, however, are denied. (41 I. C. C., 331.)

Bill of Lading Hearing

Final arguments were presented before the Interstate Commerce Commission at Washington on October 20 and 21 in the commission's investigation of matters pertaining to the provisions of bills of lading which was instituted in 1912. In June, 1908, the commission gave its tentative approval of a bill of lading which was the result of hearings and conferences between committees of the shippers and carriers in Official Classification territory and the bill was adopted substantially in that form in all three classification territories. In May, 1912, the commission instituted the present investigation for the purpose of determining whether the rules, regulations and practices in connection with the issuance, transfer and surrender of bills of lading, the conditions thereof and practices connected therewith, are unjust, unreasonable or unlawful, partly because of complaint that some carriers had failed to adopt the uniform bill. As a result of the Cummins amendment the investigation was reopened in 1915 and hearings have been held in New York, Chicago, San Francisco, New Orleans, Atlanta and Washington. As a result of the hearings an agreement has been reached between the carriers and the shippers as to most of the provisions of both the straight and order bills of lading, but certain subjects are still in dispute and were covered by the briefs filed and oral arguments presented by the carriers and a large number of commercial organizations and state commissions. The railroads were represented by committees of counsel for the three classification committees and the Uniform Bill of Lading Committee. It was contended on behalf of the railroads that they had made many concessions during their negotiations with the shippers, but that some of the provisions asked by the shippers would require the railroads to assume even greater liability than that imposed upon them by law, and that the commission could not go further in its requirements than those of the law. The very function of a bill of lading, the railroads asserted, is to modify the liability which would exist at common law, and therefore the fact that the bills of lading in use contain provisions modifying the rules of common law constitutes in no sense an argument against these provisions, but only indicates that the bills of lading are performing the usual and proper functions.

STATE COMMISSIONS

The Pennsylvania Public Service Commission, in an order issued last week, refused the petition of the Standard Chair Company and others of Erie for an order requiring the Pennsylvania and Erie railroads to install a connecting track. The commission says: "It appears clearly that the demand which the shippers make in this complaint relates almost wholly to terminal conveniences which they would secure, by means of the interchange track, at no expense to themselves and at great and unnecessary expense to respondents."

COURT NEWS

Upon application of the railroads operating in Nebraska the United States District Court at Omaha has granted a temporary injunction to the petitioners, restraining the State Railway Commission of Nebraska and the attorney-general of the state from bringing any action against the petitioners based upon their failure to employ the freight rates prescribed in order No. 19 of the state commission. The case will come up for hearing later to determine whether or not the injunction shall be made permanent.

The department of justice has presented to the Supreme Court of the United States a petition for a review of the court's decision in the Oregon-California land-grant case, in which the Supreme Court held that the company is the owner of the lands under the grant, with absolute title, but subject to restrictions as to the sale of the property. The government desires a review of the case for the purpose of settling a number of questions which are preventing the improvement of the property and the disposition of the timber on the land.

Ramsey county, Minn., has brought suit against the Northern Pacific, the Great Northern and the Chicago, St. Paul,

Minneapolis & Omaha to recover $3,030,000 in alleged delinquent taxes. The contention of the county is that the securities of the Chicago, Burlington & Quincy and the Spokane, Portland & Seattle, held by the Great Northern and the Northern Pacific, are held for investment purposes, and therefore are taxable, whereas the defendants contend that the acquisition of these roads was for the purpose of controlling tonnage and traffic in the interchange of business to further develop their own properties.

Arguments were presented before the Supreme Court at Washington on October 19 in what is known as the terminal cities case, in which the United States District Court for the northern district of California had enjoined an order of the Interstate Commerce Commission, holding that Sacramento, Stockton, San Jose and Santa Clara, Calif., were not entitled to terminal rates, and allowing the carriers to charge for the transportation of westbound transcontinental freight higher rates to those cities than were charged to San Francisco, Oakland and other Pacific coast ports of call. Solicitor General Davis and Chief Counsel Folk of the Interstate Commerce Commission represented the government and J. E. Alexander of San Francisco appeared for the commercial organizations of the cities that had secured the injunction.

Oil Tank Car Cases

Arguments were presented in the Supreme Court of the United States on October 18 and 19 in the oil tank car cases, involving the powers of the Interstate Commerce Commission to require railroads to furnish special equipment, in which the government, the Interstate Commerce Commission and the Crew-Levick Company appealed from a judgment of the United States District Court for the western district of Pennsylvania granting an interlocutory injunction against the enforcement of an order of the Interstate Commerce Commission requiring the Pennsylvania Railroad to provide and furnish tank cars for the shipment of petroleum products.

The railroad has sold all but 499 of its tank cars and announces in its public tariffs that it does not assume any obligation to furnish tank cars. When the shipper asked for tank cars which the road was unable to furnish, it offered to supply cars in which the oil could be transported in barrels. The shipper objected because this form of transportation costs 3½ cents more per gallon. John G. Johnson, for the railroad, argued that a carrier owes no duty to furnish any particular character of equipment other than to supply the cars it has on hand without discrimination and to furnish safe transportation at reasonable rates, that it cannot be required to purchase additional equipment and that it does not hold itself out to furnish tank cars. It was also contended that to require a railroad to furnish tank cars is in effect to command it to furnish the package for a shipment.

Joseph W. Folk, chief counsel for the Interstate Commerce Commission, said that section 1 of the act, including in the term "transportation," cars and other vehicles and all instrumentalities and facilities of shipment, provides that it shall be the duty of every carrier "to provide and furnish such transportation upon reasonable request therefor," requiring the carrier not only to furnish cars, but to provide such cars as are reasonably necessary to supply the demand that may be expected, and that the railroad may not relieve itself from the obligation to furnish cars by refusing to provide cars. He said the carrier has not fulfilled its duty when it supplies any kind of car. The car furnished must be suitable to the reasonable needs of the shipper. When a commodity such as oil requires a particular kind of car, and this has been recognized by the general use of such car for more than a quarter of a century by the railroads, and when the use of such car is an economic necessity, as found by the commission in this case, the carrier has not fulfilled its obligation until it has furnished such car upon reasonable request. The economy of the service must be considered. The power of the commission with respect to the furnishing of cars comes into play when a reasonable request is made for such cars and the power of the commission is in exercising its administrative functions in passing upon the reasonableness of the request.

Railway Officers

Executive, Financial, Legal and Accounting

Henry J. Hart has been appointed general counsel of the Bangor & Aroostook, with office at Bangor, Maine, vice J. F. Gould, resigned on account of ill health.

Roy W. Smith, the announcement of whose appointment as auditor of receipts for the Nashville, Chattanooga & St. Louis with office at Nashville, Tenn., to succeed the late Charles W. Stevenson, has just been made, was born in Nashville, Tenn., in 1881. He received his early education in the public schools of that city and entered railway service in 1898, with the Nashville, Chattanooga & St. Louis as a way bill clerk. A little later he was advanced to the abstract and interline desk, serving in this connection for several years. In 1905, he was put in charge of all station accounts and a year later was made chief clerk to the auditor of receipts. In 1907, he was appointed assistant auditor of receipts, which position he held at the time of his recent promotion which became effective on October 15.



R. W. Smith

G. E. McDuffie has been appointed auditor of freight accounts of the Galveston, Harrisburg & San Antonio, with office at Houston, Tex., succeeding W. E. Briggs, assigned to other duties.

Lewis Warrington Baldwin, whose election as vice-president and general manager of the Central of Georgia, with headquarters at Savannah, Ga., has already been announced in these columns, was born on February 26, 1875, at Waterbury, Md. He was graduated from Lehigh University in 1896, and began railway work in July of that year with the Illinois Central, serving consecutively as chainman, rodman and assistant engineer until June, 1898; the following three months he was assistant engineer on maintenance work, and from September, 1898, to January, 1900, he was assistant engineer on location and construction. He was then for one year supervisor of track; from February, 1901, to September, 1904, he served as roadmaster, and from the latter date to April, 1906, as trainmaster. Mr. Baldwin was superintendent from April, 1906, to May, 1910, and then was appointed engineer of maintenance of way, at Chicago. In April, 1913, he became superintendent of the Kentucky division, and from January, 1915, to the following November was general superintendent, southern lines, at New Orleans, La. On November 15, 1915, he left the service of the Illinois Central to go to the Central of Georgia as general manager, which position he held at the time of his recent election as vice-president and general manager of the same road as above noted.



L. W. Baldwin

W. L. Stanley, general claim agent of the Seaboard Air Line at Portsmouth, Va., has been appointed assistant to the president. To Mr. Stanley will be referred all questions arising between the road and the Interstate Commerce Commission, state commissions, municipalities, or counties.

Erasmus C. Lindley, the announcement of whose election as vice-president and general counsel of the Great Northern has just been made, was born in Dublin, Ind. After a preliminary education in his native community he entered first the literary department and later on the law department of the University of Michigan. Upon the completion of his studies at that institution he took up a general law practice, being for several years assistant state's attorney under former Governor Charles S. Deneen, in Chicago, Ill. He entered railway service in 1907 as general attorney with the Chicago, Rock Island & Pacific. In April, 1910, he was appointed general solicitor for the Great Northern and later general counsel. His election as vice-president and general counsel will be effective on November 1.

Operating

Henry Flanagan has been appointed trainmaster of the St. Paul division of the Northern Pacific, with headquarters at Minneapolis, Minn., vice George B. Ogilvie.

H. F. Burch has been appointed acting general superintendent of the Greenwich & Johnsonville, with office at Greenwich, N. Y., vice R. J. McCarty, Jr., resigned.

G. L. Hurley, trainmaster of the Macon, Dublin & Savannah at Macon, Ga., has been appointed superintendent, with headquarters at Macon, and the office of trainmaster has been abolished.

J. E. Callahan, assistant superintendent of the St. Louis Southwestern of Texas with office at Tyler, Tex., has been appointed superintendent with office at Mt. Pleasant, Tex. He succeeds H. G. Earl, who resigned recently to accept service with the Midland Valley.

R. J. McCarty, Jr., general superintendent of the Greenwich & Johnsonville at Greenwich, N. Y., has been appointed superintendent of the Susquehanna division of the Delaware & Hudson, with office at Oneonta, N. Y., vice T. J. Lynch, assigned to other duties.

C. H. Priest, assistant superintendent of the Portland Terminal Company at Portland, Maine, has been appointed superintendent, succeeding F. E. Sanborn. The office of assistant superintendent has been abolished. Through a typographical error in last week's issue his headquarters were incorrectly reported as Portland, Ore.

D. O. Ouellet, whose appointment as superintendent of the Memphis division of the St. Louis, Iron Mountain & Southern, with headquarters at Wynne, Ark., has just been announced, was born at St. Thomas, Quebec, Can., May 17, 1876. After attending the primary schools of this community, he entered Levis College, in Quebec province. On leaving this institution he obtained employment with the Grand Trunk in January, 1894. In October, 1896, he was appointed telegrapher of the Western New York & Pennsylvania, and two years later was made despatcher on this same road. In December, 1898, he took employment with the Grand Trunk as a despatcher, holding this connection two years and then entering the service of the Illinois Central in the same capacity. From November, 1901, to December, 1902, he was despatcher on the Union Pacific, and from December, 1902, to November, 1903, he held a similar position on the Chicago Great Western. In January, 1906, he became chief despatcher on the St. Louis, Iron Mountain & Southern, in which capacity he remained until May, 1910, when he was appointed trainmaster. He was promoted to assistant to the superintendent of transportation in July, 1915, which position he held at the time his present appointment became effective on October 1.

Henry Shearer, whose promotion from assistant general superintendent of the Michigan Central to be general superintendent has already been announced in these columns, was born March 1, 1868, at Galien, Mich. After attending the common and high schools of the neighborhood he entered railway service with the Michigan Central June 5, 1892, and has been continuously in the employ of this company since. From June, 1892, to December of the same year he was a freight clerk at Matteson, Ill., and from January, 1893, to December, 1895, he was agent at Porter, Ind. From December, 1895, to February, 1898, he was agent at Chicago Heights, Ill., and from February, 1898, to November, 1899, he was agent at Michigan City, Ind. In November, 1899, he was made traveling freight agent, with office at Chicago, Ill., and held this position until May, 1900. Then for two years he was chief clerk in the general freight department, and from August, 1902, to January, 1903, he was agent at Jackson, Mich. In January, 1903, he was made chief clerk to the general manager, with office at Detroit, Mich., and in October, 1909, promoted to division superintendent at St. Thomas, Ont., where he served until December, 1912. About this time he was appointed assistant to the general manager, doing special work in connection with congestion at Detroit, Mich., and reorganizing the company's terminals at that place. He served in this capacity until February, 1913, when he was promoted to be assistant general superintendent, which office he retained until his recent appointment as general superintendent of the same road.

George D. Brooke, who has been appointed superintendent of the Cumberland division of the Baltimore & Ohio, with headquarters at Cumberland, Md., was born on September 15, 1878, at Sutherlin, Va., and graduated from the Virginia Military Institute in 1900. He began railway work on July 17, 1902, as a rodman on the Baltimore & Ohio. From August to December, 1902, he served as levelman, and then to May, 1904, as transitman. He was appointed assistant engineer in charge of a field party in May, 1904, remaining in that position until March, 1905, when he was appointed assistant engineer at Cumberland, Md., in charge of location surveys. From July, 1908, to July of the following year he was assistant division engineer at Pittsburgh, Pa., and then to March, 1911, was division engineer at Baltimore, Md. From March, 1911, to February of the following year he was assistant engineer in the operating department, and in February, 1912, was appointed assistant superintendent at Keyser, W. Va. He was appointed superintendent of the Shenandoah division at Winchester, Va., in September, 1912, and subsequently served as superintendent of the Ohio division of the Baltimore & Ohio Southwestern, with headquarters at Chillicothe, Ohio, until his recent appointment as superintendent of the Cumberland division of the Baltimore & Ohio, as above noted.



G. D. Brooke

Traffic

G. W. Bumpas has been appointed commercial freight agent at the Cincinnati, Hamilton & Dayton with office at Chicago, Ill., succeeding C. H. Gomm, promoted.

T. J. Walters has been appointed manager of the Central States Despatch Lines, with headquarters at Cincinnati, Ohio, succeeding Stuart A. Allen, promoted.

C. H. Gomm has been appointed division freight agent of the Baltimore & Ohio Southwestern, with office at Springfield, Ill., succeeding John D. Marnay, promoted.

E. E. Cleary, chief clerk to the claim agent of the Nashville, Chattanooga & St. Louis at Nashville, Tenn., has been appointed claim agent, succeeding S. D. Cowden, resigned.

E. L. Hunt, traveling freight agent of the Queen & Crescent, with office at Louisville, Ky., has been appointed commercial agent of the same road, with same headquarters.

R. H. Carmichael, division freight agent of the Southern Pacific, Texas Lines, with office at Houston, Tex., has been ap-

pointed assistant general freight agent with the same headquarters.

R. F. Britton, commercial agent of the St. Louis Southwestern at Texarkana, Tex., has been transferred to Memphis, Tenn., succeeding A. K. James, appointed general agent, freight department, at Chicago, Ill.

W. E. Briggs, freight auditor of the Southern Pacific, Texas Lines, with office at Houston, Tex., has been appointed assistant general freight agent with the same headquarters, succeeding Gentry Waldo, promoted.

Philip Meininger, chief clerk to the president of the Baltimore & Ohio Chicago Terminal, has been appointed general freight and passenger agent with office at Chicago, Ill., succeeding P. F. Finnigan, recently promoted.

Thomas G. Beard, assistant general freight agent of the Southern Pacific, Texas Lines, with office at Houston, Tex., has been appointed general freight agent in charge of solicitation, with the same headquarters.

Gentry Waldo, assistant general freight agent of the Southern Pacific, Texas Lines, with office at Houston, Tex., has been appointed general freight agent with the same headquarters, succeeding the late James R. Christian.

C. O. Jackson, assistant general passenger agent of the St. Louis, San Francisco & Texas and the Ft. Worth & Rio Grande, with office at Ft. Worth, Tex., has been appointed general passenger agent, with the same headquarters.

Oscar A. Constans, who has been appointed freight traffic manager of the Northwest district of the Baltimore & Ohio System, with headquarters at Chicago, Ill., was born on November 23, 1862. He was educated in the grammar and high schools at Columbus, Ohio, and began railroad work in 1883 as clerk on the Baltimore & Ohio at Columbus. From 1884 to 1887 he served as secretary to the assistant general freight agent at Columbus, and then to February, 1891, as secretary to the general freight agent at Pittsburgh. He subsequently was appointed chief clerk in the general freight office at Pittsburgh, remaining in that position until March, 1895, when he became division freight agent at Pittsburgh. From May, 1897, to June, 1902, he was division freight agent at Columbus, Ohio, and then to February, 1907, was division freight agent at Cleveland. In February, 1907, he was appointed general freight agent at Pittsburgh; in April, 1910, he was appointed western freight traffic manager at Chicago of the same road, and now becomes freight traffic manager of the Northwest district of the Baltimore & Ohio System, as above noted. Mr. Coustans' entire railway service has been with the Baltimore & Ohio.



O. A. Constans

F. A. Farnsworth, general agent, freight department of the Delaware & Hudson at New York, has been appointed general eastern freight agent, with headquarters at Albany, and T. J. Lynch, superintendent at Oneonta, has been appointed general agent, freight department, at New York City, vice Mr. Farnsworth.

C. E. Bell, assistant general freight agent of the Southern Railway at Atlanta, Ga., has been transferred to Washington, D. C., in charge of work pertaining to cases before the Interstate Commerce Commission, and E. R. Oliver, assistant general freight agent at Louisville, Ky., has been transferred to Atlanta, Ga., vice Mr. Bell.

S. D. Cowden, claim agent of the Nashville, Chattanooga & St. Louis, with office at Nashville, Tenn., has resigned to become president and treasurer of the Southern Graphite Company of Ashland, Ala. He entered the service of the N. C. & St. L. in 1898 as chief clerk to the claim agent, and became claim agent in 1901, upon the resignation of H. W. Wolfe.

David H. Street, commercial freight agent of the Baltimore & Ohio at Akron, Ohio, has been promoted to division freight agent, with office at Cumberland, Md., succeeding James R. Bell, granted leave of absence until January 1, 1917, on account of ill health. Mr. Bell will be transferred to Baltimore when he returns to service and assigned to duty on the staff of the genera freight agent of the eastern lines.

Daniel S. Roberts, general agent of the Kansas City Southern at Pittsburgh, Pa., has been appointed assistant general freight agent, with headquarters at Kansas City, Mo. He will be succeeded at Pittsburgh, Pa., as general agent by E. L. Whitney, now general agent at Dallas, Tex. B. W. Haughton, traveling freight agent, with office at Dallas, Tex., succeeds E. L. Whitney as general agent, with the same headquarters.

Incident to the retirement of C. S. Wight, general freight traffic manager of the Baltimore & Ohio, from active duty at his personal request, after 50 years of active service, A. W. Thompson, vice-president of traffic and commercial development, announces that effective at once the lines of the system are divided into three districts with respect to the freight department organization, each under the jurisdiction of a freight traffic manager. Mr. Wight becomes general freight representative, reporting to the vice-president, and having charge of the rate and tariff bureau and performing such other duties as may be assigned to him. Archibald Fries, general freight agent at Pittsburgh, has been promoted to freight traffic manaer of the eastern lines, with headquarters at Baltimore, Md. C. L. Thomas, freight traffic manager of the Baltimore & Ohio Southwestern and the Cincinnati, Hamilton & Dayton, becomes freight traffic manager of the Southwest district, with headquarters at Cincinnati, Ohio. O. A. Constans, western freight traffic manager, becomes freight traffic manager of the Northwest district, with headquarters at Chicago. H. M. Matthews, general coal and coke agent, becomes coal traffic manager, with jurisdiction over all coal traffic moving over the system and reporting to the vice-president of traffic. H. R. Lewis, general freight agent at Baltimore, becomes general freight agent at Pittsburgh, succeeding A. Fries, with jurisdiction over the Pittsburgh, New Castle, Cleveland, Connellsville, Wheeling and Ohio River divisions. W. R. Askew , division freight agent, is promoted to general freight agent at Baltimore, with jurisdiction over the territory east of the Ohio river except the Pittsburgh, Connellsville, Wheeling and Ohio River divisions and excluding the territory between Moundsville and Wheeling. S. T. McLaughlin, general freight agent at Cincinnati, is promoted to assistant freight traffic manager of the Southwest district, at the same headquarters. O. S. Lewis, assistant general freight agent, at Cincinnati, is promoted to general freight agent of the Southwest district, with headquarters as at present. P. F. Finnegan, general freight agent at Chicago, continues in this capacity with jurisdiction over the Chicago and Newark divisions of the Northwest district. The title of C. H. Harkins is changed from assistant to western freight traffic manager to assistant to freight traffic manager of the Northwest district, with headquarters at Chicago.

Engineering and Rolling Stock

C. C. Hill, division engineer of the Michigan Central, with office at Niles, Mich., has been appointed to the valuation department of the road.

C. E. Bess, assistant general foreman of the Southern Pacific at Rosedale, Cal., has been appointed assistant master mechanic with headquarters at Sparks, Nev., succeeding Paul Jones, promoted.

Paul Jones, assistant master mechanic of the Southern Pacific with office at Sparks, Nev., has been appointed a member of the efficiency committee of that company with headquarters at San Francisco, Cal.

William A. Duff, engineer of bridges, of the Canadian Government Railways at Moncton, N. B., has been appointed assistant chief engineer. He will continue to perform the duties of engineer of bridges, will have charge of the Halifax Ocean Terminals and will perform such other work as may be assigned by the chief engineer.

William R. Elmore, recently appointed master mechanic of the Nevada Northern, with headquarters at East Ely, Nev., was born at Greers, S. C., on October 14, 1867. He first entered railway service with the Nashville, Chattanooga & St. Louis in March, 1895, as an air brake machinist in the locomotive and car department. He remained with this company until 1903, following which he had mechanical experience with the Southern at Atlanta, Ga., and Birmingham, Ala., with the Louisville & Nashville at Birmingham, with a steel works at Pueblo, Colo., and with the Denver & Rio Grande at Alamosa, Colo., and at Salt Lake City. He entered the service of the Nevada Northern on March 1, 1915, as general foreman. He was promoted to acting master mechanic on August 1, 1916, and was made master mechanic on October 1.

George Allen Kyle, consulting engineer, Portland, Ore., the announcement of whose appointment as chief engineer of the new railway corporation which is to construct 1,500 miles of new road in China, was born in the village of Tobasco, Clermont county, Ohio, on September 21, 1857. He took a short course in civil engineering at Holbrook's College, Lebanon, Ohio, after which he entered railway service in 1876. In 1883 he was division engineer in charge of location and construction of 30 miles of road for the Cincinnati & Eastern near Portsmouth, Ohio. During 1884 to 1886, inclusive, he was with the Chicago Great Western, in charge of the construction of 80 miles of railway in Illinois and Iowa. In 1894 he was appointed engineer maintenance of way in charge of the revision of the main line of the Baltimore & Ohio Southwestern. From 1895 to 1898 he was in mining work in South Africa. In 1899 he returned to the United States and was appointed division engineer of the Northern Pacific, working on location and construction until 1901, during part of which time he was in charge of maintenance of way. From 1902 to 1904 he was division engineer of the Grand Trunk Pacific, with headquarters at Winnipeg, Can. He resigned in 1904 to accept service with the Northern Pacific on special work. During 1905 and 1906 he was engineer of surveys and consulting engineer on construction with the Alaska Central. From 1907 to 1909 he was assistant chief engineer of the Chicago, Milwaukee & St. Paul, having jurisdiction over about 800 miles of main line and about 200 miles of branch lines on the extension to the Pacific coast. During 1909 and 1910 he was chief engineer of the Oregon Trunk, being later made vice-president and general manager. From 1911 to the time his present appointment became effective, on October 15, 1916, he was a consulting engineer, specializing in reports on railroad properties and in general engineering consultation.



G. A. Kyle

OBITUARY

W. A. Witt, formerly superintendent of the Seaboard Air Line at Jacksonville, Fla., previous to November, 1912, and subsequently general superintendent of the Norfolk Southern at Norfolk, Va., died on October 20 at Richmond, Va.

John A. Fox, superintendent of the Clifton Forge division of the Chesapeake & Ohio, died suddenly on October 15, at Clifton Forge. Mr. Fox was born in 1862, at Louisville, Ky. He entered the service of the Chesapeake & Ohio about 35 years ago as an engineer and from that position worked his way up to division superintendent of the Cincinnati and Ashland divisions, at Ashland, Ky., where he served for a number of years. Since May, 1916, he was superintendent of the Clifton Forge division of the same road with headquarters at Clifton Forge.

Equipment and Supplies

LOCOMOTIVES

The Nevada Northern is about to buy one Consolidation locomotive.

The Midland Continental is inquiring for one ten-wheel locomotive.

Ruhaak & Co. (Dutch East Indies) are inquiring for one Forney type locomotive.

The Andrews Steel Company, Newport, Ky., is in the market for 2 four-wheel switching locomotives.

The Escanaba & Lake Superior has ordered one ten-wheel locomotive from the Baldwin Locomotive Works.

The Bethlehem Steel Company, Lebanon, Pa., has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

The Mark Manufacturing Company, So. Chicago, Ill., has ordered 2 four-wheel locomotives from the Baldwin Locomotive Works in addition to 2 locomotives reported in last week's issue.

The American Rolling Mill Company, Middletown, Ohio, reported in last week's issue as being in the market for locomotives, has ordered 2 six-wheel switching locomotives from the Baldwin Locomotive Works.

The Western Maryland, reported in the *Railway Age Gazette* of October 6 as being in the market for 20 Mallet type locomotives, has ordered 10 Mallet type locomotives from the Lima Locomotive Works, Inc.

The Societe Anonyme des Plantations de Gounoung (Sumatra) has ordered one six-wheel tank locomotive from the American Locomotive Company. This locomotive will have 7 by 12 in. cylinders, 24½ in. driving wheels and a total weight in working order of 23,000 lb.

The British War Office was reported in last week's issue as having ordered 100 locomotives from the American Locomotive Company. These locomotives are six-coupled tank locomotives of the 2-6-2 type. They will have 9 by 14 in. cylinders, 27 in. driving wheels and a total weight in working order of 36,000 lb.

The Orleans Railway (France) was reported in last week's issue as having ordered 50 Mikado locomotives from the American Locomotive Company. These locomotives will have 597 by 711 mm. cylinders, driving wheels measuring 1,650 mm., a total weight in working order of 200,000 lb. and will be equipped with superheaters.

The Finland State Railways, reported in last week's issue as having ordered 20 locomotives from the American Locomotive Company, ordered 20 superheater Consolidation locomotives from that company. These locomotives will have 20 by 28 in. cylinders, 55 in. driving wheels and a total weight in working order of 138,000 lb.

The Buffalo, Rochester & Pittsburgh has ordered 10 Mikado and 5 Mallet locomotives from the American Locomotive Company. The Mikado locomotives will have 26½ by 30 in. cylinders, 63 in. driving wheels and a total weight in working order of 278,000 lb. The Mallet (2-6-6-2) type locomotives will have 23½ and 37 by 32 in. cylinders, 57 in. driving wheels and a total weight in working order of 429,000 lb. All 15 locomotives will be equipped with superheaters.

FREIGHT CARS

Swift & Co. is in the market for 400 underframes.

The Missouri, Kansas & Texas is inquiring for 1,000 stock cars.

The Chicago, Burlington & Quincy is inquiring for 1,500 box cars.

The Union Pacific is inquiring for 1,500 box and 1,000 automobile cars.

The Illinois Central has revived inquiries for 2,000 composite gondola cars.

The Philadelphia & Reading is about to place orders for 2,000 50-ton hopper cars.

The Pennsylvania Railroad is reported in the market for 4,000 to 6,000 steel underframes.

The Great Northern is contemplating the purchase of 1,000 refrigerator and 2,000 box cars.

Wilson & Co., Chicago, has ordered 250 refrigerator cars from the Haskell & Barker Car Company.

The Pennsylvania Lines West are reported to have ordered 4,000 steel underframes from the Cambria Steel Company.

The Los Angeles & Salt Lake has asked for alternate bids on 100 steel and 100 single sheathed steel underframe automobile cars.

The Baltimore & Ohio, reported in last week's issue as inquiring for 1,000 freight cars, is in the market for 1,000 50-ton side dump hopper cars.

The Pere Marquette is inquiring for specialties for 500 cars to be repaired in its own shops It is also in the market for 1,000 38-ft. 40-ton box cars.

The Atlantic Coast Line is in the market for 1,000 30-ton cars and 500 40-ton cars, and not for 1,000 cars as incorrectly reported in last week's issue.

The Chicago & North Western has ordered 1,000 composite gondola cars from the Pullman Company and 1,500 30-ton box cars from the American Car & Foundry Company.

The Louisville & Nashville, reported in last week's issue as being in the market for 750 box car underframes and 750 gondola car underframes, has ordered these underframes from the Pressed Steel Car Company.

The Union Tank Line, reported in last week's issue as having arranged for the construction of 2,250 tank cars, has ordered 500 from the Pressed Steel Car Company, 500 from the Standard Steel Car Company, 1,000 from the American Car & Foundry Company, and will build 250 cars in its own shops.

PASSENGER CARS

The Wabash is in the market for 6 postal cars.

The Central of Georgia has ordered 6 sleeping cars from the Pullman Company.

The Norfolk & Western, reported in the *Railway Age Gazette* of October 6 as inquiring for 50 passenger cars, is in the market for 22 coaches, 5 passenger and baggage cars, 13 baggage and express cars and 10 baggage and mail cars.

IRON AND STEEL

The Ann Arbor is reported to have ordered 1,500 tons of rails from the Illinois Steel Company.

The Pennsylvania Railroad has ordered 1,000 tons of bridge steel from the McClintic-Marshall Company.

The Great Northern has ordered 305 tons of steel from the Minneapolis Steel & Machinery Company for an extension to its mail and express building at Minneapolis.

MISCELLANEOUS

Atlantic Southern.—J. B. Marsh, special master, 204 Masonic temple, Des Moines, Ia., will receive bids for a limited time from the date of his notice for the whole or any portion of the property of the Atlantic Southern, extending from Atlantic to Villisca, Iowa, which includes a 100 ft. right-of-way, stockyards, station buildings and grounds; about 3,500 tons of 60-lb. steel rails; 39 sets switches and frogs; about 420 tons of fish plates, bolts, spikes and general railroad iron; about 62 miles of fencing; about 100,000 ties, and equipment consisting of 3 engines, 2 passenger coaches, 1 caboose, 6 box and coal cars, 2 section motor cars, 2 hand cars and 5 push cars; a telephone system and blacksmith and track tools.

Supply Trade News

D. P. Lameroux has been appointed general manager of the Pratt & Letchworth Company, Ltd., Brantford, Ont.

Cleveland A. James, recently connected with the Lehigh Valley, in charge of Buffalo terminal construction, has located in the Fidelity Trust Bldg., Buffalo, New York, as consulting engineer.

The Jones & Laughlin Steel Company, Pittsburgh, Pa., intends soon to establish a large warehouse in St. Paul, Minn., to handle its greatly increasing northwest business. This company has extensive mine holdings in Minnesota and operates its own steamship line on the great lakes.

William F. Leake, secretary and treasurer of T. S. Leake & Co., general contractors, and also secretary and treasurer of the Railroad Water & Coal Handling Company, both of Chicago, Ill., died at his home in that city on October 4, of pneumonia, after a brief illness. He was born in June, 1858, at Ottawa, Ill., where he received his early education. In his boyhood he took up the carpenter's trade, obtaining his first employment with the Sanders' Brothers Manufacturing Company of that city. After a few years he entered the service of the Illinois Central, later being made general foreman of carpenters for the entire system. After several years with this company he became general superintendent of George B. Swift & Co., general contractors. In 1907 he and his brother, T. S. Leake, organized the contracting firm of T. S. Leake & Co., of which he became secretary and treasurer. In 1914 he also became interested in the Railroad Water & Coal Handling Company, Chicago, Ill.



W. F. Leake

The Pressed Steel Car Company has declared a quarterly dividend of $1.50 a share on its common stock. It paid 75 cents quarterly on its common stock in 1914, but no dividends on this stock in 1915. Dividend payments on the common stock were resumed July 26, 1916, with a declaration of a quarterly dividend of $1.00 a share.

F. H. Lovell & Co., Arlington, N. J., manufacturers of marine and railroad lighting appliances and electrical specialties, have been given a contract by the United States Navy Department for $630,000 worth of ammunition material. This makes a total of $1,161,000 worth of this material on which the company has or has lately had continuous contracts. The new contract will necessitate an addition to the company's plant.

Lima Locomotive Works, Inc., held a directors meeting in New York on October 20. This company is successor to the Lima Locomotive Corporation and has taken over all property and assets of the latter corporation. All the officers of the old corporation were re-elected as follows:—J. S. Coffin, chairman of the board; A. W. Wheatley, president; J. E. Dixon, vice president; W. D. Cloos, secretary and treasurer. The board of directors is as follows: J. S. Coffin, chairman, S. G. Allen, A. W. Wheatley, Franklin Q. Brown, Le Grand Parish, H. F. Ball and John E. Muhlfeld.

The Locomotive Stoker Company, which was formerly at Schenectady, N. Y., has now for some months been occupying

the former manufacturing plant of the Westinghouse Air Brake Company, in Allegheny, Pa. The old plant has been adapted to the purposes of the stoker business, and has been modernized to some extent to suit the circumstances, and equipped with modern machinery. This plant was built and occupied by the Westinghouse Air Brake Company about 1880. It was used by the Air Brake Company until the great development of the business led to the construction of the present plant at Wilmerding, about ten years later. Since that time the old plant has been used for electric work in various departments.

William A. Austin, recently connected with the Lima Locomotive Corporation, Lima, Ohio, as chief engineer, has formed a company called the Austin Engineering Associates which have offices in the McCormick building, Chicago, Ill. This firm will conduct a general consulting engineering business, but will specialize chiefly on railway motive power and equipment. Mr. Austin was born in London, England, in 1874, and received his early education in a private school there. On coming to America, he continued his education in the public schools of Philadelphia, Pa., and then took up more advanced studies at the Technical High School in that city. His first service in railway work was with the Baldwin Locomotive Works, with which company he became connected in 1892, as draftsman. He was later made designer, assistant chief draftsman and assistant mechanical engineer. This last named position carried the entire duties of estimating engineer in charge of preliminary analyses, estimates, plans and general design in conjunction with the sales department. In 1912 he became associated with the Lima Locomotive Corporation as chief engineer in charge of all engineering, design and estimating, and he also served as general field representative for the sales department in technical matters. He left that company to form the Austin Engineering Associates, as above noted. During the period Mr. Austin was with the Baldwin Locomotive Works he participated directly in the development of the Mallet type of locomotive in this country, in the early application of the Walschaert valve gear to American locomotives and he was co-developer of the much used Ragonnet reversing gear. He also assisted the engineers of the Southern Pacific and Union Pacific systems in perfecting common locomotive standards for these lines. He is inventor of the "Austin trailer-truck," successfully applied to many Lima locomotives for trunk line service, there being about 40 of these trucks in service on the Great Northern alone. He has invented other devices used in locomotive construction, including a screw reverse gear adopted by the Southern Pacific, an outside steam pipe cover which is used on many superheater engines, a hose strainer coupling connection between engine and tender, as well as improvements in rack-rail locomotives and gear-driven engines.



W. A. Austin

John Scott Medal Awarded to Inventor of Cement Gun

The city of Philadelphia, acting on the recommendation of the Franklin Institute, recently awarded John Scott legacy medals and premiums to John V. N. Dorr, president of the Dorr Cyanide Machinery Company, of New York, and to Carl E. Akeley, sculptor, naturalist and African explorer, who is connected with the American Museum of Natural History, New York.

The award was made to Mr. Akeley for the invention of the Cement-Gun, a device for applying cement mortar by the use of compressed air. This machine is being manufactured by the Cement-Gun Company, of New York, and has proved to be of great value for water-proofing dams and reservoirs, and coating structural work, houses, etc.

Railway Construction

Atlantic Coast Line.—This company is building a sidetrack from a point on the main line near James Crossing, S. C., to the plant of Harby & Co., Harrell Hill, about two miles.

Belle Fourche & Northwestern Railroad.—Organized in South Dakota as successor of the Belle Fourche & Northwestern Railway to build from Belle Fourche, S. Dak., to Miles City, Mont., 204 miles. The capital stock has been increased from $500,000 to $1,000,000. The incorporators of the new company are: H. F. Albers, J. H. Mulcahy, Miles City, Mont.; R. F. Furnish, general manager, Miles City; S. M. Culberson, Minneapolis, Minn.; L. A. DeBelloy, Cap Crook, S. Dak.; B. S. Payne and J. Sutherland, Pierre, S. Dak. (September 22, p. 530.)

Canadian Northern.—This company is planning an extension of its line from Eston, Alta., Can., to a point about 35 miles west. No contracts have been awarded and it is not known yet just when work will be started. M. N. MacLeod, general manager, Winnipeg, Can.

Chicago & North Western.—This company will soon commence the elevation of its tracks through the township of Proviso and the villages of Maywood, Bellwood and Melrose Park, all in Cook county, Ill. The approximate cost of this undertaking will be $2,000,000.

Deep Creek Railroad.—Contracts have been awarded to the Utah Construction Company of Ogden, Utah, for the construction of a new road beginning at Wendover, Utah, on the Western Pacific, and extending to Gold Hill, Utah, in the Deep Creek region, a distance of about 35 miles. As there are no special engineering difficulties to overcome it is expected that the line will be ready for operation in about ninety days. While much of the territory to be traversed is agricultural the primary object of the undertaking is to develop the mines. The approximate cost of the line will be $500,000. (October 20, p. 719.)

Knoxville Interurban.—Incorporated in Tennessee with $10,000, it is said, to build a line from Vestal, Tenn., south of Knoxville to Maryville, about 13 miles. M. T. DeVault and N. B. Morrell are incorporators.

Lehigh Valley.—This company has just completed and placed in service a 1.5-mile addition to its Raritan branch. The new line is located in Piscataway township, Middlesex county, New Jersey, and reaches the plant of the Standard Hollow Tile Company and a new refining plant being constructed by Charles Delarue. The Raritan branch is an offshoot of the Lehigh Valley's line between South Plainfield and Perth Amboy.

Pennsylvania Railroad.—This company is building with company forces about one mile of line from the east end of Harrisburg, Pa., to the center of Steelton borough. The work includes building one steel bridge, also a freight station to be 20 ft. wide and 100 ft. long.

Red Lake Northern.—This is the name of a new road to be constructed from Alida, Minn., in a northerly direction past the west end of Red Lake to the Canadian boundary, at, or near, the Lake of the Woods, and from Alida, Minn., south and past the Itasca State Park to the Twin Cities. This will involve 41 miles of truckage. Another hundred miles is expected to be completed before the close of 1917. Actual construction on any part of this undertaking will not be attempted for several weeks, at which time contracts will be awarded and the work pushed along rapidly. Jens J. Opsahl, Bemidji, Minn.

Western & Atlantic.—Bids are wanted until December 5, 1916, by the Western & Atlantic Railroad Commission for lease of the Western & Atlantic Railroad, owned by the state of Georgia and the commission will at the same time receive any proposal submitted looking to the extension of this railroad from Atlanta to any or all of the Georgia ports, either by the construction of a new standard gage line or by the acquisition in whole or in part of existing railways. The Western & Atlantic runs from Atlanta, Ga., to Chattanooga, Tenn., 136.82 miles, only 6.33 miles of which is double track. The road is now operated by

the Nashville, Chattanooga & St. Louis, under a lease which expires in December, 1919. (January 21, p. 148.)

Western Maryland.—The report of this company for the year ended June 30, 1916, shows that the Somerset Coal Railway from Coal Junction, Pa., was completed October, 1915, to mine 123 of the Consolidated Coal Company, 2.2 miles, and is being extended to mine 125, an additional 2.4 miles. Work is under way on the Fairmont Bingamon Railway, and it is expected that grading on the entire eight miles will be completed by January 1, 1917. This branch will serve three openings at Wyatt, W. Va., belonging to the Consolidated Coal Company. Work on the second track from Edgemont to Pen Mar, 3.52 miles, was completed, and the construction of the second track from the Hagerstown passenger station to Security, 2.4 miles, and from Big Pool to Clearspring, 5.62 miles, is now under way and should be completed by January 1, 1917.

RAILWAY STRUCTURES

Baltimore, Md.—Plans have been completed by the Baltimore & Ohio for building a new passenger station at Gay street, Baltimore. The station will be of brick construction, 30 ft. by 40 ft., with concrete foundations and tile roof. Work will be started at once.

Bessemer, Ala.—Work on the proposed new freight house for the Alabama Great Southern at Bessemer will be started at once, it is said, and will be pushed to completion. The station is to be built between Carolina and Alabama avenues, two blocks west of the new passenger station. The improvements will cost about $35,000.

Greensburg, Pa.—The Pennsylvania Railroad has given a contract to H. L. Kreusler, Pittsburgh, Pa., for building a 40-foot extension to the single-story combined freight warehouse and office building at Greensburg. The extension will have concrete foundation and will be of brick construction with slate roof. The cost of the imrpovements will be about $50,000.

Newton, N. C.—Residents of Newton have asked the Southern Railway to build a new station at that place. No detailed plans have been made for this improvement.

New York.—The New York Public Service Commission, First district, has awarded to Louis Wechsler, New York City, a contract at $382,521 for the construction of station finish for five stations on the new Seventh avenue line and for the diagonal station at Forty-second street between Park and Lexington avenues near which the new Lexington avenue line connects with the first subway.

Bids have been opened by the commission for the construction of concrete track floors and platforms over the mezzanines of eleven stations on the Culver Rapid Transit Railroad now under construction in the borough of Brooklyn.

Philadelphia, Pa.—Bids were received by the Pennsylvania Railroad on October 26 for the construction of concrete culverts under its tracks west of Thirty-third street, Philadelphia.

Pomona, N. C.—Improvements at the Pomona yards east of Greensboro have been authorized by the Southern Railway. The present yard at Pomona consists of 7 tracks having a total capacity of 359 cars. Six of the yard tracks will be extended at both ends, a new southbound passing track 3,500 feet long, also 13 new yard tracks and 3 repair tracks will be constructed. The yard proper will have a capacity of 1,084 cars and the repair tracks 104 cars, or a total of 1,188 cars, an increase in capacity of 829 cars. A new engine terminal will be located at Pomona Junction between the main line and the line to Winston-Salem. It will consist of a modern fireproof 18-stall roundhouse, 100-foot turntable, mechanical coaling station with a capacity of 1,000 tons in its bins and provision for additional ground storage, sand house, 2 cinder conveyors, boiler room, machine shop, wash and locker room and oil room. A pumping plant to provide an adequate water supply will also be constructed consisting of duplicate oil engines and power pumps in a fireproof pump house, new pipe lines and electrical tank signals, new 96,000-gallon water tank, booster pump, pumphouse and standpipes at Pomona Junction. Bids for the construction of the roundhouse and heating for same are now asked for.

Railway Financial News

Chicago, St. Paul, Minneapolis & Omaha.—Samuel A. Lynde, vice-president, with office at St. Paul, Minn., has been elected a director of the road, to succeed William A. Gardner, deceased.

Ft. Smith & Western.—A press dispatch from Ft. Smith, Ark., says that the United States District Court has ordered the sale of the Ft. Smith & Western under foreclosure. No date has been set for the sale.

New York Central.—The board of directors has voted to authorize the issue of $25,000,000 new stock to be offered to stockholders at par. The proceeds of the sale of this stock are to be devoted to the general corporate purposes of the company. It is understood that subscriptions will not be opened until after the first of the year. In December there is a meeting of the directors, at which a dividend declaration is due. The New York Central is now paying dividends at the rate of 5 per cent.

New York, New Haven & Hartford.—This company and the Boston Railroad Holding Company have been given another year within which to dispose of the controlling interest of the Boston & Maine stock. Under the previous decree of the court the Boston & Maine securities were to have been sold under the supervision of five trustees by January 1, 1917. The time has now been extended to January 1, 1918. The trustees had asked for an extension of two years' time.

Wellsville & Buffalo.—President C. A. Finnegan is quoted as saying that this company will suspend operations on November 1 "on account of the continued large cash financial loss in the passenger and freight service ever since the company was organized and began operations." The Wellsville & Buffalo runs from Buffalo to Wellsville, 90 miles, and was formerly part of the Buffalo & Susquehanna system, being part of the Buffalo & Susquehanna Railway. The Buffalo & Susquehanna Railroad and part of the Railway were reorganized separately from this road, running from Buffalo to Wellesville.

Russia's New Siberian Port.—The Russian government has opened a new Pacific terminus for the Trans-Siberian Railway. This is the port of Nikolaievsk, at the mouth of the Amur river, near the head of the Gulf of Tartary, about 850 miles north of Vladivostok. Goods received here will be transported inland up the Amur river to Stretyinsk, which is reached by a railroad that connects with the Trans-Siberian line. The new port will be able to handle 72,000,000 pounds of freight, and it will thus help considerably to relieve the pressure of Vladivostok. The Trans-Siberian Railway is one of the great engineering achievements of the world, and a monument to the vision, perseverance and skill of the Russian engineer. The double-tracking of this 6,677 mile-long railway was begun some years ago. When the war started, thousands of additional men were set to work to hasten this vast undertaking, and the second track has just been finished, in time to facilitate the shipments of the enormous stores of artillery, projectiles, explosives, machinery and goods of all kinds from the United States and Japan and England that have piled up on the crowded wharves and shores at Vladivostok during the past winter. This port has been overwhelmed by the demands upon its comparatively limited resources. Its contracted harbor has been unable to accommodate the sudden access of shipping, and insufficient docks and the lack of unloading machinery and of warehouses have caused great delays; 31,000,000 tons of freight arrived at Vladivostok in the first four months of 1915, compared with 2,195,000 tons in the corresponding period of 1914. Thousands of workmen have been struggling night and day to enlarge the docks and port facilities, and the wharves are being trebled in length to accommodate at least 40 great freighters at one time. Some of this congestion will be relieved by the routing of shipments to Nikolaievsk, which has become chief port of supply for the mining district of Chita and other prosperous Siberian communities previously served via Vladivostok.—*Far Eastern Review.*

[Advertisement.]

ANNUAL REPORT

NEW YORK, NEW HAVEN AND HARTFORD

INCOME ACCOUNT FOR THE YEAR ENDING JUNE 30, 1916

	1916.	Comparison with 1915. Increase.	Decrease.
Average Miles Operated	*2,001.62*	*1.45*	
RAILWAY OPERATING REVENUES:			
Freight	$37,448,020.64	$6,268,701.93	
Passenger	29,620,567.21	2,609,768.38	
Excess Baggage	154,326.33	17,980.83	
Mail	714,772.07		$2,383.09
Express	3,578,326.45	868,687.32	
Other Transportation	1,278,586.61	320,916.35	
Incidental	2,840,076.21	815,045.62	
Joint Facility	676,977.39	33,671.86	
TOTAL RAILWAY OPERATING REVENUES	76,311,652.91	10,932,389.20	
Per Mile (Average)	*$38,067.89*	*$5,429.99*	
RAILWAY OPERATING EXPENSES:			
Maintenance of Way and Structures	8,779,166.06	1,049,925.48	
Maintenance of Equipment	10,859,656.11	1,079,326.42	
Traffic	470,278.42		3,089.86
Transportation—Rail Line	28,423,556.85	4,464,854.39	
Miscellaneous Operations	845,779.80	253,726.11	
General	1,756,431.21	145,187.75	
Transportation for Investment—Deduct	56,510.64		38,196.24
TOTAL RAILWAY OPERATING EXPENSES	51,078,357.81	6,951,734.05	
Per Mile (Average)	*$25,480.32*	*$3,451.92*	
NET REVENUE FROM RAILWAY OPERATIONS	25,233,295.10	3,980,655.15	
Per Mile (Average)	*$12,587.57*	*$1,978.07*	
RAILWAY TAX ACCRUALS	2,856,254.61	112,333.14	
Per Mile (Average)	*$1,424.84*	*$55.05*	
UNCOLLECTIBLE RAILWAY REVENUES	5,760.64		2,069.72
TOTAL TAXES AND UNCOLLECTIBLE RAILWAY REVENUES	2,862,015.25	110,263.42	
RAILWAY OPERATING INCOME	22,371,279.85	3,870,391.73	
MISCELLANEOUS OPERATING INCOME	10,601.65	9,408.31	
TOTAL OPERATING INCOME	$22,381,881.50	$3,879,800.04	
Per Mile (Average)	*$11,165.15*	*$1,928.75*	
NON-OPERATING INCOME:			
Dividend Income	$1,746,569.01	$295,902.11	
Income from Funded Securities	941,765.83	762,647.51	
Income from Unfunded Securities	1,175,373.09		$261,208.61
Rent from Locomotives, Passenger Train Cars and Work Equipment	297,489.45	64,882.90	
Joint Facility Rent Income	107,419.28		32,298.06
Income from Lease of Road	1,549,678.12		229,354.99
Miscellaneous Rent Income	644,756.98	14,270.51	
Miscellaneous (Debit)	*3,821.43*		10,662.44
TOTAL NON-OPERATING INCOME	6,459,230.33	604,178.93	
GROSS INCOME	28,841,111.83	4,483,978.97	
Per Mile (Average)	*$14,387.32*	*$2,228.03*	
DEDUCTIONS FROM GROSS INCOME:			
Rent for Locomotives, Passenger Train Cars, Floating and Work Equipment and Balance for Hire of Freight Cars	2,700,888.04	2,102,787.07	
Joint Facility Rents	2,938,564.03	216,225.77	
Rent for Leased Roads	6,156,491.09		17,657.25
Miscellaneous Rents	199,292.69		5,355.90
Miscellaneous Tax Accruals	98,128.60	4,654.10	
Separately Operated Properties—Boston R. R. Holding Co. Guarantee	117,595.24		13,976.46
N. Y., W. and B. Ry. Co. Guarantee (Bond Interest)	864,000.00		
Interest on Funded Debt	9,343,382.08		57,154.30
Interest on Unfunded Debt	1,964,519.29	184,732.33	
Miscellaneous	142,583.91	67,938.18	
TOTAL DEDUCTIONS FROM GROSS INCOME	24,525,354.97	2,476,193.54	
Per Mile (Average)	*$12,234.42*	*$1,227.29*	
Net Income	$4,315,756.86	$2,007,785.43	
Ratio of Operating Expenses to Total Operating Revenues	66.89%	.56%	
Ratio of Operating Expenses and Taxes to Total Operating Revenues	70.63%	1.01%	

NOTE—The N. Y., N. H. & H. R. R. Co. Income Account has not as yet been issued, but from Statements Company's office expect will be paid in full.

During the fiscal year there was included in Maintenance $1,002,570.47, which would not have appeared because of the inability of the Company to obtain labor and material. It has been decided, with the permission of the Interstate Commerce Commission, to carry this amount forward to the next fiscal year as a charge to be used when the maintenance expenditures are actually made.

A balance of $176,601.8 account of Insurance has also been carried over to the next fiscal year so that the actual balance for the fiscal year ending June 30, 1916, was $7,411,454.71, as against $7,234,852.89, as compared with actual figures for the previous year.

OPERATING RESULTS

Miles Operated.

There was an increase in average miles of road operated of 1.45 miles. The average miles of track maintained was 4,007.05 compared with 4,315.49 the previous year, a decrease of 7.81 miles due to various minor track changes and set-backs.

REVENUES

The Operating Revenues for the year of $76,311,652.91 were the largest in the history of the Company and $10,931,389.20, or 16.72% more than a year ago. The largest previous year was 1913, when the Operating Revenues were $68,613,503.08.

Freight.

Freight Revenue increased $6,268,701.93, or 20.11%.

There were 28,285,411 tons of revenue freight carried during the year. This was an increase of 4,413,885 tons. The number of tons of revenue freight carried one mile was 2,461,913,531, an increase of 276,784,375 ton miles. The average distance haul of one ton of revenue freight this year was 87.03 miles as compared with 91.05 miles last year. The average amount received for each ton of freight was $1.3240 as compared with $1.31453 a year ago.

The average number of tons of revenue freight per revenue train mile was 333.74, an increase of 0.37 tons. The average number of tons of revenue freight per loaded car mile this year was 16.7 as compared with 15.59 tons a year ago. The average number of freight cars (including cabooses) per revenue train mile was 19.25 this year as compared with 31.78 cars a year ago, a decrease of 2.53 cars.

Revenue freight train miles increased 804,727 miles. The increase in freight train miles is due to the increased business handled and to the lighter loading of trains because of heavy less than carload shipments and on account of the severe weather conditions during the past winter.

Passenger.

Passenger Revenue increased $2,609,768.38, or 9.66%. Excess Baggage Revenue increased $17,980.83, or 13.19%. Mail Revenue decreased $2,383.09, or 0.33%. Express Revenue increased $868,687.32, or 32.06%.

There were 82,246,385 revenue passengers carried during the year, an increase of 4,073,687 passengers. Total number of revenue passengers carried one mile was 1,571,060,117, an increase of 93,191,183 passenger miles. The average distance each revenue passenger was carried was 19.10 miles, as compared with 18.91 miles last year. The average amount received from each passenger was $.36014, as compared with $.34553 last year. The average revenue per passenger per mile this year was $.01885, as compared with $.018278 a year ago.

The average number of passengers per revenue train mile was 102, an increase of 5 passengers. The average number of passengers per revenue car mile was 6, an increase of 1 over last year. The average number of passenger train cars per revenue train mile was 5.1, as compared with 5 cars a year ago.

Revenue passenger train miles increased 136,906 miles, due to increased business and severe weather in the winter months.

Other Transportation.

Other Transportation Revenue increased $320,916.35, or 33.61%. This account includes Special Train Service, Revenue from Pullman Service, Switching and Milk Revenues.

Incidental.

Incidental Revenue increased $815,045.62, or 40.25%. This account includes: dining car revenue which increased $46,045.34, or 10.57%; revenue from restaurants which increased $178,082.85, or 183.75%; other items such as Station and Train Privileges, Parcel Room Receipts, Storage, Demurrage, etc., which increased $579,880.44, or 51.52%; and revenue from electric current and other power sold which increased $10,436.99, or 2.85%.

$132,855.61 of the increase in revenue from restaurants is due to the Company's taking over the operation of the restaurants at New Haven, Providence and Willimantic, and to the operation for the entire year of the restaurant at Hartford which was not operated a large part of the previous year as the station was being reconstructed after being destroyed by fire.

Joint Facility.

Joint Facility Revenue increased $33,671.86, or 5.23%. This account includes the Company's proportion of revenue collected for the use of privileges in stations owned by other carriers and used jointly by this Company. Most of the increase is due to additional revenues derived from privileges in the Grand Central Terminal.

EXPENSES.

During the year the expenses have been very heavy, due to increased business, severe winter weather, freight congestion, higher wages and the increased cost of material.

Maintenance of Way and Structures.

The charge increased $1,049,925.48, or 13.58%, and took 11.50% of Operating Revenues as compared with 11.8% a year ago. Removing snow and ice cost $85,731.59, an increase of $244,077.85.

A brief description of the character of the improvements made during the year is given below.

Grade Crossings eliminated during the year:

State of Connecticut	3
State of Massachusetts	2
Total	5

The elimination of the Corbin Avenue grade crossing at New Britain, Conn., ordered by the Public Service Commission, is about completed.

New Passenger Stations have been provided during the year at the following points:

Brayton, Mass.
Hanover, Mass.
Hartford, Conn.
Merwinsville, Conn.
Pawtucket-Central Falls, R. I.
Portsmouth, R. I.
South St. Station, Conn. (Suffield Branch.)

Improved facilities have been provided at twenty-seven other points.

The rebuilding of the Hartford Passenger Station is completed, and the station was opened to the public in September, 1915.

The new Pawtucket-Central Falls Passenger Station with approaches, platforms, elevators, etc., was completed and opened to the public in January, 1916.

New Freight Stations have been built during the year at the following points:

Braintree, Mass.
Colchester, Conn.
Hanover, Mass.
Merwinsville, Conn.
Unionville, Conn.

Improved facilities have been provided during the year at twenty other stations.

Improvements to Roadway and Track. Owned and leased track operated (excluding sidings) is laid with rail of the various weights per yard as follows:

Weight.	*Miles.*	*% of Total.*	*Comparison of Miles with 1915. Increase.*	*Decrease.*
141 lb.	.82	.03	.....	.04
107	123.23	4.18	91.48	.....
100	927.19	31.45	.....	53.65
90	166.90	5.66	9.52	.....
80	477.93	16.21	23.01	.....
79	105.26	3.57	.....	6.02
78	583.22	19.78	.....	40.21
75	8.68	.29	.....	.95
74	178.35	6.05	.....	7.31
72	28.20	.96	4.61	.....
70	155.18	5.26	.....	18.94
68-67-66-60	159.22	5.40	1.47	.....
56 or under	34.09	1.16	.....	5.45
Total	2,948.27	100%	.....	2.48

NOTE.—All Steel Rail. With exception of sidings (not included in above figures) there is no iron rail in the track.

New rail was laid during the year as follows:

141 lb.	242	tons
107	16,467	"
100	435	"
93	70	"
90 (rerolled)	190	"
88	16	"
80	1,920	"
78	4	"
68 (rerolled)	26	"
Total	19,370	tons

The total number of ties laid during the year was 1,014,886, of which 22,324 were creosoted and provided with tie plates and screw spikes.

Signal and Interlocking Improvements and Additions have been made during the year at forty-eight points. In addition, standard train order signals have been installed at forty-one points and forty-seven derails have been connected to main line switches.

To afford protection for the public at grade crossings, fourteen crossing bells have been installed.

Bridges. During the year thirty-two bridges were either repaired, strengthened or renewed.

The new tracks across Winthrop Cove, New London, Conn., including construction of solid embankment and twenty-two foot concrete arch, were opened to service in February, 1916. A portion of the permanent approach to Thames River bridge, including new steel bridge over the Central Vermont tracks, was placed in service in September, 1915. Contract for the bridge substructure designed to carry a four track superstructure is awarded, and the construction of west abutment and caisson for one pier is under way. The plans for two track superstructure are completed and bids asked for.

The construction of the undercrossing for the State of Connecticut and new abutments for the Fairview Avenue bridge, in the town of Groton, Conn., are practically completed.

The construction of the twenty foot highway bridge, spanning four tracks at Stonington, Conn., ordered by the Public Utilities Commission, is completed, and was opened to the public in November, 1915.

Because of the difficulty in obtaining men and materials, some work that was to have been done within the fiscal year had to be deferred.

Maintenance of Equipment.

The charge increased $1,079,326.42, or 11.04% and took 14.23% of Operating Revenues this year, as compared with 14.96% a year ago.

Included in Maintenance of Equipment are charges account of Depreciation, as prescribed by the Interstate Commerce Commission, as follows:

Steam Locomotives	$284,235.80
Other Locomotives	76,620.24
Freight Train Cars	956,550.97
Passenger Train Cars	469,259.55
Floating Equipment	87,619.68
Work Equipment	24,464.73
Total	$1,898,750.97

The equipment retired from service during the year, as shown at the bottom of Page 36, resulted in the following charges to Operating Expenses:

Steam Locomotives	$61,851.67
Other Locomotives—Cr.	*275.00*
Freight Train Cars	113,527.45
Passenger Train Cars	138,691.88
Work Equipment	103,200.93
Total	$416,996.93

Steam Locomotives. Total number on active list June 30, 1915..... 1,165
Locomotives retired from service during the year..... 34

1,131
New locomotives added during the year..... 28

Total on active list June 30, 1916..... 1,159

The thirty-four locomotives retired from service were all of light capacity, and in a number of instances their boilers would not meet the requirements of the Federal Boiler Inspection Act.

The hauling capacity of the steam locomotives is as follows:

Active List.	*Number.*	*Tractive Power, Pounds.*	*Total Weight on Drivers, Tons.*	*Total Weight of Locomotives, Tons (exclusive of tenders).*
June 30, 1915	1,165	28,573,600	61,515	78,296
Added during fiscal year*		16,996	20	39
Added during fiscal year account new locomotives received	28	1,339,165	2,737	3,669
Total	1,193	29,929,761	64,272	82,004
Retired from service during year	34	514,747	1,189	1,632
June 30, 1916	1,159	29,415,014	63,083	80,372

*Increased account of superheaters applied and change from compound to simple cylinder locomotives.

There were 657 locomotives which received general overhauling and heavy repairs during the year.

The following statement shows the character and condition of the steam locomotives on June 30, 1916:

Wheel Arrangement.	*In service 6-30-15.*	*Withdrawn.*	*Added (new).*	*In service 6-30-16*	*Average Weight Each Locomotive, Tons (exclusive of tender). Total.*	*On Drivers.*	*Average Tractive Power Pounds.*
0-0	10	2	..	8	36	36	16,399
0-0-0-0	1	1	..	..	..	..	.....
0-0-0	203	1	..	202	61	61	27,995
0-0-0	343	8	..	335	71	61	27,617
0-0-0-0	35	..	..	35	76	69	32,546
0-0-0-0	..	..	28	28	131	98	47,827
0-0-0-0	367	21	..	346	54	35	17,323
0-0-0-0-0	106	1	..	105	68	52	23,511
0-0-0-0	12	..	..	12	104	52	25,127
0-0-0-0-0	88	..	..	88	122	75	35,614
0-0-0-0							
0-0-0-0-0	1,165	34	28	1,159	70	54	25,379

Condition.	*Number.*	*Per Cent.*
Good	895	77.2
Fair	82	7.1
In shop for repairs	136	11.7
Awaiting repairs, to be repaired when suitable service demands	46	4.0
	1,159	100.0
Number of locomotives equipped with superheaters	120	10.4

The forty-six locomotives awaiting repairs are of light capacity.

Electric Locomotives. Hauling capacity and condition:

Active List.	*Number.*	*Tractive Power, Pounds.*	*Total Weight on Drivers, Tons.*	*Total Weight of Locomotives, Tons.*
June 30, 1915	102	1,503,940	8,144	10,443
Retired during fiscal year		.....	.....	.....
June 30, 1916	102	1,503,940	8,144	10,443

There were thirty-five locomotives which received a general overhauling during the year.

Cars in Freight Service.

Of the total number of freight cars owned June 30, 1916, 1,268, or 3.73%, were in need of repairs.

During the year 229,543 freight cars were repaired, the repairs varying from minor repairs to general overhauling.

The five hundred steel, self-clearing hopper coal cars, ordered under an Equipment Trust and due several months ago, have not been received on account of labor and material troubles.

Cars in Passenger Service.

Of the total number of passenger cars owned June 30, 1916, 134, or 5.72% were in need of repairs. During the year 8,608 passenger cars were repaired, the repairs varying from minor repairs to general overhauling.

New Equipment in Service.

In addition to the equipment shown under Additions and Betterments on Page 36, the following equipment was received during the year under Equipment Trusts:

28 steam locomotives.
2 all-steel dining cars.
2 all-steel multiple unit motor cars.

On June 30, 1916, there were one hundred passenger train cars due from the Osgood Bradley Car Company on the 1916 contract. Of this number there have been received since June 30, 1916:

6 all-steel coaches.
13 all-steel 60-ft. baggage cars.
9 all-steel 70-ft. baggage cars.

The twenty all-steel passenger train cars due from the Osgood Bradley Car Company on the 1915 contract have all been received and were paid for out of current cash.

Traffic Expenses.

The charge increased $4,464,854.39, or 18.64% and took 37.26% of Revenues as compared with 0.72% last year.

The most noticeable decreases were in Advertising and Stationery and Printing, while Outside Agencies and Industrial Bureau show increases.

Transportation Expenses.

The charge increased $4,464,854.39, or 18.64% and took 37.26% of Operating Revenues this year as compared with 36.65% a year ago, an increase of 0.61%.

The miles run by revenue trains of all classes were 22,543,164, an increase of 958,282, or 4.44%. The cost per revenue train mile for Transportation Expenses was $1.26 compared with $1.11 for last year, an increase of 15 cents per mile.

Cost of fuel for revenue train and yard steam locomotives increased $887,198.14 over the previous year, due to severe weather conditions, an increase in train miles and higher prices.

Miscellaneous Operations.

The charge increased $253,726.11, or 42.86% and took 1.10% of Operating Revenues this year as compared with 0.91% last year. There was an increase in the cost of operating dining car service of $48,775.11 over last year. The number of revenue meals served during the year was 417,622, an increase of 39,082 meals.

There was an increase in cost of operating restaurants of $138,851.18, due to taking over the restaurants at New Haven, Providence and Willimantic, and the opening of the Hartford restaurant upon the completion of the station.

General Expenses.

The charge shows an increase of $145,187.75, or 9.01%, and took 2.30% of Operating Revenues as compared with 2.46% a year ago. There was an increase in pensions of $11,238.43, in valuation expenses of $95,831.69 and in wages of general office clerks. Additional clerks were also employed because of the heavy business.

The amount of pensions paid during the year was $187,514.68, and the cost to the Company account of the federal act requiring valuation of railroads amounted to $186,719.43.

Payrolls and Materials.

On June 30th, the total number of employees was 35,485, and the total payrolls for the year for all classes of labor paid for directly were $29,269,103.48. Payrolls for the year increased $3,503,789.68, or 13.6%. Payrolls for the current fiscal year will show still further increases. Expenditures for material of all kinds except equipment amounted to $15,439,174.15.

Non-Operating Income.

This account increased $604,178.93. The increase is due to dividend of $291,864.00 from the New York, Ontario & Western Railway Company on its preferred and common stock, as compared with dividend of $132.00 on its preferred stock last year and to an increase in interest of $308,609.50 from The New England Navigation Company, that Company's cash income being sufficient to pay all interest for the year.

The interest on the securities of other subsidiary companies held by the New Haven Company was not included in income unless actually earned and paid in cash.

Deductions from Gross Income.

The charge increased $2,476,193.54, due principally to the increase in Hire of Equipment of $2,102,787.07 on account of congestion, embargoes, severe weather conditions and lack of facilities. Joint Facility Rents, Miscellaneous Taxes, Interest on Debt, and expenses of Trustees appointed by the Federal Court show increases.

Profit and Loss.

The properties as a whole, in which the Company has an interest, showed better results for the year than for several years and their physical condition is improved. What losses the Company will sustain when sales are made as ordered by the United States Court cannot now be stated but the properties have a greater value today than a year ago.

FINANCIAL.

The Company in the past two years has spent for the protection of its property the following:

	1916.	**1915.*
For Road and Equipment	$3,756,269.59	$1,358,261.86
For Grand Central Terminal Building	49,661.73	643,432.37
For Additions and Betterments on Leased Steam Railroad Properties	273,606.20	538,664.29
For Advances to Subsidiary Companies for Additions and Betterments	115,000.00	520,982.06
	$4,194,537.52	$3,061,340.58

* Revised for purpose of comparison.

Maturing Debt.

There will mature between October 1, 1916, and June 30, 1917, the following:

Portland Street Ry. Co. First Mortgage Gold Bonds, November 1, 1916	$ 30,000.00
The N. Y., N. H. & H. R. R. Co. One Year Collateral Gold Notes, May 1, 1917	25,000,000.00
Total	$25,030,000.00

There will also mature on May 1, 1917, Three Year Collateral Gold Notes of The New England Navigation Company amounting to $20,000,000.00 for which your Company as the only stockholder is responsible.

Changes in Debt in hands of the Public.
(Including The New England Navigation Co.)

Debt as of June 30, 1915.		
Mortgage Bonds	$ 58,354,000.00	
Debentures	155,892,100.00	
Loans and Bills Payable	30,139,000.00	
New England Nav. Co. Gold Notes	20,000,000.00	
		$264,385,100.00
Debt as of June 30, 1916.		
Mortgage Bonds	$ 58,579,000.00	
Debentures	155,546,919.50	
Long Term Note	222,000.00	
Loans and Bills Payable	25,007,000.00	
New England Nav. Co. Gold Notes	19,305,000.00	
		258,659,919.50
Decrease		$ 5,725,180.50

Accounted for as follows:

	Increase.	*Decrease.*
European Loan Debentures of 1907 due April 1, 1922, acquired and cancelled		$ 345,180.50
Worcester & Conn. Eastern Ry. Co. 4½% First Mortgage Gold Bonds due Jan. 1, 1943, purchased for Sinking Fund		24,000.00
Loans and Bills Payable		2,910,000.00
One Year Collateral Gold Notes		2,000,000.00
Sale of Treasury Holdings:		
N. Y., P. & B. R. R. Co. 4% General Mortgage Bonds due April 1, 1942	$ 247,000.00	
New Haven & Derby R. R. Co. 5% Consolidated Mortgage Bonds due May 1, 1918. Sold by New England Navigation Company	1,000.00	
Naugatuck R. R. Co. 4% First Mortgage Bonds due May 1, 1954. Sold by New England Navigation Company	1,000.00	
The New England Navigation Company Gold Notes due May 1, 1917, held in treasury		695,000.00
	$ 249,000.00	$5,974,180.50
Decrease in debt	5,725,180.50	

For every $100. of stock this Company has $164.63 of debt, which is $3.65 less than last year.

European Loan.

During the last year a large number of the Company's European Loan Debentures of 1907 found their way into this country and request was made that each 500 franc debenture be stamped at a par value of $96.50 and each coupon $1.93. For this stamping your Company was to be paid 2½% on the face value of each debenture so stamped. The request was granted by your Directors and up to October 1st the Company stamped 136,792 of these debentures, for which it received in cash $330,010.70. The amount so received was invested in the European Loan Debentures of 1907 and 3,795 of these debentures of a par value of $366,217.50 were acquired at a cost of $329,902.03. The debentures so acquired have been cancelled and the debt correspondingly reduced. The debentures in the hands of the public stamped by your Company have since been exchanged for Dollar Debentures of denominations of $1,000. in coupon form, so that on October 1st, the European Loan is divided as follows:

In Dollar Debentures	$12,834,210.50
In 500 Franc Debentures	14,784,572.00
	$27,618,782.50

Renewal of Notes.

The $27,000,000.00 Five per cent. One Year Notes due May 1, 1916, were paid on that date by a new issue of One Year Four and one-half per cent. Notes due May 1, 1917, for $25,000,000.00 and $2,000,000.00 in cash. The loan last year with interest, discount and commission cost 7¼ per cent. and this year it cost with interest and discount 4⅞ per cent.

Interest and Discount.

The amount paid for interest and discount on short term paper, including The New England Navigation Company and The Harlem River and Port Chester Railroad Company for the past three years has been:

For the year ending June 30, 1914	$4,483,366.48
For the year ending June 30, 1915	3,662,051.36
For the year ending June 30, 1916	2,862,139.34

Securities Sold and Notes Receivable Collections.

During the year securities have been sold and cash collections made on notes receivable as follows:

Securities Sold:	
32,208 Shares Waterbury Gas Light Co., Stock, Par value, $805,200.00	$1,482,587.00
New York, Providence & Boston R. R. Co., Bonds	233,202.50
Salts Textile Manufacturing Co., Mortgage Note	75,000.00
9 Shares Westinghouse Air Brake Co., Stock, Par value, $450.00	1,248.65
10 Shares Post Publishing Co., Stock, Par value, $1,000.00	1,020.00
2 Shares Queensbury Mills, Stock, Par value, $200.00	136.50
Notes Receivable Collections:	
The New England Navigation Co	301,157.10
Hartford & Connecticut Western Ry. Co	819,781.71
Housatonic Power Co	615,000.00
The Connecticut Co	300,000.00
Rutland Railroad Co	150,000.00
Shearer Realty Trust	150,000.00
Berkshire St. Ry. Co	55,000.00
City Lumber & Coal Co	5,000.00
Miscellaneous Notes	1,291.79
	$4,190,425.25

The proceeds from the sale of the securities and the collections on notes were used to reduce the debt of your Company and pay for additions to the property.

In addition there was sold by the Housatonic Power Company 23,331 shares of the capital stock of the Waterbury Gas Light Company for $1,084,812.00; 500 shares of the capital stock of the Watertown Gas Company for $50,000.00; and 7,000 shares of the capital stock and notes aggregating $67,500.00 of The Westport Water Company for $92,500.00; a total of $1,227,312.00. This amount was used to pay off the notes of the Housatonic Power Company in the hands of the public amounting to $400,000.00 and the balance was paid on the notes of the Housatonic Power Company held by the New Haven Company.

Sales of Property.

Sales of land not required for the corporate purposes of the Company amounted to $695,189.41. Land no longer needed or likely to be required by your Company, as said wherever fair prices can be obtained.

Increases in rentals for land and station concessions have been made in many cases.

During the year the Company realized from the sale of second-hand and scrap material $1,014,565.00.

Settlement of the Billard Case.

The suit against John L. Billard and others was settled, and the suit withdrawn upon the receipt of $1,750,000.00 in cash, which was applied to reduce the book value of your Company's investment in the Boston Railroad Holding Company.

Equipment Trusts.

Three lease and conditional sale agreements, one with the Farmers Loan & Trust Company dated April 1, 1914, one with the Philadelphia Trust, Safe Deposit & Insurance Company dated November 2, 1914, and two with the Commercial Trust Company of Philadelphia dated December 1, 1915, and September 1, 1916, respectively, equipment has been purchased or contracted for at a total cost of $8,776,037.10. A list of this equipment, some of which has been delivered and is in service, follows:

50 Pacific type locomotives.	76 All steel multiple unit trailer cars.
30 Mikado type locomotives.	25 Steel underframe milk cars.
182 All steel coaches.	50 Steel refrigerator cars.
85 All steel baggage cars.	6 Steel dining cars.
15 All steel postal cars.	500 Steel self-clearing hopper coal cars.
28 All steel smoking cars.	4 Steam locomotive cranes.
10 All steel combination baggage and smoking cars.	2 Steam wrecking derricks.
10 All steel combination baggage and mail cars.	1 Steel business car.
17 All steel multiple unit motor cars.	1041

For this equipment $1,566,037.10 was paid as first installment of the various trusts and the balance will be paid in installments at the rate of $638,000.00 a year for the first ten years from date of agreements and $166,000.00 a year for the succeeding five years.

PUBLIC CONTROL.

Legislation.

No legislation substantially affecting the interests of your Company was passed by any of the State legislatures during the past fiscal year. The report of the Public Service Commission of Massachusetts about the capital expenditures, investments and contingent liabilities of your Company, made as a result of an investigation ordered by the General Court of 1915, was not acted upon by the General Court of 1916.

Before the legal status of your Company is definitely settled in Massachusetts a bill must be passed by the General Court and it is earnestly hoped that public opinion and confidence in the Company will be strong enough to bring about the passage of the needed bill.

More time under Federal Decree.

Modifications of the dissolution decree of the United States District Court for the Southern District of New York were requested by your Company so as to permit of a reorganization of the Eastern Steamship Corporation. This request having been assented to by the Attorney General, the modifications were entered and the reorganization is now proceeding.

On June 30, 1916, your Company through the Navigation Company owned securities with a book value of $4,200,000.00 of the Eastern Steamship Corporation which is in the hands of receivers. Since the close of the fiscal year $1,000,000.00 par value of the Bonds and 20,000 shares of common stock have been sold, an assessment of $375,000.00 on 15,000 shares of preferred stock has been paid and securities in the reorganized Company are to be received as follows: $1,500,000.00 5% Income Bonds and 18,750 shares of preferred stock. Under the decree of the Court these securities must be sold by July 1, 1917, but as the conditions for sale of the property have been very adverse an application for an extension of time will be made.

A request to extend to January 1, 1919, the time in which, under the decree, the trustees of the Boston Railroad Holding Company are required to sell the stock of the Boston and Maine Railroad has been filed and is now pending in the United States District Court for the Southern District of New York. It is hoped that the Attorney General will consent to the extension as requested and give the trustees time in which to sell the stock after the proposed reorganization of the Boston and Maine Railroad has become effective.

Rates.

During the year much work has been done in revising both freight and passenger rates.

In August, 1915, rates for parties of 100 or more traveling together were increased from 2 cents to 2¼ cents per mile, and in January 1916, commutation rates between New York and points in Connecticut, Greenwich to Stamford inclusive, were increased to the basis in effect between New York and points within that state, declared reasonable by the Supreme Court of that state.

The revision of local commodity rates having been practically completed, consideration is now being given to revision of joint class rates with connections in New England, after which the question of increasing joint commodity rates will be considered.

While in some cases reductions were made, the revision resulted in putting the rates on a slightly higher level, and further increase should be made because of the great increase in wages and prices of material.

In order to encourage the prompt unloading of cars a "track charge" of $2.00 per delayed car day was made effective at New York and Boston and later a similar charge of $5.00 a day at all points. The establishment of demurrage and storage rules and rates that will stimulate the removal of freight from cars and warehouses is now under consideration.

Valuation.

During the year, the forces of the Interstate Commerce Commission have continued the work of valuation under the Act of Congress passed March 1, 1913.

The date of valuation of the property was fixed as of June 30, 1915. The date for the valuation of the property of the Central New England Railway Company was fixed as of June 30, 1916, but the government will not begin work on that property until next Spring.

The government Roadway Parties have made a cross-section survey of the roadbed and an inventory of the track material on about 1,352 miles of road; have completed an inventory of the terminals at Boston and at Harlem River and are now at Providence.

The Land Parties have completed an investigation of the values of similar and adjacent land on about 411 miles.

The Electrical Party has completed its inventory of electrical construction on about 82 miles, and has yet to complete the Nantasket Beach Branch, the main line between Cedar Hill and Woodlawn, and the Harlem River Branch.

The Telephone and Telegraph Party has covered 949 miles.

The inspection and inventory of the bridges and buildings started in the fall of 1915. The Bridge Party has covered 830 miles of line, and the Building Party 374 miles.

The inventory of the equipment and the machinery commenced on July 5, 1916, and this will probably take about nine months.

The Valuation Department of the Company was organized in December 1913; about 145 employes are now engaged in the work; to June 30, 1916, $301,783.94 has been expended by the Company. The work for the next year will cost about $200,000.00.

No report about the valuation is expected from the Government until after January 1, 1918.

GENERAL REMARKS.

The gross earnings of the Company for the fiscal year ending June 30, 1916, were the largest in its history, but the year was a difficult and somewhat unsatisfactory one because the volume of business in New England overtaxed the facilities of the Company and of many manufacturers and merchants. There were severe storms, especially in December 1915, which reduced the efficiency of the Company, particularly between New York and New Haven, and between Maybrook and Danbury, via the Poughkeepsie Bridge, and there was great congestion on all lines reaching New York City.

There was much unrest among many classes of men, due to the unusual manufacturing activity, and the Company had to deal with fifty-seven strikes and to hire a very large number of inexperienced men, many of whom remained in the service only a few days. There was considerable difficulty in getting an adequate supply of fuel, both for the Company and for manufacturers. As a result of these conditions, there were more freight cars on the road for months than could be handled promptly and economically either by the road or by the consignees, and there was great congestion and expense. At one time, on the New Haven and Central New England roads combined, there were over 57,000 freight cars, or at least 12,000 more cars than could be handled satisfactorily on existing tracks and terminals. From 12,000 to 15,000 cars of freight were ready for unloading each day, but the congestion of terminals and the lack of facilities of both the railroad and the owners of the freight rarely permitted the unloading of as many as 6,000 cars a day, and some days less than 4,200 cars were released.

So great was the congestion on all roads east of Buffalo and Pittsburgh that the Eastern Freight Accumulation Conference Committee was created, made up of the railway Presidents and on which Interstate Commerce Commissioner Clark was an effective member.

This Committee had full power to divert freight, to place embargoes and to take any action that would help the general situation.

For the first five months of this fiscal year to November 30, 1915, the gross earnings of the Company increased $3,684,840.06, with an increase in expenses of only $636,712.47. This was before the volume of business showed the very large increase of succeeding months and before the heavy storms and the overtaxing and clogging of terminals and other facilities. As late as August 1, 1915, the Company had 203 engines stored, in good order, waiting for business. These were quickly put into service, although they were too small for economical work, and 83 heavy engines were ordered for delivery in 1916, of which 80 were received by October 10th.

The following table shows the growth of business:

	Freight.	*Passenger.*
1909	$26,596,000.00	$22,853,000.00
1910	30,111,000.00	24,886,000.00
1911	30,329,000.00	26,213,000.00
1912	32,131,000.00	26,816,000.00
1913	34,072,000.00	27,896,000.00
1914	32,476,000.00	27,401,000.00
1915	31,179,000.00	27,011,000.00
1916	37,448,000.00	29,621,000.00

and the figures below show the amount of gross earnings used for transportation expenses and for all operating expenses:

	Transportation Expenses.	*Operating Expenses.*
1909	41.38%	66.39%
1910	37.80%	63.74%
1911	39.46%	65.80%
1912	38.75%	64.84%
1913	39.65%	68.83%
1914	40.33%	72.83%
1915	36.65%	67.49%
1916	37.26%	66.93%

Beginning with the fiscal year 1914, charges for Depreciation of Equipment have been made as follows, and included in operating expenses and the percentages shown on preceding page:

		Per Cent. of Gross Earnings.
Year ending June 30, 1914	$1,773,365.79	2.63
Year ending June 30, 1915	1,724,434.53	2.64
Year ending June 30, 1916	1,898,750.97	2.49

So great was the unrest among men, and so difficult was it to obtain and retain them that many increases in rates of pay have been made during the year. In the months December 1915, to March 1916, inclusive, very handsome increases in gross revenue were almost entirely absorbed by increases in expenses and per diem charges for freight cars. While the amount of gross earnings used for expenses, 66.93%, was less than for several years, in spite of the conditions existing, it was higher than it should have been if the facilities of merchants, manufacturers and the Company for handling, loading and unloading freight had been adequate.

The experience of the year indicates that, as pointed out in the report of 1915, the plant of the Company must have substantial additions made to it if it is to perform the present business satisfactorily and economically and be ready to do the constantly growing business of New England. Many studies and suggestions as to improvements have been made during the past few years, and a careful review of these has been made during the last six months, and the following kinds of work should be done and equipment purchased as soon as the money, men and material can be obtained:

Heavier and Stronger Bridges (including the Thames River Bridge at New London, and the Connecticut River Bridge at Hartford)	$3,400,000.00
Additional Main Tracks and Sidings	2,800,000.00
Improved Signals and Interlocking Plants	880,000.00
Improved Telephone and Telegraph Facilities, including storm proof wires between New York and New Haven	600,000.00
Improved Engine Terminals	480,000.00
Freight Terminal Improvements at large and important terminals	5,900,000.00
Passenger Terminal Improvements	1,700,000.00

Equipment, Shops and Tools	9,500,000.00
This includes 53 heavy steam freight engines; 60 heavy electric engines for passenger, freight and switching service; 100 steel passenger train cars; 700 freight train cars.	
Miscellaneous Improvements, such as heavier rail, heavier ballast, small additions to stations, industrial tracks, labor saving devices, etc., etc	2,800,000.00
Total	$27,860,000.00

Of this sum approximately $3,860,000.00 will be chargeable to Operating Expenses, leaving $24,000,000.00 to be charged to Property Account.

Nothing is included in this estimate for the elimination of grade crossings and only those passenger terminal improvements are included which are imperative for the safe and expeditious handling of passengers, nor is anything included for carrying the Company's tracks through New London on an elevated structure,—something that should be done after the Thames River bridge is finished.

If these expenditures can be made, the capacity of the road will be increased, better service will be given to the public, and large savings in expenses can be made which are most important, especially if wages and material are to continue on the present basis. The Company is prepared to do as much of this work as practicable, believing that the only way it can be restored to a dividend paying basis is to put the plant in condition to produce and furnish safe and adequate transportation at the lowest unit cost, and to give improved working conditions to the employes.

In order to make these improvements, there is needed the co-operation of the public, the owners of the property and the employes. The public should realize that the New England railroads have to pay freight on all fuel coal for their locomotives and that a very large amount of this coal has to be brought in all rail. These freight charges on coal increase the fuel cost for a road like the New Haven between $3,000,000.00 and $4,000,000.00 a year as compared with the same amount of coal used by roads like the Pennsylvania, Baltimore & Ohio, and Delaware, Lackawanna & Western, and yet the passenger and freight rates on the New Haven are no higher than on those roads, and in many cases are lower. It is also to be borne in mind that the New Haven derives nearly one-half of its earnings from the operation of passenger trains and that the average distance traveled by each passenger is only nineteen miles. More than half of the passenger trains run by the Company earn less than $1.00 per mile, and many earn less than 25 cents a mile. The average cost of running all trains one mile, both freight and passenger, without allowing anything for maintenance of track and equipment or taxes for the year was $1.76, and including all expenses and taxes was $2.39. A very large proportion of the freight cars handled are loaded with less than carload merchandise, and the average haul of all freight is only eighty-four miles. This large proportion of short haul passengers and merchandise makes the business of the Company a retail instead of a wholesale one, and with the increase in wages and the high cost of fuel adds largely to the expense of operation.

The Federal Government is now underpaying the Company for the carriage of mail and parcel post at least $1,000,000.00 a year, a sum that the Company is justly entitled to today and for a number of previous years. Under these conditions, if legislation and the economic conditions of the country force upon the road very large increases in wages and higher prices for material, the public authorities should allow increased rates, if the road is to be kept in position to furnish the amount and quality of transportation that it properly needs. The public should also realize that those improvements that will be necessary if the road should be made safe and should extend to the improvement of the present line passenger service and elimination of grade crossings, which will be made, are not included, necessary to the future development of the territory served by the Company and which do not increase the earnings of the road.

The owners of the property should realize that 25,769 stockholders and a large bond fund are entitled to a reasonable return on the capital and reserves which should be used for the protection of their property by depending upon the management of the railroads in order to meet adverse as well as favorable conditions in a commercial.

Recently because of excessive rates for labor organizations, the President recommended and Congress passed a measure called "Eight Hour Law," which has cause, also, the like other effect, a very large increase in expenses between December 1 and September 30 of this year, operating on the interpretation of the law. There are more than 2,500 men in these organizations on the New Haven System and less than 1,000 men on all the railways in the United States. These men, as already told, 25,769 stockholders of the New Haven, and at least one-half million of railway stocks in the United States ought to receive a fair return on their number of bondholders, but their interests have not been considered for their just protection. The directors and officers are doing their utmost to safeguard and improve the property, but the active influence and support of all owners of securities are needed, not only in creating a favorable public opinion, but in providing new capital, in excess of that can be saved from earnings and sales of property, in order to make those improvements that will increase the earning power of the property.

The employe should realize that the prosperity of the territory served by the road, as well as members of labor organizations. They owe a duty to themselves and their families, to the Company that furnishes employment, and to the communities in which they live, as well as to their organization. It is very much to their present and future interest to have the road adjusted to the needs of the territory served and improved working conditions created. This work can be accomplished more quickly if every man who receives pay from the Company will be economical and careful and do the best work he can. A very few days saved by each employe would make more than $10,000.00 a year to be put into improvements.

It is the interest of the territory served the corporation, of the public, the employes and the owners in order that the Company will the sooner be in a position to serve adequately all interested in its welfare.

On March 11th, Mr. E. J. Pearson was appointed Assistant to the President to expedite the work of making and executing plans for the improvement work mentioned and to relieve the President of certain detailed work to which it was impossible to give sufficient attention.

During the year a very large amount of service was given to the public and the thanks of the public and of the Company are due to many loyal officers and thousands of loyal men who performed their tasks under very difficult conditions.

Statements of account of the New Haven Company and of various subsidiary companies are submitted.

By order of the Board of Directors,

HOWARD ELLIOTT,
Chairman.

THE NEW YORK, NEW HAVEN & HARTFORD RAILROAD CO.

GENERAL BALANCE SHEET, JUNE 30, 1916.

ASSETS.

	1916.	Comparison with 1915. Increase or Decrease.
Investments:		
Road	$135,741,269.29	$1,717,106.74
Equipment	61,921,134.78	439,353.61
	197,662,404.07	2,156,560.35
Improvements on Leased Railway Property	4,169,546.08	179,124.68
Sinking Funds	$168,000.00	
Less Company's own issues	168,000.00	
	.....	—495.00
Miscellaneous Physical Property	5,356,944.11	470.84
Investment in buildings at Grand Central Terminal, New York City	5,999,055.85	3,738.27
Stocks—In hands of		
Trustees	52,119,953.36	-1,250,000.00
Pledged	31,444,196.21	.....
Unpledged	76,463,107.59	1,176,261.13
Bonds—Pledged	14,270,037.50	.....
Unpledged	4,470,668.50	—45,000.00
Notes—Unpledged	35,878,646.28	—1,637,003.86
Advances Unpledged	1,678,755.11	56,083.48
Total Investments	429,513,304.66	2,740,200.59
Current Assets:		
Cash	5,042,265.55	1,255,622.62
Special Deposits	2,126,457.48	13,092.66
Net Balance due from Agents and Conductors	5,411,821.09	3,278,755.43
Traffic and Car Service Balances Receivable	230,169.73	24,783.46
Miscellaneous Accounts Receivable	4,517,927.30	476,779.87
Materials and Supplies	6,811,461.98	1,288,762.81
Interest and Dividends Receivable	698,332.55	76,111.52
Loans and Bills Receivable	3,702.18	991.79
Rents Receivable	1,008.34	1,008.34
Other Current Assets	83,019.70	105,294.46
Total Current Assets	24,882,165.90	5,378,604.95
Deferred Assets:		
Working Fund Advances	99,902.59	11,107.72
Unadjusted Debits:		
Rents and Insurance Premiums Paid in Advance	50,744.90	30,736.19
Other Unadjusted Debits	3,557,718.79	189,814.74
Total Unadjusted Debits	3,608,463.69	220,550.93
Grand Total	$458,103,836.84	$8,169,693.01

LIABILITIES.

	1916.	Comparison with 1915 Increase or Decrease.
Stock:		
Capital Stock (in hands of public)	$157,117,700.00	.....
Premium on Capital Stock (since July 1, 1909)	19,282,787.50	.....
	176,400,787.50	.....
Grants in aid of Construction	18,271.69	$18,271.69
Long Term Debt:		
Mortgage Bonds (See page 42)	$58,577,000.00	
Less held in Treasury and Sinking Fund	165,000.00	58,611,000.00
Debentures (See Page 43)	157,619,269.50	
Less held in Treasury	2,072,350.00	155,546,919.50
		-345,180.50
Miscellaneous Obligations (See Page 43)	32,000.00	.....
Loans and Bills Payable	350,000.00	4,910,000.00
Non-Negotiable Debt to Affiliated Companies	679,385.42	181,143.16
	249,013,312.92	—5,213,323.66
Current Liabilities:		
Traffic and Car Service Balances Payable	4,257,639.34	—172,369.44
Audited Accounts and Wages Payable	4,181,111.53	439,386.51
Miscellaneous Accounts Payable	56,000.00	
Matured Dividends and Interest Unpaid	1,974,744.04	28,902.45
Matured Funded Debt Unpaid	6,411.68	
Unmatured Interest Accrued	1,378,783.33	—48,878.98
Unmatured Rents Accrued	48,287.50	7,694.25
Other Current Liabilities	179,556.05	—50,677.06
	12,515,733.67	188,669.23
Deferred Liabilities:		
Returned Percentages due Contractors	39,956.91	43,203.15
Deposits account of Sidetracks	88,777.67	16,124.67
	128,734.58	—27,078.48
Unadjusted Credits:		
Accrued Taxes	187,000.00	—13,542.57
Personal Injury Reserve	64,560.00	97,068.69
Operating Reserve	1,116,674.05	1,116,674.05
Other Unadjusted Credits	2,780,814.94	172,087.14
	4,148,988.99	1,377,609.93
Reserve for Accrued Depreciation of Equipment	5,490,554.60	1,748,089.42
Reserve for Accrued Depreciation Account of Thames River Bridge	180,000.00	180,000.00
Equipment and Personal Property Leased	9,477,069.23	
Profit and Loss—Surplus (See Pages 32 and 33)	8,343,583.17	4,697,454.88
Grand Total	$458,103,836.84	$8,169,693.01

PROFIT AND LOSS ACCOUNT.

Credit.

Balance brought forward from June 30, 1915		$3,733,034.29
Net income for the year		4,315,756.86
Amount received for stamping 178,883 Five Hundred Franc French Loan Debentures, par value of $96.50 each and coupon $1.93 each		310,930.24
Profit on sale of land		105,706.71
Final adjustment in connection with the Boston & Albany Operating Agreement of 1912, which was cancelled as of Jan. 31, 1914		52,325.52
Profit on sale of securities		26,533.52
Amount received from outside parties for cost of sidetracks and other facilities located on railroad property		35,789.38
Difference between cost and par value of 3,577 Five Hundred Franc French Loan Debentures purchased		34,336.83
Overcharges carried in "Other Unadjusted Credits," unrefundable and transferred to Profit and Loss		21,848.55
Cancellation of unpaid wages		4,661.75
Miscellaneous Credits		4,062.42
		$8,644,986.07

Debit.

Book value of abandoned facilities	$104,198.80	
Payments to other roads on unadjusted per diem charges during period October 1, 1907, to February 28, 1908	23,501.25	
Discount on Equipment Trust Certificates Series "BB" dated December 1, 1915	22,785.00	
Loss on Second Mortgage Notes of Park Square Theatre, Boston	20,000.00	
Old Colony R. R. Co. account representing excess of current liabilities over current assets assumed at the time of lease, July 1, 1893	9,621.54	
Cost of printing "Dollar Debentures" exchanged for French Franc Debentures	4,400.00	
Miscellaneous charges	29,990.31	$ 214,496.90
Balance June 30, 1916, as per balance sheet		8,430,489.17
		$8,644,986.07

STATEMENT OF CONTINGENT LIABILITIES.

June 30, 1916.

Under the provisions of Section 4, Chapter 519, of the Acts of the General Court of the Commonwealth of Massachusetts, passed at its 1909 Session, The New York, New Haven and Hartford Railroad Company is authorized to guarantee the principal of, and the dividends and interest upon, the capital stock, bonds, notes and other evidences of indebtedness of Boston Railroad Holding Company. On June 15, 1910, the General Court of the Commonwealth of Massachusetts passed an act authorizing the issue of preferred stock (without voting power) of Boston Railroad Holding Company, in exchange for its four per cent. fifty-year Debentures dated November 1, 1909; and on January 10, 1911, the $20,012,000.00 Debentures owned by The New York, New Haven and Hartford Railroad Company were exchanged for preferred stock. On June 30, 1916, there were held by the public 28,000 shares of preferred stock of Boston Railroad Holding Company, on which the guaranty of four per cent. cumulative dividends per annum and the payment of principal at one hundred per cent. on liquidation had been executed, and on the same date The New York, New Haven and Hartford Railroad Company owned the following stock, which is held for the Company by Trustees under decree of the Federal Court:

31,065 shares of Common Stock of Par Value	$3,106,500.00
244,939 shares of Preferred Stock of Par Value	24,493,900.00

The New York, New Haven and Hartford Railroad Company

Is liable jointly with other roads for any deficiency on foreclosure of bonds of the Boston Terminal Company.

Guarantees the payment of principal and interest of the four per cent. First Mortgage Gold Bonds of the Central New England Railway Company of the issue of January 1, 1911, to the amount of $13,427,000.00.

Is liable for the amount of the Connecticut Railway and Lighting Company Sinking Fund, $963,932.45, which liability is offset by the securities, etc., in hands of the Trustees.

Guarantees four per cent. dividends on preferred stock of the New England Investment and Security Company, $4,000,000.00, and payment of principal at one hundred five per cent. on liquidation; also guarantees the payment of principal, $5,000,000.00 and interest of the New England Investment and Security Company fifteen-year Funding Gold Notes dated April 1, 1909.

Guarantees the payment of principal and interest of the Gold Debentures of The New England Navigation Company in case of termination of lease of the Old Colony Railroad Company, $3,600,000.00.

Guarantees jointly and severally with The Pennsylvania Railroad Company the payment of the principal and interest of The New York Connecting Railroad Company First Mortgage 4½% Gold Bonds due August 1, 1953, of the principal amount outstanding of $24,000,000.00.

Guarantees the payment of principal and interest of the four per cent. fifty-year First and Refunding Mortgage Gold Bonds of the New York and Stamford Railway Company of the issue of November 1, 1908, to the amount of $247,000.00.

Guarantees the payment of principal and interest of the four and one-half per cent. First Mortgage Gold Bonds of the New York, Westchester and Boston Railway Company of the issue of July 1, 1911, to the amount of $19,200,000.00.

Guarantees four per cent. dividends on preferred stock of the Springfield Railway Companies, $3,387,900.00, and payment of principal at one hundred five per cent. on liquidation.

ADDITIONS AND BETTERMENTS.

Owing to financial conditions, severe weather during the past winter, scarcity of labor and material, the expenditures for Additions and Betterments have been smaller than they would have been under normal conditions.

The expenditures for the year ending June 30, 1916, follow:

New or improved bridges	$ 374,487.85
New York Division electrification, power plant, etc	154,794.34
Bridgeport, Conn., increased yard facilities	103,009.55
Waterbury, Conn., yard improvements	27,842.67
New York Division, signals	167,540.76
Increased weight of rail	48,039.82
Increased weight of other track material	70,662.55
Westbrook-Saybrook, passing sidings	117,568.12
Other new passing sidings	118,304.71
New roadway machines	19,691.94
Kingston to Midway, stone ballast	84,620.29
Elimination of grade crossings	95,038.78
Cedar Hill, Conn., coaling facilities	18,310.18
Hartford, Conn., reconstruction passenger station	71,179.33
Midway, Conn., extension eastbound lead track	22,982.45
Groton-Midway, four tracking	112,669.51
South Boston cut improvements	86,604.11
New York-New Haven, telegraph plant	94,995.75
Sundry other additions and betterments	84,646.04
	1,872,988.75

New Equipment, consisting of 30 coaches, 10 combination passenger cars, 5 other combination cars, 24 baggage and express cars, 5 postal cars, 51 cabooses, 1 box car, was received during the year.

Cars were converted as follows: 71 coaches, 8 combination and 3 baggage and express cars into "Other company service cars," 5 coaches into combination passenger cars, 9 postal into other combination cars, 12 coaches into Officers' and pay cars, 40 box cars into "Other company service cars," and 30 flats into "Other company service cars" 1,008,722.74

Initial payments and installments on Trust Equipment 874,558.10

3,756,269.59

Less:

Equipment put out of service: 22 passenger, 9 freight, and 3 switch locomotives; 85 box, 52 flat, 132 coal, 38 caboose, 46 coaches, 37 combination passenger cars, 11 baggage and express, 1 other passenger car, 1 Officers', 1 ballast, 2 steam shovels, 1 wrecking car, 145 "Other company service cars" and 7 other combination cars $676,546.17

*Real Estate sold, book value 592,782.73

Facilities abandoned 71,003.46 1,340,332.36

$2,415,937.23

Charged to Cost of Road	1,209,202.56
Charged to Equipment	332,176.57
Trust Equipment Charged to Equipment Suspense	874,558.10
Total as above	$2,415,937.23

*Sold for $698,489.44.

STATEMENT OF FINANCIAL OPERATIONS, YEAR ENDING JUNE 30, 1916.

RESOURCES TO ACCOUNT FOR.

Cash on hand and in banks June 30, 1915	$3,786,642.93	
Special deposits for payment of interest, dividends, etc.	2,113,400.82	
		$5,900,043.75
Income for the year:		
Balance after expenses, taxes and fixed charges		4,315,756.86
Decrease in sundry assets:		
Treasury securities sold—		
N. Y., P. & B. R. R. Bonds	247,000.00	
Miscellaneous securities	1,221,261.13	
Notes of and advances to other companies and individuals paid off	2,805,395.65	
Park Square Property	2,209.00	
		4,275,865.78
Settlement of Billard suit		1,250,000.00
Grants in aid of construction		18,271.69
Increase in sundry current liabilities less increase in sundry assets		511,980.51
Profit and Loss:		
Balance of sundry accounts		381,698.02
		$16,653,616.61

RESOURCES ACCOUNTED FOR.

Expenditures:		
For additions to road	$1,872,988.75	
For new equipment	1,008,722.74	
Initial payments and installments on Trust Equipment	874,558.10	
	$3,756,269.59	
Less real estate sold, book value	$592,782.73	
Abandoned structures	71,003.46	
Equipment retired	676,546.17	1,340,332.36
		$2,415,937.23
Advances account structures at Grand Central Terminal, New York		49,661.73
Additions and Betterments on Leased Steam Railroad Properties	273,606.20	
Less charged to income	58,398.04	215,208.16
Advances to subsidiary companies covered by notes		115,000.00
		379,869.89
Decrease in Notes Payable		4,910,000.00
Decrease in Non-Negotiable Debt to Affiliated Companies		181,143.16
Mortgage Debt paid off		345,180.50
Bonds purchased for Sinking Fund		24,000.00
Increase in sundry assets:		
Materials and Supplies		1,228,762.80
Cash on hand and in banks June 30, 1916	5,042,265.55	
Special deposits for payment of interest, dividends, etc.	2,126,457.48	
		7,168,723.03
		$16,653,616.61

INVESTMENTS.

STOCKS—IN THE HANDS OF TRUSTEES APPOINTED BY U. S. DISTRICT COURT.

	No. of Shares.	*Par Value.*	*Book Value.*
*Boston & Maine R. R. Leased Lines:			
Boston & Lowell R. R. Corp.	412	$41,200.00	$88,775.13
Concord & Montreal R. R.	2,469	246,900.00	395,765.70
Concord & Portsmouth R. R. Co.	18	1,800.00	3,285.00
Conn. & Pass. Rivers R. R. Co.	1,464	146,400.00	208,162.44
Connecticut River R. R. Co.	1,015	101,500.00	276,220.04
Hereford Railway Co.	246	24,600.00	21,928.77
Lowell & Andover R. R. Co.	193	19,300.00	41,919.26
Manchester & Lawrence R. R. Co.	63	6,300.00	14,081.66
Massawippi Valley R. R. Co.	354	35,400.00	46,020.00
Nashua & Lowell R. R. Corp.	84	8,400.00	20,170.51
Northern R. R. (of New Hampshire)	922	92,200.00	130,750.27
Pemigewassett Valley R. R. Co.	710	71,000.00	99,676.51
Peterborough R. R. Co.	86	8,600.00	8,390.00
Upper Coos R. R. Co. (of New Hampshire)	73	7,300.00	10,242.75
Vermont & Mass. R. R. Co.	184	18,400.00	30,439.77
Wilton R. R. Co.	98	9,800.00	21,389.14
Boston R. R. Holding Co., Common and Preferred	276,004	27,600,400.00	26,350,400.00
Rhode Island Co., The	96,855	9,685,500.00	24,352,336.41
Total	381,250	$38,125,000.00	$52,119,953.36

*Under decree of the Court the investments in Boston and Maine leased lines must be sold on or before January 1, 1917.

NOTES—UNPLEDGED.

	Rate of Interest.	*Amount.*
Berkshire Street Ry. Co.	6%	$ 3,309,760.45
City Lumber & Coal Co.	5%	5,000.00
Connecticut Co., The	6%	1,725,000.00
Harlem River & Port Chester R. R. Co., The	4%	15,000,000.00
Housatonic Power Co.	6%	625,000.00
Larkin, P. C.	5%	63,894.05
Millbrook Company	5 and 6%	2,313,241.21
New England Navigation Co., The	4½, 5 and 6%	3,603,650.94
New York and Stamford Ry. Co.	6%	204,872.08
New York, Westchester & Boston Ry. Co.	5 and 6%	5,462,888.50
Providence, Warren & Bristol R. R. Co.	6%	352,397.30
Rhode Island Co., The	6%	2,964,798.45
Trustees of the Mass. Automobile Club Trust	5%	90,000.00
Westchester Street R. R. Co., The	6%	153,643.30
Wood River Branch R. R. Co.	5 and 6%	4,500.00
Total		$35,878,646.28

ADVANCES—UNPLEDGED.

	Amount.
Boston & Providence R. R. Corporation	$ 101,060.62
New York, Westchester & Boston Ry. Co.	¶ 1.00
Norwich & Worcester R. R. Co.	832,224.58
Old Colony R. R. Co.	745,468.91
Total	$ 1,678,755.11

¶ The advances made to the New York, Westchester & Boston Railway Co. amount to $3,727,325.00, but as the prospect of their being repaid is very remote, they have been reduced to a nominal value of $1.00.

STOCKS—PLEDGED AND UNPLEDGED.

		PLEDGED.		*UNPLEDGED.*	
	Shares.	*Par Value.*	*Book Value.*	*Par Value.*	*Book Value.*
Berkshire Street Ry. Co.	53,981			$5,398,100.00	$6,371,395.58
Boston & Providence R. R. Corporation	5,246	$524,600.00	$1,582,443.18		
Boston Terminal Co., The	2,000			200,000.00	200,000.00
Central New England Ry. Co., Common and Preferred	85,320 / Scrip, $136.78			8,532,136.78	1,921,727.96
Harlem River & Port Chester R. R., The	10,000			1,000,000.00	1,000,000.00
Hartford & Connecticut Western R. R. Co.	17,482			1,748,200.00	1,201,063.69
Holyoke & Westfield R. R. Co.	200			20,000.00	20,000.00
Iron Works Aqueduct & Water Co.	1/12 interest			100.00	100.00
Millbrook Company	1,000			100,000.00	100,000.00
New England Navigation Co., The	494,055			49,405,500.00	53,322,899.48
New York Connecting R. R. Co., The	15,000			1,500,000.00	1,527,204.33
New York, Ontario & Western Ry. Co., Com. and Pfd.	291,622	29,162,200.00	13,108,397.62		
New York & Stamford Ry. Co.	5,000			500,000.00	610,643.40
New York, Westchester & Boston Ry. Co.	49,249 / Scrip, $37.50			4,924,937.50	6,241,951.76
Norwich & Worcester R. R. Co.	971	97,100.00	219,038.19		
Old Colony Railroad Co.	98,132	9,813,200.00	13,065,341.80		
Pennsylvania R. R. Co., The	1,168			58,400.00	71,907.64
Pittsfield & North Adams R. R. Corp.	50			5,000.00	6,965.26
Providence, Warren & Bristol R. R. Co., Com. and Pfd.	4,868	486,700.00	730,212.67	100.00	220.00
Providence & Worcester R. R. Co.	9,551	955,100.00	2,738,762.75		
Quincy Quarries Co.	38			1,900.00	2,110.00
Roxbury Central Wharf Co.	7			700.00	†7.00
Rutland R. R. Co.	23,520½			2,352,050.00	2,364,977.15
South Bay Wharf & Terminal Co.	9			900.00	†9.00
Vermont Co., The	6,500			650,000.00	571,164.31
Westchester St. R. R. Co., The	7,000			700,000.00	905,783.53
Wood River Branch R. R. Co.	336			33,600.00	21,477.50
Miscellaneous	15			1,500.00	1,500.00
Total	1,182,320½ / Scrip, $174.28	$41,038,900.00	$31,444,196.21	$77,133,124.28	$76,463,107.59

*Pledged as part of collateral securing $25,000,000.00 One Year 4½% Gold Notes of The N. Y., N. H. & H. R. R. Co. dated May 1, 1916.
†Nominal Value.

BONDS—PLEDGED AND UNPLEDGED.

	Rate of Interest.	*PLEDGED.*		*UNPLEDGED.*	
		Par Value.	*Book Value.*	*Par Value.*	*Book Value.*
Berkshire Street Ry. Co.:					
20 Year Gold Debentures due 1925	5%			$200,000.00	$200,000.00
Central New England Ry. Co.:					
First Mortgage 50 Year Gold Bonds due 1961	4%	$1,500,000.00	$1,270,027.50		
Income Bonds (Scrip) due 1949	5%			608.50	608.50
Dutchess County R. R. 1st Mtge. Gold Bonds due 1940	4½%			5,000.00	5,230.00
Chicago & Eastern Illinois R. R. Co.:					
Consolidated & 1st Mtge. 50 Year Bonds due 1937	5%			22,000.00	25,300.00
Chicago, Rock Island & Pacific Ry. Co.:					
General Mtge. Gold Bonds due 1988	4%			38,000.00	38,000.00
Harlem River & Port Chester R. R., The:					
15 Year Prior Lien Gold Debs. dated May 1, 1915	5%	13,000,000.00	13,000,000.00		
New York & Stamford Ry. Co.:					
First & Refunding 50 Year Gold Bonds due 1958	4%			678,000.00	599,880.00
New York, Westchester & Boston Ry. Co.:					
First Mortgage Gold Bonds due 1946	4½%			2,190,000.00	2,190,000.00
Park Square Theatre Co., Inc.:					
Second Mortgage Notes due 1932	5%			275,000.00	275,000.00
Pawtuxet Valley Electric St. Ry. Co.:					
Bonds due 1933	5%			38,000.00	39,900.00
Vermont Co., The:					
First Mtge. 20 Year Gold Bonds due 1931	5%			846,000.00	846,500.00
Westchester Street R. R. Co., The:					
First Mtge. Gold Bonds dated Sept. 1, 1914	5%			222,000.00	222,000.00
Wood River Branch R. R. Co.:					
First Mortgage Bonds due 1924	5½%			56,500.00	28,250.00
Total		$14,500,000.00	$14,270,027.50	$4,571,108.50	$4,470,668.50

*Pledged as part of collateral securing $25,000,000.00 One Year 4½% Gold Notes of The N. Y., N. H. & H. R. R. Co. dated May 1, 1916.

MORTGAGE BONDS INCLUDING BONDS OF MERGED ROADS ASSUMED.

	Rate and Character of Debt.	Total Outstanding.	Date of Maturity.	Interest Payable.	
N. Y., N. H. & H. R. R. Co. H. R. & P. C.	4% First Mortgage	$15,000,000.00	May 1, 1954	May 1.	Nov. 1.
New York, Prov. & Boston R. R. Co.	4% General Mortgage	1,000,000.00	April 1, 1942	April 1.	Oct. 1.
Housatonic R. R. Co.	5% Consolidated Mortgage	2,839,000.00	Nov. 1, 1937	May 1.	Nov. 1.
Danbury & Norwalk R. R. Co.	6% Consolidated Mortgage	100,000.00	July 1, 1920	Jan. 1.	July 1.
Danbury & Norwalk R. R. Co.	5% Consolidated Mortgage	400,000.00	July 1, 1920	Jan. 1.	July 1.
Danbury & Norwalk R. R. Co.	5% General Mortgage	150,000.00	April 1, 1925	April 1.	Oct. 1.
Danbury & Norwalk R. R. Co.	4% First Refunding Mtge. Gold	350,000.00	June 1, 1955	June 1.	Dec. 1.
New Haven & Derby R. R. Co.	5% Consolidated Mortgage	575,000.00	May 1, 1918	May 1.	Nov. 1.
Providence and Springfield R. R. Co.	5% First Mortgage	750,000.00	July 1, 1922	Jan. 1.	July 1.
Naugatuck R. R. Co.	4½% First Mortgage	2,500,000.00	May 1, 1954	May 1.	Nov. 1.
Boston & New York Air Line R. R. Co.	4% First Mortgage Gold	3,777,000.00	Aug. 1, 1955	Feb. 1.	Aug. 1.
Providence Terminal Company	4% First Mortgage Gold	1,000,000.00	Mch. 1, 1956	Mch. 1.	Sept. 1.
†Worcester & Conn. Eastern Ry. Co.	4½% First Mortgage Gold	1,992,000.00	Jan. 1, 1943	Jan. 1.	July 1.
New Haven & Centerville St. Ry. Co.	5% First Mortgage	283,000.00	Sept. 1, 1933	Mch. 1.	Sept. 1.
Meriden Horse R. R. Co.	5% Consolidated Mortgage	115,000.00	Jan. 1, 1924	Jan. 1.	July 1.
Norwich Street Railway Co.	5% First Mortgage	350,000.00	Oct. 2, 1923	April 1.	Oct. 1.
Montville Street Railway Co.	5% First Mortgage	250,000.00	May 1, 1920	May 1.	Nov. 1.
New London Street Railway Co.	5% First Mortgage	150,000.00	Oct. 2, 1923	April 1.	Oct. 1.
Portland Street Railway Co.	5% First Mortgage	30,000.00	Nov. 1, 1916	May 1.	Nov. 1.
Hartford, Manchester & Rockville Tram. Co.	5% First Mortgage	200,000.00	Oct. 1, 1924	April 1.	Oct. 1.
Hartford Street Railway Co.	4% First Mortgage Gold	2,500,000.00	Sept. 1, 1930	Mch. 1.	Sept. 1.
Greenwich Tramway Co.	5% First Mortgage	320,000.00	July 1, 1931	Jan. 1.	July 1.
*Branford Electric Co.	5% First Mortgage	63,000.00	Oct. 1, 1937	April 1.	Oct. 1.
Torrington & Winchester St. Ry. Co.	5% First Mortgage	159,000.00	Dec. 1, 1917	June 1.	Dec. 1.
Meriden, Southington and Cheshire Tramway Co.	5% First Mortgage	175,000.00	July 1, 1928	Jan. 1.	July 1.
Pawtuxet Valley R. R. Co.	4% First Mortgage	160,000.00	April 1, 1925	April 1.	Oct. 1.
New England R. R. Co.	4% Consolidated Mortgage	10,000,000.00	July 1, 1945	Jan. 1.	July 1.
New England R. R. Co.	5% Consolidated Mortgage	7,500,000.00	July 1, 1945	Jan. 1.	July 1.
Stafford Springs Street Ry. Co.	5% First Mortgage Gold	400,000.00	July 1, 1956	Jan. 1.	July 1.
New Haven and Northampton Co.	4% Refunding Cons. Mtge. Gold Bonds	2,400,000.00	June 1, 1956	June 1.	Dec. 1.
Total		$58,772,000.00			

† In Sinking Fund (New York Trust Company, Trustee).

Worcester & Connecticut Eastern Ry. Co. 4½% First Mortgage Gold Bonds $168,000.00

NOTE.—Certain property of this Company is subject to a lien under a mortgage of the New York & New England Railroad Company to secure Boston Terminal Bonds of that Company to the amount of $1,500,000, due April 1, 1939, bearing interest at 4 per cent.

* Principal and interest to maturity deposited with the Union and New Haven Trust Co.

DEBENTURES, INCLUDING DEBENTURES OF MERGED ROADS ASSUMED.

	Total Outstanding.	Date of Maturity.	Interest Payable.	
*Convertible 6% Debenture Certificates	$39,029,000.00	Jan. 15, 1948	Jan. 15.	July 15.
*Convertible 3½% Debenture Certificates	9,765,450.00	Jan. 1, 1956	Jan. 1.	July 1.
Non-Convertible 4% Debentures	5,000,000.00	Mch. 1, 1947	Mch. 1.	Sept. 1.
*Non-Convertible 3½% Debentures	5,000,000.00	Mch. 1, 1947	Mch. 1.	Sept. 1.
*Non-Convertible 3½% Debentures	10,000,000.00	Apr. 1, 1954	Apr. 1.	Oct. 1.
Non-Convertible 4% Debentures	15,000,000.00	July 1, 1955	Jan. 1.	July 1.
Non-Convertible 4% Debentures	15,000,000.00	May 1, 1956	May 1.	Nov. 1.
European Loan of 1907	27,639,819.50	Apr. 1, 1922	Apr. 1.	Oct. 1.
Naugatuck R. R. Co. 3½% Debentures	234,000.00	Oct. 1, 1930	Apr. 1.	Oct. 1.
Hartford Street Railway Co.				
4% Debentures Series M.	165,000.00	Jan. 1, 1930	Jan. 15.	July 15.
The Consolidated Railway Co.				
*3%, 3½% and 4% Debentures	972,000.00	Feb. 1, 1930	Feb. 1.	Aug. 1.
4% Debentures	4,255,000.00	July 1, 1954	Jan. 1.	July 1.
4% Debentures	2,309,000.00	Jan. 1, 1955	Jan. 1.	July 1.
4% Debentures	1,340,000.00	Apr. 1, 1955	Apr. 1.	Oct. 1.
4% Debentures	2,011,000.00	Jan. 1, 1956	Jan. 1,	July 1.
Providence Securities Co.				
*4% Gold Debentures	19,899,000.00	May 1, 1957	May 1.	Nov. 1.
Total	$157,619,269.50			

MISCELLANEOUS OBLIGATIONS.

Suffolk Savings Bank for Seamen and Others				
Promissory Note	$222,000.00	May 7, 1919	May 7.	Nov. 7.

*Include Treasury Holdings as follows:

Convertible 6% Debenture Certificates	$487,800.00	The Consolidated Ry. Co. 3%, 3½% and 4% Debentures	$2,350.00
Convertible 3½% Debenture Certificates	852,100.00	Providence Securities Co. 4% Gold Debentures	719,000.00
3½% Non-Convertible Debentures, 1947	9,000.00		
3½% Non-Convertible Debentures, 1954	2,100.00		$2,072,350.00

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Car Buying Heavy in October

Purchases of freight cars in the United States and Canada were heavier in October than in any previous month this year. According to our records, 21,034 freight cars were ordered in this period, as compared with 19,949 ordered during the same month in 1915. This makes the total of freight car purchases up to November of this year, 88,398, as against 70,798 for the same period a year ago. In no other month of this year have freight equipment purchases exceeded 10,000 cars, except in January and February, when over 14,000 cars were ordered. If the orders placed in November equal those placed during the past month the total purchases for the year will exceed the orders placed in 1915, i.e., 109,792. Locomotive orders reported for October, 1916, were only 87, as compared with 295 placed in the same month in 1915. Orders were reported in October this year, however, for 180 locomotives for export. The total purchases of locomotives for domestic use so far recorded, are 2,130, as compared with 1,612 reported for the entire year of 1915. Passenger cars are also showing up well, orders having been placed during October for 212 cars, this making the month the best during the past two years with the exception of one exceptionally good month, December, 1915, when orders for 422 cars were reported. The total orders for passenger cars reported thus far this year, exclusive of subway, elevated and Pullman cars, are 1,052, as compared with 996 in the first ten months of 1915, or with 1,467 for the entire year.

Bridge Floors and Track Circuits

The problem of safeguarding train movements over the Rock Island-Government drawbridge at Rock Island, Ill., referred to elsewhere in this issue, was an unusual one. The use of a steel trough floor on this through truss structure can readily be explained in the light of the facts that the presence of street traffic on a lower deck made a solid floor essential and that the trough floor with rails clipped directly to steel plates was then in favor on some roads, particularly for structures where vertical clearance was limited, as on track elevation subways. This design proved to have disadvantages, however, in its riding qualities and in maintenance, and improved types, utilizing either concrete slabs or ballast filled troughs have practically displaced it. The impracticability of maintaining electrical insulation between the rails and the steel floor was not an important consideration when this bridge was built, but the universal adoption of track-circuit control for automatic signals and the steady development in the application of such protection on all important lines has made it essential in any such structure to provide for the insulation of the rails if desired. The Rock Island has made the best of the situation and has greatly improved the protection at this point, but the work would have been simpler and better if the standard automatic signal protection could have been used. In present-day bridge work this consideration should be given due weight in the choice of a design for any steel structure, for, even though it may not be located in automatic signal territory when built, it is impossible to foretell when such protection may become desirable.

Southern Railway's New Financing

The proposal which the directors of the Southern Railway make for meeting the short term notes which will fall due in the near future and providing for permanently financing future needs of the property is a common-sense and fair facing of the change that has taken place in the market for railroad bonds. The mortgage under which the Southern Railway was to have done its permanent financing is that securing the outstanding $61,333,000 development and general mortgage 4 per cent bonds. This mortgage was made in 1906 and limits the rate of interest on any future issue of bonds under it to 4 per cent. Railroad bonds of the class of the Southern Railway's development and general mortgage bonds cannot now be sold bearing 4 per cent interest except at a very large discount. To create another mortgage junior to the development and general mortgage would be a complicated arrangement, but one which, if it were possible to sell bonds secured by this mortgage, would enhance the market value of the outstanding $61,333,000 4's. Bonds secured under it, however, could not be made attractive to investors. The lien on the railroad property would be too indirect. The Southern Railway management, therefore, proposes to create a new mortgage—the refunding and improvement mortgage, and give it the same lien as the old development and general mortgage—and all holders of the outstanding 4's are asked to exchange their bonds for bonds secured by the

new mortgage. As an inducement, their rate of interest will be increased from 4 per cent to 4½ per cent. There is every reason why the holders of the 4's should make the exchange, except that perhaps they might think that they could get a better bargain still from the management. It is to the interest of all of the security holders that the future needs of the property shall be financed fully and as cheaply as possible. The fact that the present holder of general and development mortgage 4's paid more for them than he would now have to pay for a 4½ per cent bond is no reason why he should not accept the fact of the change in bond market conditions, and by his acquiescence in the plan materially strengthen the credit of the Southern Railway, which, in time, should enhance the value of the new bonds which he will take in exchange for his old ones.

Railroad Collection Bureaus

An interesting paper—printed elsewhere in this issue—was read at the recent meeting of the Society of Railway Financial Officers, by H. W. Myers, manager of the Kansas City Railroad Collection Bureau. This bureau collects all bills for freight, demurrage, switching and other charges, except bills paid prior to the delivery of freight, for the 14 railroad companies entering Kansas City. Extension of credit is often used as an aid to the traffic department in securing business. Advocates of the bureau collection plan lay stress on the possibilities of the abuse of this practice. The possibilities are there, certainly, but local conditions determine how much danger there is in the actual practice. Theoretically a collection bureau in a city where a dozen or more roads enter ought to be able to make a considerable saving in the cost of collections. Mr. Myers frankly admits that a careful study of the cost prior to the establishment of the bureau at Kansas City was not made. He says, however, that there were 34 collectors in the service of the railroads at Kansas City, with some supervising collectors, the total payroll on this account amounting to approximately $2,800 a month, whereas the payroll of the bureau in September was only $1,633. The question, however, is not quite fully answered by this comparison. It could only be fully answered if each road were to determine with a fair degree of accuracy how much it had been able to cut down its payrolls in consequence of the establishment of the bureau. The fact that is easy to determine and is obvious is that each month each railroad company has to pay out a certain amount for the expenses of the bureau. It is quite true that it is no fault of the bureau if a railroad did not cut down its payroll when it no longer had to make collections for itself, but from the railroad point of view the bureau is a success only if it not only potentially but actually saves money to the road or makes collections much more satisfactorily, or does both. There is strong evidence that the working of the Kansas City Collection Bureau is satisfactory to Kansas City shippers, but it would be interesting to know just what each one of the 14 roads is saving by the elimination of individual collection expenses.

THE CONGRESSIONAL INVESTIGATION OF RAILROAD REGULATION

POSSIBILITIES of the greatest importance to the railroads of the United States are involved in the investigation of the entire subject of government control of transportation about to be undertaken by the congressional Joint Committee on Interstate Commerce. This committee, which is a sub-committee of the Senate Committee on Interstate Commerce and the House Committee on Interstate and Foreign Commerce, was appointed in accordance with a joint resolution adopted by Congress at its last session "to investigate the subject of the government control and regulation of interstate and foreign transportation, the efficiency of the existing system in protecting the rights of shippers and carriers and in promoting the public interest, the incorporation or control of the incorporation of carriers and of proposed changes in the organization of the Interstate Commerce Commission and the act to regulate commerce, also the subject of government ownership of all public utilities..."

Hearings are to begin at Washington on November 20 and the committee has outlined a tentative plan for its investigation which will require two years to complete. It is proposed to hold hearings in all parts of the country in order to give ample opportunity to all interested in, or having any information or opinions relating to the subject matter of the proposed inquiry to express their views.

The inquiry has been undertaken on the initiative of President Wilson, who, in a message to Congress on December, 1915, said that there has of late been reason to fear that our railroads would not much longer be able to cope with the transportation problem successfully, as at present equipped and co-ordinated, and suggested a commission of inquiry "to ascertain whether our laws as at present framed and administered are as serviceable as they might be in the solution of the problem" and "whether there is anything else we can do that would supply us with effective means in the very process of regulation for bettering the conditions under which the railroads are operated and for making them more useful servants of the country as a whole."

Senator Newlands, chairman of the committee, has outlined a tentative program for the investigation calculated to follow President Wilson's suggestion for a thorough reconsideration of the problem from all sides before further legislation in this field is attempted. Among the questions on which the investigation is expected to furnish enlightenment, according to this outline, are the following:

Whether the Interstate Commerce Commission is overloaded and whether its jurisdiction should be confined to questions of discrimination, rebates and rates, its jurisdiction over other subjects to be turned over to some other body;

Whether it is necessary to make any change in the organization of the commission with a view to prompt and efficient action;

Whether under the present system the credit of the common carriers is assured;

Whether government regulation of the issue of securities is advisable;

What is the effect of dual regulation by both the states and the nation of the rates of carriers;

Whether regulation of the wages and hours of employees is feasible or advisable;

Whether national legislation is required in the nature of national incorporation or national holding companies.

These questions and the details incidental to them, together with questions as to the advisability of government ownership, will constitute the principal subjects of the inquiry.

The railroads agree with President Wilson that there has been reason to fear that they would not much longer be able to cope with the problems presented to them without some improvement in the methods of regulation, and they also believe that our laws as at present framed and administered are very inadequate and unsatisfactory as a solution of these problems. By force of necessity they have been giving very serious consideration to the problem for some time and through the Railway Executives' Advisory Committee they have been preparing evidence to submit to the congressional committee, which they believe will furnish the answers to some of the questions suggested in Senator Newlands' outline.

In the first place, they hope to demonstrate that one of the principal defects in our present system of railroad regulation is the lack of co-ordination in the simultaneous and even conflicting regulation of the federal government and

of the 48 states, which has resulted in waste, discrimination, duplication and litigation and has restricted proper development of the transportation industry. They are, therefore, prepared to urge strongly a concentration of most of the regulating authority in the Interstate Commerce Commission, as the representative of the federal government, and a curtailment of the power of the state commissions, much of which is now exerted unintelligently and which, even when it is not open to that charge, is exercised in such a way as actually to interfere with the work of the federal commission while creating discriminations between the states and between state and interstate traffic and imposing useless, expensive and conflicting restrictions upon the carriers.

With a view to making possible this centralization of authority, they are prepared to advocate federal incorporation of interstate carriers so that a national system of transportation may be regulated without reference to state lines. For the purpose of properly co-ordinating the administration of this regulation, they will urge a reorganization of the work and of the personnel of the Interstate Commerce Commission. The commission now exercises the tri-partite function of prosecutor, judge and jury. It is proposed that the preparation and prosecution of cases against the railroads shall be put in the hands of some other agency of the government so that the commission may devote its energies to its administrative functions, and that the commission itself shall be enlarged and possibly organized into district commissions or sub-commissions for the handling of local matters, so that the main commission may be more free to consider the more important problems.

With the commission thus relieved of some of its present duties and equipped to handle its business more promptly, the railroads would urge a reduction of the period during which it is now authorized by law to suspend advances in rates.

It is believed that a reformation of the plan of government regulation along these lines would result in increasing the credit of the carriers by relieving them of some of the uncertainties which have made it so difficult for them to attract new capital into the railroad business and which will continue to do so as long as the individual states have the power to undo or interfere with the work of the federal commission.

The railroads are also prepared to advocate a law providing for government supervision of railway security issues, provided they can be emancipated at the same time from security regulation by the individual states.

Representatives of the state and interstate commissions, of shippers and commercial organizations, and bankers and economists, as well as representatives of the railroads and their employees, are to be given an opportunity to express their views before the committee. The advocates of government ownership of railroads may be expected to muddy the waters to a considerable extent and the members of the state railway commissions, who will not only be under fire but faced with the fear of losing their jobs, are already planning a fight against the idea of paramount federal control, but the railroads will find much support for their ideas among the shippers and various commercial organizations, many of whom have already adopted resolutions advocating exclusive federal regulation.

What the outcome of the investigation will be is, of course, uncertain. The committee will make its report to Congress and the entire railroad question will undoubtedly receive an agitation such as has not been witnessed since the Hepburn law was passed, but it is inconceivable that some improvement shall not result from this opportunity for a thorough presentation of the way our present patchwork of regulating laws has worked out and for a reconsideration of the entire subject from the new viewpoint afforded by the perspective of a quarter of a century.

THE WESTERN MARYLAND REORGANIZATION

FOR more than two years the Western Maryland, although technically operated by its stockholders, was out of the hands of a receiver only because holders of its $16,000,000 defaulted notes had not pressed their claims. The management now announces a plan of reorganization. This plan will leave undisturbed the $50,000,000 bonds of the present company; will call for the immediate sale of $5,000,000 new 5 per cent bonds, the issue of $18,000,000 new first preferred 7 per cent stock, $10,000,000 second preferred non-cumulative 4 per cent stock and $50,000,000 new common stock; a payment in cash of the overdue interest on the outstanding notes, and the payment in cash in full of the principal of these notes, and the cancellation through exchange of the present $10,028,000 preferred stock and $49,429,198 common stock, and the distribution of $3,960,000 Davis Coal & Coke Company stock and $4,500,000 Monongahela Coal Lands Company stock. The holder of the present preferred stock is asked to exchange it at par for new second preferred 4 per cent stock and is given the privilege of subscribing pro rata at par for new 7 per cent preferred (cumulative after July 1, 1918), with which preferred stock he will receive without additional payment his proportionate share of the Davis Coal & Coke Company stock and the Monongahela Coal Lands Company stock. Holders of the present common are asked to exchange it for new common and are given the same privileges of subscription for new preferred and coal company stock as holders of the old preferred. A holder of one share of either preferred or common who made the exchange and exercised his privilege of subscription would get one share of new preferred or common, as the case might be; $30 par value of new first preferred; approximately $7 of Davis Coal & Coke Company stock, and approximately $8 of Monongahela Coal Lands Company stock.

Western Maryland common has sold recently in the neighborhood of 30 and preferred in the neighborhood of 53. In the fiscal year ended June 30, 1916, the Western Maryland, after charging the interest due on its $16,000,000 notes, earned about 5 per cent on the present $10,000,000 preferred. Assume that the holder of this preferred exchanges for new second preferred without exercising his option of subscription. If earnings were to be the same in 1917 as in 1916 nothing would be shown as earned on the second preferred. If he does not exercise his option to subscribe to new preferred, the holder of the present preferred, who makes the exchange, will apparently be further away from dividends after the reorganization than he was before, with this difference, however: That he will have stock in a solvent company, which is no longer at the mercy of creditors, instead of in a company which could be put at any moment into the hands of receivers.

Let us assume, however, that the preferred stockholder not only exchanged his old stock but also exercised his option to subscribe. If earnings were to be the same in 1917 as in 1916 and the plan were to go through, almost the full 7 per cent dividends would be earned on the new preferred. The Davis Coal & Coke Company stock represents ownership in a leasing and operating coal company. The Monongahela Coal Lands Company stock represents ownership in reserve coal lands and in certain coal company bonds, the interest on which is enough to pay the taxes on the reserve coal lands. Apparently in 1916, the Davis Coal & Coke Company earned about 5 per cent. Assuming that this is so, for an additional investment of $30 the holder of present preferred stock would get $30 par value of new preferred, which ought to pay 7 per cent at least within two years, and $7 of the Coal company stock, which may pay 5 per cent, and $8 of the Coal Lands company stock, which will not pay any returns in the near future, but represents substantial assets.

To the preferred stockholder who does not exercise his option of subscription, the plan will hardly look very favorable. It would not seem likely that the new second preferred would sell as high as 50. On the other hand, the subscription rights appear to have a very real value. The holder of a single share of old preferred exercising this right would pay in all about $83—$53 in his old preferred and $30 in cash. He would get one share of new second preferred worth something less than $50, a fraction of a share of new 7 per cent cumulative preferred worth three-quarters of its par value, say, $23, and Coal company and Coal Lands company stock worth together something over ten dollars. To the holder of present Western Maryland common the advantages of subscription to new first preferred and coal company stock are the same as to the holder of old preferred. A greater part of the Western Maryland stock is supposed to be held by John D. Rockefeller and his associates, but in fairness to the small holder of preferred or common some provision might well be made by which he could exercise his option of subscribing for new first preferred and Coal company stock by means of a loan to be paid back in small payments. Were such a provision to be added to the plan it would appear eminently sound and satisfactory.

EL PASO & SOUTHWESTERN

THE El Paso & Southwestern is in many respects a picturesque railroad, unlike any other thousand mile railroad in the country, but one which is very well operated. It has the distinction of having been earnestly sought after by the late E. H. Harriman, but he was unable to get control of it. Operating a mountain railroad into the copper mines, where in some cases there are 33 deg. curves, the operating ratio and the transportation ratio are low. With an imposing array of very wealthy New York men as its chief executive officers, it is actually operated by its general manager, with headquarters in El Paso.

The mileage operated in 1916 was 1,027. The northwestern part of the system runs into the copper mines of Arizona and a large part of the freight traffic is furnished by ores outbound and bituminous coal inbound to the mines. The road is controlled by the same interests which control the Phelps, Dodge & Company copper properties. The main line from El Paso, Tex., to Tucumcari, N. M., forms the connecting link between the southwestern end of the Chicago, Rock Island & Pacific and the Southern Pacific, and over this line passes all of the Rock Island's freight and passenger business for California that goes by the southern route.

In the fiscal year ended June 30, 1916, total operating revenues amounted to $10,672,000, or at the rate of $10,390 per mile of road. These are the largest earnings in the history of the property and in comparison with the lean year 1915 show a very heavy increase. Freight revenue amounted in 1916 to $8,439,000, an increase over 1915 of 43 per cent, and passenger revenue to $1,643,000, an increase over 1915 of 24 per cent. The total operating expenses amounted to $5,924,000, an increase of 25 per cent over 1915. Not only did the road derive very largely increased revenues from the increase in output of the mines, but it also had largely increased revenues resulting from the movement of troops and supplies to the Mexican border. The increase in passenger revenues was very largly accounted for by this circumstance.

The total ton mileage of revenue freight carried in 1916 was 892,419,000, giving a freight density of 869,000 ton-miles. The average length of haul was 169 miles in 1916, comparing with 179 miles in 1915, and the average receipts per ton per mile were the same in both years—9.5 mills. It is rather interesting to note that with a larger percentage of ores carried the trainload was less in 1916 than in 1915, the 1916 figure being 411 tons, and the 1915, 441 tons. Probably with the incentive that there has been to work the mines to the limit of their capacity, fuel for the mine would be run in short trains wherever it was necessary to do so to prevent any fuel shortage. Then, too, for part at least of the haul of the ore it is not practical to get heavy trainloads. Of the total 5,380,000 tons of all traffic carried in 1916, 49.92 per cent was ore. This compares with 41.49 per cent of the total 3,605,000 tons carried in 1915. It is also interesting to note that the operating expenses per revenue train-mile for freight were slightly less in 1916 than in 1915, namely, $1.80 in 1916 and $1.81 in 1915. Notwithstanding the smaller trainload, operating expenses in 1916 compared favorably with 1915.

The following table shows the percentage of each class of expenses to total operating revenues in the two years:

	1916.	1915.
Maintenance of way and structures	12.32	13.12
Maintenance of equipment	12.54	13.80
Traffic expenses	2.08	2.89
Transportation expenses	24.66	26.48
Miscellaneous operations	.71	.91
General Expenses	3.21	3.71
Transportation for investment—Cr	...	.19
Total	55.51	60.72

The El Paso & Southwestern pays 5 per cent on its $25,000,000 outstanding stock, calling for $1,250,000. There



The El Paso & Southwestern

was available for dividends in 1916 $2,568,000, comparing with $1,813,000, the amount available for dividends in 1915. The company had no funded debt in 1915, but had $3,000,000 of loans and bills payable. This was paid off during the year and there are now outstanding $2,000,000 of funded indebtedness. On the consolidated balance sheet the investment in road and equipment is carried at only $5,263,000, and the investment in affiliated companies at $31,574,000. Cash on hand at the end of the year amounted to $1,427,000, comparing with $903,000 on hand at the beginning of the year. There was a total spent for additions and betterments of $704,000.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916.	1915.
Average mileage operated	1,024	1,024
Freight revenue	$8,438,925	$5,898,826
Passenger revenue	1,643,229	1,327,353
Total operating revenues	10,671,627	7,788,736
Maintenance of way and structures	1,314,373	1,021,496
Maintenance of equipment	1,337,981	1,075,214

Traffic expenses	221,241	225,199
Transportation expenses	2,631,995	3,062,308
General expenses	342,732	288,988
Total operating expenses	5,924,268	4,729,225
Taxes	471,367	400,743
Operating income	4,262,499	2,623,581
Gross income	6,199,940	4,028,701
Net income	2,567,749	1,812,647
Dividends	1,250,000	1,250,000
Surplus	1,317,749	562,647

CHICAGO & ALTON AND TOLEDO, ST. LOUIS & WESTERN

THE relations of the Toledo, St. Louis & Western and the Chicago & Alton are peculiar. The Toledo, St. Louis & Western, operating only 451 miles of road, owns a majority of the stock of the Chicago & Alton, which operates 1,053 miles of road. The smaller road is in the hands of a receiver, and yet in the fiscal year ended June 30, 1916, it earned and paid the interest on all its bonds, including the interest on the bonds which were issued to pay for the Chicago & Alton majority stock, while the Chicago & Alton, which is not in the hands of a receiver, not only failed to pay any dividends on its stock so as to help the Toledo, St. Louis & Western pay the interest on the bonds secured by this stock, but failed by $172,000 to earn its own fixed charges. The Toledo, St. Louis & Western has a credit balance to profit and loss of $2,530,000; the Chicago & Alton has a debit balance to profit and loss of $8,094,000.

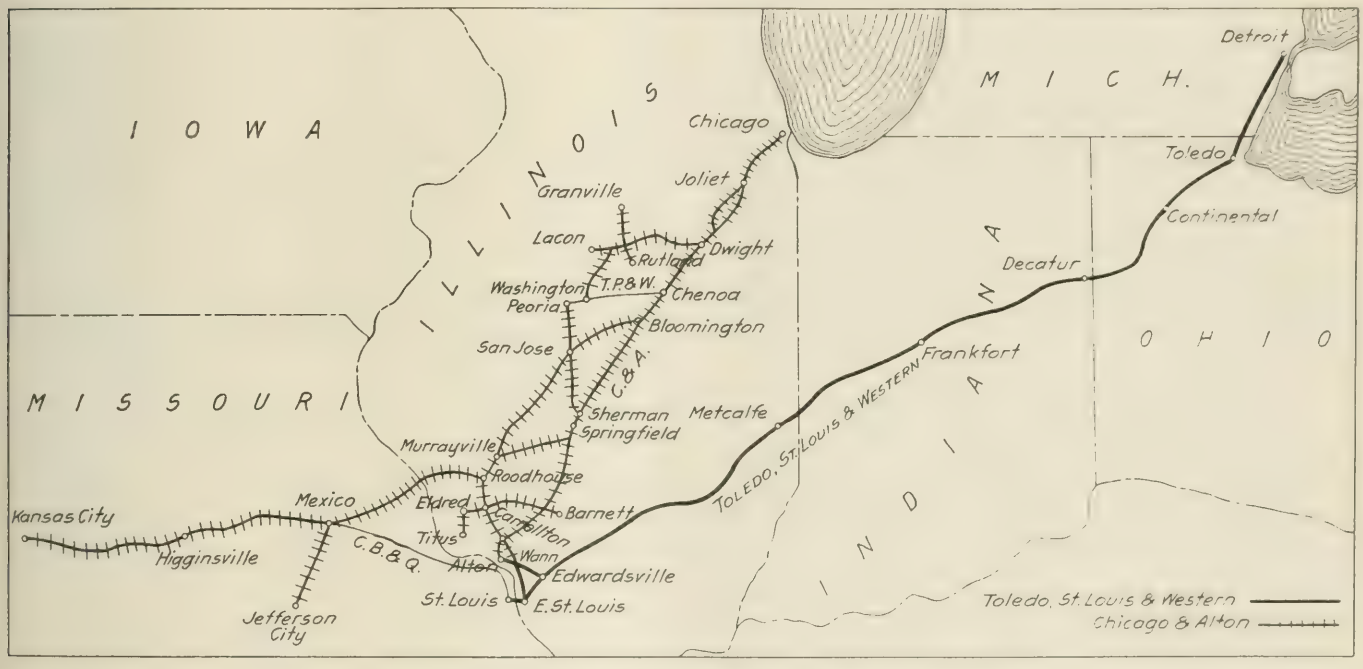
The total outstanding stock of the Chicago & Alton is about $40,000,000, of which $869,000 is cumulative 4 per cent prior lien stock and the remainder equally divided between non-cumulative preferred and common. The Union Pacific owns a little over $10,000,000 Alton preferred, and the Toledo, St. Louis & Western owns $6,480,000 Alton preferred and $14,420,000 Alton common. It has been by the help of loans made to it by the Union Pacific that the Alton has escaped receivership. The Toledo, St. Louis & Western bought its majority stock of the Alton in 1907, paying for it through the issue of $11,527,000 4 per cent bonds, maturing in 1917. The bonds are divided into two series, the "A" series being issued at par for the Alton preferred and the "B" series being issued for common stock at 35.

It is easily understandable that the Union Pacific should for strategic reasons desire to have a voice in the management of the Chicago & Alton with its line from Kansas City to St. Louis and Chicago. If separate and different interests had controlled the Alton and the Toledo, St. Louis & Western, the reasons for the purchase of the majority stock of the Alton by the latter would have hardly been apparent. As it is now, former holders of Alton stock who exchanged for Toledo, St. Louis & Western bonds are getting interest on their investment, that is, sharing in the earnings of the Clover Leaf, where they certainly would have gotten no dividends from the Alton had they not had an opportunity to make the exchange.

A comparison of the showing made by the two roads in the fiscal year ended June 30, 1916, emphasizes strongly the peculiar features of the case where the apparently solvent road is in the hands of a receiver and the insolvent road operated by its own management.

Total operating revenues of the Toledo, St. Louis & Western, which is being operated by W. L. Ross, as receiver, amounted to $5,643,000, an increase of 21.73 per cent over 1915, and an average of $12,525 per mile. Total operating revenues of the Chicago & Alton amounted to $16,074,000, an increase of 14.60 per cent over the previous year, an average of $15,511 per mile of road. Total operating expenses of the Clover Leaf amounted to $3,624,000, an increase of 3.63 per cent over 1915, and total operating expenses of the Alton amounted to $11,602,000, an increase over 1915 of 4.78 per cent. The percentage of operating expenses to operating revenues of the Clover Leaf was 64.22 in 1916, and of the Alton, 71.07. The Clover Leaf gets an average ton-mile rate for its freight of 5 mills and an average rate per passenger per mile of 1.1 cents. The Alton's ton-mile rate is 6.18 mills and its rate per passenger per mile, 1.92 cents.

The passenger business of the Toledo, St. Louis & Western is carried on at an absurdly heavy loss. The total passenger service train revenue per train-mile for the Clover Leaf was 75 cents in 1916 and 68 cents in 1915, and the corresponding figures for the Alton were $1.36 in 1916 and $1.35 in 1915. The Clover Leaf had an average of between 42 and 43 passengers per train-mile in 1916 and between



The Chicago & Alton and the Toledo, St. Louis & Western

28 and 29 in 1915; the Alton an average of between 58 and 59 in 1916 and between 57 and 58 in 1915. The passenger business of the Alton is not as much more profitable, or rather not as much less unprofitable, as would be indicated by the passenger train-mile figures. Much of the Alton's business is high class and a very expensive service to perform. Especially is this so between Chicago, Ill., and St. Louis, Mo.

The average trainload of all freight for the Clover Leaf in 1916 was 527 tons, comparing with 473 tons in 1915. The average for the Alton was 510 tons in 1916, comparing with 454 tons in 1915. With an increase in total ton mileage carried of 21.67 per cent and in passenger mileage of 50 per cent, there was an increase of 3.89 per cent in the transportation expenses (out of pocket cost of doing the business) for the Clover Leaf; and with an increase of 25.46 per cent in the ton mileage of revenue freight carried and of 3.03 per cent in the passengers carried one mile there was an increase of 5.07 per cent in transportation expenses for the Chicago & Alton.

The following table shows the principal figures for operation for the Toledo, St. Louis & Western and for the Chicago & Alton for the year 1916 with comparisons for the year 1915:

	Clover Leaf		Alton	
	1916	1915	1916	1915
Average mileage operated.	451	451	1,052	1,050
Freight revenue	$4,928,512	$3,984,042	$11,126,697	$9,200,547
Passenger revenue	387,949	330,384	3,929,506	3,839,893
Total operating revenues.	5,643,365	4,636,059	16,325,288	14,245,624
Maintenance of way and structures	656,200	573,700	1,849,002	1,647,541
Maint. of equipment..	823,580	844,225	3,421,351	3,334,943
Traffic expenses	195,810	199,811	430,103	436,498
Transportation expenses	1,849,729	1,780,396	5,480,917	5,216,447
General expenses	100,824	98,822	369,629	361,520
Total operating expenses.	3,623,892	3,496,954	11,601,794	11,072,708
Taxes	208,068	250,182	566,839	508,839
Operating income	1,808,438	888,922	4,147,140	2,660,584
Gross income	1,919,178	1,032,615	4,401,322	2,757,821
Net income	323,689	530,482*	171,578*	1,690,156*

*Deficit.

CHICAGO GREAT WESTERN

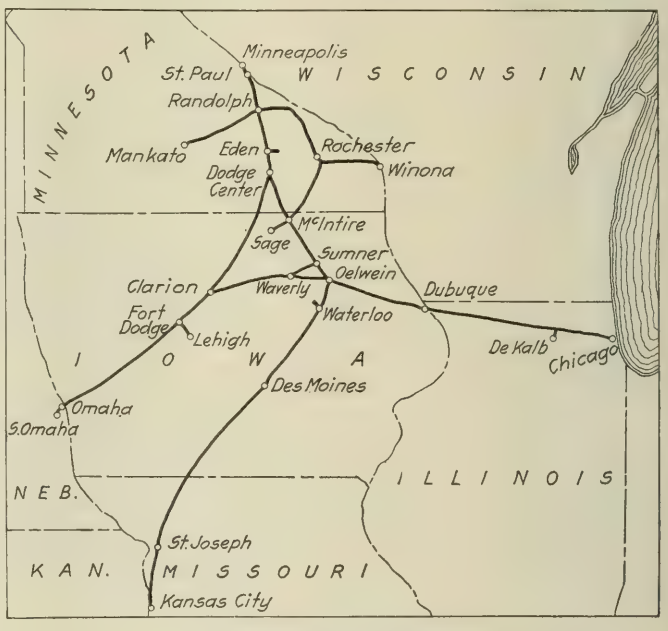
THE Chicago Great Western earned its 4 per cent dividend on preferred stock in the fiscal year ended June 30, 1916, but paid, however, only 2 per cent. The preferred dividends became cumulative on June 30, 1914, and since this is the first payment, there has been 2 per cent paid to date out of the accrued 8 per cent (cumulative) dividends. It was estimated in 1909, when the Chicago Great Western was reorganized, that with earnings of $10,000 per mile or more, the company could pay 4 per cent on its outstanding $43,868,000 preferred stock. In no year, however, until 1916 did the road earn as much as $10,000 per mile. At present its earnings are at a rate considerably better than this.

President Felton believes, and the company's showing in 1916 bears him out, that the physical plant and equipment of the Chicago Great Western are sufficient to handle a considerably larger business than would yield $10,000 per mile of gross revenue. If there is no serious setback in business in the territory served by the Great Western, 1916 will apparently mark the beginning of the period of earnings which the reorganizers of the road had hoped and expected would begin somewhat earlier.

In the fiscal year ended June 30, 1916, total operating revenues amounted to $14,830,000, an increase of 8 per cent over the revenues of 1915 and an average per mile of road operated of $10,352. Operating income amounted to $3,787,000, and net income available for dividends to $1,764,000. The full 4 per cent dividends on the preferred would have called for $1,755,000. While the progress, in gross earnings, at least of the Great Western, has not been as rapid since 1909 as the financial interests which reorganized the road hoped that it would be, it is nevertheless striking. Gross per mile of line in 1909 was $7,322. Every year showed some gain over the previous year, and gross per mile in 1916 was 41.38 per cent larger than in 1909. The operating ratio in 1909 was 84.63. This has been brought down to 71.19 in 1916. The revenue per ton per mile in 1909 was 6.88 mills, and has been above that in each year since, until 1916, when it was 6.84 mills. The revenue per freight train mile was possibly the most striking figure of all. In 1909 it was $1.95. Every year it showed an increase over the previous year, until in 1916 it was $3.77, or nearly twice as great as in 1909.

The average total freight train load was 326 tons in 1909 and showed an increase every year over the previous year, until in 1916 it was 610, an increase over 1909 of 87.26 per cent. Even passenger revenue has shown an improvement. The revenue per train-mile in 1909 was 86 cents; in 1916 it was $1.27.

The gain in trainloading in 1916 as compared with 1915—36 tons—was helped to some extent by a better balanced traffic, the loaded cars per freight train being 29.25 in 1916 and 28.17 in 1915, and the empty cars per train being 10.84 in 1916 and 12.95 in 1915. The percentage of



The Chicago Great Western

empty to total freight car mileage was 27.05 in 1916 and 31.49 in 1915. The Great Western has a rather unusually high percentage of helper or double-heading locomotive mileage. The percentage of locomotive-miles in excess of train miles was 20.56 in 1916 and 17.46 in 1915. With as heavy trainloading, however, as the Great Western gets, and with its grades scattered as they are, necessitating in many cases long helper engine runs, with the consequent light run returning, the high percentage of light and helper engine mileage is explainable. During the year 1916 the Chicago Great Western received ten new Mikado freight locomotives and has ordered seven Santa Fe type locomotives.

Total transportation expenses in 1916 amounted to $5,258,000, an increase of only $107,000 over the previous year, or only slightly more than 2 per cent. The ton mileage of revenue freight in 1916 was 1,534,000,000 an increase over the previous year of 11.13 per cent. The pas-

senger mileage was 163,000,000 in 1916, an increase over the previous year of 3.47 per cent. In addition to the saving made by heavier trainloading there were economies directly traceable to what might be called the application of scientific principles. It is estimated that a saving of over $22,000 was due to the installation of a plant for reclaiming and repairing track materials and tools; a saving of $39,000 was made by the use of gasolene section cars as compared with the old hand cars in use some years ago. It is estimated that the modern coaling stations are now making a saving as compared with the stations which they replaced of about $31,000 a year and that the gasolene oil and electric engines used at water plants are making a saving as compared with the old steam plants which they replaced of about $26,000 a year. There was $189,000 paid in 1916 for loss and damage to freight, a decrease of $11,000 as compared with 1915, or 5.39 per cent. There was $145,000 paid for injuries to persons in 1916, a decrease as compared with 1915 of $23,000, or 13.87 per cent.

The total tonnage of revenue freight carried in 1916 was 5,960,000, an increase of 317,000 tons, or 5.62 per cent over the previous year. It must be remembered that 1915 was a good corn crop year. This is one explanation of why the Great Western, which carries a very large tonnage of corn, did not show a greater gain in tonnage of products of agriculture in 1916 as compared with 1915. The total tonnage of products of agriculture in 1916 was 1,664,000, or 27.92 per cent of the total tonnage of all products in 1916, and 1,593,000 tons, or 28.24 per cent of all products carried in 1915. The tonnage of manufactures showed a large gain, the total in the year 1916 being 1,416,000 tons, or 23.75 per cent of the total tonnage of all products, comparing with 1,221,000 tons in the year 1915, which was 21.63 per cent of the total tonnage of all products in that year.

Industrial development of the territory tributary to the Great Western was unusually great in 1916. Among other new sources of traffic there was a grain elevator of 20,000 bushels capacity, and a warehouse and coal sheds with a steel storage tank for 10,000 gallons of fuel oil built at Byron, Ill.; a packing plant with a capacity for slaughtering 2,000 hogs a day has just been completed at Faribault; an elevator with 100,000 bushels capacity is being built at Minneapolis on the Great Western property; a boiler construction plant has been built adjacent to the tracks of the company at Omaha; and a new warehouse for paper stock has been built at Omaha on land leased from the Great Western.

At the end of the year the Chicago Great Western had $2,239,000 cash on hand, with no loans and bills payable. No new securities were issued during the year, and there was a net additional investment in road of approximately $705,000.

The following table shows the principal figures for operation during the year 1916 as compared with the year 1915:

	1916	1915
Average mileage operated	1,456	1,428
Freight revenue	$10,492,684	$9,645,527
Passenger revenue	3,280,656	3,074,050
Total operating revenues	15,067,345	13,920,685
Maintenance of way and structures	1,983,135	1,876,924
Maintenance of equipment	2,436,353	2,398,216
Traffic expenses	546,487	561,526
Transportation expenses	5,257,979	5,150,730
General expenses	406,925	384,092
Total operating expenses	10,716,498	10,446,567
Taxes	553,129	580,026
Operating income	3,787,049	2,889,931
Gross income	3,984,544	3,136,149
Net income	1,763,994	868,194
Dividends	877,343	.....
Surplus	886,651	.....

Letters to the Editor

OUR UNBUSINESSLIKE TRAIN SERVICE

Memphis, Tenn.

To the Editor of The Railway Age Gazette:

The eight-hour day will have an important effect on the public as well as the railroads. In 30 years' association with train and enginemen it has been my observation that there are several classes of them, when considered from an efficiency standpoint. There will always be differences in the ability of men in all kinds of business, but in almost every business employers have more latitude in making promotions. Most of the men in the train and engine service are originally chosen from among young men living along the line who are desirous of becoming railroad men. Many of them make excellent railroad men, while some make very poor ones. But almost all of them, good and poor, are able to hold on, and finally their turn comes for promotion to conductor or engineer. Regardless of their natural ability, if they are able to pass the required examinations, they are promoted to these positions. Those with ability and ambition make good. The others manage to do enough to keep from losing their positions, but do not do their work in a manner that would justify their retention in the service if the railroads were operated as most business is operated.

On most railroads in the west the ambition of the great bulk of the men in the train and engine service was killed when the seniority rule was adopted; or, if it was not, it certainly will be now.

A brakeman or a fireman entering the service of a railroad, by close figuring could tell very nearly how many years it would be before he could become a conductor or an engineer regardless of his merit or ability, as compared with any who were a little older in the service, for as long as they did enough to hold their job they were in line for promotion ahead of him.

This has had a bad effect on the rank and file of the train and engine service; bad for the railroad, and, in turn, bad for the public.

The 10-hour day was based on averages. The first-class man does not use all of this time in making his 100 miles; the second-class man uses it all, and the poor man uses a little more; so that the granting of the new rate will not help the good men, if they remain as ambitious as they have been, but will result in the poorer men getting a large increase in pay. A first-class crew will take a tonnage train over a 100-mile division in from 5 to 8 hours, while the poor man will use probably 10 hours making the same trip, and unless an officer is on the train he will have so many plausible excuses for using this time that the crew cannot be blamed for the poor time made.

Suppose the rate of pay is five dollars a trip and they make 30 trips a month; the good crew will draw $150 and the poor crew will draw for their month's work $206.55. The good crew will have made their trips without delaying themselves or any other train, using less fuel and with probably less damage to equipment, but they must do it for less money.

Does any one think for a minute that such a condition will have the effect of making any man better? This condition exists to some extent on every railroad in the country, and now it will become worse because many good men will become disgusted on account of their ability not being recognized, and use as much time as the poor man.

The only rational remedy is to abolish seniority, except when ability is known to be equal, and to make the rate of

pay for overtime less per hour than the regular rate. Promote only such men as have shown loyalty to their employers and ability and desire to assume increased responsibilities. Increase the pay a little, if thought best, but retain the ten-hour basis. If any premiums are to be paid let us pay them to the men who make miles instead of those that make overtime.

Of course, on local runs, pusher service or in yards, where overtime is figured as a part of the day's work, regular rate per hour should also be paid for overtime made.

GENERAL MANAGER.

PRAISE FROM "OLD TIMER"

MINNEAPOLIS, Minn.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Many of your readers believe that "Observer" in your issue of October 6, page 587, hit the proverbial nail squarely on the head when he spoke of your editorial independence and your fair and square utterances.

To an old time reader, your editorials "Was it a Political Frame-up?" and "The Triumph of Mobocracy" were models of clear vision and brave expression. They will live long in memory.

I am reminded of the story of old Jim Hinkins, a sheriff down in Texas years ago, who always brought in his man, dead or alive, usually dead. A friend asked him once how he did it, and the reply was: "Well, I jest usually get a purty good aim—and then I keep right on shootin'."

Your aim is good, and you "keep right on shootin'."

OLD TIMER.

THE FARMERS' DIRECT GRIEVANCE

DENVER, Colorado.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The firm and unanswering attitude maintained to the last by the managers and presidents of our railroads in the face of the recent mob which finally, through intimidation, won over the President and congress has created more genuine universal respect for them by thinking people than anything that has occurred in the history of the American railroads; and, moreover, it has set in motion the gray matter of untold numbers who have heretofore been drifting with the crowd through the "Psychology of Orthodoxy" which inhibits ratiocination and which is the curse of the world.

No man or set of men desire "peace at any price." Fairness must be tempered with firmness and character or it is not fairness. A thoughtful person, conversant with history, does not have to stretch his imagination greatly to see in the near future a subversion of our democratic form of government, and it may be that Hamilton, Macaulay and their followers were right in their contentions against democracy —near-pure—such as we have. It may be that we are not yet sufficiently advanced in the scale of civilization to succeed with it. Elbert Hubbard observed that a horse is safe until he gets frightened; then you can't even drive him out of the burning barn that is about to consume him. Fear has relatively the same effect on man. What is the cause of it? Same as in the horse: Lack of understanding. We must at least be charitable enough to credit President Wilson, and the members of congress who put through the Adamson bill, with mental myopia, induced by fear; and sympathize with them accordingly.

How many of them could have given a thought as to the further exodus from farm to city as a consequence of this temporary fiat, dazzling with gold—a small per cent of artisans? Agriculture, as the late empire builder, James J. Hill, continually and forcefully pointed out, is the basis of all wealth and prosperity, and it would seem that the very fact that its husbandmen necessarily must, in a relative sense, be sparsely scattered over the country, as opposed to the mob of urban life, was one of Nature's wise provisions. Thus the stability of her law of supply and demand is assured. Through the operation of this law, what at the beginning of the describing of the circle is a fiat, will on its completion, be a true or real value, at least relatively; but the agriculturist must suffer during the process. And, moreover, one of these vicious circles is scarcely completed before the mob forces the start on another.

If all the units of value of the world could always be raised or lowered concomitantly it would make no difference whether a trainman drew one or one hundred dollars a day; but, with particular unfairness to the farmer, the mob always has the advantage by making the start on this vicious circle; and the farmer is continually at a disadvantage. He must see a continued exodus from farm to city with consequences so painfully obvious.

Through this rule of mobocracy the mob is becoming in a sense a parasite on the brow of agriculture and consequently its own worst enemy.

The leaders of these unrestrained, lawfully organized mobs are necessarily men of a single selfish idea. They are monomaniacs, evolutions by fission from the producers, but now parasites on society in proportion to their arrogance. What is the lesson? What the remedy? The lesson is that these organizations and their intoxicated leaders must be made amenable to law, the same as other combinations. Where strife and fear enter, reason abdicates.

AGRICULTURIST.

A SWEDISH VIEW OF SPEED-SIGNALING

STOCKHOLM, Sweden.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Lately there has been much discussion in the railway periodicals regarding signal matters, and the views of a European in this respect might be of some interest. In the U. S. A. the so-called "speed signaling" was first successfully introduced, and I believe that most railway men all over the world will sooner or later come to the conclusion that this is fundamentally right.

In the "three-position" signals, indicating "stop," "caution" and "proceed," however, only the first and third really give a definite instruction, whereas the "caution" indication leaves the interpretation largely to the driver.

It is evident that the driver of an express train and the driver of a slow freight train have a different way of interpreting the "caution" signal; further, the driver running behind time has a tendency to interpret "caution" signals more liberally than when he is well ahead of his schedule. The weakness of the speed signaling system as used in the U. S. A. thus consists in the flexibility with which the "caution" indication may be interpreted.

In the more complicated signaling schemes with several arms where "Proceed at medium speed," "Proceed at slow speed," etc., are also signaled, the inconsistencies seem to us over here still more pronounced, and I very much doubt if any real benefit arises from such a complication, or if a driver, when such complicated signal aspects are met with, under the stress of circumstances might not more easily fail to interpret them correctly, or make an error of apprehension.

It seems unquestionable to me that the automatic stop will soon be considered a necessity; also some device to keep the speed of the trains within the maximum speed limit considered safe for the section in question. It also seems to me necessary to find some solution to the problem of conveying a more definite instruction to the driver as to *what* speed a given "caution" signal really means; and also at the same time giving him a possibility of ascertaining if the speed of his train is below or above the desired speed.

HALVAR A. BERGGREN.

Railroad Credit and the Success of Regulation*

Federal Regulation Is Necessary But State Commissions Should Continue to Regulate Local Public Utilities

By A. J. County
Vice-President in Charge of Accounting, Pennsylvania Railroad.

I AM here to exercise the right of a railroad man to utter his own views and not those of his company on current events. Railroad regulation must encourage sound credit, or regulation is a failure.

Foresight, courage, prudence and ability are required to found sound credit. Efficient and honest business management and trained and loyal working organization are essential to retain it. I assume this Association will endorse Bailie Jarvie's conclusions as to credit as expressed in Sir Walter Scott's Rob Roy, at a time when honor meant a ready sword to avenge insults, real or fanciful:

"We ken naething here (in Glasgow) but about credit. Honor is a homicide and a blood-spiller that gangs about making frays in the street; but credit is a decent honest man that sits at home and makes the pat play."

Sound credit is just as essential in the railroad business as in mercantile affairs. A railroad cannot have credit without the earning power to produce a credit basis. Railroad credit would scarcely concern the public at all if the railroads were not a part of the daily life of the country, and if their ownership of over sixteen billions of dollars was not widely held by all classes of citizens. If we did not have public ownership of the railroad lines, through money furnished by a great army of upward of 50,000,000 people, consisting of individual investors in railroad securities,savings bank depositors, building and loan associations, and insurance policy holders, to say nothing of charitable and many other institutions, then railroad credit would be an academic discussion. If the financial condition of the railroads did not mean loss or profit to the country, we would not have so many hearings accorded to railroad men.

If these railroads did not employ nearly 2,000,000 men, who, with their families, represent about 9,000,000 people, and did not pay over a hundred and fifty millions of dollars annually as taxes into the public treasuries, and many more millions for materials and wages, we might consider the railroad transportation service as a side issue and not a gigantic industry to be fostered and expanded.

As transporters, consumers, employers, taxpayers, and national institutions in which our government, our citizens, our savings bank depositors and our insurance policy holders are interested, the railroads require national attention.

Serious Effect of Weak Credit

It is unnecessary to argue that these railroads can exist without sound credit. We have just tried such an experiment and it has failed. Let us not forget that experience but profit by it. In about eight years, their credit gradually weakened and finally became impaired. The kernel of the railroad question, and the grave responsibility of railroad managements for several years past, has been the vanishing credit margin. The situation reached a climax reflected by the conditions in 1914 and 1915 when less new railroad mileage was constructed in this country than in any year since the Civil War, and when approximately over one-sixth of the railroad mileage of the country was in the hands of receivers, and when revenues and expenses were seriously reduced, new work stopped, and thousands of unemployed men were evident in all of the large cities, and our industries were in a serious plight. From that discouraging position it required an unfortunate world-wide war to arouse us.

Signs are multiplying that we have more public sympathy now with us, and that we have a better credit basis at our disposal than for many years.

Now you hear a great deal of the many millions of increased earnings the railroads are making compared with a year ago. That is exceedingly gratifying. Railroad earnings had fallen so low that they could not do otherwise than show an increase.

Profit Not Excessive

Look at a strong road like the Pennsylvania. In 1914, it earned 6.8 per cent upon its capital stock, or less than one per cent in excess of its reasonable dividend payments. In 1915, despite the increased traffic resulting from the war, it earned 8.5 per cent, or only 2.5 per cent over dividend requirements, which is not a high margin of safety. In 1916, we expect to earn 10 per cent on the stock, and we will doubtless spend every cent earned above our dividend requirements for betterments heretofore postponed. You business men have been told that many railroad stocks have been watered, and, while that does not apply to Pennsylvania Railroad stock, you will, nevertheless, ask what is being earned by the Pennsylvania Railroad upon the cash spent for the railroad and its rolling stock provided for public use. You ask that question concerning your own affairs. In railroad accounting we call this the "property investment" account, and the answer to the same question put to the Pennsylvania is that in this active year 1916 we will earn less than six per cent on the total cash invested in the road and equipment furnished for public transportation purposes. In 1915 the return was 4.81 per cent and in 1914, 3.78 per cent. I am not now making any plea for greater revenue, but is six per cent too much to earn in order to pay a fair return on capital and leave something over for improvements? It is so much greater than 3.78 per cent that it feels munificent, but it certainly is not excessive.

How can the Pennsylvania Railroad afford to continue in business with these results? The answer is not difficult. The financial policy of the company from its foundation has been that its capital stock shall be fully paid in cash; that fair but regular dividends shall be paid thereon, and that the remaining surplus shall be used for improvements to its railroad and equipment, instead of paying large dividends and selling stock and bonds to provide such improvements, additions and betterments.

In 1854 the book cost of the company's road and equipment was practically the same as in 1867—13 years later—notwithstanding about $7,000,000 had been spent in those years for additions and betterments paid for from surplus earnings. At the end of 1915 I am safe in saying that over $140,000,000 of surplus earnings or profits have been used in this way, for which no stock or bonds have been issued. By adherence to that policy the company has maintained a sound credit basis.

The improved condition of the railroads is most welcome. Railroad prosperity is reflected in all lines of business. In the railroads we have effective business instrumentalities, charging the lowest freight rates in the world and paying the highest wages in the world. We want good service and

*From an address delivered before the Philadelphia Credit Men's Association, October 24, 1916.

railroads charging reasonable rates, possessed of sound credit and sufficiently prepared for any emergency, whether it be moving an abnormally large commerce in time of peace, or performing the many indispensable transportation services necessary in time of war.

Your association will, I am sure, endorse the view as to the necessity for maintaining sound credit, but is it not equally essential in the public interest that railroad regulation be maintained and not crippled?

Government Inquiry Into Public Regulation

Without a constructive and unified policy, regulation will break down sound railroad credit instead of promoting it. The present system is disjointed, expensive and inharmonious federal and state regulation, and must be revised, and exclusive federal regulation substituted. The Philadephia Bourse, the Chamber of Commerce and other commercial organizations of this city have pointed the way to help remedy that situation. You know that a law was passed known as the "Newlands law," under which a joint sub-committee of the Senate and House has been appointed to investigate the subjects of government control and regulation of interstate and foreign transportation; the efficiency of the existing system in protecting the rights of shippers and carriers and in promoting the public interest; the incorporation or control of the incorporation of carriers; government ownership, etc. May I suggest that you consider joining with the other organizations of this city in making this investigation very thorough for reasons which you will appreciate?

About nineteen states are trying to regulate the issuance of securities, but by different methods. What is the benefit of several different states regulating the securities of one railroad company? Some states in approving of security issues of an interstate railroad company require that a certain amount of the money will be spent in their own state, while the issue of securities may be required for improvements in another state hundreds of miles away.

In another state, a heavy tax is laid on security issues, which, if levied to the same extent in the remaining states through which the road was constructed, would jeopardize the principal of the issue.

Then there have been cases where the orders of the Interstate Commerce Commission are practically nullified by the states in refusing to approve of them, so far as they affected intrastate matters, or by delaying so long in doing so that the order of the federal commission is practically negatived or modified.

We have 20 states regulating the hours of railway service, the variation running from 12 to 16 hours a day. Twenty-eight states specify headlight requirements, without any co-operation with one another. Fourteen states have different safety appliance acts. Some states have extra train crew laws, and others do not. The states and the federal government are investigating accidents and are duplicating each other's efforts at the expense of the railroads and the public. The railroads of the country are required to make over two milion reports a year to various federal and state authorities, a great many of which might well be abolished and many others curtailed; there are so many thousands of laws covering railroads in the states through which the Pennsylvania system passes that several thousands of them could be removed from the statute boks without detriment.

Is it any wonder that the railroads look to business men to get them a unified scheme of regulation under a single regulatory body, upon whom responsibility should be placed instead of the present divided responsibility? The federal government, under the committee clause of the constitution, has assumed the regulation of the interstate carriers and uses them to pay a large part of the government taxes, and we ask it not to leave its task half done, but to assume full responsibility. We call on the business men and the public, who are paying the cost, in their own interest to help the government inquiry in this matter. We ask you to get at the facts and ask congress to legislate the proper solution. We cannot believe that the public, with a knowledge of the facts, would remain indifferent, and continue to pay the cost of the needless duplications, conflicts and complexities in our present system of railroad regulation.

We estimate that since 1906 it has cost the Pennsylvania Railroad Lines East of Pittsburgh, alone, about nineteen millions of dollars to comply with new legislative enactments. That sum is equal to 6 per cent on over $300,000,000. I do not claim that all of this was wasted, but a great part of it could be saved and utilized for public purposes. Railroads recognize the many helpful features of regulation, but we want to see it raised above criticism, confusion and weakness. I believe regulation has passed through its weakest and worst stage.

State Commissions Essential to Regulate Public Utilities

I do not suggest that the states should be deprived of the usefulness of their commissions. The commissioners have tried to fully do their duty in accordance with the laws of their own state. They are hard working bodies not to be criticised because the federal and other state laws and regulations do not harmonize with their own. But if exclusive federal regulation is adopted, the commissions would still be occupied in regulating the state public service activities and corporations. They would in this manner be trained to become excellent federal regulators. Their continued regulation of so many electric traction companies and transit questions, water, gas, electric light and power companies means in any state a vast responsibility. In the city of New York alone it requires a separate state commission, one of the most active in the country. The upstate or second district commission of New York, in the year 1914 held 630 hearings, 298 entire days being actively devoted to such hearings. In 1914, over 2,500 complaints and applications were disposed of by the commission. This commission has under its jurisdiction 1,024 corporations. If the 159 steam railroad companies were regulated by the federal commission, is there not a serious remaining responsibility for that commission?

In Pennsylvania if we exclude all the steam railroads, it means the regulation of several thousand corporations with millions of dollars of capitalization, with their rates, service, and all other activities affecting over 7,000,000 people. I cannot escape the view, even eliminating steam railroads, that the Pennsylvania Public Service Commission has a responsibility of the highest magnitude, which will increase instead of decrease, and fully justifies all the compensation and honors they may receive.

Scope of Suggested National Regulation

Some of the features of any scheme of exclusive national regulation, which many statesmen, business men and railroad men are beginning to believe as essential, are the creation of a larger and stronger federal railroad commission, acting as a central body in Washington and through several regional commissions, so as to be close to the country's needs and facilitate the hearings on rate and other questions.

The scope of regulation includes rates, capitalization, railroad valuation, uniform accounting, and probably wages, because of their effect upon revenues; also safety appliance laws, hours of service laws, accidents, inspection of railroads, the character of the service, investigation and detection of any infractions of the law.

From this it is clear that if the proposed federal railroad commission is to be successful in carrying out its regulatory powers in constructive fashion, so that the railroads may properly serve the country and their credit be protected, the duties of detection and prosecution must be separated from its constructive and regulatory activities.

It is very apparent that the federal railroad commission should not be required on the one hand to constructively regulate railroads and encourage their expansion and protect their credit, and on the other hand be their accuser, prosecutor and judge. In all these matters the several regional commissions would be exceedingly helpful in disposing of questions pertaining to their own regions, and only in the event of an appeal from their decision would it come before the national commission in Washington. This is merely a suggested outline of the form this new legislation might take to facilitate railroad regulation. No final conclusions can be reached until after all sides are heard at the pending government inquiry.

In any event we need some definite standard to be enunciated by the commission by which it is possible for the public and the railroads to gage whether railroad rates are reasonable or unreasonable without the loss of time and great expense to both the shipper and the public that the present rate suspensions and hearings now involve, aside from the tremendous burden laid upon the commission itself. We need a regulatory policy that will permit the railroads to prosper with the country when prices are high and profits rise, rather than a policy which forces the railroads to apply for rate increases in times of depression when industries are bound in self defense to actively oppose such action. The commission should also have the right to fix minimum as well as maximum rates.

Finally, any scheme of paramount national legislation to regulate the national carriers, I think, must inevitably lead to federal incorporation of the national trunk lines, including their feeders. The present federal laws are largely prohibitive rather than permissive laws. They must be modified to meet the country's transportation necessities. In rate hearings, wage disputes, car distribution, and in many other features affecting traffic charges and service, no attention is paid to the individual companies that go to make up a railroad system. For instance, in the Pennsylvania system today there are over 100 companies; originally there were about six times that number. Many of them have special charter rights and others are under general laws. Some can construct branches and others cannot. The individual interests and finances of each of these lines which make up the large system, and their particular state laws, are not, and cannot be, specially considered by a federal commission in any of the larger railroad problems. Yet each of these companies stands as a separate entity before the law, with its own separate stock and bondholders who must be dealt with by the parent company. With the governmental control of revenues, and largely of expenses, and so many operating and traffic features, it does not seem, therefore, that any scheme of national regulation can be complete unless it permits, under federal charter, the full development of the territory served by the parent or system company, and the acquisition and merger of these various smaller companies into the larger system on some reasonable basis. This is necessary to secure the advantages of concentrated capital, administration and control, and eliminate the very detailed features of accounting, traffic and operation that must exist so long as the companies remain as separate corporate entities. That is just one phase of a big question.

Even if we get unified railroad regulation based on business principles, we cannot expect immediate perfection, for it takes time, experience and knowledge to solve their varied difficulties, but responsibility to the public and the railroads will be squarely placed on one set of regulators, and railroad credit will be strengthened by such action. The responsibility of public regulation is to see that the railroads charge rates that are reasonable and non-discriminatory and that such rates yield a fair return to the railroads so that they may render a proper and efficient service, and that no obstacle shall exist which may discourage investment in their securities. We are trying to give the public a clear conception of what is necessary to protect and promote its own vital interest in the transportation industry by laying the situation before the American public.

While railroads will be affected by business depressions, yet with increasing population and commerce, and with unified regulation under a federal commission to perform for them a constructive service similar to that which the Federal Reserve Board is constituted to perform for our financial institutions, then their credit is bound to be improved and stabilized, and railroad securities should again occupy the prominent position in the public confidence which they held for so many years.

To show that our railroads are worthy of that confidence, may I close with an opinion from a Frenchman, Monsieur C. Colson, who could criticise as well as appreciate:—

"In fine, the railways of the United States represent one of the most marvelous efforts of human industry to turn to good account the resources of a country. Through the rapidity of development and the decrease in transport prices—which is more important to a population spread over an immense area than to the crowded population of western Europe—the railways of the United States have made of this territory a country which has one common economic life. They have enabled places most distant from the sea to populate rapidly and to exchange their products with the chief centres of the old world.

"Notwithstanding the criticism which the many abuses evoked, the railways of the United States, without demanding of the state anything but liberty of action, have been the principal factor of its wonderful growth in agricultural, commercial and industrial power which may shortly attain world-wide supremacy."

SPECIAL PROTECTION FOR A DRAWBRIDGE

The Chicago, Rock Island & Pacific has recently installed a form of automatic signal and interlocking protection at the government drawbridge over the Mississippi river at Rock Island, Ill., which comprises a number of special features made necessary by the difficulties encountered. The government's interest in the structure lies in the fact that it connects an island, on which an arsenal is located, with the Iowa shore. For this reason the expense of building the bridge in 1896 was shared by the government and the railroad, and while it is operated by the government, the expense of operation is divided, as is also the responsibility and cost of maintenance.

Although continuous automatic signal protection has been in service for sometime on each side of the bridge, it has never been extended across this structure, which is 1,850 ft. long with a 370-ft. swing span. Also until recently there was no interlocking between the drawbridge control and the signals at the end of the bridge. These signals were of the Hall disk type, controlled from the tower on top of the swing span, their control circuits being broken through the end jacks of the movable span in addition to the knife switches in the operating room, so that before the bridge could be moved, the signals would be set at stop even if the operator were to neglect to throw the switches.

An unusual difficulty confronted any plan to extend the automatic control of the signals across the bridge. The railroad tracks are laid on an upper deck with a roadway and an electric car line below. This makes it essential to maintain a solid floor on the upper deck and, in the design used, the rails are laid directly on transverse steel troughs without ties or ballast. Plans have been proposed at various times in the past for insulating the rails on the structure, but while it would doubtless be possible, it is easy to demonstrate that the expense would be prohibitive, both in first cost and maintenance. As about 3,000 train movements are handled across this bridge monthly, and it is opened on an average of 250

times a month for boats, the desirability of improving the signal and interlocking protection has long been realized. In addition to the impracticability of using track circuits, however, the unavoidable complications incident to negotiations with the government delayed a decision and resulted in the final adoption of a plan which under ordinary conditions might possibly have been further perfected.

The adopted plan utilizes "trap" circuits, i. e., short setting and releasing track sections, at the ends of the bridge, and comprises a number of special arrangements by which the control of the bridge has been interlocked with the new signal protection. Five new signals were included in the installation, two home, two dwarf for reverse moves, and a dwarf to repeat the indication of one of the home signals. It was desired to locate the home signals about 200 ft. from the ends of the draw span. As this span is the second from the east end of the bridge, it was possible to get a satisfactory location for the westbound signal just east of the end of the bridge, but the eastbound signal had to be mounted on the bridge superstructure.

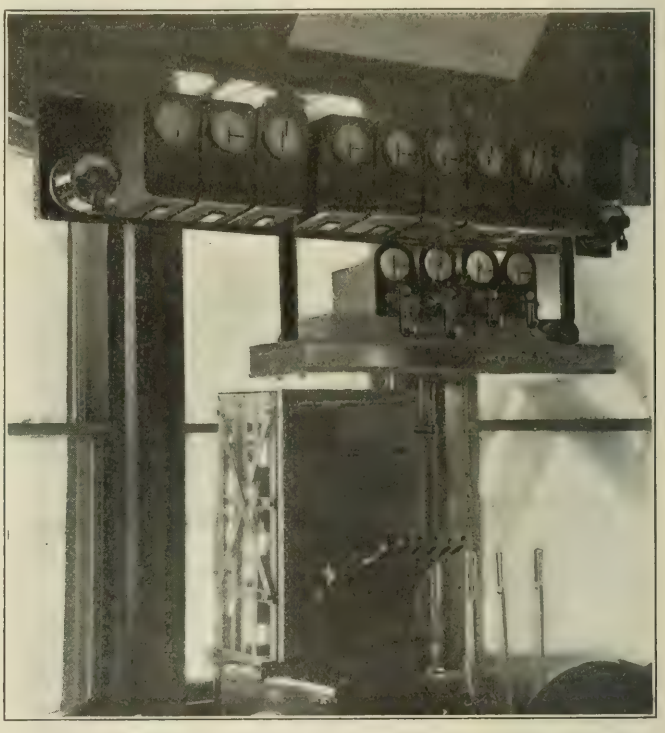
On account of considerations of clearance and visibility, it would have been practically impossible to use semaphore signals with satisfaction, and light signals were therefore adopted. The westbound home signal is mounted on a standard mast, but the eastbound had to be suspended between tracks from the west portal of the span next west of the draw-span. While this signal is visible from a distance, it cannot be seen by the engineman at short range, and a dwarf repeater was therefore mounted near the bottom of the



Home and Dwarf Light Signals at East End of Bridge

end post of this span, on the engineman's side. The back-up dwarfs are located on the bridge floor between tracks. All signals give two aspects, red and yellow, the most favorable indication being caution. They are normally red, being cleared by the bridge operator only on the approach of a train. All trains are required to stop short of the home signals, and then proceed at caution, if the light is yellow.

The rail locks on the movable span, which are easer rails moving longitudinally alongside the track rails and bridging the gaps between the movable and the fixed spans, are operated by air cylinders, as are also the end jacks; while the bridge turning mechanism is electric. In order to interlock the operation of the bridge with the signals, four circuit controllers equipped with levers like those used on electro-pneumatic machines were mounted over the mechanical levers controlling the pneumatic functions. Two of these circuit controllers govern the five signals, each lever having a left and a right position in addition to the center. The other two levers, operating only to the left, are mechanically interlocked with the signal levers, and are connected by vertical rods to locking which controls the air levers below. In order to move the bridge, it is necessary to have both signal levers on center. The circuit controller connected to the rail lock lever must then be thrown before that function can be operated pneumatically. This, in turn, allows the pneumatic lever controlling the end jacks to be released by the circuit



Interior of the Operating Tower Showing Indicators and Circuit Controllers

controller and then operated, after which the bridge can be turned.

To clear the signals, the pneumatic levers must be in the position corresponding to a closed and locked bridge, and locked in this position by the circuit controllers. After either of the signal levers is thrown to clear, a push button must be operated to complete the signal actuating circuit. Three such push buttons are provided for each signal, one in the tower, one on the track deck, and one on the turntable deck, thus enabling the operator to throw the signal lever, and then go below to work, pushing the most convenient button to let a train pass without the necessity of climbing back to the operating tower.

THE CANTON-SAMSHUI RAILWAY.—The Canton-Samshui Railway, a short line of only 30 miles, carried during 1915, 4,167,673 passengers and 8,187 tons of freight. The total receipts of the line were $302,636. It is considered to be one of the best paying lines in China for its size, as it connects Canton with Fatshan, a city of some 600,000, distant only about 12 miles, and the entire country through which it passes is well populated. No new roadbed was constructed during the year, but new station buildings, platforms and turntables were erected, and other improvements made in connection with the workshops and the roadway.

Traveling Engineers' Association Convention

Reports and Discussions on Mechanical Stokers, Superheaters, Handling Trains and Assignment of Power

THE twenty-fourth annual convention of the Traveling Engineers' Association was held at the Hotel Sherman, Chicago, October 24 to 27, inclusive, President J. R. Scott, assistant superintendent of locomotive performance, St. Louis & San Francisco, presiding. The secretary reported a total membership of 1,056 and the treasurer a cash balance of $4,080.75.

President's Address

The whole aim of this association is an educational one. It brings together trained men from all sections of the country, who by working under a variety of conditions, are in a position to exchange ideas, not only on the convention floor, while discussing subjects, but in casual conversation during intermissions, also in the exhibit room, while viewing the modern equipment so extensively brought before us for exhibition and inspection. The knowledge thus gained is disseminated by us to others, and especially to our enginemen. The exhibits are more extensive this year than ever before. With the modern power of today, we are confronted with many problems that did not exist with the smaller power of the past, and as new appliances are constantly taking the places of the old, it behooves us as traveling engineers, or representatives of our employers in whatever capacity, to so familiarize ourselves with all things surrounding our work, that we may be ever ready and willing to direct or assist others, as the occasion requires, and for which a convention of this character is most profitable.

As a direct result of the great European conflict, the cost of supplies of all kinds necessary for railroad operation, has soared high in price. This together with the increased wages of labor, and lack of corresponding returns with which to meet the abnormal operating costs has created a burden which falls most heavily upon all railroads. In order that we may do our part to assist in relieving this unusual strain, we as traveling engineers, should zealously guard the machinery, fuel and supplies under our charge, that the best possible use may be secured from them. More skillful operation of the locomotive on the road, and increased efficiency in the handling of trains are matters that will tend to reduce cost of operation. Therefore, we should give our attention and special effort to bring locomotive operation to the highest possible standard of economy and good service.

Another matter of unequalled importance is the question of the great railroad strike, which was recently threatened by the four brotherhoods, representing more than 400,000 trainmen and enginemen. Such a strike, regardless of the cause, would have been a calamity beyond words to express, or thoughts to imagine. Although men may differ in opinion as to the action taken to avert this strike, none should differ in opinion as to the importance of warding it off, or the necessity of greater preparedness by national law, to protect the one hundred million people of this nation, their transportation facilities, their properties and industries.

Address by Mr. McManamy

Frank McManamy, chief inspector locomotive boilers, Interstate Commerce Commission, addressed the convention during the Wednesday morning session. He spoke chiefly on the locomotive inspection rules, calling attention to the fact that the railroad company was held responsible for the general design, construction and maintenance of the locomotive and tender. The daily inspection reports serve to protect the mechanical offices in charge of the equipment, especially where engines are ordered out before proper repairs have been made. The purpose of the law is to do what the motto of this association states, namely, "To improve the locomotive engine service of American railroads." The safe operation of the railways depends upon two things—good locomotives and competent men to operate them.

ADVANTAGES OF MECHANICAL STOKING

The feeding of fuel into locomotive fireboxes by mechanical means has passed the experimental stage, and locomotives are operating at a mechanical efficiency of from 85 to 100 per cent, hauling trains and effecting operating economies that would not be possible under ordinary hand firing conditions. The application of appliances for firing solid fuels mechanically has made quite rapid strides since 1912, and there are now about 1,900 engines fired in this manner.

The average tractive effort of all locomotives in the United States has increased in the past ten years 38.6 per cent; the heavy locomotives of years ago ranging from 36,000 lb. to 42,000 lb. have given place to those ranging from 54,000 lb. to 160,000 lb., and the figures are increasing yearly. The average tons handled per freight train has increased 54.1 per cent in ten years. The gross ton-miles handled per locomotive has increased 11.3 per cent, which shows that we are not getting the full benefit of the increase in tractive effort.

The following figures covering the four railways using the largest number of locomotives with appliances for feeding fuel mechanically, and by which a large proportion of their freight traffic is handled, show interesting comparisons of average trainloads. (The figures are taken from reports made to the Interstate Commerce Commission.)

Fiscal Year Ending June 30, 1915, Compared with Fiscal Year Ending June 30, 1904

	Increased average tractive power (Per cent)	Increased average number of tons of freight per train load (Per cent)
Road A	43	78
Road B	40	72
Road C	30.7	72
Road D	29	54

(The locomotive fuel cost per ton-mile on each road shows a decrease for 1915 as compared with 1904.)

This study is not intended to show that the method of firing the fuel is entirely responsible for the results obtained, as many features, such as brick arches, superheaters, improved design, change in line, and increased activity on part of the transportation officers in more closely following the proper loading of locomotives, have all had a hearing on the matter, and it should be remembered that in all cases of application of appliances for mechanical firing the locomotives were also equipped with the brick arches and superheaters.

The results that are being obtained from mechanical firing of the fuel may be summed up about as follows:

Increased Tonnage.—It has been reported that on some roads the trainload has been increased from 8 to 15 per cent as compared with hand firing, with much the same conditions as to grade and time. Such increase, it will be understood, can only be expected with large power where the advisability of the use of the stoker is clearly indicated.

Increased Speed.—The experience of most roads is that better time is made with the same tonnage on the same grade than with the hand fired engine. The following is quoted from report made by one road:

"It is a daily occurrence on —— Division for trains hauled by stoker fired locomotives to overtake trains hauled by hand

fired locomotives, and to reduce speed on this account. If all the locomotives on the division were equipped with stoker, there would at once be a further increase in the speed at which trains are put over the road, and this would be more noticeable at periods when the traffic is heavy and line congested, and, therefore, when it is most desirable."

Saving in Labor of the Fireman.—With the type of appliance in most general use, the amount of coal placed in the firebox by the stoker is from 85 to 95 per cent of the total fuel fired. Some trouble has been experienced due to the back corners of the firebox not being filled properly, resulting in the necessity for some hand firing.

Elimination of Necessity for Second Fireman.—The manual labor of supplying fuel to the firebox has been so largely reduced by the use of the stoker that this question has been settled permanently.

Shaking Grates.—When the appliances and fire are properly handled, it has been the experience of some roads that grate shaking between terminals is not necessary. While in some localities the character of the coal is such that some shaking is required, with the thinner fire carried as compared with hand firing, less of it is indulged in. The thinner fire also results in saving time in cleaning fires.

Firemen Follow Engines More Regularly.—On account of the reduced physical labor connected with their duties, the firemen are inclined to follow their engines, resulting in reduction of extra lists, raising the standard of new men employed and providing opportunity for better training, so that the firemen will eventually become better engineers.

Reduced Number of Engine Failures.—Fewer failures are the rule, due principally to the ability to largely overcome defects, such as leaky superheater units, firebox sheets, flues, cylinder packing, valves, etc.

Length of Run Increased.—It has been found on some roads that locomotives could be operated successfully and continuously over two divisions, when this was found impossible under hand firing conditions.

Smoke Emissions.—With the engine using steam, it has been found that the density of the smoke on stoker engines can be kept uniform by careful manipulation. In some restricted smoke districts where more or less switching is necessary, it has been found that the smoke emission cannot be controlled as well as under hand fired conditions where run-of-mine or lump coal is used.

Fuel.—Grades of coal, such as nut pea and slack or screenings can be utilized successfully. As to the relative value of four grades of coal found on one road, the following table and analyses covering five round trips with each grade made under the same conditions will be of interest:

		Gas		Soft or low volatile	
		Nut-pea-slack	Slack	Run-mine	Screenings
Basis per horse power hour..	Lb. coal	3.88	4.23	4.32	5.17
	Relative lb. coal	100.00	109.00	111.19	132.98

Note: Nut-pea-slack—Coal passing through 1½-in. bar screen.
Slack—Coal passing through ¾-in. bar screen.

Attention is called to the fact that except when the haul is small, the use of low volatile screenings is prohibitive, due to their slower burning properties and resultant loss on account of being drawn through the flues and out of the stack when the locomotive is being worked to capacity.

Consumption of Fuel.—Burning either the same grades of fuel on both, or run-of-mine or lump on hand fired and screenings on mechanically fired locomotives, the consumption on a pounds unit basis is higher with the latter. It has been found, however, that locomotives can be operated with fine coal, such as it would not be possible to hand fire and allow the working of engine to be anywhere near the maximum.

Powdered Fuel on Locomotives.—The latest development for putting fuel into locomotive fireboxes, and which has been worked out to a practical basis within the past two years, is that of burning powdered fuel, a number of locomotives equipped for the purpose now being in operation and in the process of being equipped. As to the results that have been obtained in locomotive service, the following are the conclusions of the standing committee on Powdered Fuel of the International Railway Fuel Association, presented before the annual convention held at Chicago, Illinois, May 15, 1916:

"Summing up the results that are being obtained in locomotive service, these may be stated as:

"Smokeless, sparkless and cinderless operation.

"Maintenance of maximum boiler pressure with a uniform average variation of 3 lb. without popping.

"An increase of from 7½ to 15 per cent in boiler efficiency as compared with burning lump coal on grates.

"Saving of from 14 to 30 per cent in fuel of equivalent heat value fired.

"Enlarged exhaust nozzle area resulting in greater drawbar pull and smoother working of the locomotive.

"Elimination of ash pit delays, facilities and expense and reduction in time required for and ease in firing up.

"Maintenance of a relatively high degree of superheated steam.

"No accumulation of cinders, soot or ashes in superheater or boiler flues, smokebox or on superheater elements.

"No punishment of or overheating of firebox, new or old sheets, seams, rivets, patchbolts, stays or flue beads.

"Elimination of arduous manual labor for building, cleaning and dumping fires and for firing.

"Avoids expense and annoyance for providing various sizes and kinds of fuels.

"Eliminates the necessity of front end and ash-pan inspection and for special fuels, firing tools and appliances for building fires and for stoking and cleaning fires.

"Equal provision with engineer for fireman to observe signals and track, thus reducing liability of accident.

"Your committee is of the opinion that the effectiveness and utility of fuel in pulverized form has been demonstrated from the past year's development and that the progress in the use of this method of stoking and burning bituminous and anthracite coals and lignites for generating power, heat and light on railways, will be quite marked from now on."

Conclusions.—The capacity of the power unit is largely dependent upon that of the boiler. With the increase in size of the locomotive, in the case of many new types the boiler has had to be enlarged to the extent of overreaching the limitations of hand firing, clearly indicating the necessity of introducing the fuel into the firebox by mechanical means. In fact, locomotives have within late years been constructed, the building of which would probably not have been attempted had not the practicability of this means of handling the fuel been established. There is little doubt that many locomotives are in service the maximum capacity of which is not being obtained due to the limitations in connection with the ordinary methods of manual firing on grates.

The committee on this subject is: W. L. Robinson (B. & O.), chairman; E. Hartenstein (C. & A.); J. H. De Salis (N. Y. C.); M. J. McAndrew (M. C.) and E. A. Averill (Locomotive Feed Water Heater Company).

Discussion

J. H. De Salis, (N. Y. C.): On the Pennsylvania division of the New York Central there are 15 Mallet and one Consolidation locomotives equipped with stokers and superheaters. The engine crews follow the engines more closely; they are in assigned service, and take more interest in the locomotive. Many firemen prefer these engines to local passenger runs. The smoke conditions have been materially improved and the steam pressure can be maintained better than on the hand fired engines. The train tonnage has

been increased from 3,600 to 3,900 tons by the use of the stoker engines.

F. P. Roesch, (E. P. & S. W.): On the El Paso & South Western there is a long pull of 117 miles with one per cent grade and another one per cent grade of 38 miles. In hot weather it has been found necessary to reduce the tonnage on the hand fired engines, but the stoker engines are loaded to full capacity. While more coal is used by the stoker engines it costs only $2.10 per ton as compared with $4.65 paid for the coal used on the hand fired engines. It is now planned to put the stokers on some passenger engines which are called upon to handle 14 steel cars over the long one per cent haul.

W. W. Shelton, (C. & O.): Special men are assigned to take care of the stoker engines. The cost for maintenance, including labor and lubrication, is 50 to 60 cents per 100 miles. With wet coal occasioned by heavy rains steam failures are liable to result. More trouble is experienced with clinkers than on hand fired engines with slack coal.

A. W. Willsie, (C. B. & Q.): The stoker engines on the Burlington use screenings passing through 2 in. round hole screens. It has been found that coal prepared on a round screen will be distributed better by the stoker than when it is prepared through the shaker bars. The stoker engine must be handled with care and the fire watched to see that proper distribution is being obtained.

Other speakers stated that after the men had once fired a stoker engine they would handle a hand fired engine more intelligently. Mr. Robinson in closing the discussion stated that from a six months' observation of Mikado engines on the same division it was found that the coal consumption per ton-mile varied as follows: Hand fired—100 per cent; stoker fired (assigned service)—110.8 per cent, and stoker fired (pooled service)—114.8 per cent.

SMOKE ELIMINATION

More real progress in smoke abatement has been made in this country within the last five years than had been made in 50 years previous to this period. This great and permanent advancement was obtained through the executive heads of the railroads taking hold of the question. To some extent this was forced on them by legislative action, which in many cases was unreasonable. The smoke problem is a question of perfect combustion. The nearer we come to it the nearer we are to smokeless operation, but when the varying conditions under which a locomotive is operated are considered it is not an easy matter. At times it is necessary to burn as high as 150 lb. of coal per square foot of grate surface per hour, a condition that few combustion engineers ever consider in advocating smokeless operation. There are cases where the engine crews are not responsible for smoke violations. One of these is where the power is in poor condition, but the great majority of these cases were caused by carelessness of the engine crews.

There is no question but that seniority as conducted today, encourage this class of men and is an injustice to the man who takes a pride in educating himself and doing things the best he knows how. On the other hand, those of us who are old enough to have worked under conditions existing before seniority became general, still believe it to be a lesser evil than favoritism. One thing that could be done without affecting senior rights would be to make a record of the men at stated periods. This would be along the lines followed some years ago on many roads when each engineer received an individual performance sheet monthly, showing the number of miles made by his engine, the cost for fuel, oil and repairs, the engineers' and firemen's wages, wipers' wages, average cost per hundred tons per mile and all details pertaining to the operation and maintenance of their engine. It would in our opinion result in saving the present cost of supervision needed to keep smoke elimination within the limits required.

Perhaps the nearest approach to smoke elimination in the operation of locomotives will come with the use of powdered coal, now being experimented with on several railroads. The use of powdered coal will afford a more perfect combustion of the fuel than is otherwise possible, which will, of course, be a great advantage, but in spite of that fact there will ever be a need of the faithful and intelligent co-operation of the engine crews. This latter factor really represents the most difficult feature of the whole problem.

The report was signed by Martin Whelan, chairman.

Discussion

W. L. Robinson, (B. & O.): It is not necessary to discipline the men for bad smoke performance. Records should be kept of each offence and explanations called for. Let the men know frequently where they stand and if possible to get a good performance they should be transferred to other districts. Close supervision is necessary. In Washington, D. C., every smoke emission lasting more than 10 seconds for black smoke and 30 seconds for dark gray is recorded. No smoke prevention devices are used except the brick arch. The placing of the smoke consumers on an engine admits that it is impossible to have smokeless firing. The stoker engines give the greatest trouble.

W. H. Corbett, (M. C.): In case of a second violation the offender is given a suspended sentence of 5 days which is held over him for a year. At the end of that time if he has an otherwise clean record it is removed. The brick arch and the steam jet smoke consumer used in the vicinity of Chicago give excellent results.

C. W. Corning, (C. & N. W.): When firing up a cold engine, by placing the coal on the grates and covering it with kindling such as edgings from the mill and igniting it with waste saturated with coal oil a fire can be started with but very little smoke. The fire up man can also handle more engines in this way. The engines must be maintained in good condition for smokeless operation.

SUPERHEATER LOCOMOTIVES

[The question of the advantages of superheaters, brick arches and other modern appliances on large engines, especially those of the Mallet type, was continued over from last year, the report of the committee remaining substantially the same. This will be found in the issue of the *Railway Age Gazette* for September 17, 1915, on page 505, under the heading of Modern Appliances on Large Locomotives. The discussion this year centered on the subject of superheaters. —Editor.]

W. A. Buckbee (Locomotive Superheater Company): In some instances where superheaters have been applied to locomotives and no other change has been made in the design of the locomotives, it has been found that the tonnage can be increased about 10 per cent. The reason for this is the increase in boiler capacity, and the shorter cutoff at which the engine may be run. It is well known that the efficiency of the superheater increases as the engine is worked harder, which means that the steam supply is greater. In many cases the diameter of the cylinders has been increased with the application of superheaters, but where this is done the factor of adhesion must be carefully considered. In some cases it is advisable to increase the cylinder diameter and to decrease the boiler pressure, keeping the same tractive effort. This not only gives a fuel saving by the use of a superheater, but also increases the life of the boiler. It has been found that with the cylinders hot that the superheater engines will start a train that a saturated steam engine of the same tractive effort will not. The reason for this is that the steam will pass through the cylinders without being condensed. In the saturated engine the steam that is condensed in the cylinder evaporates back into steam as soon as the pressure has been reduced sufficiently, and this produces a large volume

of steam which must be forced out through the nozzle. With superheated steam this does not occur.

F. P. Roesch (E. P. & S. W.): In order to obtain the full benefit of superheated steam in locomotives the engines must be so maintained that the full amount of superheat will be obtained. In order to determine properly whether or not an engine is giving the proper degree of superheat a pyrometer is absolutely necessary. The difference between the correct temperature and an inefficient temperature is so hard to detect in the operation of a locomotive, especially where they are used in pool service, that no engineer can be expected to tell whether or not he is getting the proper degree of superheat without a pyrometer. We have found that the brick arch is absolutely necessary, and that steam should be admitted to the cylinders when not working steam in order to give them the proper lubrication. Forty degrees more superheat is obtained when the arch is used, and on starting there is a difference of 100 deg. in superheat.

Other members spoke on the efficiency obtained from the use of superheater locomotives. On one road 20 engines had been converted to superheaters with absolutely no other change in the engine, the slide valves and the Stephenson valve motion being retained. Where 3,600 tons were handled with the saturated engine at 200 lb. boiler pressure, from 3,900 to 4,000 tons were handled with the superheater engine at a boiler pressure of 185 lb. It was believed by some that due to the absence of condensation in the cylinder and also to the higher degree of temperature of the cylinder that the mean effective pressure of a superheater engine under the same conditions as a similar locomotive using saturated steam, was higher. It was generally reported that better time and more tonnage could be handled with the superheater engine at a lower fuel and water consumption. The question of oil to be used was brought up, but it was the general opinion that if the air was kept out of the cylinders, while the cylinders were at a high degree of heat, no trouble would be experienced with carburization.

HANDLING FREIGHT TRAINS

The purpose of this report is to recommend proper methods for making up and handling modern freight trains on both level and steep grades, so that the smallest amount of damage will be done to the draft gear. In general, it may be recommended that:

All passing tracks, stations, water tanks, and, in fact, any place where heavy trains have to stop, be located on such a grade that the train may be stopped without either severe pushing or pulling action on the draft gear.

All unnecessary stops be cut out.

The brake piston travel be kept uniform, brake pipe leakage be kept down to a reasonable amount, retainers and their piping be kept in absolutely good condition, good pumps be placed on the locomotives which will furnish the necessary air to handle the brakes.

The engineer be thoroughly instructed in the handling of the brake equipment.

Special attention be paid to the inspection of draft gear at terminals.

Records be kept of the individual performance of engineers on train handling, and that they be required to make a written statement as to the cause of the damage to the draft gear on the trains they handle.

Yard Switching.—Much of the damage to draft gear is done in switching. It has been found that when a bunch of cars was coupled up at a speed of 5 m. p. h., there was a buffing strain of 255,000 lb. In taking slack to cut off a dynamometer car, which was 21 cars from the engine, a shock of 78,000 lb. was experienced. It will be seen from this that too much care cannot be exercised in handling cars by all concerned.

The committee recommends that uniform instructions be given to cover local conditions, in the proper manner in which to handle the cars and trains in different yards, also that hand brakes be kept in good condition, so the yard men can stop the cars by them if necessary.

Make-Up of Trains.—The ideal arrangement of a train of empties and loads would be to so alternate them as to produce, as near as practicable, a uniform degree of retardation throughout the trains, but this would obviously be impracticable. Tests have shown that, where possible, place about one-third of the empties next to the engine and ahead of any loads, or else scatter the loads throughout the train and not allow them to be bunched in any one place.

From the tests it was found that the maximum strain reached under any conditions with a train made up as above was 92,000 lb., while the maximum strain with the loads all behind was 223,000 lb., or two and one-half times greater, and with the loads all ahead 150,000 lb., 60,000 lb. greater than we experienced where the loads were near the middle of the train.

Empty and Load Brake.—One of the most fruitful causes of damage to draft gear is the difference in braking power between empty and loaded cars. This is the reason why so much stress is laid upon the importance in mixing the loads and empties in such a manner that the unequal strains will be spread over the train so that it will not do damage.

Braking power on cars varies in different parts of the country from 60 per cent to 80 per cent of the light weight of the car, and drops to from 17 per cent to 30 per cent when the car is loaded. Now, then, if we could get a brake equipment which would give a uniform braking power with both empty and loaded cars, we will be in a position to handle long, heavy freight trains faster and with less damage to draft gear and with greater safety.

In the new empty and load brake, which has been introduced on several roads, we have to a great extent such a brake. On one road the cars have a standard braking power of 50 per cent of the light weight of the car, and when loaded and cut into load position they then have 40 per cent of the weight of the car, or a loss of only 10 per cent in braking power when the car is loaded as against a loss of 40 per cent to 43 per cent with the single capacity brake.

The reports concerning this brake indicate that it will increase the hauling capacity of a road handling heavy trains down steep grades and tend to increase the safety of the operation of trains.

The following is a summary of tests of the empty and load brake made with a dynamometer car on one road:

The greater safety, control capacity and economy possible by the use of the empty and load equipment is illustrated by the fact that when the same brake pipe reduction was made with a 90-car train having 30 empty and load brake equipments on the head end, and also with a 90-car train of single capacity brake equipment, both on a tangent of 1½ per cent grade and at a speed of about 21 m. p. h., the train with the empty and load equipment on the first 30 cars was stalled, whereas the speed of the other train was only reduced to about 8 m. p. h. The average brake pipe reductions required to control the 90-car train with the 30 empty and load brake cars on the head end was only half as great as with the 90-car train of all single capacity brakes. The single capacity brake train could not be re-charged as promptly or as uniformly as the other, because 100 per cent heavier brake pipe reductions had to be made.

The average speed on the grade was about 16½ m. p. h. for the train without empty and load brakes, and about 19 m. p. h. for the train having empty and load brakes (thirty on the head end). This shows that a higher speed and therefore greater capacity of road can be secured and at the same time a greater factor of safety in operation afforded by the use of the empty and load brake equipment.

Just preceding the final application at the foot of the

grade with the train having all single capacity brakes, the brake pipe pressure was only 78 lb. instead of 91 lb., as it was at the start. With the similar train having thirty empty and load equipments on the head end the brake pipe pressure preceding each successive application was maintained at 93 lb.

With both the 90 and 100-car trains having empty and load equipments there was an average reserve braking force available at all times during the descent of the grade such that at any time the forces being employed might have been increased by from 35 per cent to 55 per cent as occasion demanded. On the other hand, the train without empty and load equipment was being taxed to its capacity throughout the descent of the grade.

The best estimate possible from the data at hand shows that only about 48 per cent of the maximum available air supply was required in the handling of the train having empty and load equipment, whereas it was necessary to use about 54.5 per cent of the maximum compressor capacity for the train not having empty and load equipments.

Emergency stops from 23 m. p. h. on the grades with trains consisting of one locomotive, dynamometer car, six loaded coal cars and caboose (brake on locomotive and caboose cut out) were made in an average distance of 1,780 ft. when the cars were equipped with single capacity brakes. A similar train having cars equipped with empty and load brakes was stopped from the same speed in approximately 720 ft., 40 per cent of the distance required to stop with the single capacity brake.

[The report also included quite complete instructions for freight train handling, including instructions for engineers, train conductors and others who have to do with this work.—Editor.]

The committee is: L. R. Pyle, chairman, (Soo Line); E. F. Boyle, (Sunset Central); W. G. Wallace, (Am. Steel Frdies.;) Wm. Owens, (N. Y. Air Brake), and C. W. Irving, (N. & W.).

Discussion

Walter V. Turner (Westinghouse Air Brake Co.): Where the brake equipment is not properly maintained it is very difficult to give the engineer any definite instructions as to how his train should be handled. It must be remembered that the shocks are caused by the difference in velocity between the cars. This difference in velocity is caused, to a very large extent, by the unequal braking power on the different cars. A difference of one mile per hour in the velocity of two cars produces a shock between those cars equal to the weight of one of the vehicles, provided they are of the same weight. So it is very important that this braking power be maintained as nearly constant as possible, which means that the piston travel should be standard throughout the train. The best brake is the one that produces the least velocity between the cars, and which will apply them simultaneously; otherwise slow stops must be made if no shocks are to be obtained.

With the heavier cars of today in long trains the empty and load brake is found to be necessary. Cars of 315,000 lb. capacity are now being built. If the single capacity brakes were used on these cars it would require a 22-in. brake cylinder to properly brake a 100-car train, and this, of course, is impossible under existing conditions. With the empty and load brake the capacity of the brake is increased 3½ times, and 60 per cent as much air is used as in the 10-in. single capacity brake. The principal feature of the empty and load brake is that it can handle heavier cars at a greater speed, which means that it is just as necessary for heavy cars in long trains on level tangent as it is on the grades. It not only permits of better handling of the trains but would materially decrease the cost of maintenance of the cars, inasmuch as they would be handled more smoothly. The acceptance of the improvements in air brake design have not followed the acceptance of the development in the car and locomotive design, but it is necessary that they go hand in hand. It is just as important to control the speed of the new equipment as it is to build it.

T. F. Lyons (N. Y. C.): It pays to make haste slowly in braking the long, heavy trains of today. Terminal tests are very important and should be made. In making coal and water stops in cities where there are many crossings it is better to stop the train and draw it up to the water plug slowly, rather than to cut off from the train and run to the water plug light. By doing this the train will be ready to start right off after the engine has received coal and water, and will block the crossing for a much shorter time.

F. P. Roesch (E. P. & S. W.): The trouble with break-in-twos is due very often to defects in the draft arrangement caused by rough handling in the yards. It is estimated that fully 60 per cent of the damage to freight equipment originates in the yards, and defective equipment gets out unnoticed, especially at night, when it is difficult to properly inspect the cars. One break-in-two out on the road caused by this defective equipment will attract more attention and the engineer is often held to blame when it really is the fault of the men in the yards and the inspectors who let this defective equipment get out onto the road.

G. H. Wood (A. T. & S. F.): It is my opinion that fully 75 per cent of the damage to the equipment is done in the yards, and that every means should be taken to prevent any defective equipment from getting out onto the road. On the Santa Fe the terminal tests include stretching the trains to find where undue slack in the draft arrangement is.

W. G. Wallace (American Steel Foundries): Many of the break-in-twos occurring on the line of road are occasioned by improper attention being given to draft rigging at the terminals. It is important that the draft gears be maintained properly, and that excessive slack be eliminated. It might be well to stencil on the side of the car the proper length of draft gear travel in order that this may readily be determined.

L. R. Pyle (committee chairman): We should never ask an engineer to do anything unless the equipment is in condition to do it and that we could not do ourselves. Attention must be given to the handling of the cars in the yards. The number of break-in-twos can be diminished if a determined effort is made to do so. I know of one specific case where 100 break-in-twos per month were reduced to 26 by simply getting after them and following them up. The traveling engineer should make recommendations concerning the makeup of trains.

ASSIGNMENT OF POWER

Power Assignment.—The officer that assigns the power to the sub-divisions on the system should be a man who understands the construction of the different type engines and who also understands the requirements of the sub-divisions on which the power will have to work. This officer should have absolute authority and report direct to either the general manager or superintendent of transportation, or general superintendent of motive power, and should at all times keep in close touch with these general officers. He should have an organization with an assistant or assistants on each sub-division to co-operate with the local officers, and conduct tests with reference to tonnage and fuel economy.

Assigning of power with reference to density of traffic is very important; the less train miles made will be the most economical operation. The grade line and the shop facilities for caring for the engines should also be considered. The power should be run to or from some point

where they have necessary facilities for caring for it, except in isolated cases of engines working on runs and coming to the shop every one or two weeks, as the case might be.

The assigning of engines with regularly assigned engine crews versus the pooled system, is a very important question, which, to a large extent, is governed by local conditions. It is possible to run engines successfully and economically over more than one division in continued service. This will save terminal consumption of fuel and reduction in mechanical forces at intermediate points. At the end of the engine's run it should be thoroughly inspected and all necessary work done. With our modern passenger engines equipped with brick arches and superheaters it is possible to run them over two or three divisions from 200 to 350 miles. The advantages in assigning regular men on engines would apply where the power is old and facilities for caring for power are limited, such as branch service and all locals and on runs that tie up at outlying points.

A number of roads have shown that engines can be pooled successfully and economically, provided there is a proper organization to inspect and repair them.

The condition of power reflects—first, the class of work that the roundhouse foreman will accept from his mechanic; second, lack of personal inspection and failure to keep in close personal touch with the mechanical condition of this power by the local mechanical officers that is so necessary in planning future repairs and up-keep.

Engine Mileage.—Every effort should be made to increase the mileage of the power the result of which is increased earnings on the capital invested, decreased cost of engine handling and less overcrowding at terminals, which automatically increases the mechanical facilities without increasing the expenditure and reduces the terminal consumption of fuel. The larger earning power created guarantees quicker returns and permits quicker retirement of power. Railway companies are finding that by converting saturated engines to superheaters increased mileage can be successfully made.

A recent striking example of what can be accomplished by running power through and over two divisions has come under the observation of the writer on two freight divisions of 120 and 119 miles respectively, making a total of 239 miles. A number of 49,000-lb. tractive effort superheated consolidation engines have been used for several years for handling all freight business, much of which is expedite freight. The freight engines were run through from Springfield to St. Louis, crews changing at Newburg, and engines making mileage of 239 miles. A careful check for sixty days, including the months of May and June, showed the following results:

Engines run through made	133,000 engine miles
Engines not run through made	52,000 engine miles
Fuel used per 1,000 gross ton miles, through service	159 lb.
Fuel used per 1,000 gross ton miles, not run through	178 lb.
Saving in favor of engines that went through	$2,611
Equals a saving of 10.7 per cent.	
Reduced force at intermediate point, account going through	$1,260
Total for two months	$3,871
At same rate will show annual saving	$23,226

Also, five engines were removed from the division and used elsewhere, in face of increased business of 20 per cent in train miles per mile of road or 246 train miles per mile of road a year ago and 299 train miles per mile of road in 1916 on this territory.

The reason that all engines are not run through is due to grade, line and operating conditions, which require turnarounds be made.

The following passenger engine mileage is made between terminals before the engine is relieved, one, two and in some cases three crews manning the same engine:

Springfield to St. Louis	239 miles
Springfield to Memphis	282 miles
St. Louis to Monett	283 miles
Springfield to Oklahoma City	304 miles
Sapulpa to Sherman	207 miles
Springfield to Kansas City	204 miles
Springfield to Ft. Smith	178 miles
Kansas City to Oklahoma City	378 miles
Memphis to Birmingham	251 miles
Memphis to St. Louis	318 miles
Monett to Wichita	239 miles
Making an average run of	262 miles

From 6,000 to 10,500 miles per month are made with passenger engines. Taking, for instance, the run from Memphis to St. Louis, 318 miles, four runs are handled with five engines—one to protect. The accumulative mileage will require that one of these engines shall go through the shop every ninety days for general repairs, as every ninety days one of the five engines has made more than 114,000 miles.

Another feature in assigning power that should be given serious consideration is where a limited number of superheated engines are available, the conditions being equal, the superheated power should be assigned in territory and on divisions where company coal haul is longest and where company fuel costs the most, thereby decreasing the cost of company coal and increasing revenue train haul.

Some of the factors contributing to successful assignment of power are a thorough knowledge of condition and capacity of the power, of the business requirements and co-operation between the departments.

The committee is: P. O. Wood, chairman (St. L. & S. F.); J. D. Heyburn (St. L. & S. F.); D. Meadows (M. C.); F. R. Melcher (C. & N. W.), and W. H. Corbett (M. C.).

Discussion

W. L. Robinson (B. & O.): The effect of pooling engines may be shown perhaps, in a general way, by referring to the annual statistics published by the Interstate Commerce Commission. In 1904 a great many railroads followed the system of assigning regular engines to the crews, while in 1914 most of these railroads were using the pooled system. During that time the average tractive power for locomotives increased 38.6 per cent, while the ton-miles per freight locomotive only increased 11.3 per cent. This may be due to the fact that the engines do not give the service under the pooled system that they would where they were assigned. In the annual report of one large railroad, however, to the assignment of power is attributed largely the decrease in operating cost. With an increase of seven million dollars in business there was a decrease of $347,000 in operating cost and a decrease of $89,000 in fuel cost, which was attributed by the general manager of that road to the assignment of power. Regardless of this fact, however, it is apparent that the management of most roads prefer the pooled system. We should acknowledge this and make the best of it, and keep the engines up in the best possible condition, having the shops ready to make quick and adequate repairs.

C. W. Irving (N. & W.): On one division of the Norfolk & Western there are 10 Mallet engines in assigned service. These engines are always to be found ready for their trip and seldom get to the back shop for repairs more than once in 18 months. These engines make 3,000 miles per month in freight service, which is considered good for this class of engines.

E. F. Boyle (Sunset Central): No difficulty is found on the Sunset Central in operating the pooled system of handling engines, and it is believed with proper organization and proper maintenance it is not difficult to work this system to advantage. Every time an engine reaches a terminal it is given a thorough inspection and repairs are promptly made. A district of 1,190 miles is operated with three engines with no difficulty whatsoever. Oil engines are used on this road.

B. J. Feeny (I. C.): Four years ago there was a bad congestion on the Illinois Central, which was then operating under the pooled system. The general manager ordered that the engines be assigned to specific crews against the judgment of many of the road foremen on the road at that time. This was done and two weeks afterward the engine

delays were materially decreased. The fuel consumption was decreased and, as it proved later, the cost of maintenance was less.

Other speakers on the subject strongly recommended the assignment of power, and numerous interesting cases were mentioned wherein it had been found to be the most desirable thing to do. One case on the Baltimore & Ohio, where the power had been assigned, the failures were very small, varying between two and three a month, and the engines made 119 to 121 miles per day. Later when these engines were pooled the failures increased from three to 29, and only 29 to 103 miles per engine per day were made. It was also claimed that the firemen would learn to handle their engines better and thus make a better fuel performance than if they were given a different engine every day. Several instances were mentioned as to where better mileage and more ton-miles were hauled by engines under the assigned than under the pooled system, contrary to the idea that the pool system usually permits the engine to make better mileage.

OTHER BUSINESS.

W. H. Corbett, M. C., presented his report of attendance at the Master Mechanics' Association last June, and also read the paper he was requested to prepare for that association at its convention.

The committee on Constitution and By-Laws changed the articles requiring that all papers to be presented at the annual convention should be in the hands of the secretary ninety days before the convention. It was also voted that the executive committee confer with representatives of the Air Brake Association and the International Railway Fuel Association regarding their consolidation with the Traveling Engineers' Association.

During the closing exercises W. O. Thompson, secretary of this association since its inception and who was largely responsible for its organization, was presented with a past president's badge, being voted to an honorary past presidentship. In replying to this gift Mr. Thompson stated that since the association has been organized 900 members have served on committees, 181 subjects have been considered and that the average attendance the past 15 years has been 300. Professor Louis E. Endsley, of the University of Pittsburgh, was voted an honorary member of the association.

The following officers were elected for the ensuing year: President, B. J. Feeney, Ill. Cent.; first vice-president, H. F. Henson, N. & W.; second vice-president, W. L. Robinson, B. & O.; third vice-president, G. A. Kell, G. T.; fourth vice-president, W. E. Preston, Southern; fifth vice-president, L. R. Pyle, M. St. P. & S. S. M.; treasurer, David Meadows, M. C. The following new members were elected to the executive committee: J. Keller, L. V.; J. P. Hurley, Wabash; P. F. Roesch, E. P. & S. W.; E. Hartenstein, C. & A.

HEATING GERMAN PASSENGER TRAINS.—The administration of the German State Railways, it is reported, has given public notice that it will no longer be possible to supply sufficient steam heat in passenger trains, especially if they are long and it is very cold. The patrons have been requested, as the weather gets colder, to supply themselves with warm clothing for traveling.

ENGLISH EXPORTS OF RAILWAY MATERIALS.—According to the Board of Trade export tables, during the eight months ended August 31, 1916, 37,562 tons of rails of the value of $1,934,911 were exported, as compared with 198,133 tons, valuing $7,039,108, in the corresponding eight months of 1915; chairs and steel sleepers, 9,231 tons, of the value of $412,363, as against 45,283 tons, valuing $1,648,795; and locomotives to the value of $4,023,072, as compared with $8,702,377.

THE WORK OF THE ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS*

By George W. Lyndon

The work of our association during the past year has been based upon the recommendations which were made to the Master Car Builders' Wheel Committee during the year of 1914.

Since our organization in the year 1909, we have steadfastly maintained that the varied service in the 60,000 lb. capacity cars made it imperative that the weight of the wheel should either be increased to meet the maximum conditions of service, or that we should have two standards in this class. The variation in service arises from the variations in the light weight of the cars in the 60,000 lb. capacity class, and as the standard of operation is to brake the cars at 60 per cent of their light weight, it must follow that any class of cars in which there is 100 per cent variation in light weight, which is common in the 60,000 lb. capacity class, cannot with safety carry the same weight of wheel. This is what the manufacturers have been required to do. The standard wheel specified for the 60,000 lb. capacity car weighs 625 lb. and the light weight of the cars may vary from 20,000 lb. to 53,000 lb.

Our association has recommended that the weight of the wheel be increased to 675 lb., which would provide a standard wheel to meet the maximum conditions of service as to load and braking and in asking an increase in weight of the two standards 625 and 725 lb. M. C. B. wheels, we are not actuated by commercial considerations.

It is estimated that there are 2,500,000 chilled iron wheel renewals annually, and if the weight should be increased 50 lb. each, the additional metal to be purchased would approximate 62,500 tons, provided all the renewals required an increase. This is by no means the case, because many of the prominent railroads in the country, representing over a fourth of all the cars in use, are already introducing advanced standards and are using wheels much heavier than the present M. C. B. standards.

Our association has made a very satisfactory arrangement with the University of Illinois through Dean W. F. M. Goss, in which it is agreed "That the University Experiment Station will undertake an investigation concerning the stresses and behavior of chilled iron car wheels." In submitting a draft of this arrangement to the president of the University of Illinois, Dean Goss made the following statement:

The importance of securing proper design and proper methods of manufacture for chilled iron car wheels may be judged by the fact that there are now in operation in the country approximately 20,000,000 freight car wheels and the demand for renewals alone involves the manufacture of 2,500,000 chilled iron car wheels per year. With these facts in mind, the Association of Manufacturers of Chilled Iron Wheels has agreed to co-operate with the Engineering Experiment Station in a study of the questions fundamental to the design of such wheels.

PROJECTED BATUM-TREBIZOND RAILROAD.—The British consul at Batum reported recently that the Russian government has decided to build a railroad from Batum to Trebizond. The new railway, which is to be of the ordinary Russian 5 ft., is, as far as possible, to skirt the foot of the mountains and follow the coast. In spite of the difficulties that they have to encounter in building the line, the state engineers are confident that they will be able to finish the work in six months. It is not expected that the new line will be of much value for general commercial purposes for some years to come.

*Extract from President's address at the annual meeting of the association in New York, October 17, 1916.

Progress on the New Chicago Union Station

Negotiations Between Railroads Have Been Completed and Preliminary Construction Is Well Under Way

PLANS for the new Union Station in Chicago, which will be owned jointly by four of the railroads using the present station, are now assuming definite form. The city ordinance authorizing this work was passed about two years ago and the intervening time has been occupied in preparing plans, in negotiations between the railroads for the exchange of property, etc., and in preliminary construction work.

The land to be occupied by the new Union Station facilities consists of 1,528,000 sq. ft. of ground, or over 35 acres in the heart of Chicago's business district. Over 1,300,000 sq. ft. was in the hands of the railroads and has been occupied by their freight and passenger facilities for many years. In order to make the Union Station project feasible it was necessary, therefore, that the railroads provide themselves with new freight facilities in lieu of those surrendered. This brought about an exhaustive study and investigation to enable the roads to find a location which would be adequate for their present and future needs and to harmonize with the city's requirements and the development of the city from a practical aesthetic point of view.

The estimated cost of the project is in the neighborhood of $47,000,000 divided as follows:

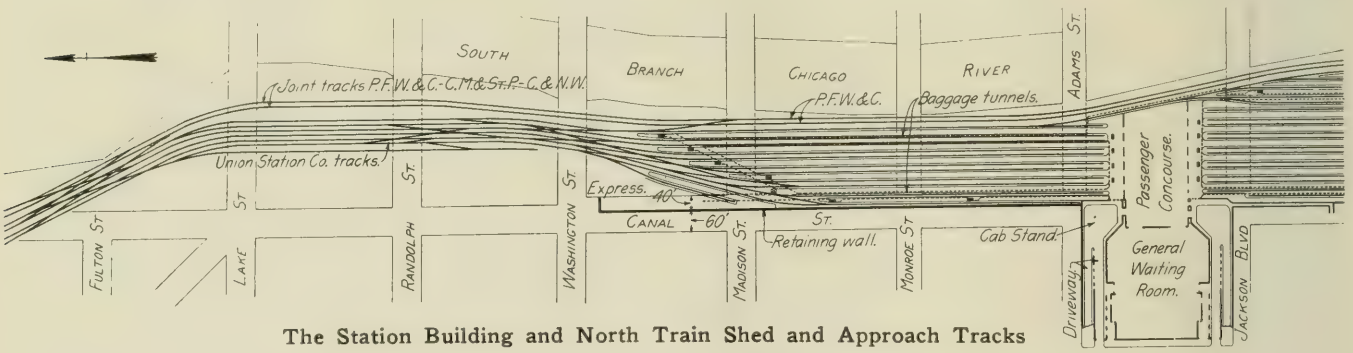
Land, about	$32,000,000
Property damages and improvements, required by the city as compensation (includes street changes, public utility changes, viaducts, etc.)	4,500,000
Station improvements, etc.	10,500,000
	$47,000,000

The Present Facilities Inadequate

The existing station was built in 1880 and occupies a strip of ground about 134 ft. wide on the east side of Canal street, extending from Madison street to Van Buren street. The station building faces on Canal street between Adams and Monroe streets. It was owned by the Pittsburgh, Fort Wayne & Chicago (Pennsylvania Lines), and is used jointly by that company; the Chicago & Alton; the Chicago, Burlington & Quincy; the Pittsburgh, Cincinnati, Chicago & St. Louis (Pennsylvania Lines); and the Chicago, Milwaukee & St. Paul, the last four being tenants on long term leases. The Fort Wayne, the Alton and the Burlington enter from the south over a four-track line located on property formerly owned jointly by the Fort Wayne and the Alton, between Van Buren and Twenty-first streets. The Burlington operates over this line as a tenant as far south as Sixteenth street, where it connects with its own line. The Pan Handle and the St. Paul enter from the north on a two-track line between Madison street and a point on Canal street near Carroll avenue owned jointly by the Fort Wayne, the St. Paul and the Chicago & North Western.

The station is used for both through and suburban trains, approximately 170 through and 115 suburban trains entering and departing daily. Over 75 per cent of the suburban traffic is carried by the Burlington. The total number of passengers using the station daily under normal condition is 35,000. A large amount of baggage is handled, the quantity being relatively high in proportion to the number of passengers. Nearly half of the mail of the city of Chicago is handled through this station, amounting normally to 500 tons per day.

Having approaches from the north and the south, the layout of the tracks in the present station is that of the through type although it is a terminal for all the roads using it. However, the through tracks are all so short that the long trains frequently occupy portions of the tracks both north and south of the axis of the station and consequently the handling of the trains is much the same as in a through station.



The Station Building and North Train Shed and Approach Tracks

The elimination of the grade crossings between the city streets and the tracks was accomplished years ago by the depression of the tracks and the elevation of the streets. The south branch of the Chicago river lies a short distance east of the station and parallel to it, and the east and west streets are carried over the tracks on viaducts and across the river; all of these streets have inclined approaches commencing west of Canal street, with the result that the intersections of these streets with Canal street have been elevated materially, giving Canal street a somewhat undulating grade line.

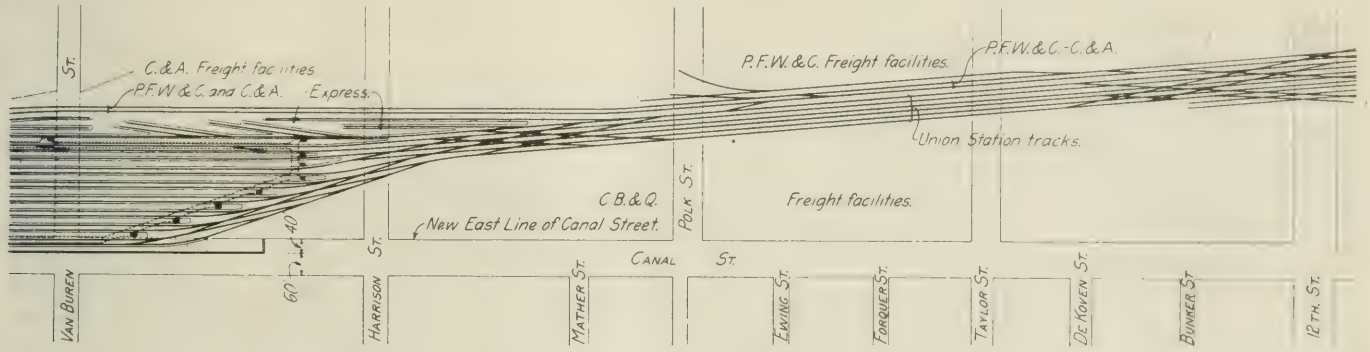
The old station has been overcrowded and congested for some years, but as it is located within a short distance of the center of the business district of the city, the adjacent property is used intensively, most of it for railroad freight terminals. It has been, therefore, impractical to acquire any additional space in which to expand the existing station either by adding more tracks or by lengthening the existing ones. Because of this the only solution is a new station occupying a materially larger area and involving, in the acquisition of additional property, a simultaneous re-arrangement of the adjacent railroad freight facilities.

Ordinance Requirements

The enabling ordinance for the new station was passed by the city council of Chicago on March 23, 1914, after many months of negotiations between the city and the railways. This ordinance had been under consideration for more

than a year, but many things conspired to obstruct and delay its passage. The ordinance was accepted by the Chicago Union Station Company, September 23, 1914. Among the obstacles was the insistence on the part of some of the organizations of citizens that the new station be placed on the site south of Twelfth street to conform to a scheme of the Chicago Plan Commission. Another serious objection was on the part of the Council's Terminal Committee, which committee would not approve the proposed location of the new Fort Wayne freight station upon land bought for the purpose between Jefferson and Desplaines streets, south of Van Buren street, provision for which was made a part of the plan submitted to the city for the new passenger terminal. This compelled the making of a new plan in which provision was made for a Fort Wayne freight terminal between Polk street and Twelfth street just west of the South Branch of the Chicago river. This plan was finally approved after arrangements had been made for compensation to the city for street vacations and other concessions.

Under the terms of this ordinance the Union Station Company is required to widen Canal street, now 80 ft. wide, so that it will be 100 ft. wide, from Twelfth street to Washington street, the extra width to be provided on the east side of the street. In part return for this, the station company is permitted to occupy under the street level for a width of



The South Train Shed and Approach Tracks

40 ft., on the east side between Washington street and a point 256 ft. north of Harrison street. It is also required to raise Canal street to give a generally uniform grade, approximately on a level with the roadways of the existing city bridges over the Chicago river, and thus eliminate the irregular grade line which this street has at present.

The approaches to the river bridges, 11 in all, between Lake street and Twelfth street inclusive, must be rebuilt to provide for the track rearrangement, and to accommodate a much greater width than is provided in the present structures. In addition, a bridge will be built over the river at Monroe street for which the Union Station Company must furnish the approach structure between the river and Canal street. A viaduct must also be provided on Canal street north of Lake street and on Kinzie street west of Orleans street, with a total length of 2,100 ft. including the approaches.

The grade requirements of the new station necessitate the removal of all the sewers entering the river from the west between Washington and Harrison streets. This will be made possible by the construction of an intercepting sewer in Canal street and around the site of the head house, with river connections at Harrison street and just south of Washington street. These changes in the sewer system are to be made at the expense of the Union Station Company and are now in progress, the first portion comprising an 11-ft. sewer from Monroe street to Washington street and thence east to the river, having recently been completed.

A new dock wall must be built along the river from Madison street to Van Buren street, upon which work will commence in a short time. In addition to the above requirements, the sum of $2,686,558.92 was paid to the city as compensation for the vacation of certain streets and alleys as required for the perfection of the plans for the new station as well as those for the facilities of the several railroads, whose freight terminals must be rearranged as a consequence of this project.

Following the passage of the Union Station ordinance in March, 1914, and its acceptance by the Union Station Company in September of the same year, the company undertook to complete all the negotiations for the land purchased; these negotiations had been held in abeyance pending a decision as to the advisability of accepting the ordinance in question.

The deals for the exchange of land between the railroads which are owners of the station company were completed very shortly, while the deal for the purchase of land from the Chicago & Alton was not completed until January, 1916, being a very involved arrangement, making it necessary to take over important property belonging to outside interests. Simultaneously with these negotiations others were in progress for the transfer of land owned privately and the securing of approval of all such transfers from the Illinois Public Utilities Commission. All of this had to be gone into in very great detail and was in progress with little interruption from 1907 to 1916.

The New Station

The new station will be constructed and operated by a new corporation, the Chicago Union Station Company, the stock of which is owned equally by the Pennsylvania company, the Burlington, the St. Paul and the Pan Handle. The Chicago & Alton will use the station as a tenant. Of the 35 acres to be occupied by the new terminal, 9 acres will comprise the right of way for the approach lines between Harrison street and Twelfth street on the south and between Washington street and a point on Canal street near Carroll avenue on the north and 26 acres will be used for the station proper as against 5 acres—the total area of the existing station.

The tracks of the station will be arranged to form what may be termed a double stub-end station, one group of tracks for trains using the north approach and the other group for trains using the south approach, the two groups terminating respectively on the north and south sides of a concourse between Jackson boulevard and Adams street.

The station head house will occupy a separate block bounded by Canal, Clinton and Adams streets and Jackson boulevard, with communication between the head house and the concourse by a subway under Canal street. It is the plan to depress the tracks and raise Canal street a sufficient amount to make this possible.

Most of the property acquired for the expansion of the station facilities was already owned by the railroads inter-

ested in the new terminal. Between the present station and the river the Fort Wayne has a freight station extending from Van Buren street to Madison street. The Chicago & Alton has an extensive development east of the main tracks between Van Buren street and Polk street, and the Chicago, Burlington & Quincy has a freight station extending for a considerable distance south of Harrison street between Canal street and the present station approach tracks.

It has been necessary for the Union Station Company to take over practically all of the ground occupied by the Fort Wayne freight station, except a narrow strip next to the river which will be retained by that road for a two-track running line, which will connect joint running tracks of the Fort Wayne and the Alton south of Van Buren street with running tracks north of Madison street, owned jointly by the Chicago, Milwaukee & St. Paul, the Chicago & North Western and the Fort Wayne. It was also necessary to obtain about 30 per cent of the holdings of the Chicago & Alton between Van Buren street and Polk street and also material portions of the property of the Burlington. The transfer of this railroad property to the Union Station Company necessitated an extensive rearrangement of the freight facilities of these roads.



Architect's Drawing of the New Station

In the case of the Chicago & Alton, this has been provided for by the acquisition of additional property further east, which will be turned over to the Alton in exchange for the property which that road will release. In the case of the Fort Wayne, it was necessary to obtain an entirely new site for the freight terminal. The property required north of Madison street and the block to be occupied by the station head house were acquired from private property owners. Much of this land was purchased by the Fort Wayne before negotiations were entered into with the city.

The Station Building

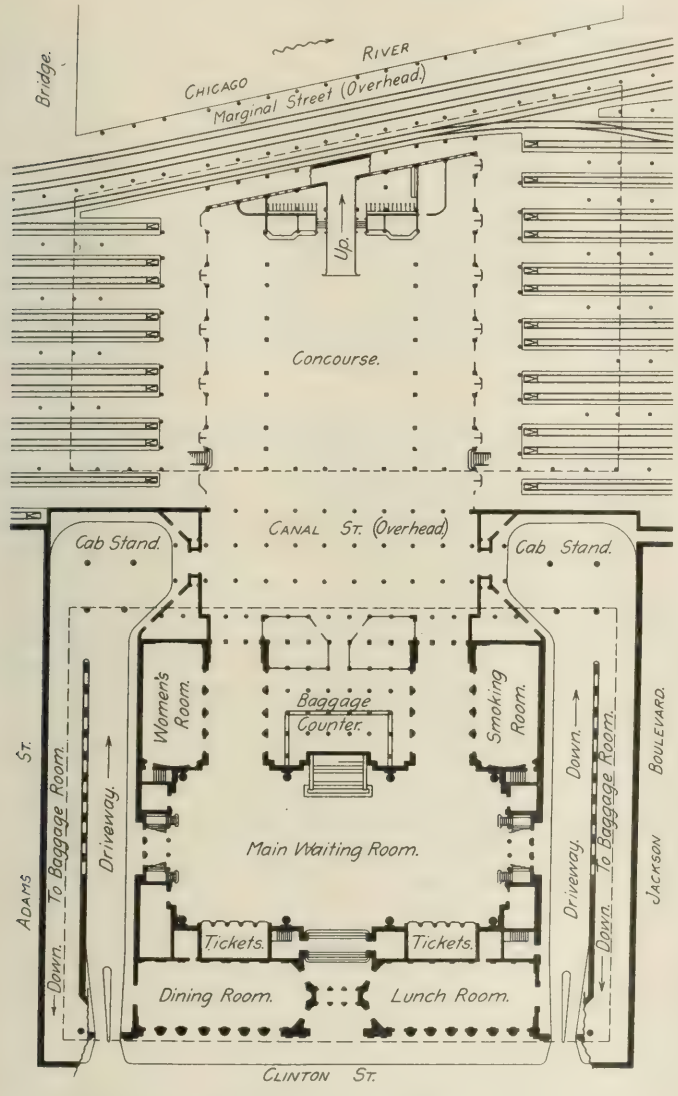
The head house of the station west of Canal street will be a monumental structure bounded on all four sides by a colonnade, 64 ft. in height and surmounted by a high attic. Above this, in the center of the building, will rise the clear-story of the lofty waiting room. The area east of Canal street between Jackson boulevard and Adams street will be covered to the north and south by the roofs of the train sheds, and in the center by the superstructure of the passenger concourse, which will rise to a considerable elevation above the street level and be surmounted by an arched roof. From the street, therefore, the new station will give the appearance of two independent buildings. On the interior this impression gives way to a sense of a simple unified plan.

The fundamental idea for the new station is a single level for all the important functions with which the passengers must deal directly. The concourse, main and auxiliary waiting rooms, ticket offices, baggage counters, restaurants and cab stands will be at the same elevation as the track platforms, about 18 ft. below Canal street. The lobby of the passenger concourse with the subway under Canal street will form a single room 180 ft. wide by 300 ft. long which will communicate through wide corridors with a main waiting room located in the center of the head house west of Canal street. This room will be more than 100 ft. wide and nearly 250 ft. long with a lofty vaulted ceiling illuminated by large clear-story windows.

Although located materially below the level of the streets, entrance to and exit from the station will be provided conveniently from all directions. From Adams street and Jackson boulevard, west of the river, ramps will lead directly to the concourse so that passengers, particularly those using the suburban trains, may enter and leave the station without going into the head house. The main entrance to the latter will be in the center of the Canal street side through a spacious entrance hall down a broad stairway, leading directly into the great waiting room. In order to accommodate the ever-increasing traffic arriving and departing from the station by automobiles and other vehicles, a very commodious arrangement has been planned for handling such traffic, as two cab stands are to be provided, one along Adams street and another along Jackson boulevard, both of which are to be located at the level of the concourse floor connecting with the street by means of drives opening out of the head house building on Clinton street. The pedestrian inclines will terminate at doors in the north and south ends of the waiting room.

The central waiting room will be surrounded by auxiliary facilities, including separate waiting rooms for men and women at the southeast and northeast corners respectively, and two ticket offices along the west wall in the most obvious location opposite the foot of the main stairway. Dining rooms and lunch rooms will also be located along the Clinton street side of the building.

In order to accommodate suburban passengers to the fullest extent in the concourse, thereby obviating the necessity for entering the station head house, additional toilet facilities, a suburban ticket office, news stands, etc., will be provided at the east end of the concourse. On the street level above these facilities will be located the immigrant waiting room,



Plan of the Station at the Waiting Room Level

having direct access to the track platforms independent of the passenger concourse.

The plan contemplates a baggage room in a basement about 36 ft. below the street level, covering practically the entire area below the waiting room and concourse. Access to this baggage room from the street will be obtained by a continuation of each of the ramps to the cab stands, these continuations having a reverse direction downward on a five per cent grade toward Clinton street with a team concourse under the Clinton street side of the building. The baggage room will communicate directly with elevators at the inner ends of the track platforms and by means of baggage subways with elevators located at the outer ends of the platforms. Other elevators will be provided to afford communication with the baggage counters in the concourse and near each of the cab stands.

The general plan contemplates two express buildings, one for the use of the express companies serving the Pennsylvania Lines, the Burlington and the Alton, the other for the express company serving the St. Paul. The former will be located east of the south group of tracks between Van Buren and Harrison streets. It will be a two-story building about 56 ft. wide served at the street level by a driveway 40 ft. wide, extending from Harrison street to Van Buren street. At the track level several tracks will be provided for standing express cars. The other express building will be located on Canal street south from Washington street with a general arrangement similar to the south express building.

Tracks, Platforms and Subways

There will be six approach tracks leading to the station at the north and south ends. Cross-overs at the north and south limits will provide for connections to the main line tracks of the roads entering the station, and the cross-overs at the entrance to station tracks will provide for parallel movements of trains to and from the approach tracks. There will be also two through tracks along the east side of the terminal, extending the entire length, for the handling of interchange freight.

The station tracks will be in pairs, 13 ft. center to center and high platforms between with a 27-ft. spacing of tracks, exceptions being made for the mail tracks. In the south yard there will be 13 passenger tracks having a combined capacity length of 13,065 ft., the maximum capacity length being 1,395 ft., and the minimum 545 ft., two mail tracks, provided with cross-overs so that a few cars can be switched without disturbing the entire track and 8 stub-end tracks having a capacity of from 2 to 12-cars each for the express companies. In the north yard there will be 9 passenger tracks having a combined capacity of 10,070 ft., the maximum capacity length being 1,405 ft. and the minimum 815 ft., two mail tracks with a capacity length of 1,450 ft., and 2 express tracks with a capacity of 11 cars.

It is proposed to use a concrete track construction for the station tracks, the rails resting on tie plates and felt pads, fastened to 7-in. by 9-in. by 2-ft. 6-in. creosoted blocks by screw spikes. The blocks will be imbedded in concrete, and will rest on a reinforced concrete base, with provision for drainage in the center of the track. The ladder and approach tracks will be of ballasted construction. All turnouts and slips with the exception of a few specials are to have standard No. 8 frogs.

The platforms are to be of reinforced concrete slab construction with the edge of the platform 5 ft. 4½ in. from the center line of track and the surface 4 ft. above top of rail. Working space is to be provided under the platforms for the necessary station facilities.

Provision is made for the handling of all incoming mail on trains by means of belt conveyors to a general sorting room in the basement, where mail is also to be delivered from the street by means of a spiral chute, and by conveyors from the proposed new postoffice. Outgoing mail to trains will be handled by trucks, taking the subways and elevators at outer ends of the platforms. Mail for the street will be delivered from a sorting room in the basement by means of an inclined conveyor to a platform on the street level and to the proposed postoffice by means of a conveyor. Provision will also be made for handling the mail to and from the street by elevators.

The design and construction of the Union Station project is under the direction of Thomas Rodd, chief engineer, Union Station Company, Pittsburgh, Pa., and J. D'Esposito, assistant chief engineer, in direct charge at Chicago. Graham, Burnham & Company are the architects for the station building.

Comments on the "Protest to Executives"

A Variegated Picture; Warm Confirmation, Incredulous Questioning; Defense of the Conciliatory Manager

THE following sixteen letters are comments on the one printed October 20, entitled "A Protest to American Railroad Executives." They are abridged severely. They are samples of a considerable number received—a number far too large to be printed in the space available. The present aim is to give typical statements of opinion. One correspondent refers to the author of the protest as an "alleged superintendent"; but he is a real one, on a prominent road. The only deceptive thing about his letter is the date line—Chicago. His home is a considerable distance further west than Chicago. The anonymity of all of the correspondents is explained by the delicate nature of the subject. The signatures, appended by the editor, indicate, in each case, the title of the writer and the section of the country which he represents. All of the writers are in active service, though "Ex" appears in some of the titles.

ILLUSTRATIVE EXPERIENCES

I read the article September 15 on "The High Cost of Expediency" and I fully sympathize with it. If there is one thing that I have been sick to death of hearing during the past 20 years it is the words from those in control "this is not the time to fight out this question—just wait." But I think the superintendent in question goes too far in his criticisms of the seniority rule and its administration. Some superintendents think the manager must *always* sustain them. This is manifestly unfair.

These cases are exactly parallel with law suits in the courts; if a litigant defeated in a lower court knew that there would be no use of appealing to a higher court because the decision would always be confirmed, the higher courts might as well be abolished. If railroad companies, voluntarily or for any other reason, enter into labor contracts, the provisions of which give the men the right of appeal up to a certain executive officer; and then if the superior invariably sustains the ruling of the superintendent, those provisions in the labor contracts might as well be abolished.

The best superintendents are usually those who have risen from the ranks of brakemen, conductors, engineers, etc., but I have had experience with two who had risen from such positions and who were men of ability, but who unconsciously or otherwise carried with them grudges against other men in train service with whom they had had personal quarrels, and they were unjust to those men. This, however, is not common. Our general manager has had but few appeals in the last three years; I have had none.

On the other hand I have known of a good many cases where weak executive officers, thinking to curry favor with the rank and file, have overruled fair decisions of subordinates. The seniority rule is a fair rule *if properly administered.* Years ago when I was an operator, I knew a fireman who was firing a passenger train; in due course of time he was promoted to engineer, and on his first trip he was assigned to haul the same passenger train upon which he had been firing the day before. This seemed very strange to me, when there were other engineers who had been hauling freight trains for ten or twelve years, and I asked him how he came to get this choice run; and with a wink he replied, "Oh, I stand in with the old man." It struck me then as very unjust and I have thought so ever since.

The trouble with the seniority rule is that the proviso "provided he is competent" seems to be lost sight of. Managers seem to be afraid to deal with that phase of the subject. I recall the case of an engineman whose deficiencies were not easily defined, yet he could not make time, where other runners were successful. We took him off that run and put on the next senior man. The man displaced was very indignant; and being a member of the grievance committee and the committee having an appointment with me on other matters, he brought up his own case, claiming that his seniority rights had been taken from him. I (then general manager) explained the facts and stated that he was "incompetent" and the committee unanimously, with the exception of himself, sustained my view of the matter; and the man had to take spare work for some months. Later on he bid in a new fast run and made good on it; evidently as a result of his previous experience. I could relate similar cases of recent date.

In regard to that sentence in the Superintendent's letter which reads "General officers and executives must face the situation as it is," I think the recent determination of the executives to stand a strike rather than yield to the eight-hour day movement, shows that whatever weakness there may have been in the past in this respect certainly does not exist now, in matters where a real crisis is concerned.

PRESIDENT (Eastern).

PLACE RESPONSIBILITY NEARER THE TOP

Although I recognize that there is much merit in some of the criticisms which are made (September 15 and October 20), I get the impression that there is something the matter with the writers themselves. Where you find conditions such as are described in the two letters referred to, there is evidently something radically wrong with the management. In former years a prominent Eastern road permitted many of the practices such as the two correspondents describe. It was the result of what has been termed "paternal management." Organized labor was used as a part of the machinery to accomplish political ends. Labor leaders were quick to take advantage of the situation. . . .

. . . Taking four or five of the larger roads with which I am familiar, I should say that the conditions such as are described do not generally prevail on such roads; or if they do prevail then it is largely because of the weakness of the division officers. Many managers still find difficulty in impressing on the division authorities that theirs is the responsibility. As a division officer I have never consciously been influenced as to how my superiors might regard my action, nor have I been influenced by what the "grievers" might think, say or do. As a general officer I have been more concerned with the lax manner of handling discipline cases by division officers than by any improper request or demand of labor committees in behalf of their members. The "Superintendent" is right when he says, "The majority of these men will stand for a square deal when they are given the opportunity, and made to see that it pays." Indeed, the men may be treated so fairly as to largely nullify the power of labor leaders, except possibly in matters affecting compensation.

There are many vicious rules in all schedules which never should have been acceded to; but if there had been, 20 years ago, fewer so-called "big men," whose word was law, there would be fewer vicious rules today.

If superintendents will handle discipline cases with a view of saving instead of getting rid of men; and, if, in placing responsibility for things that go wrong, they will

place the responsibility by starting at the top and working down, instead of at the bottom and working up, many of the troubles that now seem to confront "Old Trainmaster" and "A Superintendent" in dealing with discipline will, I feel sure, disappear, and the influence of labor leaders will be very, very seriously impaired.

PRESIDENT (Eastern).

NOT OVERDRAWN

I think the picture is not overdrawn. The condition described prevails to a far greater extent than one would like to think. . . .

PRESIDENT (Eastern).

EASTERN ROADS IN GOOD CONDITION

I think the Superintendent has considerably overdrawn the situation so far as the railways of the country generally are concerned. It may be that those conditions do actually exist on the line with which he is connected, but they do not, I know, obtain on our line. Men are promoted on their seniority only if they are competent to fill the higher positions and have passed the necessary qualifying examinations, which with us are quite strict.

We do not give division superintendents final authority in dealing with questions of seniority and discipline, but I am satisfied that our practice in this matter has not destroyed or relaxed discipline or demoralized our service; nor have such undesirable results been observed on other roads in our territory. PRESIDENT (Eastern).

Not only is the letter overdrawn; I think the subject is misrepresented. The conditions referred to do not prevail on this road and such knowledge as I have of other lines does not justify me in believing that there is any material basis for such conclusions.

VICE-PRESIDENT (Eastern).

A BIG PUBLIC QUESTION

. . . When a few men, representing only a small percentage of the employees, can stampede the President and Congress within a week, it is foolish to talk about the minute details of organization and discipline just now. It will come some day, but it will come with a bayonet. . . . We have passed the era when the local officer is a big man; in fact, we have almost passed the era when the railroad itself, or a combination of railroads, has any material power of initiative or private control. We are drifting as a mass until public interests, as reflected in the public pocket-book, awaken to the situation and put a stop to it.

VICE-PRESIDENT (Eastern).

THE "BIG FOUR"

. . . The story is not overdrawn in so far as it describes roads where the extreme situation exists. The methods adopted by the "Big Four" in dealing with Congress, at Washington last month, and the success of those methods, seem to prove the writer's contention. I would say that the story is a little overdrawn in describing *average* conditions; but there are roads on which the situation is just about as he puts it.

GENERAL SUPERINTENDENT (Eastern).

UP TO THE DIVISION HEAD

I think that this condition does exist but I have never had any such experience. If the division superintendent cannot handle the discipline on his division in such a way as to avoid being overruled, the only answer is to change the superintendent. This man writes as though he had a personal grievance; but he has opened up a big question which can be viewed from many different angles. . . .

GENERAL MANAGER (Eastern).

TIMES HAVE CHANGED

. . . The writer of the article may be located so far from his superiors as to not come in contact with them or in frequent conference, as on the long western divisions may happen to be the case. I have known conditions to exist in some cases, as cited, where the local officers were not taken into conference, but I think they are only isolated cases. Times have changed and to a certain extent the local officer is not the "big man" that he was, generally speaking; but I do not think this is any reflection on the general superintendent or general manager. . . .

EX-GENERAL MANAGER (Eastern).

A TRUE PICTURE

If the writer of that article had been trying to represent the majority he couldn't have done it better. It is the best pen picture I ever read of facts as they do exist.

TRAIN MASTER (Eastern).

CONSIDERATION FOR LONG-TIME GOOD RECORDS

Some of the matters mentioned are undoubtedly true, others not quite as bad as presented in the article. It is true, generally speaking, that all that a fireman or a brakeman has to do to be promoted to the position of engineer or conductor is to hold on until his seniority places him there. We require on our road that these men shall pass the prescribed examinations and they must pass them in a creditable manner. We have had several cases where the men were not permitted to take promotion because their examinations did not develop a satisfactory condition. At the same time it must be conceded that generally speaking this charge is true.

We have found in some cases that local officers took a decided stand on a matter which seemed to be of minor importance, and we reversed the decision; but even in these cases we have endeavored to protect the local officers by requesting the committee to take the question back to the superintendent in order that he might have the opportunity of reversing himself.

The question of grievance committees forcing reinstatement is a large one, in which is involved the general methods of discipline. This company does not believe generally in dismissal as a corrective discipline, excepting in extreme cases. Therefore, we do not have very many cases of forcing reinstatement of dismissed men. An employee who has been dismissed after giving many years, and the best years, of his life to the service of the company, naturally believes that he should be given a chance. . . . We have in our service today employees who have been concerned in serious accidents, including collisions. When discipline was about to be applied their general services were taken into consideration and if it was believed that this employee should be able to render better service than some new man who might be employed in his place he was given the benefit of that feeling. Of course, such men had to have good records and had to have good service performances behind them. They were not men who violated rule G, or who had made themselves undesirable men. . . .

GENERAL SUPERINTENDENT (South).

SUPERINTENDENT ENDORSED

I think the article is not too strongly drawn, and I endorse every point in it.

EX-GENERAL MANAGER (Western).

A GENERAL PRACTICE

That letter is one of the best things I've read in many a day; and not one whit overdrawn. It has been asked, How extensively does this condition prevail? Why, my dear sir, it is the rule rather than the exception.

I think that in some respects "Superintendent" does not go far enough in giving his reasons why. He might have

added that some of the officers who are big factors in the situation are themselves members of labor organizations. . . . He does well to utter a caution to "be careful in selecting men from brotherhoods for official positions."

"The idea that men can be handled as so many pins in a board is too absurd to admit of argument," and yet men do sit in general offices and attempt to play on the details of complicated affairs much in the same way, and with the idea of getting the same results, as an artist "touching" the keys of a piano. . . .

SUPERINTENDENT (Western).

OVERDRAWN

My own experience, as well as my acquaintance with superintendents in various parts of the country, leads me to the conclusion that while "A Superintendent" undoubtedly writes out of a full heart and under the sting of the conditions which he describes, these conditions are exceptional and not at all typical of the general situation.

It is undoubtedly true that there are general officers who are afraid of the organizations and others who, from natural laziness, follow the lines of least resistance, but I am positive that these men are few and far between.

SUPERINTENDENT (Western).

A PAINFUL LACK OF FIRMNESS

The situation referred to by "A Superintendent" does not exist on every railroad throughout the country but, unfortunately it does exist on a great many railroads, and with respect to such roads the condition is pretty much as described by the writer, and in the Peoria article signed by "An Ex-Trainmaster," printed in the September 15 issue, both of which I have read with interest.

There has been a painful lack of firmness in dealing with many of these situations, and this lack or want has gradually, yet surely, resulted in the serious situation which confronted the railways of the country in the latter part of August.

In saying this, I do not wish to imply that the subordinate officer is always right and the superior officer, who overrules him, always wrong. Quite frequently the subordinate is wrong; and this position is more in evidence with men promoted from ranks of the four organizations than with officers promoted from other branches of the service; but the failure or lack of support accorded the subordinate officer when his action is proper and the practice of continually giving way to the demands of the various committees is unquestionably largely responsible for "The High Cost of Expediency."

PRESIDENT (South Western).

A DEFENSE OF THE CONCILIATORY EXECUTIVES

Your correspondent of October 20, appealing to railway managers, states the truth; but it is a wholesome truth. This situation exists on most of the railroads of the United States, and is for the most part a righteous one. It must be taken into consideration that if the railroad managers did not compromise they would in many cases have a strike on their hands; for when the general grievance committee has gone as far as it can, then a vice-president of the order is brought in to handle the matter. If he cannot move the general manager a strike vote is taken. If the general manager does not settle at the first meeting he, according to the agreement with brotherhood, must use a lot of his time in entertaining committees. Then, after the strike vote is taken, it means several imperative meetings. Also, before the strike vote is taken, the vice president of the order, who is experienced in such matters, arranges to have newspaper publicity given to the fact that a strike vote is being taken. There has been so much said against the railroads that general managers are fearful of publicity, because it is always adverse to the management. The men have their say, through the newspapers, but the reporter seldom goes to the executive officer for his side of the controversy. Then, again, a general officer has not time for a newspaper discussion of the merits of the case. A general manager has a great deal to do besides entertaining committees; but the brotherhood men, who make a special study of these matters, have days in which to study a case where a general manager only has hours. The brotherhood knows by previous experience that the railroad executive can be so bothered and harassed that he will not stand for a long drawn out controversy; so the wise general manager settles the case at the first meeting. "A Superintendent," if he were in the general manager's place, no matter how great his moral strength, would, considering the present attitude against the railroads, choose the expedient way.

Maybe, after all, the discrimination is not in favor of the brotherhoods. Probably the brotherhoods are right, and that the unorganized men are being discriminated against. In this day of co-operation severe discipline is not always necessary. Unwarranted discipline is one cause of unionism, and now the head officers of the brotherhoods, using the big stick, finding that might makes right and becoming intoxicated with power do, in some cases, put through unworthy cases. They know that the general managers cannot afford to stand out against them. Furthermore, the heads of the brotherhoods today are as smart and keen as general managers. And they seldom push absolutely unworthy cases; they are more likely to ask for clemency.

"A Superintendent" will have to join with those who seek expediency and do the compromising himself, instead of letting it go beyond him to his general manager, there to be compromised. He has it within his power to be the good fellow and to save the general manager the botheration of meeting committees. In any large organization he has to deal with good, bad and indifferent men. All men are not the same, but they all have to be taken care of, and there is a broader view coming over railroad officers. While we are making money for the railroads we also have to do something towards making men. We are in the reformation business in spite of ourselves. The time to catch the man who cannot spell and is grossly illiterate is before he gets into the service; disapprove his application. He should be in some business not requiring education.

Mr. Superintendent can rest assured that seniority has come to stay. Men have got to be handled a good deal like so many pegs in a board. There is not any more difference in men in railroad work than there is in soldiers, yet the common soldiers all get the same wages. There is a growing tendency all over the country towards the leveling of wages of men in the same class of service. A helpless and inefficient man may be working alongside of a very efficient man and still have a larger family and more expense than the efficient man. The railroads have got to do their share in taking care of the man who is inefficient but not so inefficient that he could be discharged for inefficiency. Maybe if "A Superintendent" will examine himself he will find the measures he would like to take are too harsh and that the milder attitude of the general manager after all is the best. Probably it is better to keep the inefficient man and try to educate him towards efficiency rather than discharge him and, in all likelihood, get in his place a man just as inefficient and without a knowledge of the railroad. It is "A Superintendent" who is behind the times and it is for him to catch up, rather than the general manager. He should observe the handwriting on the wall and be governed accordingly. It is being learned that you can accomplish more by being gentle and kind than by being severe and hateful. The way for officers and men to go along is to get together and co-operate rather than work against each other. Your correspondent takes too pessimistic a view of the situation.

A general manager who does not have the local officer present at all sessions with the grievance committee, I should say was not competent to be a general manager. My plan,

and I do not see why "A Superintendent" could not so handle, before taking severe action, is to talk the case over with the general manager. There are not so many cases of discipline on a division nor such a need of haste that the case cannot be talked over with the general manager. It will take much less of his time and your time to talk over a case of discipline than to have to entertain committee after committee if the brotherhood chooses to fight it.

I believe superintendents are just as big men today as ever they were. From an ethical and humanitarian standpoint they are bigger, for the old-time superintendent was a tyrant. There is nothing in wholesale discharges as was the custom in the old days, and I should say that "A Superintendent" has put the case too strong in criticising our superiors. If he were a general officer and expected to make a success as such, he would have to act just as our general officers are acting.

Acting on his theory, why does not "A Superintendent" claim that our roads are less efficiently operated today than they were in the old days? According to the general tenor of his grievance he would have you believe they are less efficiently operated; whereas, when we come right down to the facts, they are more efficiently operated than they ever were before. There is more sobriety and less necessity for discipline. If a man is disciplined and a committee is asked to take up his case his mistake is just as deeply engraved on his mind as if he had been discharged; and the fact that, to hold his position, he had to be fought for by his brother members raises him up morally, in all probability, a good deal higher than if he had been discharged without any power to get back; so that from a psychological standpoint a man who has one grievance takes care not to have another; for whenever he has a grievance he is not only getting in bad with the railroad officers, but he is disgracing himself with his fellow lodge members; he doesn't want to be a chronic griever. We are moving ahead in this railroad game and not backwards as "A Superintendent" would have us think. The local officer is just as important as ever, only there are so many more of them than there were twenty years ago. Big business all around us has made big men more common than they were years ago.

The railroad superintendent should not be antagonistic towards the brotherhoods. If the best man on the division is a brotherhood officer, he is the one who should be selected for an official position. In most cases he makes a first class officer because he knows how to handle men, which is the most important thing an officer has before him. If the gentleman has had too many cases go to the general manager and be reversed it is time for him to correct his attitude. One is excusable for getting burnt once, but when he gets burnt the same way twice it is not a sign of wisdom on his part. The large results accomplished and the excellence of the operation of our railroads disprove the arguments advanced. We are surely moving forward. It is generally conceded there is nothing more magnificent in the world than the operation of the railroads of North America. Taken as a whole there is no finer type of men than the rank and file of operating department employees. Every way you look at the proposition there is an improvement over what existed twenty years ago. SUPERINTENDENT (Western).

FRENCH CONTROL OF SPANISH RAILWAY.—When the president of the Southern Railways of Spain died last year the British Government purchased his interest in the railways in order to keep the line, which serves important British mining interests, from falling into German hands. By agreement with the French Government, the shares so purchased have been transferred to the Andalusian Railway Company, a French concern, which has long wanted to get control of the Southern Railway, which must not be confused with the Great Southern of Spain Railway, in order to secured a monopoly of the southwestern corner of Spain.—*The Engineer.*

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., October 29.

I. C. C. INVESTIGATING CAR SHORTAGE

The Interstate Commerce Commission has instituted an active investigation of the causes of and possible remedies for the present acute car shortage, the extent of which is indicated by the report of the American Railway Association Committee on Relations between Railroads showing a net shortage as of September 30 of 61,000 cars, the largest net shortage on that date in 10 years. As reported in last week's issue of the *Railway Age Gazette,* the commission has assigned some of its boiler and safety appliance inspectors to investigate complaints of car shortage made by shippers in various parts of the country, and on October 28 the commission announced that Commissioner McChord will hold an informal conference on car shortage conditions at Louisville, Ky., on Friday and Saturday of this week, November 3 and 4. It was announced that this conference had been called in response to urgent requests of shippers, and that representatives of all the southern carriers, including those reaching the Gulf, and all eastern carriers, including those reaching the seaboard, will attend, as well as representatives of some of the western roads and of state commissions. This indicates that the effect of the enormous volume of export traffic on the car supply will be a particular subject of inquiry. The announcement says that shippers charge the railroads with receiving cars for export without assurance of water shipping facilities and permit their use for storage, and that the originating lines claim that their cars are not promptly returned to them.

The railroad representatives are to be asked to discuss car distribution, delays in movement and unloading, return of foreign cars to owning carriers, penalties for misuse of equipment, measures for securing relief, and generally all conditions affecting the subject. In addition, the roads have been requested to make answer to the following list of questions:

1. How many of your cars were off your lines on November 1, 1916? (Give character of equipment.)
2. How many foreign cars were on you line at said date? (Give character of equipment.)
3. What effort have you made to have your cars returned to your lines and what responses have you had to demands therefor?
4. What restriction, if any, do you apply to use of your equipment? If you have any restrictions state nature of same and reasons therefor.
5. Do you favor any particular traffic in distribution of cars, and if so what traffic and what are the reasons for so favoring it?
6. Is there any particular traffic that you have felt warranted in giving less than its ratable proportion of available cars, and if so name the commodity or commodities and give reasons for your action with reference thereto?
7. Have you any reason to believe that employees are discriminating between shippers in distribution of cars?
8. Is the present traffic in your territory abnormal for this season of the year, and if so to what extent?
9. How much additional equipment would be required to take care of all the traffic now being offered?
10. What percentage of your equipment is out of service by reason of not meeting with interchange requirements?
11. What proportion of your equipment has been repaired within past six months so as to make it fit for the service for which it is intended?
12. How many cars have been scrapped or retired during past 12 months? (Give class and description.)
13. How many cars have been placed in service during past 12 months? (Give class and description.)
14. How many new cars have been ordered in past 12 months and when do you expect delivery? (Give class and description.)
15. To what do you attribute the present acute car shortage?
16. Have you any suggestions as to how this condition may be now relieved or prevented from recurring?
17. Are shippers co-operating with you in endeavor to relieve situation?

The commission has also indicated its intention of keeping more closely informed regarding the conditions relating to the question of car supply by issuing orders requiring the carriers to file semi-monthly reports of freight car requirements and supply and quarterly reports of the condition of freight cars.

Beginning as of October 15 railroads whose operating revenues exceed $1,000,000 a year are ordered to compile and file in the commission's division of statistics a semi-monthly report showing: number of carloads of freight awaiting cars;

number of empty cars available for loading; number of empty cars moving in trains; number of loaded cars awaiting unloading; available car supply applicable to freight awaiting cars; total number of cars owned (or leased) by respondent; number of respondent's cars on respondent's road; number of other carriers' cars on respondent's road; total number of railway-owned cars on respondent's road; and number of private cars on respondent's road. These reports are to be compiled on forms prescribed by the commission as of 7:00 a. m. of the first and fifteenth days of each month and to be filed within 10 days thereafter.

Beginning as of January 1, 1917, the same roads are ordered to file quarterly reports showing the number of respondent's cars on respondent's road; other carriers' cars on respondent's road; total railway-owned cars on respondent's road; private cars on respondent's road; total cars owned (or leased) by respondent; units installed in service during last quarter; units withdrawn from service during last quarter; net increase or decrease in units in service; also the number and percentage of cars, under the first four items named, in shop or awaiting shop, including all freight-carrying cars not fit for service. These reports are to be filed within 10 days from January 1, April 1, July 1 and October 1.

There has been such a scarcity of coal in Washington, attributed partly to the shortage of cars, that fears have been expressed that many of the government buildings would have to be closed for lack of fuel. Shortly after the Interstate Commerce Commission had issued its announcement of the proposed hearing the elevator service in the building which it occupies was discontinued on account of lack of coal, and a committee of supply agents of the government departments that called on Secretary McGinty to see what the commission could do to hurry up their coal shipments were obliged to climb the stairs.

U. S. Chamber of Commerce to Discuss Railroad Situation

The widespread interest among the business men of the country in the important questions regarding the future course of railroad regulation which are to be investigated by the Newlands joint committee on interstate commerce, is indicated by the announcement that these subjects will constitute the main topic for discussion at a special meeting of the National Council of the Chamber of Commerce of the United States at Washington on November 17 and 18. The National Council is composed of one representative from each of the 800 or more organizations that are members of the national chamber and was created for the purpose of bringing about the continuous co-operation with the board of directors of as many business men as possible in every section of the country. It is said to be the opinion of the national chamber officials that at present no question is more prominently before the public or calls more loudly for sane and businesslike solution than that affecting the railroads. This is the first special meeting of the national council ever held, and, according to the announcement by Elliot H. Goodwin, general secretary of the national chamber, because of the interest in the hearings before the Newlands committee which are to begin on November 20, it is planned to devote much of the time of the four sessions of the council to the problem of getting rid of the conflict in the regulation of railroads between the state and federal governments and to means for the prevention of railroad strikes.

The national chamber took a leading part in the effort to settle the wage controversy between the railroads and the brotherhoods of train employees by trying to induce legislation providing for an investigation of the entire wage question by the Interstate Commerce Commission, and, as the wage question is to be one of the subjects considered by the Newlands committee, the chamber will again attempt to crystallize the ideas of its members on this problem.

It is planned to have prominent speakers on such subjects as the Canadian industrial disputes act providing for a public investigation for the purpose of permitting public sentiment to be formed in facts publicly brought out before a strike can take place, and on a plan for giving the Interstate Commerce Commission or some other commission power to fix the minimum wage for railroad employees, permitting labor to appeal to the commission just as a shipper brings rate questions to it for decision.

Interstate Commission Allows Advances in State Rates

In two instances within a week the Interstate Commerce Commission has allowed to go into effect advances in intrastate rates filed by the railroads in accordance with its orders, for the purpose of removing discriminations against interstate shippers caused by low rates made by state commissions. On the petition of Texas shippers who had asked the suspension of the new tariff filed by the Texas lines in accordance with the commission's order in the Shreveport case, the commission on Tuesday issued an order suspending until March 1, 1917 the proposed advances on lignite, cattle, stock cattle, cord wood and tan bark in carloads, but it allowed the remainder of the tariff to become effective on November 1. On October 25 it also allowed to go into effect the tariffs filed by the railroads in accordance with its order in the Missouri River—Nebraska case increasing rates applicable in the state of Nebraska, in spite of protests made by Nebraska shippers. In both states the attorney general has sought to prevent the higher rates becoming effective by application to the state courts and in both cases the railroads have secured injunctions in the federal courts restraining the states from enforcing the lower state commission-made rates. In both instances, therefore, the federal authority is still paramount. Although a state court has issued an injunction against 32 short lines in the state restraining them from making the new rates effective these roads were not parties to the injunction suit in the federal court restraining the Texas commission from enforcing its rates.

The southwestern lines filed through Agent Fonda in his Texas Lines tariff No. 2-B, rates between Shreveport and Texas points and between points in Texas. In removing the discrimination against Shreveport the railroads advanced rates throughout the state of Texas above those that had been made by the Texas commission and the shippers protested that in many instances the advances were so great as to seriously injure their business. The railroads agreed to make some adjustments that appeared necessary, at the hearing reported in last week's issue, but the commission evidently considered that the objections to the tariff were not serious except in the case of the rates which it suspended. At the same time, however, the commission ordered the case reopened for argument on the petitions filed with the commission and set a hearing at Washington for December 6 to consider to what extent if any the case shall be reopened. The Texas commission has indicated its intention of becoming a party to the case if the commission should suspend the tariff, but what action it will take in view of the partial suspension has not yet been made known. Thus far it has carefully refrained from taking any part in the proceedings before the Interstate Commerce Commission.

The Nebraska case is similar in many respects to the Shreveport case. The Nebraska commission on September 6, 1914, issued a general order reducing class rates in the state about 20 per cent. This disturbed the relation of rates from and to the principal distributing centers on the Missouri river and in interior Nebraska and a number of commercial organizations in Iowa, Nebraska and Kansas filed a complaint asking the interstate commission to remove the discrimination. The commission in its order in July held that the commission-made state rates were too low for application

as reasonable maximum rates between the Missouri river cities and points in Nebraska, and therefore too low to form the measure by which the discrimination found to exist should be removed. It therefore prescribed a scale of class rates for interstate business and ordered the roads to cease from discriminating against the interstate shippers by means of the lower state rates.

KANSAS CITY RAILROAD COLLECTION BUREAU*

By H. W. Myers
Manager of the Kansas City Collection Bureau

For years, the officers of the transportation lines of the United States have been trying to find a way to harvest the revenue of the railroads in an efficient, as well as practical way that would be satisfactory to both the railroads and their patrons. On account of the volume of the rapidly increasing business in the west, and the prospects of a continuous increase, resulting from the development of new territory, the question of the collection and protection of freight revenue became a very prominent subject with the credit officers and the agents' associations of the western lines, especially in Kansas City, Mo.

Various methods were submitted but the collection bureau plan appealed to the majority, and it was therefore decided to establish a bureau at Kansas City, if possible. We succeeded in this, and inasmuch as this is the only arrangement of the kind with which I am acquainted, I will of necessity have to confine my remarks to the organization and operation of the Kansas City Railroad Collection Bureau, thereby indicating what may and can be accomplished at other large railroad centers throughout the United States.

I will not burden you by going over the constructive work of this organization; the fact that the organization was completed, is a demonstration in itself of the closest co-operation between the local agents and between the agents and their credit officers.

It was decided by the attorneys of the transportation companies interested, that it would be advisable to first organize a clearing house association, and to form the Kansas City Railroad Collection Bureau under the Kansas City Railroad Clearing House Association. We therefore organized the clearing house, which is composed of the credit officers of the 14 lines entering Kansas City, and organized the Kansas City Railroad Collection Bureau under an executive committee of three credit officers, namely, E. L. Copeland, secretary and treasurer, of the Atchison, Topeka & Santa Fe; C. M. Carter, assistant treasurer, of the Chicago, Burlington & Quincy, and R. J. McCarthy, vice-president, of the Kansas City Southern, who dictate the policy and promulgate the rules under which the bureau operates.

I will quote the rules and regulations adopted.

The following-named railroad lines, doing business in Kansas City, Mo.: Atchison, Topeka & Santa Fe, the Chicago & Alton, Chicago, Burlington & Quincy, Chicago Great Western, Chicago, Milwaukee & St. Paul, Chicago, Rock Island & Pacific, the Kansas City Southern, Kansas City Terminal, Missouri, Kansas & Texas, the Missouri Pacific, Quincy, Omaha & Kansas City, St. Louis & San Francisco, Union Pacific and Wabash Railway hereby associate themselves under the name of the Kansas City Railroad Clearing House Association, with headquarters in the city of Kansas City, Mo., for the purpose of organizing a bureau for the collection of transportation charges.

The business of the association shall be managed and controlled by an executive committee of three persons, who shall be elected by the members of the association, and shall continue in office until their successors are elected. At the first election, one member shall be elected for a term of three years, one for two years and one for one year, and thereafter one member shall be elected annually for a term of three years.

Annual meeting of the association for the election of the executive committee, and for the transaction of such other business as may be presented, shall be held on the second Wednesday in June of each year at such place in the city of Kansas City, and at such hour as may be designated by the executive committee who shall cause notice thereof to be sent to each member.

The executive committee shall organize a bureau to be known as Kansas City Railroad Collection Bureau for the collection of transportation charges for all members; shall appoint a manager for such bureau and fix his compensation.

The organization of the bureau shall be substantially as follows, but the committee shall have the power to make from time to time such changes in the methods of transacting business thereof as may seem to it expedient.

This bureau shall be in charge of a manager, appointed by the executive committee, who shall, with the approval of the committee, employ such clerks and collectors as may be necessary for the transaction of its business.

The business of the bureau shall be the collection of all bills for freight, demurrage, switching and other charges accruing in connection with the transportation of freight for all members of the association, except such bills as may be paid direct to their respective agents prior to the delivery or shipment of freight, and also excepting bills due from one transportation company to another or other joint agency which might be established for the collection of bills covering live stock.

Bills must be sent daily to the bureau, Sundays and holidays excepted.

The manager of the bureau shall arrange to collect immediately all charges on grain or other shipments which require prompt attention in order to protect the line delivering to elevators, industries or connecting lines.

For convenience of patrons, one check may be received for the aggregate amount of bills paid at any one time by any person or firm, such checks to be drawn to the order of ..... Bank, account of the Kansas City Railroad Collection Bureau, and all bills shall be receipted in its name. In order that such receipt may be good as against the individual members of the association, agents shall stamp all bills before sending them to the bureau:

Pay.....Bank,
Account Kansas City Railroad Collection Bureau.
.....Railroad.
By.....Agent.

The manager of the bureau shall be required to consult with the executive committee in regard to the matter of accepting blanket or other bonds from shippers to insure payment of charges, and to be guided by its directions.

The manager of the bureau shall not have authority to cash checks received in payment of bills, but shall endorse them for deposit to the credit of the bureau in some bank to be selected by the executive committee, approved by the association, and shall deposit all receipts, both checks and currency, in the bank so selected. Against this deposit the manager of the bureau shall draw checks daily for the distribution of all collections made; such checks to be drawn to the order of the respective railway companies, members of the association, and to be remitted to the respective agents with a list of the bills covered thereby, or shall be deposited according to instructions of the financial officer of the railway company.

Definite instructions must be given by the executive committee to the depository bank to the effect that no checks against the funds of the Kansas City Railroad Collection Bureau issued by the manager shall be honored unless drawn in favor of a member of the bureau.

In the event that exception is taken to any bill, the collector shall obtain written statement of the exceptions, such statement and all parts of the bill shall be returned by the manager to the local office, and receipt taken for it. When correction is made, it shall be treated as a new bill, and take its regular course.

Bills shall be considered payable on presentation, but for the accommodation of patrons who pay by voucher, a reasonable length of time will be allowed to voucher their bills.

If bills without sufficient reason are not paid when due, in accordance with the above provision, the manager shall at once notify in writing the agents of all members.

The expense of the bureau shall be divided between the members on a basis of number of bills collected and total amount collected, using an average of the combined proportion. Illustration: Percentage of bills collected, 20; percentage of money collected, 10; proportion of expense chargeable to interested line, 15 per cent.

The distribution shall be made by the manager, who shall on the first day of each month furnish each member of the association with a statement showing the total number and amount of bills collected, the number and amount collected for the member to whom the statement is sent, the total expenses of the bureau for the preceding month, and the amount apportioned to the member to whom the statement is sent. On the following day the manager shall make drafts on the respective members for the amount found to be due from each, payable to.....Bank, account Kansas City Railroad Collection Bureau, manager, such drafts to be promptly paid when presented and correction of error if any should be found, made in the following month.

This association to become effective must be entered into and approved by all Kansas City lines, but any member shall have the privilege of withdrawing upon serving six months' notice in writing after the expiration of the first five months. It is further agreed that upon two-thirds vote of the association it can be disbanded at any time within the first six months.

I will next take up briefly the operation of the collection bureau:

All bills collected by the bureau are listed by each railroad daily on form six made in triplicate, at the close of each day's business, and delivered to the collection bureau the same evening. One form is receipted by the collection bureau and returned to the local freight agent. The bills are sorted and necessary manifesting done the same night. Grain, hay and produce bills are collected on presentation the day following the receipt of the bills from the railroads. Miscellaneous

*From a paper read before the annual meeting of the Society of Railway Financial Officers at Washington, October 19, 1916.

carload bills are manifested by the bureau on form seven in duplicate, the bills from all lines for one consignee being listed on one manifest. A copy of each miscellaneous carload bill and manifest is retained by the bureau until payment is received, affording practically a ledger account with each patron for all railroads.

Such bills as are to be distributed by mail, are deposited in the post office not later than 4:30 a. m., which insures first morning delivery to payor. Three collectors are employed in the collection of grain, hay and produce bills, which bills are presented not later than 10:00 a. m., and collected not later than 4 p. m. the day following receipt of them from the railroads.

Street collectors are employed only where bills are to be paid on presentation, which is the case in commission business, such as grain, hay and produce. All other settlements are delivered to the bureau by the patron, or by mail. All transfer companies to whom credit is extended, are under bond, and settlements are made twice a week, namely, on Tuesday and Friday, according to the stipulations of the blanket bond, form ten, which must be endorsed by a responsible surety company.

Large shippers, who handle heavy shipments of l. c. l. freight, and use their own teams, also settle twice a week. Where these arrangements are made, the agents list the bills to the bureau on the day before settlement days agreed upon, setting same out in detail in triplicate on form six, and the bills are payable on the day following presentation.

When collections are made, the original statement copy of form six is returned to the road with the remittance, one copy being retained in the bureau files, and one copy accompanies the bills to the payor, together with form eight; the form six thereby serving the purpose of a sub-cash book for both the bureau and the local office, and eliminates the necessity of re-writing collections in a sub or general cash book.

Miscellaneous carload bills are payable on delivery of cars to consignees, or in 48 hours after presentation of the bill.

All collections received during the day are distributed by check during the same night, the checks being delivered to the local offices by eight the following morning. All funds collected by the bureau are deposited in the bank by 9:30 the day succeeding collection.

Incorrect bills returned by consignee must be accompanied with suitable explanation, and with supporting papers; less than carload bills are returned to the local offices attached to the form six on which they were originally listed to the bureau. Incorrect carload bills are transmitted to the agent on form six, accompanied by statement on form nine, or letter when necessary.

A uniform card index of patrons is maintained, and no bills are sent to the Kansas City Railroad Collection Bureau for collection from patrons whose names do not appear therein.

A committee was appointed by the agents' association, before the Kansas City Railroad Collection Bureau was opened, of which I was a member, for the purpose of determining just what the cost of collections were, and what amount of money we would collect monthly, and I want to say here and now that we failed in our duty. Instead of being systematic in our check of time, postage, car fare, stationery, etc., we, after some discussion and some investigation through a series of reports with the agents, decided it was costing us about $2,350 to collect $2,500,000 which would be our average monthly collections. A report was made accordingly, and submitted to show the result of our efforts.

The business for all lines for the month of August, 1916, amounted to $3,350,437.69, while the cost of operating the bureau was but $2,140.71; this cost includes not only labor, but rent, light, postage, stationery, telephone service and in fact everything pertaining to the operating cost.

You will note by comparing the estimate with the actual amount of business handled in August, that we have gradually increased in receipts until the estimate made missed the actual figures practically $1,000,000 a month.

A comparison of the cost of operation on the other hand, shows we have gradually decreased until the cost last month for collecting $3,350,000 was but $2,140, or six cents per one hundred dollars.

The greater saving, however, is the saving of interest on the money which we place in the hands of the railroads more promptly. This is the epoch in the history of the railroad world when specializing is not only desirable, but necessary. If we wish to keep apace with the times, we must adopt the same advanced methods as the commercial world, or, better still, improve them if possible. We are specializing in the collection of transportation charges.

It is a well known fact that when collections were being made by the railroads themselves, the payors were fully acquainted with the fact that they must practically clear their accounts at the end of the month, in order to protect the agent from severe criticism, therefore, they would keep falling behind from the first of the month, until the last, promising the collector or agent that they would make settlement within the next few days, or the following week, stating they had been so busy they could not check the bills, or offer some other equally frail excuse, until the end of the month was reached, at which time they would make a heavy payment. Under this plan, the public had the use of the money, and the railroads, who are heavy borrowers, at all times, were paying interest on a vast amount of money unjustly. Under our plan of collection, we are just as rigid one day as another, and if bills are not paid when due, we are immediately after the payor, and insist that remittance be made.

The rate making bodies of our transportation lines base their freight rates, as I understand it, on a cash basis, and it is fully understood at the smaller stations that freight charges are cash, while in the larger cities, where the greater volume of business is handled, we have, unfortunately, fallen into the practice of extending credit on freight charges, which courtesy has been taken advantage of to such an extent that there are millions and millions of dollars in the hands of the public in the United States today, that rightfully belongs in the treasuries of the railroads.

In the commercial world, it is the general practice to allow a per cent off for cash, showing conclusively that their prices are based on a credit basis, thereby permitting a reduction in the cost, for cash. Unfortunately, our rates are just the reverse. If we were permitted to add two per cent to our published rate on all credit business, the transportation lines could well afford to extend a line of credit, such as is now being extended in the larger cities, but inasmuch as our rates are compiled on a cash basis, we practically reduce our tariffs when we extend credit for any length of time.

It has been estimated that through specializing on collections through a bureau, we have created a saving in interest alone of many thousands of dollars yearly, and I believe I am conservative when I claim we are making a saving of from eight to ten thousand dollars yearly in salaries.

There were 34 collectors in the service of the railroads at Kansas City drawing about $2,400 monthly before we started, and four or five of the larger lines had supervising collectors, paying them $75 or $80 per month each, making a total roll of about $2,800. Our entire labor roll last month with an increase in business of $1,091,000 over the same month a year ago, was but $1,633.

The increase in business in Kansas City the past year has been from 25 to 30 per cent. Notwithstanding this large increase, we have taken care of the collections for all lines entering Kansas City with a total payroll of but $1,633 monthly. It is fair to assume that with an increase of 25 to 30 per cent in business, it would have been necessary for the roads to increase their expenses accordingly, but if the

roads had been able to take care of the collections with the same force, at an expense of $2,800 per month, and we with an expense of $1,633 per month, we have created a saving of $1,200 per month, or $14,400 per year. I think I am very conservative therefore when I say the saving in the cost of collection of freight charges is from eight to ten thousand dollars yearly.

Another benefit, which is one of the most, if not the most, important benefit of the collection bureau, is the separation of credits from the solicitation of freight by the traffic department. It is, I believe, unnecessary for me to dwell on this point, as you all realize the importance of discontinuing such a vicious practice, as well as the magnitude of its possible growth if it is permitted to exist.

We also derive a benefit from the more correct revision of freight bills. This is brought about by the rendition of a comparative statement monthly, showing the percentages of bills returned to each railroad for correction. This not only creates competitive ideas in the minds of the agents, but inasmuch as all bills returned can easily be obtained by the agent personally, it gives him an opportunity of ascertaining and correcting the faults. This has been fully proven by the fact that while our percentage of bills returned in the early existence of the collection bureau was 8 per cent, it now runs about 2½ to 3 per cent.

For the past number of years, the railroads have been making a decided effort to create harmony between themselves and the public. The organization of collection bureaus throughout the United States is in my opinion a long step in the right direction. Some of those present will discredit this statement, but I believe we can prove it logically. The first and most substantial proof I will offer is, a house to house canvass of the shippers with whom we transact business showed 94 per cent in favor of this plan of handling collections. Their reasons are obvious—formerly fourteen collectors called at their places of business, visited with their bookkeepers or clerks while they were verifying the bills, and fourteen checks were written to fourteen railroad agents; now, the business is handled by mail, with no loss of time, and one check serves the purpose of fourteen.

When we have the approval and support of the public in perfecting a plan or method of handling business with the public, we have created a more satisfactory and harmonious condition between the public and the transportation lines.

When we remove disputes over the payment of bills from the local, general or traffic agents of our individual line or lines, we improve the friendship of the public to the railroads themselves. The collection bureau was in very bad repute for a time with the public, and permit me to say the fault was ours. When the bureau was opened, we lacked system throughout, which resulted in duplicate collections, and demands for payment of bills that had previously been paid, and many other annoyances. The Commercial Club even called a meeting of the shippers with a view of our abolition, but they had waited too long; we had succeeded in completing our organization and adjusting our differences before the date set for the meeting and a vast majority of the big shippers present were in favor of its continuance. One of the healthiest signs of the satisfaction of the public to my mind is, that in the face of the very bitterest opposition by some, caused by our early inefficiency, the public practically became a unit in supporting the plan, as soon as our internal troubles were adjusted, and our position and purpose was explained and understood, until now, with 94 per cent of the shippers in favor of the Clearing House or Bureau, we probably could not abolish it if we cared to.

The local representatives of the packing interests are well pleased in the handling of their accounts by the Kansas City Railroad Collection Bureau. Formerly, they would make up their settlements to the railroads individually, transmitting the bills and checks to the lines for signature. The bills would not be returned in all cases promptly, but would come back to them in piece-meal, each line checking the bills when it was convenient. Under our method of handling, the packers make their settlements for all lines at one time, and deliver the settlements to us, and on the day of receipt of the settlements, the entire settlement is checked and the bills receipted and returned. This is done not only for them, but all other large industries.

We must not overlook the fact that close collections by one line as against the lax methods of another, result in the ultimate diversion of business against the line that is the more rigid; under the collection bureau plan, the rigid lines are protected against the loss of business from this cause.

I also want to call your attention to the fact that we have in effect a blanket bond covering all railroads, which bond is furnished by grain and hay dealers, thereby protecting the freight charges until the board of trade weights are secured, enabling the railroads to pass the bills on the correct weight, eliminating overcharges and undercharges and the expense and annoyance incident to the adjustment of them.

There are a number of lines in Kansas City that handle very little grain, and, inasmuch as the minimum bond issued is $1,000, you can readily see the expense to the patron of furnishing sufficient bonds to protect all lines, when we formerly demanded an individual bond for each line. Under our plan, all lines are accorded the same protection, and all lines are protected. These bonds are furnished by grain firms, hay dealers and some other firms, when we feel that occasion demands.

We also maintain a uniform list of patrons, under the index card file system, and when a name is added to our list, a card is forwarded to all lines, giving the name of the firm, and location; when we discontinue handling the account of any patron, notice is sent to all lines and the card is removed from the file.

I state without fear of successful contradiction, that the present plan of collecting freight charges in Kansas City has proven successful. We have not reached the acme of perfection which is desired by all organizations, but any business of any importance is always susceptible to improvements, and corrections, and experience will doubtless bring some of the defects to light, and suggest necessary remedies for them.

I know we have taken some rapid strides in the right direction in the past year or so, which should be accredited to the natural evolution of a new business, started without a model by which to be guided, resulting in a definite, decisive, efficient organization operated on a systematic basis, that can be installed in any large city without causing friction or dissatisfaction.

The fundamental principles underlying the plan of uniform collection through an office operated outside of the railroad agencies are sound and feasible, and in anticipation of a further expansion of business for the railroads, and the importance of protecting their earnings in such a way as to avoid loss from industrial failures, limitations must be placed around the accumulation of outstanding accounts, bearing in mind always the privilege of verification by industries handling a large volume of business. We should have installed a bureau in Minneapolis, St. Paul, Council Bluffs, Omaha, St. Joseph, St. Louis, Chicago and many other cities long before this, thereby strengthening Kansas City, as well as benefiting both the public and the railroads; it should, in fact, be a national plan.

Discussion.—In the discussion which followed it was brought out that the manager of the collection bureau was made the agent for each road individually, so that he was empowered to give a legal receipt for freight charges which were collected by the bureau. It was pointed out that whereas Mr. Myers had commented on the increase in amount of money collected, this did not accurately measure the work of the bureau, since it was no more troublesome or expensive

to collect a bill for $2,000 than for $1,000, and much of the increase in business during the last year had been in the nature of bigger bills for the same shippers rather than an increased number of bills.

I. C. C. REOPENS HEADLIGHT CASE

A hearing was held at Washington on October 30 and 31 before the members of the Interstate Commerce Commission to enable the railroads to present additional testimony in connection with the commission's order requiring locomotives to be equipped with high-power headlights with sufficient intensity to enable persons with normal vision, in the cab of the locomotive, to see a dark object the size of a man for a distance of 1000 feet, under normal weather conditions. The commission has postponed the effective date of its order until January 1 and the hearing was called for the purpose of taking testimony regarding a series of tests made with electric headlights on the New York Central just outside of New York on September 28, at which Commissioner Clark and the officers of the commission's boiler inspection department were present.

The hearing at once developed into a contest between the representatives of the railroads and the officers of the engineers' and firemen's brotherhoods, who challenged the fairness of the test, which they had refused to have anything to do with, and sought to prevent the introduction of further testimony. After a day and a half of testimony regarding the test the commission granted the request of the railroad attorneys, C. C. Paulding, solicitor of the New York Central, D. E. Minard, assistant general solicitor of the Erie, and S. B. Lloyd, assistant general counsel of the Pennsylvania, and ruled that each side should be allowed to present 20 witnesses before an examiner and that the evidence need not be confined to the New York test. This gave the railroads an opportunity to put on the witness stand a number of locomotive engineers, who testified that the dazzling glare of the electric lights obscured signals and was dangerous. The brotherhoods also expected to call as witnesses engineers to testify in favor of the electric lights. W. S. Carter, president of the Brotherhood of Locomotive Firemen and Enginemen, said he proposed to call as witnesses the representatives of the commission who were present at the test and he also asked the commission, before making any change in its order, to have tests of its own made.

At the opening of the hearing Mr. Carter told the commission that the New York test had been conducted expressly for the purpose of proving that the headlight order was impracticable, and he asked that, as the commission was represented at the test, it pass on the results without further hearing. When Chairman Meyer said that the case had already been reopened for further testimony he asked that the witnesses be limited to those subpoenaed by the commission. Mr. Paulding said that as serious charges had been made against the fairness of the test he wished to introduce testimony to meet them and he also wished to put on the stand a number of engineers. The roads had been taunted, he said, by statements that they have been unable to get engineers to testify in this case. At the hearings last year only two engineers were willing to testify for the railroads and there had been considerable difficulty since in getting engineers to testify, he said, because those two had been expelled from the brotherhood because of their testimony. In spite of this fact, however, he said, a large number of engineers who are familiar with the operation of high-power headlights were willing to testify "under proper safeguards."

Chairman Meyer said that if practicable the commission wished to confine the witnesses to one representing the carriers, one representing the employees and one called by the commission. A. G. Trumbull, assistant to the mechanical superintendent of the Erie, testified regarding the tests for the roads. A. G. Pack, assistant chief boiler inspector, was called as a witness by Mr. Carter, and G. E. Murray, headlight electrician for the Chicago & North Western, was called as a witness for the commission.

Mr. Trumbull gave a detailed description of the tests, in which steam and electric locomotives were used, equipped with 250-watt, nitrogen bulb electric headlights furnished by the Pyle-National Company, with 9 by 18 in. reflectors. The headlights were adjusted by a representative of the headlight company. He said that when the locomotive on which he was riding was moving north and rounding a curve, facing three locomotives standing headed south, equipped with electric headlights, the effect was to seriously interfere with his vision. As he approached the opposing locomotives, it was impossible to tell whether any hand signals were being given and indications of the automatic block signal lights on a signal bridge across the track between him and the opposing locomotives were greatly confused. The green light was completely obliterated until the locomotive on which he was riding approached within a distance of about 500 feet, the red light was rendered very much less distinct and the yellow light appeared white, and he was not able to distinguish the signals correctly until within a distance too short in which to stop, except under the most favorable conditions. He also saw confusing reflections from other signal lenses. He was unable to distinguish a flagman at as great a distance as he could under normal conditions and the light from the flagman's lantern was obscured. On one test he missed the flagman entirely. The rear markers on a train ahead were also rendered much less distinct. A red marker was mistaken for yellow by several mechanical officers and as the locomotive approached the bridge the lights were obscured and he was unable to see any of them for a time. White classification lights on the locomotive ahead were practically invisible for distances exceeding 200 or 300 feet. In the tests to see at what distance objects on the track could be seen, a man dressed in dark blue overalls walked down the track toward the locomotive and the observers in the locomotive indicated when they saw the "object" by blowing a whistle, whereupon the locomotive was stopped and the distance was measured. John McManamy, assistant chief inspector of locomotive boilers, thought he saw the object at a distance of 2,389 ft., but after the distance had been measured he asked for a re-test and saw the man at a distance of 994 ft. A. G. Pack, assistant chief inspector, blew the whistle on a distance of 772 ft. and various railroad mechanical officers blew the whistle at distances ranging from 552 to 764 ft. The eyes of the railroad officers were tested afterward and they were found to have normal vision according to the standards prescribed for locomotive engineers.

Mr. Trumbull said these tests had confirmed his opinion that for congested suburban territory with multiple tracks and a large number of signals the high-power headlight is positively dangerous.

Mr. Carter said that as no representatives of the brotherhoods were present at the hearing he would ask Frank McManamy, chief inspector of locomotive boilers, to cross-examine the witness. Mr. McManamy asked why dimmers had not been used on the lights during the test. The witness replied that the order permitted the use of dimmers only when standing at stations or in yards. Mr. McManamy also sought to show that the tests were not conducted under representative conditions and that the Erie has some signals which it is not possible to see in time to stop within 500 feet. He also asked if fusees were not used as an additional safeguard to enable engineers to see flagmen, and showed that the witness had had comparatively little recent experience in riding locomotives at night. Mr. Carter also questioned the manner of conducting the test, but the witness said it was conducted under actual operating conditions.

Mr. Pack testified that he had run an engine with an electric headlight for 11 years on the Colorado Springs & Cripple Creek District, before becoming connected with the commission, and had never experienced any difficulty with them. Although he admitted that his road was mostly single track with no block signals he said he ran into a station facing an electric headlight on the locomotive of another road and could see the order boards back of the light as plainly as he could if it had been an oil headlight. He read from a program prescribing the conditions under which the test was conducted, which he said he had seen before going to New York for the test. The railroad lawyers asked that it be put into the record. Mr. Pack said that he had never experienced any difficulty in seeing flags or reading signals governing the track on which he was running, with electric headlights, that he never saw any "phantom" signals or confusing indications caused by high power lights, nor any other conditions that would interfere with safe operation if the rules were observed. He regarded high-power headlights as one of the greatest safety devices yet used on a locomotive. Cross-examined by Mr. Paulding he said that he was having trouble with his eyes on the night of the test, caused by a pair of new glasses, that some steam leaking from the locomotive occasionally interfered with vision, and that the headlights used did not seem to be giving results up to standard. He said he had interviewed more than 1,000 engineers who had operated with electric headlights and had never heard one express an unfavorable opinion of them.

Mr. Murray testified in favor of the electric headlights, saying they had given satisfactory results on the North Western, but that during the tests in New York he thought that the lights were not up to standard. He judged from the color of the light that it was below 500,000 beam candlepower. Mr. Paulding said that by actual measure the candlepower was 550,000. Mr. Murray said that the requirement of the commission would relieve his company from observing state laws with even more rigid requirements, and in reply to questions by Commissioner Clark he said he had never known of an accident on his road caused by the headlights of the nitrogen bulb type. Asked whether he thought the proposed rule of the commission was a feasible one for all roads he said it would be necessary for each road to study its own conditions and to adopt the type of light most suited to its requirements. In reply to a question by Chairman Meyer he said he did not raise any question about the fairness of the test.

Mr. Paulding then asked permission to introduce additional witnesses, saying that other tests under similar conditions had been made to which a large number of engineers had been invited as observers, that the railroad officials had a firm conviction that a uniform rule, except one with only minimum requirements, would not work satisfactorily on all roads, and they wished to offer witnesses who had had actual experience. This was opposed by Mr. Carter, who said the roads had had ample opportunity to present witnesses but had avoided putting on real experts, and that the New York tests were unfair both to the employees and to the commission because they were ex parte. He preferred to have the case rest, but said that if the railroads were to put on more witnesses he would want to do the same and would call the representatives of the commission who were at the test. W. S. Stone, grand chief engineer of the Brotherhood of Locomotive Engineers, said he hoped the commission would not extend the scope of the hearing but that there are 28,000 men now riding behind electric headlights and that if the railroads brought in additional witnesses he could get 500 men "who will testify against anything they may say." The commission took a short recess and announced that each side might put on 20 witnesses.

On Tuesday afternoon the hearing was resumed before Examiner-Attorney E. W. Hines. C. P. McGinnis, special representative of the Pyle-National Company, who had adjusted the lights before the New York test, was called as a witness for the railroads. He said he had left nothing undone to get the best results possible and that the lamps used had been sold from the regular stock, but that they had not given entirely satisfactory results. He said that there was a wide variation in reflectors and lamps and that if it had been possible to try out several lamps and reflectors it would have been possible to match up a lamp and a reflector that would give better results. He had never had any complaints but had occasionally found in tests that he could not get the required distance with the lights. He said that there are about 40,000 Pyle-National headlights in service.

Several locomotive engineers gave testimony regarding the effect of the high-power lights in obscuring signals. J. Doherty, road foreman of engines of the Michigan Central, who was a locomotive engineer up to ten months ago, said that he had never run an engine equipped with an electric headlight but that in the Chicago suburban territory where the Illinois Central has engines which are so equipped, the light was so intense that when approaching them it was impossible to see signals back of the lights until they had passed and that it was impossible to judge the distance of an opposing train. Also at Michigan City where his track is paralleled for a short distance by the Chicago, Indianapolis & Louisville, the electric headlights used by the latter obscured his view of a three-position quadrant signal on his own track. He had been present at tests on the New York Central at Harmon and had been unable to see signals when facing an electric headlight, or the red signals had appeared green. He thought that electric headlights were a positive menace to safe or prompt transportation on multiple tracks and said that the better the light the worse it is in a fog because of the effect of the moisture in the air on the rays of light. He said that if dimmers were used when passing stations or signals they would have to be used most of the time on a busy railroad. Mr. Doherty said that the views of most of the engineers he has talked with coincide with his. Mr. Stone asked how he had managed to avoid accidents long enough to be promoted if the headlights were so dangerous. Mr. Doherty replied that he had managed to get along without doing any damage by stopping or slowing down when passing the electric lights. Mr. Carter emphasized the fact that Mr. Doherty had recently been promoted and asked if it was because he had expressed an unfavorable opinion of the electric light. He also asked if Mr. Doherty had not been largely employed at tests since his promotion. Mr. Doherty said he had been at but two tests.

B. B. Milner, engineer of motive power, New York Central, described tests conducted on October 26, at which a large number of engineers and representatives of the Public Service Commission were present. O. P. Keller, an engineer on the Manhattan and Broadway Limited trains of the Pennsylvania, who was present at the test, said that he would rather have no headlight than the electric blinding light in the eyes which prevents seeing signals or gives false indications. If dimmers were used when passing trains or stations they would be required most of the time on a busy railroad.

HEATING OF PASSENGER CARS IN ARGENTINA.—By a decree of August 21, 1916, the Argentine government has made the heating of passenger cars compulsory during the winter months. At present trains are not heated. During the last two years Argentina has experienced abnormally cold winters and the traveling public has been subjected to great discomfort. The decree states that the Direction General of Railways will, after an agreement with the several companies, fix dates for the presentation of plans and the installation of heating appliances.

General News Department

The United States Civil Service Commission announces an examination, November 28, for examiner of accounts for the Interstate Commerce Commission; salaries from $1,860 to $3,000. Applicants must be not over 48 years old.

The four arbitrators who were selected several weeks ago, by fourteen Midwestern railroads and the officers of the Switchmen's Union, to agree upon two neutral arbitrators to complete an arbitration board for the settlement of the pending wage dispute have failed to agree, and on Wednesday sent a joint telegram from Chicago to W. L. Chambers, of the United States Board of Mediation and Conciliation, advising him of the failure. The government board will now select the neutral arbitrators.

E. P. Ripley, president of the Atchison, Topeka & Santa Fe, recently gave out a statement at Kansas City, Mo., to the effect that negotiations are under way with the Chicago, Burlington & Quincy to secure an entrance for the Santa Fe into St. Louis. The arrangement will involve the construction of a line from the Burlington at Mexico, Mo., to the Santa Fe at Carrollton, about 75 miles. This line has already been located by the Burlington. In addition to giving the Santa Fe access to St. Louis, it will give the Burlington a low grade line from St. Louis to Kansas City. The shortest existing line between Mexico and Carrollton is that of the Wabash, 111 miles.

Two more of the western railroads negotiating with the shopmen's unions as to wage increases have settled their differences with the men. The Chicago & Eastern Illinois has granted a general increase of 2½ cents an hour to all machinists, boiler makers, blacksmiths, sheet metal workers, electrical workers and their helpers and apprentices with the exception of machinist helpers, whose rate has been increased to 24½ cents an hour. An eight-hour day has been granted for the back shops but the remainder of the men will continue to work nine hours. The shopmen on the International & Great Northern have been granted an increase which will total about $100,000 a year on the whole road. The increase is retroactive dating from October 1.

The Kentucky Court of Appeals, at Frankfort, Ky., October 5, affirmed a fine of $500 against the Louisville & Nashville for failing to have a coach for colored people on a transfer train at Cincinnati. The court held that the law requires separate cars for negroes on all trains regardless of whether there are any negroes desiring to ride on that particular train. The fine was for an offense committed in April, 1915. The road also was indicted for operating the same train without the separate car, on May 1, 1915. The Court of Appeals holds that the offense is continuous and that each day the law is violated does not constitute a separate offense, but only cumulative evidence of the same offense. Consequently, the conviction under the indictment for operating the train in April is a bar to prosecution under the indictment for operating the train May 1; the second indictment was returned before the conviction under the first one.

Marketing Southern Pine Abroad

A special committee of the Southern Pine Association appointed to devise plans for the organization of an export selling agency, met at New Orleans, La., on October 17. Edward Hines, of the Edward Hines Lumber Company, Chicago, chairman of the committee, emphasized the necessity of co-operation by the manufacturers of Southern yellow pine in the marketing of their products in foreign countries following the termination of the war. A resolution was adopted providing for the appointment of committees of three manufacturers in each of the seven states from which Southern yellow pine is exported, and the organization of a general committee including these state representatives, to perfect a scheme for co-operation in foreign marts. A number of those present, representing firms which had a large export business in the past, expressed a desire that the identity of their companies should be maintained in any selling organization which they might join, and the sentiment of the meeting was that this could be done without interfering with the work of the agency. M. B. Nelson, of the Long Bell Lumber Company, Kansas City, Mo., was elected permanent chairman of the committee.

The following companies were represented at the New Orleans meeting: Edward Hines Lumber Company, Chicago, Ill.; Kirby Lumber Company, Houston, Tex.; Gilchrist-Fordney Company, Laurel, Miss.; Bagdad Land & Lumber Company, Bagdad, Fla.; Sabine-Tram Company, Beaumont, Tex.; Stout Lumber Company, Thornton, Ark.; Great Southern Lumber Company, Bogalusa, La.; J. J. Newman Lumber Company, Hattiesburg, Miss.; Lutcher-Moore Lumber Company, Orange, Tex.; Standard Export Company, New Orleans, La.; H. Weston & Co., Logtown, Miss.; Eastman-Gardner & Co., Laurel, Miss.; Kaul Lumber Company, Birmingham, Ala.; Gulf Lumber Company, Houston, Tex.; Stearns Lumber & Export Company, Pensacola, Fla.; Jordan River Lumber Company, Kiln, Miss.

St. Paul Electrified 336 Miles

The Chicago, Milwaukee & St. Paul, on November 1, put in operation its third electrified district; the line from Deer Lodge, Mont., to Alberton, 110 miles. This makes the total length of line electrified, Harlowton to Alberton, 336 miles. The last district to be electrified, that from Alberton to Avery, is expected to be put in operation in January. With the completion of this section the total electrified mileage will be 440.

The Hudson Bay Railway

At Ottawa last week before the Canadian Royal Commission, W. A. Bowden, chief engineer of construction of the Department of Railways, gave a summary of the present condition of the Hudson Bay Railway.

He said that the railway would be about 425 miles long, and that the railhead would be at mile 332 this fall. The road, exclusive of rolling stock, will cost about $16,000,000, the harbor work another $10,000,000, and the elevator $1,000,000. The ruling grade will be 0.4 per cent.

"The problem is more complex than any other I have had to deal with," said the engineer, when asked what benefits are to be derived from this great expenditure. He outlined the advantage in distance. From the grain centers to the northern terminus, Port Nelson, the distance is the same as from Winnipeg to Fort William. The distance from Port Nelson to Liverpool is the same as from Montreal to Liverpool. Accordingly, in distance there is a saving by the Hudson Bay route equal to that from the head of the Great Lakes to Montreal. The cost of haulage over this distance is from 5 cents to 12 cents a bushel.

"The information we had when we started the work has proved very unreliable during the five seasons we have been working. For example, our information was to the effect that the route through Hudson Bay would be open to navigation about the last of June of the 1st of July. The facts are that it is not open until the last of July or the 1st of August. The date when it closed was not fixed in that early information. However, ordinary tramp steamers have left Port Nelson on October 23, and have gone through without damage by ice. A government tug went through on November 1, but the ice would have damaged a tramp. By having observation points at the straits to direct the boats to the open water, it is possible that the season could be lengthened past October 23."

"Would the grain be harvested in time to be shipped this way?" he was asked.

"For August the grain shipped would be that which had been left over from the year before. There is always some at the head of the Great Lakes at that time. The new grain would

come forward in September, and could be shipped in September and October."

"Before this great expenditure was undertaken," asked one of the commissioners, "were any steps taken to insure steamship service when the road is completed?"

"No, I do not think there should have been," replied the engineer, "because such a service would have been based on the worst conditions that might arise, and therefore at the maximum expense." He believed that for the first few years the government would have to buy or charter boats to demonstrate that the route was a safe and economical one. For example, in 1913, the insurance rate was guessed at, and was very high. There was a boat lost that year, with the result that the rates asked the next year were too high to be considered, and since then the government has carried no insurance on the boats going over the Hudson Bay route. During one season 38 boats went across the bay; and there have been no accidents during the past three years.

He explained that the harbor at Port Nelson was to be 20 feet deep at low tide, and 30 feet deep at the wharves. Thus, boats drawing more than 20 feet would have to wait for high tide to get to the wharves, but would have water to a depth of 30 feet when lying at the wharf. There is little settlement along the route of the Hudson Bay Railway, and most of the land is not suitable for cultivation.

Mr. Bowden gave the commission information regarding the canals from Lake Superior to Montreal, showing that with the completion of the Welland canal there would be a 24-foot route from Port Arthur to the head of the canals on the St. Lawrence river. Those canals are only 14 feet deep. He was asked whether the deepening of the St. Lawrence canals was to be carried out, and said that it had not yet been decided on. It is a disputed point whether it is advisable to deepen them as it might be more economical to use barges to carry the grain through them.

Proposed Municipal Railroad in Baltimore

The City of Baltimore, Md., is thinking of establishing a municipal railway, and the mayor has proposed to the officers of the city that appropriations looking to that end be made during the coming year. Mayor Preston presents the reasons for starting such an enterprise in the shape of a communication telling of the success of the New Orleans city railway, as follows:

"The muncipal railroad in operation in the city of New Orleans, the only municipally-owned railroad in the United States, is a terminal switching railroad, operated and controlled by the municipality. It is operated by 16 citizen taxpayers and the mayor, who is president of the commission, the members being appointed by the mayor with the approval of the council, who serve without salary. The purpose of this road is to supply comprehensive, economical and nondiscriminatory switching service. It transfers cars from railroad to railroad; from railroads to wharves; from wharves to railroads; from railroads to industries, and from industries to all the transportation outlets at a low and uniform charge, and is open in common to all the railroads.

"It is handled with its own equipment and the operation of any other railroad over the tracks of the public belt line railroad is prohibited by law.

"After successful operation of four years, the practical utility of the enterprise has been demonstrated and the project has been approved by popular vote (practically unanimous) on an amendment to the Constitution of the State of Louisiana. The charge for switching is two dollars a car for each movement, which movement includes both the delivery of the loaded car and the return of the empty. The New Orleans road is much longer than Baltimore needs, and I believe that the switching charges can be made much less, probably one dollar per car, and the switching could be done in Baltimore by electric or oil motors."

Mayor Preston, with other city officers, proposes to visit New Orleans.

The June Mechanical Conventions

The executive committees of the Master Car Builders, the Master Mechanics and the Railway Supply Manufacturers Associations will hold their fall meeting in the office of J. W. Taylor, secretary of the railroad organizations, in the Karpen building, Chicago, on November 10. The purpose of the meeting is to decide the time and place for holding the annual meetings and exhibit for 1917. Several cities have extended invitations to the associations, among them being Atlantic City Chicago and Cleveland.

Association of American Railway Accounting Officers

E. R. Woodson, secretary of this association, Woodward building, Washington, D. C., announces that, by a vote of a majority of the association's entire membership, the next annual meeting will be held in Richmond, Va., beginning May 30, 1917.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Next convention, October, 1917, San Francisco, Cal.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, East St. Louis, Ill. Next meeting, June, 1917, Denver.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—H. G. McConnaughy, 165 Broadway, New York.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Brown Palace Hotel, Denver, Colo.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, St. Paul, Minn.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 20-22, 1917, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June, 1917.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Next convention, December 5-8, 1916, Engineering Societies' Bldg., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Annual meeting, May 30, 1917, Richmond, Va.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J. Next meeting, May, 1917, Louisville, Ky.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Next meeting, October 31 to November 3, 1916, Hotel La Salle, Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connely, Superintendent of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting, September 18-20, 1917, Washington, D. C.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Tom Lehon, The Lehon Company, Chicago. Meetings with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

Freight Claim Association.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Annual convention, June 19, 1917, Banff, Alberta.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

International Railroad Master Blacksmiths' Association.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next annual meeting, August, 1917, Chicago.

International Railway Fuel Association.—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago. Next meeting, May 14-17, 1917, Hotel Sherman, Chicago.

International Railway General Foremen's Association.—Wm. Hall, 1126 W. Broadway, Winona, Minn.

Maintenance of Way and Master Painters' Association of the United States and Canada.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex.

Master Boiler Makers' Association.—Harry D. Vought, 95 Liberty St., New York.

Master Car and Locomotive Painters' Association of the United States and Canada.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 11, 1917, Chicago.

Master Car Builders' Association.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June, 1917.

National Railway Appliances Association.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago. Next convention, March, 1917, Chicago.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo., Regular meetings, 3d Saturday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 30 Church St., New York. Annual meeting, January 16, 1917, Waldorf-Astoria Hotel, New York.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

Railway Development Association.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next semi-annual meeting, November 9-10, 1916, La Salle Hotel, Chicago. Annual meeting, May 9-11, 1917, Louisville, Ky.

Railway Electrical Supply Manufacturers' Association.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

Railway Fire Protection Association.—C. B. Edwards, Office of the President's Assistant, Seaboard Air Line, Norfolk, Va.

Railway Real Estate Association.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.

Railway Signal Association.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September, 1917, Atlantic City, N. J.

Railway Storekeepers' Association.—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio.

Railway Supply Manufacturers' Association.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Associations.

Railway Telegraph and Telephone Appliance Association.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

Roadmasters' and Maintenance of Way Association.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Chicago.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Salt Lake Transportation Club.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

Signal Appliance Association.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

Society of Railway Financial Officers.—L. W. Cox, N. & W., Philadelphia, Pa.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga.

Southern & Southwestern Railway Club.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Traffic Club of Pittsburgh.—D. L. Wells, Gen'l Agt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

Train Despatchers' Association of America.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next meeting, June 19, 1917, Fresno, Cal.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio.

Western Association of Short Line Railroads.—Clarence M. Oddie, Mills Bldg., San Francisco. Annual meeting, November 15, 1916, Brown Palace Hotel, Denver, Colo.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Traffic News

A daily freight boat is now running between Chicago and Joliet, Ill., and Lockport. The venture is backed by the River & Canal Transit Company, Chicago. The route taken by the boat is through the Chicago river and the drainage canal. The Chicago terminal is at the foot of Orleans street.

The attorney general of Missouri has asked the appointment of a commission to take testimony in a test case of the state of Missouri against the Chicago, Burlington & Quincy, involving refunds by Missouri railroads of excess passenger fares collected while the legality of the state two cent fare law was being contested.

A recommendation of the Western Passenger Association that homeseekers' rates for 1916 be continued in 1917 was met with objection by some roads. The general basis of the 1916 rates is a charge of one and one-half fares plus $2 for a round trip between all points, with stop-overs at all stations. Tickets are sold the first and third Tuesdays of every month.

The Transportation Club of Indianapolis held a hallowe'en dinner on October 31, in honor of the Louisville Transportation Club, which made the trip to Indianapolis in a special car. Among those scheduled to speak were Joseph E. Bell, mayor of Indianapolis, and W. L. Park, vice-president of the Illinois Central, whose subject was "The Transportation Question."

The "Clarke Scale" applying to freight rates within the State of Nebraska was put into effect on October 26, following a decision of the Interstate Commerce Commission handed down last August. The "Clarke Scale" replaces the scale provided by Order No. 19 of the state railway commission and raises the freight rates from Missouri river to eastern Nebraska points, but reduces them to points in the central and western parts of the state. It puts all Missouri river shipping points on a parity with Omaha, where the distance is the same.

The Nebraska State Railway Commission has canceled its emergency order of October 4, requiring, in the face of the car shortage, that all railroads return to the delivering road cars received in switching. The action of the commission followed the filing of a formal notice by the Missouri Pacific that the order had been ignored, and an appeal taken to the state supreme court. As the appeal acted as a suspension of the order, so far as the Missouri Pacific is concerned, the commission took the ground that it would be an injustice to other roads to continue the order.

Proposed Advance in Demurrage Rates

On the recommendation of the Committee on Relations between Railroads of the American Railway Association, the railroads of the country have filed and are filing tariffs to take effect on December 1, providing for the following revision of demurrage rates: A demurrage charge of $2 for the first day after the expiration of free time, $3 for the second day, $4 for the third day and $5 for the fourth and each succeeding day; a change in National Car Demurrage Rule 9, average agreement, changing the time during which the debits on a car may be cancelled by credits to three days' instead of five days' detention and an abolition of the "weather rule" (Rule 8—Section A).

Advance in Demurrage in Kansas and Colorado

The Public Utilities Commission of Kansas has ordered an increase of demurrage charges to facilitate the moving of crops. Under the new rates announced 48 hours of free time will be allowed for unloading cars; a charge of $1 a day will be made for the next 48 hours, $2 a day for the next succeeding 48 hours, $3 a day for the next two days, $4 a day for the next two, and for all succeeding days a flat rate of $5 a day will be charged. Seventy-two hours of free time will be allowed on open cars (without drop bottoms) of 80,000 lb. or more capacity.

The Public Utilities Commission of Colorado has granted an increase in demurrage rates effective November 1. The order of the commission provides for a charge of $3 per day following the expiration of the free time period of 48 hours.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission has suspended from November 1 until March 1, 1917, proposed increases in rates on cotton from Alexandria and other points in Louisiana to New Orleans for export.

The commission has allowed to go into effect tariffs filed by the Texas lines increasing rates in Texas in accordance with the Shreveport decision, but has suspended items in the tariff increasing rates on lignite, tanbark, cord wood and cattle.

The commission has suspended from November 1 to March 1, 1917, proposed increases in rates on soap, less than carloads, from Kansas City, Mo., and related points to Memphis, Tenn., Cairo, Ill., Evansville, Ind., and other river crossings, applicable on traffic destined to southeastern territory.

The Interstate Commerce Commission has postponed the effective date of its order in the case of the Business Men's League of St. Louis against the Atchison, Topeka & Santa Fe and others until further order. The commission had previously postponed the effective date of this order from October 16 to November 16.

The Commercial Club of Kansas City has filed an amended petition with the Interstate Commerce Commission charging discrimination against Kansas City in commodity rates to the Pacific coast terminals and intermediate points, in favor of points east of Kansas City. They ask for the same relation as to commodity rates that now prevails as to class rates.

The National Live Stock Exchange has filed a complaint with the Interstate Commerce Commission alleging that on account of the lack of uniformity in the manner and method of publishing rates, shippers of feeder cattle, hogs or sheep are frequently charged the same or a higher rate than for cattle, hogs and sheep for slaughter. The complaint asks for rates on feeders not exceeding 75 per cent of the rate on livestock for slaughter.

Cottonseed Products from Texas

Opinion by Commissioner Meyer:

Proposed increased rates on cottonseed cake, meal and hulls in carloads from points in Southern Texas to Kansas City, Mo., and points taking same rates, and points in the State of Kansas are found not justified. (41 I. C. C., 333.)

Industrial Railways

In the matter of divisions of joint rates for transportation of stone from points in Indiana to points in other States. Opinion by Commissioner Meyer:

The Bedford Stone Railway and the Bedford & Wallner Railroad, which are short lines of railroad in the Bedford stone district of Indiana, are found to be common carriers controlled by their principal patrons and divisions allowed them by their trunk line connections out of joint rates in excess of a reasonable switching charge of $3 per car for all traffic, are found unlawful.

Damage attributed by shippers of stone from Kentucky points to discrimination alleged in favor of shippers in the Bedford stone district through the divisions received by the originating carriers in that district, controlled by shippers there, is held not proved. (41 I. C. C., 321.)

Nashville Flour Transit Rules

Freight Bureau Chamber of Commerce, of Macon, Ga., v. Southern Railway et. al. Opinion by Commissioner Clements:

Tariffs of the defendant carriers, proposing to withdraw any quantity transit arrangements on self-rising flour produced by manufacturers at Nashville, Tenn., while continuing to accord the same to this commodity when produced by millers located at this and other points on their lines, found not to have been justified and required to be canceled.

The maintenance and participation in such arrangements as applied to manufacturers of this article at Nashville, while not affording same to manufacturers located at Macon, Ga., is found to result in unjust discrimination which is required to be removed. (41 I. C. C. 483.)

STATE COMMISSIONS

The Railroad Commission of Louisiana held a hearing on Thursday, November 2, to consider a proposed amendment to its car service and demurrage rules providing for an increase in the demurrage rate during October, November, December, January, February and March from $1 to $2 a day.

The announcement that the Wellsville & Buffalo would suspend operations because of insufficient earnings has disturbed some important shippers; Commissioner Hodson of the New York Public Service Commission, Second district, held a consultation with them at Buffalo, last week, with a view to seeing if some temporary extension of time could be made. At one town on the line, a contractor needs 300 car loads of material for improving highways, which must come over this road or not at all, and large quantities of milk are carried to Buffalo daily over the line. The owners of the road say that they have already sunk $40,000 in the operation of the road, and that appeals to concerns which originate large quantities of freight have failed to bring a satisfactory response.

COURT NEWS

The Supreme Court of the United States has refused to review decisions by district and circuit federal courts in California dismissing 16 suits contesting the title of the Southern Pacific to river front land at Sacramento, California, on which the railroad terminals are located. The California courts held that as the railroad had been in possession of the land for 50 years plaintiffs could not maintain suits in equity setting up adverse title.

Punitive Damages

The North Carolina Supreme Court holds that where a railroad's ticket agent assured a passenger that a through train would stop at the station of his destination, but the conductor required the passenger to alight before reaching that point and take a local train, and thus the passenger was put to inconvenience, the passenger has no right to punitive damages.—White v. Norfolk-Southern (N. Car.), 89 S. E., 788.

Station Agent's Authority

The North Dakota Supreme Court holds that a station agent, as such, without further authorization, has no power, express or implied, to bind his company by a contract to transport goods from places distant from such station and distant from his company's line; nor has he any authority to assume liability for acts of a preceding carrier.—Knapp v. Minneapolis, St. Paul & Sault Ste. Marie (N. Dak.), 159 N. W., 81.

Limitation of Liability

The Oklahoma Supreme Court holds that, as to interstate shipments, the common-law liability of the carrier for the safe carriage of property may be limited by special contract with the shipper, when the contract, being supported by a consideration, is reasonably and fairly entered into by the shipper, and does not attempt to cover losses caused by the negligence or misconduct of the carrier.—St. Louis & S. F. v. Okard (Okla.), 159 Pac., 344.

Passenger or Trespasser

A person who had paid less than full fare had ridden in a freight car with the consent of a brakeman and the conductor. On getting within 1,400 feet of a station in the night time the brakeman informed him that he could not be carried further, but must walk to the station and get a ticket. Following this direction the man was injured by a passing train. The Oklahoma Supreme Court holds that whether or not the person was a passenger or a trespasser was a question for the jury under proper instructions.—Rock Island v. Shadid (Okla.), 159 Pac., 913.

Railway Officers

Executive, Financial, Legal and Accounting

Thomas F. Brennan, general manager of the Buffalo, Rochester & Pittsburgh, at Rochester, N. Y., has been promoted to vice-president.

R. M. Scott, chief clerk to Vice-President A. J. Stone of the Erie at New York, has been promoted to assistant to Mr. Stone, succeeding John D. Cummin, promoted.

R. S. Hoxie, auditor of freight accounts for the St. Louis-San Francisco, at St. Louis, Mo., has been appointed auditor in full charge of accounts, with headquarters at the same point.

F. H. Hamilton, who was treasurer of the St. Louis & San Francisco, is now secretary and treasurer of its successor the St. Louis-San Francisco Railway with headquarters at St. Louis, Mo.

Hudson Campbell has been appointed acting auditor and acting treasurer of the Marietta, Columbus & Cleveland, with office at Marietta, Ohio, vice C. B. McCann, resigned to engage in other business.

T. A. Hamilton has been appointed special representative in the president's office of the St. Louis-San Francisco, with office at St. Louis, Mo. He will perform such special duties as will be assigned to him by the president. B. T. Wood becomes assistant to the president.

E. E. Calvin, president of the Union Pacific, with office at Omaha, Neb., has also been elected president of the St. Joseph & Grand Island, succeeding G. G. Lacy, who becomes in turn vice-president and treasurer. Alexander Millar, of New York, was elected secretary, and W. N. Purvis, now secretary, becomes assistant secretary.

A. Douglas, chief accounting officer of the St. Louis-San Francisco, with office at St. Louis, Mo., has been appointed consulting auditor, a newly created position, effective November 1, with the same headquarters. He will be in charge of valuation accounting matters and will perform such other duties as may be assigned to him by the president.

A. J. Pharr, assistant controller of the Louisville & Nashville at Louisville, Ky., has been appointed controller, succeeding Charles Haydon, retired from active service. R. E. Ryan, cashier at Louisville, has been appointed assistant treasurer, with office at Louisville, vice G. W. Proctor, retired from active service, and O. C. Leason succeeds Mr. Ryan.

Maurice Dailey, receiver and general manager of the Muscatine North & South, with office at Muscatine, Iowa, has been elected president and general manager, and the name of the road has been changed to Muscatine, Burlington & Southern. Mr. Dailey was born on March 7, 1865, at Galesburg, Ill. In October, 1881, he entered railway service with the Chicago, Burlington & Quincy as a machinist apprentice. In 1883 he was made a locomotive fireman, and in 1886 became a locomotive engineer with the same company. From May, 1888, to March, 1911, he was with the Chicago Great Western as a locomotive engineer, roundhouse foreman, traveling engineer, trainmaster, master mechanic, superintendent of terminals and division superintendent. From August, 1912, to July, 1913, he was general superintendent of the Missouri, Oklahoma & Gulf, with office at Denison, Tex., and then was appointed general manager of the Muscatine North & South, at Muscatine, Iowa. In December, 1914, he was appointed receiver of the same road. His election as president and general manager became effective on November 1.

Operating

Harry D. Earl has been appointed general superintendent of the Midland Valley with office at Muskogee, Okla., succeeding W. E. Green.

W. A. Nash, despatcher on the Denver & Rio Grande at Salt Lake City, Utah, has been appointed chief despatcher, succeeding W. L. Watkins, deceased.

E. R. Allen, formerly superintendent of terminals of the Erie at Jersey City, N. J., has been appointed superintendent of terminals at Akron, Ohio.

Edgar F. Robinson, chief engineer of the Buffalo, Rochester & Pittsburgh, at Rochester, N. Y., has been appointed general manager, succeeding T. F. Brennan, promoted.

Andrew B. Moore, chief clerk to the general manager of the Western Maryland at Hagerstown, Md., has been appointed trainmaster on the Eastern division, with headquarters at Hagerstown.

George L. Griggs, division superintendent of the Chicago, Burlington & Quincy, at Wymore, Neb., has been appointed division superintendent at Omaha, Neb. He was succeeded by F. R. Mullin, division superintendent at Omaha.

R. L. Barrett, trainmaster of the Pittsburg, Shawmut & Northern, has been appointed superintendent of car service, with office at St. Marys, Pa., and T. G. Gorman has been appointed trainmaster, with office at St. Mary's Junction, Pa., vice Mr. Barrett.

P. J. Flynn, manager of terminals of the Grand Trunk Pacific and the Canadian Northern at Winnipeg, Man., has been appointed superintendent of the Buffalo division of the Lehigh Valley with headquarters at Buffalo, N. Y., succeeding C. T. O'Neal, promoted.

J. H. Boyle, superintendent of the Canadian Pacific at Farnam, Que., has been appointed general superintendent of the Eastern division, replacing Allan Purvis, who has been appointed general superintendent of the Ontario division, replacing J. T. Arundel during his absence on account of illness and W. E. McGill, assistant superintendent at Toronto, Ont., has been appointed assistant superintendent, with headquarters at Sudbury, Ont., vice R. W. Scott, transferred.

Charles T. O'Neal, who has been appointed general superintendent of the Lehigh Valley with headquarters at South Bethlehem, Pa., as has already been announced in these columns, was born on December 29, 1873, at Brandywine Springs, Del., and was educated in the common schools. He began railway work on May 1, 1890, as clerk and timekeeper in the trainmaster's office of the Philadelphia & Reading. From 1891 to 1892 he was clerk to the superintendent of transportation of the same road, and then for about one year was a clerk to the general agent of the California Fruit Express at Chicago. From 1893 to 1897 he served as stenographer in the general superintendent's office of the Lehigh Valley and subsequently as clerk, accountant and chief clerk in the general manager's office In 1904 he was appointed trainmaster of the Pennsylvania division and in 1907 became trainmaster of the New Jersey & Lehigh division of the same road. In 1908 he was promoted to superintendent of the New York division at Jersey City, N. J. The following year he was made superintendent of the Buffalo division with headquarters at Buffalo, N. Y., and in 1914 his jurisdiction was extended over the Lake Lines of the Lehigh Valley which position he held at the time of his recent appointment as general superintendent of the same road, as above noted.



C. T. O'Neal

James E. Turk, general superintendent of the Philadelphia & Reading at Reading, Pa., has been appointed assistant to the general manager, and W. H. Keffer, superintendent of the Reading division at Reading, has been appointed general superintendent, with office at Reading. F. M. Falck, superintendent of the Atlantic City Railroad at Camden, N. J., has been appointed acting superintendent, Reading division of the Philadelphia & Reading with office at Reading, Pa., vice Mr. Keffer.

Ross S. Marshall, whose appointment as assistant general manager of the Seaboard Air Line, with headquarters at Norfolk, Va., has already been announced in these columns, was born March 15, 1880, at Rock Island, Ill. He was educated in the high school at Anaconda, Mont., and at the age of 16 entered the service of the Great Northern, remaining with that road until 1902, at which time he was chief clerk to superintendent. From October, 1902, to September, 1905, he was with the Chicago, Rock Island & Pacific as division accountant and chief clerk to the division engineer. He then served on the Panama Railroad, for two years as chief clerk to the general manager and local auditor, at Colon, Panama, and from September, 1907, to November, 1910, as statistician in the general superintendent's office of the New York, New Haven & Hartford. He entered the service of the Minneapolis & St. Louis in November, 1910, serving first as assistant to vice-president and later as superintendent. On July 1, 1914, he was appointed superintendent of the Seaboard Air Line at Richmond, Va., and now becomes assistant general manager of the same road as above noted.

William H. Keffer, who has been appointed general superintendent of the Philadelphia & Reading, with headquarters at Reading, Pa., was born on June 16, 1863, at Frackville, Pa. He began railway work on April 1, 1880, as a telegraph operator on the Philadelphia & Reading. In 1882 he became coal clerk at the Frackville scale office, and in 1888 was appointed shipping agent at the same place. He was appointed train despatcher in 1889 at Mahanoy Plane, and later in the same year became car agent in connection with the office of the transportation master. In 1892 he was appointed traveling despatcher on the Shamokin division. Three years later he was appointed assistant trainmaster at Mahanoy Plane, and in 1897 trainmaster on the Shamokin division at Tamaqua. On October 19, 1904, he was appointed assistant to general superintendent at Reading; in February of the following year he was appointed assistant superintendent in charge of transportation, Reading division, at Reading, and in October, 1905, was made superintendent of the same division, which position he held at the time of his recent appointment as general superintendent of the same road, as above noted. Mr. Keffer's entire service has been with the Philadelphia & Reading.



W. H. Keffer

Frank J. Moser, superintendent of the Mahoning division of the Erie at Youngstown, Ohio, has been appointed superintendent of the New York division and branches with headquarters at Jersey City, N. J., succeeding Alva C. Elston who has been elected general superintendent of the New York, Susquehanna & Western and the Wilkesbarre & Eastern. Robert E. Woodruff, superintendent of the Kent division of the Erie at Marion, Ohio, has been appointed superintendent of the Mahoning division succeeding Mr. Moser. William J. English, superintendent of the Susquehanna and Tioga divisions at Hornell, N. Y., succeeds Mr. Woodruff. Herman J. Klein, assistant superintendent at Youngstown, has been appointed superintendent of the Meadville division with headquarters at Meadville, Pa. Carl Bucholtz, assistant superintendent of the Kent division at Kent, Ohio, has been appointed assistant superintendent of the Mahoning division; Harry R. Adams, trainmaster at Huntington, Ind., has been appointed assistant superintendent of the Kent division. Samuel E. Ferguson, superintendent of the Meadville division at Meadville, Pa., has been appointed assistant to the general superintendent at Youngstown; Charles P. Eckels, superintendent of the Rochester division at Rochester, N. Y., has been appointed superintendent of the Susquehanna division, and John D. Cummin, assistant to vice-president at New York, has been appointed superintendent of the Rochester division.

Traffic

W. B. Wells has been appointed general freight agent of the St. Louis, San Francisco & Texas, with office at Ft. Worth, Tex., succeeding W. C. Preston, who becomes general agent at Dallas, Tex., at his own request.

Engineering and Rolling Stock

William J. Tracy has been appointed superintendent of the system shops of the Lehigh Valley at Sayre, Pa., succeeding J. C. Seeger, resigned.

D. A. Shope, general foreman of bridges and buildings on the Atchison, Topeka & Santa Fe, Coast Lines, with headquarters at Fresno, Cal., has resigned to go into other business.

Charles A. Lemmon, chief engineer of the Butte, Anaconda & Pacific, has resigned to become assistant to the general manager of the Anaconda Copper Mining Company, Anaconda, Mont.

A. Leckie, division engineer of the Arkansas Western, has been appointed division engineer of the Kansas City Southern, with office at Kansas City, Mo., succeeding E. M. Basye, assigned to other duties.

T. J. Raycroft, assistant master mechanic of the Cumberland division of the Baltimore & Ohio, has been promoted to master mechanic of the Wheeling division, with headquarters at Wheeling, W. Va., succeeding James Bleasdale, resigned to accept service elsewhere.

E. I. Rogers, assistant roadmaster of the Iowa division of the Illinois Central, has been appointed roadmaster of that division, with headquarters at Fort Dodge, Iowa, effective October 28. He succeeds H. Gilleas, retired on a pension after 52 years of service with the road.

F. A. Butler, master mechanic of the Boston division of the Boston & Albany at Beacon Park, Allston, Mass., has been appointed master mechanic of the Albany division, with office at West Springfield, succeeding J. B. Canfield, assigned to other duties, and F. A. Hussey, road foreman of engines, at Allston, has been appointed master mechanic of the Boston division, with headquarters at Beacon Park, Allston, succeeding Mr. Butler.

Harry Hardin Orr, the announcement of whose appointment as signal engineer of the Chicago & Eastern Illinois was recently made, was born September, 1885, at Ocala, Fla. He received his early education in this community and later graduated from high school in Louisville, Ky. He then took up an engineering course at Rose Polytechnic Institute, which he completed in 1907. In June of the same year he took employment with the Chicago & Eastern Illinois, later being made signal inspector and chief signal inspector in turn. His appointment as signal engineer became effective Oct. 1.

J. S. McBride, recently promoted from valuation engineer to principal assistant engineer of the Chicago & Eastern Illinois, with office at Chicago, Ill., was born at Louisville, Ky., and graduated from the Rose Polytechnic Institute, in civil engineering. In 1905, he entered railway service with the Chicago & Eastern Illinois as instrument man on construction and maintenance, since which time he has been continuously in the employ of that road. In 1908, he was appointed assistant engineer of the Illinois division at Salem, Ill., and in 1914, was promoted to valuation engineer at Chicago, Ill. As principal assistant engineer, he will continue to have charge of the federal valuation work in addition to taking care of his new duties.

Purchasing

P. J. Shea has been appointed general storekeeper of the Boston & Albany, with headquarters at West Springfield, Mass., succeeding E. B. Rockwood, resigned.

OBITUARY

Charles L. McIntyre, right of way and real estate agent of the Pittsburgh & Shawmut, died on October 30 at Freeport, Pa.

L. L. Scherer, general claim agent of the Chesapeake & Ohio at Richmond, Va., died in a hospital in that city on October 21. Mr. Scherer was born on February 27, 1872, at Columbus, Texas, and entered the services of the Chesapeake & Ohio in

1901 in the special agent's department at Richmond, and since 1910 was general claim agent of that road.

Frederick W. Bright, superintendent of motive power, Armour & Company, died at his home in Chicago, Ill., Sunday, October 29. He was born in Barry, Ill., where he received his early education. On attaining young manhood he entered the service of Armour & Company in the mechanical department as an apprentice, being sent to the Kansas City plant, where he remained for 26 years, and during which time he was promoted in turn to every position in this department. At the time of his death he was in charge of all the mechanical and engineering work of this company.

Theodore Newel Ely

Theodore N. Ely, formerly chief of motive power of the Pennsylvania Railroad System, incduding the lines both east and west of Pittsburgh and Erie, who retired from railway work on July 1, 1911, after 43 years of service, died on October 28, at his home in Bryn Mawr, Pa. He was born June 23, 1846, at Watertown, N. Y., and was graduated from the Rensselaer Polytechnic Institute in 1866, as a civil engineer. Immediately after graduation he was engaged as an engineer at the old Fort Pitt foundry at Pittsburgh, experimenting with projectiles. A year later, 1867, he was at work in mining operations in the Monongahela river region. In 1868 he entered upon his long career in the service of the Pennsylvania Railroad as an engineer in the roadway department on the Pittsburgh, Fort Wayne & Chicago at Pittsburgh, from which he was soon sent as assistant engineer to the Philadelphia & Erie division of the Pennsylvania. In 1869 and 1870 he was superintendent of the Middle division of the Philadelphia & Erie, and was then promoted to assistant general superintendent, a position which he held until 1873. From 1873 to 1874 he was superintendent of motive power of the same division. In 1874 he was made superintendent of motive power of the Pennsylvania Railroad division, and in 1882 became general superintendent of motive power of the Pennsylvania lines east of Pittsburgh and Erie. From March, 1893, to the date of his retirement he was chief of motive power, Pennsylvania Lines east and west of Pittsburgh and Erie.



Theodore N. Ely

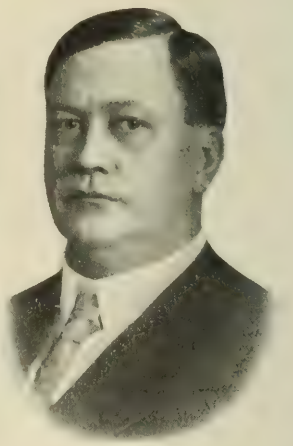
Mr. Ely was a member of the American Society of Civil Engineers, the Institution of Civil Engineers (England), the American Society of Mechanical Engineers, the American Institute of Mining Engineers, the Franklin Institute, the American Philosophical Society, the American Association for the Advancement of Science, and other technical and scientific associations. He was a lover and patron of art and had a wide circle of friends in that field. He was vice-president of the American Academy in Rome, and an honorary member of the American Institute of Architects. He was president of the Eastern Railroad Association for several years, and also a member of the executive committee of the American Railway Association and of the permanent commission of the International Railway Congress; also of the boards of trustees of the Drexel Institute of Art, Science, and Industry, and of the Philadelphia Commercial Museum. The honorary degree of Master of Arts was conferred upon Mr. Ely, in 1897, by Yale University, and that of Doctor of Science by Hamilton College in 1904.

The great work of Mr. Ely's life was performed in the mechanical department of the Pennsylvania Railroad, at the Altoona (Pa.) shops, where he inaugurated the department for testing materials, and established the system of purchasing supplies on rigid specifications. This was a new field at that time in railroad work and Mr. Ely encountered much opposition, but he acted on the courage of his convictions, and lived to see the system of specifications, which he inaugurated, adopted by many other railroads. As a result of his work at Altoona, the plan of purchasing railroad supplies on specifications has now become general, to the benefit of both buyer and seller.

Mr. Ely's character as an engineer was well summed up in a notice printed in the *Railway Age Gazette* on July 7, 1911, on his retirement from active service, from which we take the following:

"Mr. Ely was a bold originator, and yet possessed of a boldness so tempered with caution and certainty that his mistakes were few indeed as compared with his achievements. He never hesitated to launch out into the untried, yet he was never carried away by impulse, but guided his craft with cool calculations. It was Mr. Ely who took the first step, alone, against the protests of many by whom he was surrounded, that has led to the development of the large locomotives of today. While builders and engineers considered that the end had come, that the locomotive had reached the limit of its power, because of the restrictions current construction put upon the size of the firebox; Mr. Ely lifted his whole boiler into the air, set his foundation ring on top of the frames, widened his firebox and gave the machine a new lease of life. Many and dire were the predictions made as to the instability of the new design. But we all know the result. It did not upset, but ran with unexampled smoothness; and, with construction revolutionized, the whole country followed in his wake. This is but a single example of his work. Mr. Ely's success was so based on sound discrimination and careful consideration, that, to a wonderful degree, he gained and held the confidence of all who came in contact with him. As one of his associates expressed it, he was the balance wheel of the mechanical organization of the road; and to his influence the wonderful team work of the various departments was largely due. No man could have gained the reputation for clear judgment than Mr. Ely possesses, among all who know him, who has not merited it; and the position which he holds in the opinion of his associates speaks volumes for the character of the man and his work."

Charles Wilcox Hotchkiss, chairman of the board of directors of the Virginian Railway and president of the Chicago Tunnel Company of Chicago, Ill., died on Saturday, October 28, at Battle Creek, Mich., from organic heart trouble. He was born in Unadilla Forks, N. Y., June 19, 1863. After a preliminary education in the public schools of this neighborhood he entered the West Winfield Academy at West Winfield, N. Y., graduating in 1881. He immediately took employment with the New York, West Shore & Buffalo at Newburgh, N. Y., as rodman. From August, 1886, to May, 1896, he was assistant engineer on the Michigan Central, and from May, 1896, to January, 1899, he was chief engineer on the Chicago Junction. In August, 1899, he was appointed chief engineer of the Chicago Transfer & Clearing Company, and in June, 1900, he was elected president of the Indiana Harbor Railroad and built the Indiana Harbor Belt and the Chicago, Indiana & Southern. In October, 1905, when the New York Central took over these lines, he became also general manager of the Indiana Harbor Belt. In April, 1906, he was also appointed general manager of the Chicago, Indiana & Southern. In May, 1912, he was elected president of the Chicago Tunnel Company, Chicago, Ill. In February, 1915, he was elected also to the chairmanship of the Virginian Railway's executive committee, becoming at the same time president of the Rail Joint Company of America and president of the Staten Island Railroad.



C. W. Hotchkiss

Equipment and Supplies

LOCOMOTIVES

The Union Pacific has issued a new inquiry for 15 Santa Fe type locomotives.

The Duluth, Missabe & Northern is inquiring for 6 eight-wheel switching locomotives.

The Midland Valley has ordered 2 Mikado locomotives from the Baldwin Locomotive Works.

The Southern Railway is in the market for 12 Mallet, 8 Mountain and 25 Santa Fe locomotives.

The Chicago, Burlington & Quincy is inquiring for 20 Mikado and 10 Santa Fe type locomotives.

The Italian State Railways have ordered 40 Consolidation locomotives from the American Locomotive Company.

The Central of New Jersey has ordered 5 eight-wheel switching locomotives from the American Locomotive Company.

The Louisville & Nashville is building 8 Mikado locomotives in its own shops and will soon start construction of 8 more.

The Norfolk & Portsmouth Belt Line has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

The Standard Oil Company, Baltimore, Md., has ordered one four-wheel switching locomotive from the Baldwin Locomotive Works.

The Delaware, Lackawanna & Western, reported in the *Railway Age Gazette* of September 22 as inquiring for 5 Pacific type locomotives, has ordered these locomotives from the American Locomotive Company.

The Detroit Terminal has ordered 3 superheater six-wheel switching locomotives from the American Locomotive Company. These locomotives will have 21 by 28 in. cylinders, 57 in. driving wheels and a total weight in working order of 173,000 lb.

The Copper River & Northwestern has ordered one superheater Mikado type locomotive from the American Locomotive Company. This locomotive will have 20 by 28 in. cylinders, 48 in. driving wheels and a total weight in working order of 195,000 lb.

The Erie has ordered 15 Santa Fe type locomotives from the American Locomotive Company. These locomotives will have 31 by 32 in. cylinders, 63 in. driving wheels, a total weight in working order of 404,000 lb. and will be equipped with superheaters.

The Borneo Company, Ltd., has ordered 2 superheater six-wheel switching locomotives from the American Locomotive Company. These locomotives will have 10 by 16 in. cylinders, 30½ in. driving wheels and a total weight in working order of 36,000 lb.

The Hocking Valley has ordered 5 superheater Mallet (2-6-6-2) type locomotives from the American Locomotive Company. These locomotives will have 22 and 35 by 32 in. cylinders, 56¼ in. driving wheels and a total weight in working order of 435,000 lb.

The Russian Government is expected, momentarily, to close definite contracts for 400 Decapod locomotives. It is understood that Canadian builders will be given from 40 to 60 of these engines and that the remainder will be divided between the American Locomotive Company and the Baldwin Locomotive Works.

The British Government recently increased to 395 the order for 45 narrow gage 4-6-0 type tank locomotives given to the Baldwin Locomotive Works as reported in the *Railway Age Gazette* of August 25. It is also understood that the British War Office will increase the order recently given to the American Locomotive Company for 100 18-ton 2-6-2 type tank locomotives by 100 or 150 engines.

The Chicago, St. Paul, Minneapolis & Omaha, reported in the *Railway Age Gazette* of October 20 as being in the market for locomotives, has ordered 9 six-wheel switching locomotives from the American Locomotive Company. These locomotives will have 21 by 28 in. cylinders, 51 in. driving wheels and a total weight in working order of 140,000 lb. This road remains in the market for a number of Mikado locomotives.

The Chicago & North Western, reported in the *Railway Age Gazette* of October 13 as being in the market for 77 locomotives, has ordered 25 Mikado, 12 Pacific and 40 six-wheel switching locomotives from the American Locomotive Company. The 25 Mikado locomotives will have 27 by 32 in. cylinders, 61 in. driving wheels and a total weight in working order of 302,000 lb. The 12 Pacific type locomotives will have 25 by 28 in. cylinders, 75 in. driving wheels and a total weight in working order of 264,000 lb. Of the 40 six-wheel switching locomotives, 25 will have 18 by 24 in. cylinders, 51 in. driving wheels and a total weight in working order of 140,000 lb. The other 15 six-wheel switching locomotives will have 21 by 28 in. cylinders, 51 in. driving wheels, and a total weight in working order of 171,000 lb. All 77 locomotives will be equipped with superheaters.

FREIGHT CARS

The Penn Tank Car Company is in the market for 150 cars.

Anderson, Mayer & Co. are in the market for 75 cars for China.

The Standard Car Equipment Company is inquiring for 208 tank cars.

The Ohio Cities' Gas Company is reported in the market for 200 cars.

The Erie has ordered 1,000 box cars from the Standard Steel Car Company.

Davis & Lloyd are reported in the market for 100 gondola and 400 flat cars for France.

The Atlantic Coast Line has ordered 1,200 box and 500 flat cars from the Barney & Smith Car Company.

The Baltimore & Ohio has ordered 2,000 box cars from the Mount Vernon Car Manufacturing Company.

The Anaconda Copper Mining Company has ordered 20 flat and 10 gondola cars from the Pressed Steel Car Company.

The Chicago, Burlington & Quincy has ordered 500 gondola and 1,000 automobile cars from the Western Steel Car & Foundry Company.

The Southern Railway is reported in the market for 500 to 1,500 box cars and has ordered 1,313 gondola cars from the Pressed Steel Car Company.

The New York Central has ordered 1,000 box cars from the Barney & Smith Car Company. and has placed orders for 4,000 cars with other companies.

The Chicago & North Western has ordered 500 stock cars from the Barney & Smith Car Company. This makes a total of 2,500 freight cars ordered by this company in the last few weeks.

The Louisville & Nashville was incorrectly reported in last week's issue as having ordered 1,500 underframes from the Pressed Steel Car Company. It ordered 750 underframes for box cars, which it will build in its own shops, from the Pressed Steel Car Company, and 750 underframes, for gondola cars which it will build in its own shops, from the Mount Vernon Car Manufacturing Company. It has also ordered 2,000 cars from the Pressed Steel Car Company in addition to 1,000 gondola and 500 hopper cars previously reported.

PASSENGER CARS

The Central of Georgia is in the market for 14 sleeping cars. These are in addition to the 6 sleeping cars which it recently ordered form the Pullman Company.

The New York Central has ordered 50 coaches from the Pressed Steel Car Company, 25 coaches from the Barney & Smith Car Company and 25 express and baggage cars from the Pullman Company.

The Baltimore & Ohio, reported in the *Railway Age Gazette* of October 13 as being in the market for 100 passenger train cars, has ordered 75 coaches and 25 combination baggage and mail cars from the Pullman Company.

Supply Trade News

The Kirby Lumber Company, Houston, Tex., announces that after November 1 its sales will be handled exclusively by the Kirby-Bonner Lumber Company.

The Irving-Pitt Manufacturing Company, Kansas City, Mo., maker of books and forms, has moved its New York office to new and larger quarters at 428 Broadway.

At the recent meeting of the board of directors of the U. S. Light & Heat Corporation, Niagara Falls, N. Y., C. L. Lane, who has been secretary of the company, was elected vice-president.

Exum M. Haas, western editorial representative of the Electric Railway Journal, has been appointed manager of sales of the International Steel Tie Company, Cleveland, Ohio, effective November 1. He graduated in civil engineering from Purdue University in 1905. Previous to his college course, and during vacations he served on the engineering corps of the Baltimore & Ohio and the Chesapeake & Ohio. After graduation he was made resident engineer for the Chicago & Eastern Illinois in charge of the construction of a large freight yard at Dolton, Ill. In 1906 he was appointed assistant engineer maintenance of way of the Illinois Traction System, where he helped organize a maintenance of way department. In 1907 he was appointed locating and construction engineer in charge of the building of extensions to that system. In 1909, when work on the track extensions had practically ceased, his title was changed to superintendent of bridges and buildings, and while in this capacity most of this company's standard way stations and sub-stations, as well as the terminal buildings in St. Louis, Mo., were built. In November, 1912, he joined the editorial staff of the Electric Railway Journal, and has since served as western editorial representative.



E. M. Haas

J. T. Griffin, storekeeper of the South African Railways and Harbors, at Williston, Cape Province, South Africa, writes that he would like to receive railway supply catalogues dealing particularly with maintenance of way work.

Herbert W. Dow, assistant sales engineer of the Nordberg Manufacturing Company, Milwaukee, has been appointed sales manager succeeding Fred W. O'Neil who resigned to accept an executive position with the Ingersoll-Rand Company, New York.

Jacobs-Shupert fireboxes will be applied to all of the 10 Mallet type locomotives recently ordered by the Western Maryland from the Lima Locomotive Works. This is a repeat order, the Jacobs-Shupert U. S. Firebox Company, New York, having supplied its fire boxes for 5 of the 15 Mallet type locomotives ordered by the Western Maryland a year ago last June.

Judge Hazel, sitting in the district court for the western district of New York, on October 17 handed down a decision in the case of the Safety Car Heating & Lighting Company, vs. U. S. Light & Heat Corporation, in which he held that the latter's car lighting equipment did not infringe the Creveling patent owned by the plaintiff, but was manufactured under the McElroy patents owned by the United States Company. He also dismissed a counter claim declaring that the Safety Type F system of the Safety Company was an infringement of the McElroy patents.

D. P. Lameroux, whose appointment as general manager of the Pratt & Letchworth Company, Ltd., Brantford, Ont., has already been announced in these columns was born in Mayville, Wis., December 12, 1873. He received his education at the University of Wisconsin, where he took a course in civil engineering as a member in the class of 1895. After leaving college he spent two years in the maintenance department of the Milwaukee Northern Railway, and the California Oregon Railway, and for the following three years was private secretary to the commissioner of the general land office at Washington, D. C. In 1900, he became associated with the Beaver Dam Malleable Iron Company and worked his way up through that organization until in 1913 when he left to take up another position, he was the company's general manager. During this period, also, he was on the executive legislative committee of the Wisconsin Manufacturers' Association, and for three years of this time, was also regent of the University of Wisconsin. In 1913 he entered the railway supply business in Chicago, and was connected with the Cleveland Steel Company and the Trumbull Steel Company. In his new position he will act as general manager of the various malleable plants of the Canadian Car & Foundry Company, Limited, including the Pratt & Letchworth Company's plant at Brantford and the Malleable iron plant at Amherst.



D. P. Lameroux

Steel Corporation Earnings Again Break Record

Directors of United States Steel Corporation at their meeting last Tuesday, declared the regular dividend of 1¼ per cent on the common and 1 per cent extra, the same as three months ago. The regular quarterly dividend of 1¾ per cent on the preferred was also declared.

Net earnings of $85,817,067 for the third quarter established a new high record, comparing with $81,126,048, the previous high record, reached in the second quarter of the current year.

TRADE PUBLICATIONS

Electric Signal Appliances, Direct Current.—The General Railway Signal Company, Rochester, N. Y., has issued a loose leaf catalogue of 1,100 pages, bearing this title, and marked Volume 1. It is in a very substantial binder, 7½ in. x 9½ in., and is a model of the bookmaker's art. It supersedes the company's former catalogue (in light blue binder) containing this class of information. The nature of the contents of the volume is indicated by the title. A separate catalogue of alternating current appliances is to be issued later. The present volume is divided into five sections and there are additional tab indexes for three others. That is to say, the book may be called an eight-lever frame with three spare spaces. Leaves can be taken out and new leaves put in with the utmost facility. The sections are divided into from 10 to 21 parts each, with large size thumb indexes for each part, making access to any detail extremely easy. The book is embellished with a number of full-page half tone photographic out-door views of interlocking and block signals, most of them without titles. The editing of the material in the catalogue bears every evidence of being of the highest quality—which means a prodigious amount of work and patience on the part of careful specialists. In those items where it is necessary or desirable, references are given to the number of the drawing, a feature which must be a great convenience in checking invoices; and in descriptive matter concerning standard parts such as pipe, screws, bolts and pins, quick reading is facilitated by the addition of the dimensions of the pipes, screws, etc.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company intends soon to construct a new line from Caney, Kan., through Pawhuski, Okla., to Ralston, Okla., a distance of about 60 miles. Surveys are being made, but no actual construction will be undertaken until the details in connection with the securing of the right of way have been completed.

CHARLESTON & SUMMERVILLE INTERURBAN.—Right of way is being secured, it is said, for a proposed line to be built between Charleston, S. C., and Summerville, about 22 miles. J. L. David, president.

CHATTAHOOCHEE VALLEY.—Work on the extension which this company is building from McCullough, Ga., to Bleecker, Ala., and a connection with the Central of Georgia, is nearing completion. The Nichols Contracting Company, Atlanta, are the contractors. (April 21, p. 926.)

KANSAS CITY, OZARK & SOUTHERN.—This company plans to begin work soon on an extension of its line from Ava, Mo., in a southerly direction. The idea is to tap the Ozark timber lands, which contain thousands of acres of timber suitable for railway ties now unavailable on account of the lack of transportation facilities.

KELLYS CREEK RAILROAD.—Incorporated in West Virginia, it is said, with $10,000 capital, to build a 7-mile line from Cedar Grove, W. Va., up Kellys creek. It is reported that Cleveland, Ohio, capitalists are back of the project.

KEWANEE & EASTERN.—It is proposed to build a new line from a point in Rock Island County, Ill., just opposite Muscatine, Iowa, through Kewanee to a point near Streator, Ill., a distance of about 120 miles. Application for a franchise has been filed with the Illinois Public Utilities Commission and it is expected to be favorably acted upon at once.

MISSISSIPPI VALLEY RAILROAD & NAVIGATION CO.—This is the name of a new company recently incorporated in Illinois to construct a line from Danville, Ill., to Metropolis, on the Ohio river. The company will also operate a barge line across the Ohio river to transport passenger and freight cars to the Kentucky side. Among the incorporators are John C. Curtis of Huntington, Ind., and William Annan Taylor of Chicago, Ill.

MISSOURI PACIFIC.—This company intends to begin work in the early spring on its track elevation at Dodge, Douglas and Farnam streets, Omaha, Neb. For this purpose the federal court at St. Louis, Mo., has authorized B. F. Bush, receiver, to expend $200,000. It is the intention of the railroad ultimately to elevate the Belt Line tracks for a considerable distance beyond the point mentioned.

NEW YORK ROADS.—Plans are under way for the construction of a railroad to be laid along the bed of the abandoned Erie canal from the New York Central and Delaware & Hudson freight yards at Green Island, N. Y., to the northerly section of Cohoes. A large warehouse is also included in the improvements, to be built west of the old canal at Garner street. Mayor James S. Calkins, Cohoes, is said to be back of the project.

NORTH TEXAS & SANTA FE.—This is the name of a new company which contemplates building a line from Hannaford, Tex., to Shattuck, Okla., a distance of about 85 miles. Surveys have been completed, and the final details concerned with the titles to the right of way are being completed. About one-half of the construction will be through a level prairie country, while the other half will involve heavy work. Engineering headquarters have been established at Shattuck, Okla., and much material for the undertaking has already been delivered at that point. It is understood that the Atchison, Topeka & Santa Fe will assume control of the road on its completion.

OKLAHOMA & NORTHERN (ELECTRIC).—This is the name of a new electric interurban railway system shortly to begin construction from Miami, Okla., through Commerce to Columbus, Kan., with a branch line running from a point at or near Carden, Okla., to Baxter Springs, Kan., approximately 35 miles. The above is one division of an extensive system projected by this company, the main line of which is projected from Baxter Springs, Kan., through Nowata, Welsh and Miami, Okla., to Joplin, Mo., about 105 miles. W. K. Palmer Company, 919 Baltimore avenue, Kansas City, Mo.

PITTSBURG & SHAWMUT.—Work on the extension under construction between Cadogan, Pa., and Freeport, 8 miles is expected to be completed and ready for operation by December 1. (March 31, p. 773.)

VIRGINIA ROADS.—The Augusta Wood Products Company has under consideration the question of building a line, it is said, from Goshen, Va., on the Chesapeake & Ohio, to timberlands. J. F. Zimmerman, Goshen, is said to be interested.

WASHINGTON & LINCOLNTON.—This company, building from Washington, Ga., northeast via Metasville to Lincolnton, about 20 miles, has completed work on 13 miles of the line. J. R. Dyson, president, Washington. (February 4, p. 228.)

RAILWAY STRUCTURES

ANN ARBOR, MICH.—Bids will be called for on or about January 1 by the Michigan Central and the Michigan State Highways Commission for the construction of a reinforced concrete bridge 620 ft. long, over the Huron river near this city, to cost about $45,000. John J. Cox, Ann Arbor, Mich.

BOWLING GREEN, KY.—The Kentucky Railroad Commission has issued an order directing the Louisville & Nashville to replace its old station at Bowling Green, with a new structure.

BOLTON, CONN.—The elimination of a grade crossing on the New York, New Haven & Hartford at Bolton will be carried out by the railroad company and the state of Connecticut. The cost of this improvement will be about $8,000.

BUFFALO. N. Y.—The New York Central does not contemplate building at the present time a station on the Terrace at Buffalo. Negotiations with the Terminal Commission at Buffalo in regard to a site for a new station are under way, but no conclusion has as yet been arrived at.

GRANITE CITY, ILL.—The railroads entering this city intend very shortly to erect a new union passenger station to cost about $40,000. The plans provide for a subway under all the tracks of the several companies involved, except those of the Cleveland, Cincinnati, Chicago & St. Louis. The structure will be 99 ft. long, 25 ft. wide and will be of brick construction and have a slate roof.

MONROE, VA.—The Southern Railway has given a grading contract to Langhorne & Langhorne, Lynchburg, Va., to be carried out in connection with improvements to be made to its terminal yard at Monroe. Five tracks will be constructed east of the main line and three tracks on the west side will be extended which will increase the capacity of the yard by 680 cars, making it approximately 1,000 cars. For this improvement 20 acres of additional right of way was necessary, and there will be 170,000 yards of excavation. The work includes moving the present station; also the construction of a new highway bridge, air brake testing facilities and signal and interlocking devices. A modern water supply plant will also be installed.

NEW YORK.—The New York Public Service Commission, First district, has awarded to the Snare & Triest Company, New York City, the contract for the construction of concrete track floors and platforms over the mezzanine of eleven stations on the Culver Rapid Transit Railroad now under construction in the borough of Brooklyn. The contract price is $52,654. October 27, p. 774.)

ST. JOHN, N. B.—Bids are wanted until November 15, by J. W. Pugsley, secretary Department of Railways and Canals, Ottawa, Ont., for the construction of the superstructure of the reinforced concrete grain elevator to be built at St. John. The elevator is to have a capacity of 500,000 bushels. (September 8, p. 435.)

SIBLEY, LA.—The Vicksburg, Shreveport & Pacific has not yet decided to build a new combined passenger and freight station at Sibley to replace the structure damaged by fire.

Railway Financial News

Minneapolis & St. Louis.—Hayden, Stone & Co. and J. S. Bache & Co., both of New York, who underwrote the readjustment of the Minneapolis & St. Louis finances, recently, have given an option to a banking firm on all of the underwriters' stock, and the Wall Street Journal says that this firm has also secured options on the stock of three of the largest individual shareholders. It is rumored that the road will be purchased in the interests of the Canadian Pacific.

Muscatine, Burlington & Southern.—This is the name under which the Muscatine North & South, running from Muscatine, Iowa, to Burlington, 55 miles, has been reorganized and taken out of receivership.

Pere Marquette.—A plan of readjustment worked out under the auspices of J. & W. Seligman, Robert Winthrop & Co. and E. V. R. Thayer as reorganization managers, and with the assistance of L. F. Loree, president of the Delaware & Hudson, has been made public.

The new plan is expected to accomplish these things:

The preservation of the railroad as a system and such control for the reorganized property as shall safeguard the rights of security holders.

Reduction of fixed charges to a limit believed, under all conditions, to be safely within the net earning capacity of the reorganized property.

Adequate capital provision for present and future requirements.

Payment or adjustment of all debts and provision for existing equipment trust obligations.

The plan provides for the sale under foreclosure of various mortgages of all the property of the company. The new company will have an authorized issue of $75,000,000 first mortgage bonds; $11,200,000 5 per cent cumulative prior preference stock; $12,429,000 5 per cent preferred stock, cumulative after January 1, 1919, and $45,046,000 common stock. All three classes of stock will be held for five years by a voting trust consisting of James S. Alexander, Francis R. Hart, Frederick Strauss, Eugene V. R. Thayer, Robert Winsor, and Beekman Winthrop.

The estimated cash requirements under the plan are $16,000,000, to provide for which a purchase syndicate consisting of J. & W. Seligman & Co., Robert Winthrop & Co., and Kidder, Peabody & Co. will purchase $6,000,000 first mortgage series A 5 per cent bonds, $11,200,000 5 per cent prior preference stock trust certificates, and $25,675,400 common stock trust certificates. The syndicate will pay for these securities $16,000,000 and accrued interest on the bonds and will receive a commission of 5 per cent on the maximum syndicate obligation of $16,000,000. No provision has been made for underwriting the cash required for payment to nonassenting holders of bonds or of any of the issues provided for in the plan.

The Guaranty Trust Company will form a loan syndicate of which it will be the manager. This syndicate will advance to the purchase syndicate funds up to 80 per cent of the par amount of prior preference stock and common stock not subscribed for by security holders. It is expected that these advances will be payable not later than January 1, 1919.

The reorganization managers will receive as compensation three-quarters of 1 per cent on the aggregate principal amount of the new bonds about to be issued and one-half of 1 per cent upon the aggregate par value of the three classes of new stock. The reorganization managers may participate in any of the syndicates.

St. Louis & San Francisco.—The following are the directors of the new company: F. W. Allen, E. N. Brown, Henry Ruhlender, J. W. Lusk, James Speyer, Frederick Strauss, E. V. R. Thayer, W. B. Biddle, Murray Carleton, Sam Lazarus, Charles H. Sabine, A. L. Shapleigh, Festus J. Wade, M. L. Wilkinson and W. C. Nixon. Mr. Ruhlender is chairman of the board. The new company began operation on Wednesday, November 1.

Southern Railway.—See editorial comments in this issue on new financing.

Texas & Pacific.—Pearl Wight and J. L. Lancaster, first vice-president, have been appointed receivers of the Texas & Pacific. The receivership was on the application of B. F. Bush, receiver of the St. Louis, Iron Mountain & Southern. The following statement was given out at the New York office of the Texas & Pacific.

The appointment of receivers of the Texas & Pacific by the United States District Court at Shreveport, La., was the outcome of action taken by the board of directors at a recent meeting at which the financial position of the company was carefully considered. It has been recognized for years that the rigid financial structure of the Texas & Pacific has prevented it from raising money to enable it to reap the benefit of its excellent location, large gross earnings and limited fixed interest bearing debt. The continued use of its substantial net earnings for additions and betterments is injurious to the income bondholders and an unnecessary burden on the stockholders.

It is clear that with enough money provided to meet public requirements and secure economical operation an early readjustment will be for the good of all classes of security holders. Counsel advised that it would not be practicable to accomplish such a readjustment without judicial proceedings. The subject became imminent at this time because some of the suits on the company's overdue notes, aggregating about $3,000,000, which the company is unable to pay, were on the eve of trial.

Furthermore, proceedings are pending on behalf of income bondholders to enforce their claims. It seemed inadvisable to enter into a period of expensive litigation simply to defer a receivership, which in all probability would eventually be unavoidable, inasmuch as the interests of the stockholders and creditors could better be safeguarded by a financial readjustment. The board was advised that a plan of readjustment was under consideration, the details of which would be submitted to the stockholders at an early date.

The reorganization plan is being prepared by Kuhn, Loeb & Co. and Blair & Co.

A committee has been formed to protect the second mortgage income bondholders other than the St. Louis, Iron Mountain & Southern, consisting of Mortimer N. Buckner, chairman; Owen F. Roberts and Edward Schafer, with the New York Trust Company as depositary.

Western Maryland.—See editorial comments in this issue on the reorganization plan.

Wheeling & Lake Erie.—At last the Wheeling & Lake Erie has been sold under foreclosure. The purchasers are the reorganization managers, Blair & Co. and Kuhn, Loeb & Co. The upset price was fixed at $12,000,000. This was the tenth time that the Wheeling & Lake Erie had been offered for sale.

Transportation Routes in Central Africa.—An important factor in the development of the trade and industries of the lake region of Central Africa and the territory between it and the Indian Ocean is the Uganda Railway, which extends from the port of Mombasa-Kilindini through 584 miles of plain and mountain country to Port Florence on Lake Victoria Nyanza. Over this lake in time of peace runs a fleet of vessels as an auxiliary service to the railroad. These ships call at the ports of Uganda, of German East Africa, and of British East Africa, all of which have a shoreline on this great inland sea. From the head of the Nile at Jinja to Namasagli on Lake Chiogo, the Busogo Railway runs for 61 miles, which in conjunction with the boats on the lake taps a large and prosperous community of Uganda. The Magadi branch of the Uganda Railway extends from the main line for 95 miles to Lake Magadi, where it opens to transportation the vast soda deposits of that region. The Thika Tramway extends from Nairobi to Fort Hall through a stretch of 31 miles of prosperous plantations. Thus by means of railway and water transportation, which form practically one system, expansive regions of eastern and central Africa are brought into communication with tidewater shipping at Mombasa. So the large importing houses that have their main offices in Mombasa are in a position to distribute imported goods to millions of natives in eastern and central Africa, and to collect their agricultural and pastoral products and consign them to numerous foreign markets.

ANNUAL REPORT

CHICAGO GREAT WESTERN RAILROAD COMPANY—REPORT FOR THE YEAR ENDED JUNE 30, 1916

To the Stockholders of the Chicago Great Western Railroad Company:

The Board of Directors submit herewith their report for the year ended June 30, 1916:

OPERATING REVENUE:

The detailed statement indicates an increase of $1,146,659.92 in the total Railway Operating Revenue in this year, over the preceding year, of which $1,107,224.46 was from transportation, $847,156.91 being from freight, and $206,606.32 from passenger.

Operating Revenue this year was the largest of any year since the organization of the present company, notwithstanding the decrease in the average revenue per ton mile from 7.00 mills in 1915, to 6.84 mills in 1916. This decrease in average revenue per ton mile alone diminished the freight revenue for 1916, $247,788. On the other hand, the average revenue per passenger mile in 1916 was 2.011 cents, as compared with 1.950 cents in 1915, which produced an increase of $100,085. in the total passenger revenue for 1916. Taken together these changes in the average revenues effected a decrease of $147,703. in the total revenue from transportation in 1916.

In considering the revenue in 1916, it should be borne in mind that more than the indicated increase for the year was earned in the eight months beginning with November, the total revenue for the first four months of the year (July to October inclusive) being $119,115, less than for the preceding year. This resulted from the unusual conditions growing mainly out of the European war.

OPERATING EXPENSES:

Briefly analyzing the Operating Expenses it is found:

MAINTENANCE OF WAY AND STRUCTURES increased $200,958., principally in Road Maintenance; Bridges, Trestles and Culverts; Rails; Other Track Material; Track Laying and Surfacing; Water Stations; Tools and Supplies, and Maintaining Joint Tracks, Yards and Other Facilities. And decreased $94,747., principally in Ballast; Station and Office Buildings; Fuel Stations, Signals and Interlocking; Removing Snow and Ice, and Injuries to Persons.

The final increase under this heading was $106,211.

MAINTENANCE OF EQUIPMENT increased $199,324., principally in the following accounts:

Shop Machinery; Steam Locomotive Repairs; Steam Locomotive Retirements; Freight Train Cars Depreciation; Work Equipment Repairs; Work Equipment Depreciation, and Injuries to Persons.

And decreased $161,188., principally in Freight Train Cars Repairs; Freight Train Cars Retirements; Passenger Train Cars Repairs; Passenger Train Cars Retirements, and Work Equipment Retirements.

The final increase under this heading was $38,136.

TRAFFIC EXPENSES increased $5,119., principally in Advertising account. And they decreased $20,158., principally in the accounts of Outside Agencies; Traffic Associations, and Stationery and Printing.

The final decrease under this heading was $15,039.

TRANSPORTATION EXPENSES increased $182,566., principally in the following accounts:

Station Employes; Yard Conductors and Brakemen; Yard Enginemen; Fuel for Yard Locomotives; Train Enginemen; Fuel for Train Locomotives, and Trainmen.

And decreased $75,317., principally in Enginehouse Expenses; Operating Joint Yards and Terminals; Lubricants for Train Locomotives; Train Supplies and Expenses; Clearing Wrecks; Damage to Property; Loss and Damage of Freight, and Injuries to Persons.

The final increase under this heading was $107,249.

MISCELLANEOUS OPERATIONS increased $15,414., in the accounts of Dining and Buffet Service, and Hotels and Restaurants. Last year there was a credit of $467., while this year there was none.

The final increase under this heading was $15,881. (It will be noted that the revenues from dining cars and hotels and restaurants increased $20,405.46.)

GENERAL EXPENSES increased $24,319., principally in Valuation (Federal) Expenses and Joint Facilities, and decreased $15,742., principally in the accounts of Stationery and Printing, and Other Expenses.

Last year there was a credit of $14,256. growing out of settlement of an old account.

The final increase under this heading was $22,833.

The work done on the roadbed and track during the years ended June 30, 1916 and 1915, was as follows:

	1916	1915
BALLAST:		
Miles of track reballasted with gravel	30.52	145.35
Miles of track reballasted with rock	4.60	2.76
Miles of track reballasted with other material	7.15	13.52
Total miles of track reballasted	42.27	161.63
BRIDGES, TRESTLES AND CULVERTS:		
Lineal feet of bridges, trestles and culverts rebuilt or replaced	9,217.00	10,250.00
ROADBED:		
Miles of roadbed widened and grades rectified	52.00	6.59
Miles of ditching for roadbed drainage (track miles)	20.92	16.29
Number of cuts widened	70.00	17.00
Cubic yards of material moved	247,090.00	47,890.00
Miles of right of way fencing rebuilt (track miles)	49.56	41.79
Cross Fences and Cattle Guards	319.00	221.00
RAILS:		
Miles of track relaid with new 85-lb. steel rail	52.01	43.82
Miles of track relaid with 85-lb. relaying steel rail	18.08	.....
Miles of track relaid with 75-lb. relaying steel rail	18.94	19.59
Miles of track relaid with 60-lb. relaying steel rail	6.33	.....
Total miles of track relaid	95.36	63.41
CROSS TIES PUT IN TRACK:		
Total number treated cross ties	46,453	17,510
Total number untreated cross ties	512,582	341,982
Total number of cross ties put in track	559,035	359,492
Equal to miles of continuous track	194.11	124.82
TIE PLATES AND RAIL JOINTS:		
Total number of new tie plates	178,368	142,824
Equal to miles of continuous track	30.97	24.80
Total number of new rail joints	85,300	24,891
Equal to miles of continuous track	266.25	77.77

The work done upon the equipment during the year was as follows:

174 locomotives received heavy repairs and 60 received light repairs, at the average cost of $2,280.14 for the former, and $405.58 for the latter.

87 passenger-train cars received heavy repairs or rebuilding, and 94 received light repairs at the average cost of $903.29 for the former, and $167.56 for the latter.

Of freight-train cars 2,834 received heavy repairs and 83,115 received light repairs at the average cost of $128.67 for the former and $6.74 for the latter.

INDUSTRIAL DEVELOPMENT:

The following industries have been located on the company's line during the year:

BYRON—A grain elevator of 20,000 bushels capacity, a warehouse for storage of flour, feed and cement; coal sheds and a steel storage tank of 10,000 gallons capacity for storage of fuel oil.

FARIBAULT.—A large packing plant with capacity for slaughtering from 800 to 2,000 hogs per day is in process of construction and will be ready for operation about October 1, 1916.

FT. DODGE—A plant for the manufacture of gypsum plaster block has been considerably enlarged.

GOODHUE—Grain elevator reopened.

HAYFIELD—New coal and cement sheds erected.

LAMONT—Lumber yard established.

LILY LAKE—A concrete elevator of 30,000 bushels capacity has been constructed.

MARSHALLTOWN—A new grain elevator has been erected. The tracks of the company have been extended to a factory for small finished castings and to the plant of a lumber company dealing in lumber and building material.

MINNEAPOLIS—An elevator of 100,000 bushels capacity, located on the company's property, is in process of construction. The plant of an oil company located on property leased from this company has been enlarged by the addition of two storage tanks, each of 200,000 gallons capacity, for storage of gasoline, and six tanks, each of 12,000 gallons capacity, for storage of lubricating oil.

OMAHA—A boiler construction plant has been erected on the terminals of the company, and the elevator capacity of an alfalfa mill has been enlarged. A paper-stock company has constructed a new warehouse on land leased from this company, thereby increasing its capacity about fifty percent. A grain company has in process of construction two additional concrete tanks, each of 20,000 bushels capacity, for storage of grain, which will be completed about the middle of October, 1916.

PETERSBURG—A warehouse for storage of agricultural implements has been erected.

PINE ISLAND—A feed warehouse has been erected by an elevator company.

RENOVA—Coal sheds have been erected by a coal, lumber and grain company.

ROCHESTER—The warehouse of a dealer in hides, furs, wool and tallow has been enlarged, and additions to the coal storage facilities of three establishments located on the company's right of way have been made.

ST. CHARLES, ILL.—The capacity of the plant of a malleable iron company, located at this station, has been increased more than twenty-five per cent, and sheds for the storage of coke have been located on this company's right of way.

ST. JOSEPH—A hardware company has erected a six-story building served by the company's tracks. The establishments of a wool company and of a hide and fur company have been located on the company's right of way. The plant of a structural steel company has been enlarged.

ST. PAUL—A flour mill of 1,000 barrels per day capacity has been erected.

STANTON—The plant of a company handling lumber, coal and building material has been located on the company's right of way.

ZUMBROTA—An elevator and coal sheds have been erected.

In addition to the foregoing, the Standard Oil Company has established new distributing stations at Conception, Elizabeth, Hudson, Irwin, Lamont, Lanesboro, Lehigh, Pine Island and Vincent.

ECONOMIES:

By the installation of a plant for reclaiming and repairing track material, by welding machines, electrical machines of various kinds, and many minor improvements to tools and machinery, a saving of $22,054 per annum has been effected.

The saving from the use of gasoline section cars in place of the old fashioned hand car has continued, and the experience in their use since their installation some years ago has been most gratifying. They are saving approximately $39,000 per annum, with greater efficiency in the work of the section forces.

The modern coaling stations which have been installed from time to time are now effecting a saving of $31,000 per annum.

By the substitution of gasoline and oil engines and electricity for the old steam plants at water stations an average annual saving of $26,000 is now being realized.

EQUIPMENT:

The equipment has been increased during the year by additions as follows:

1 Steel postal car,
1 Russell Wing snow plow,
2 Automatic dump cars,
5 Switching locomotives,
10 Mikado-type freight locomotives.

Contracts have been made for additional equipment which had not been delivered before the close of the year, as follows:

3 Pacific-type passenger locomotives,
7 Santa Fe-type freight locomotives,
10 Switching locomotives,
2 Steel dining cars,
2 Parlor-Observation cars.

GENERAL REMARKS:

This year shows the largest gross and net earnings in the history of the company.

The present company has always been provided with equipment and track facilities to meet any sudden increase in business, and the officers have been diligently working for the last six years in an effort to get the gross earnings more nearly up to the capacity of the property. The year marks the first in which any fair test of the facilities of the road has been made.

It has been the thought of the Board of Directors from the first that if the gross earnings could be raised to fifteen million dollars, or approxi-

mately ten thousand dollars per mile the net earnings would be equal to at least four percent on the preferred stock. This report verifies that prediction. The physical property and its locomotive equipment are today in shape to handle a gross business on present rates of twenty million dollars per annum.

What might be termed the overhead charges, i. e., taxes and rentals, have always been heavy, owing to the extensive use of other lines by the Chicago Great Western in reaching its terminals. These charges, including as rental the interest on the Mason City & Ft. Dodge bonds, amounted to $1,176,701, leaving a surplus of $2,796,792, nearly three times the annual interest on the outstanding first mortgage bonds of the Chicago Great Western Railroad.

The Company has no floating debt, short term notes, equipment trusts or any obligations due prior to January 1, 1950.

Owing to the strong cash position of the company it was able to save during the year $26,155, through discount of bills for materials and supplies purchased. The total amount so saved since September 1, 1909, is $119,329.

During the year the company earned interest on its bank balances $57,665. The total so earned since September 1, 1909, is $530,920.

A careful study of Exhibit 12 will prove of interest. It shows what has been accomplished by the expenditure of $19,444,000, or $13,788 per mile of road, on the property since its organization. The increase in Net Income yielded a return equal to 12.74% on the total expenditure.

Operating Revenue in the year shows an increase of 39.46% over 1909; Operating Expenses increased but 17.32%; Taxes, over which the company has no control, increased 57.75%. Nevertheless, the Percentage of Operating Expenses and Taxes has been reduced 14.8%, and the Net Operating Income increased 189.2%.

Among the causes contributing to this improved result is the reduction of 27.1% in Freight Train Mileage while Revenue Ton Mileage increased 41.92%; consequently the Average Revenue Tons Per Train Mile increased 94.68%, and the Revenue Per Freight Train Mile increased 93.33%. Revenue Per Ton Mile decreased .58%. It will be noted that the Average Tons of All Freight Per Train Mile this year were 610.16—a record that will compare favorably with any western line.

In the conduct of the passenger business, as compared with 1909, Passenger Train Mileage was reduced 10.36%, while Passengers One Mile increased 18.08%; Revenue Per Passenger Mile increased 11.9%; Passenger Revenue Per Train Mile increased 46.38%.

Much stress has been laid in recent years on the ratio of Transportation Expenses to total Operating Revenue. A reference to Exhibit 10 will show that the Great Western's Transporation ratio has been reduced to 34.9%, which, considering the fact that included in the Transportation account is freight paid on company coal, of $549,597, while many other lines with which it competes have abundant coal supplies on their own lines, shows in another way what has been accomplished by the additional capital expenditures on the property.

Claims paid for loss and damage of freight in 1909 amounted to 3.27% of the freight revenue. In 1916 1.8%, being a decrease of 44.95% in this one item.

During the year two dividends, one December 1, 1915, and the other May 1, 1916, of one percent each, were paid on the preferred stock of the Company out of the income since July 1, 1914, when the dividend on the preferred stock became cumulative.

The reserve account for accrued depreciation is as follows:

Total amount charged in the Operating Expenses, September 1, 1909, to June 30, 1915	$804,600.89
Total amount thereof applied in connection with equipment retired to June 30, 1915	71.661.73
Balance of reserve brought over at beginning of this year	732,939.16
Amount charged to Operating Expenses and credited to the reserve account in this year	169,261.58
Amount of reserve applied in connection with retirements of equipment during this year	21,979.45
Amount at credit of accrued depreciation account June 30, 1916	880,221.29

The amount charged to Operating Expenses and credited to reserve accounts for depreciation of equipment this year shows an increase of $20,506.36 over last year, and it is deemed to be ample to cover the actual depreciation accruing during the period.

The gross earnings since the close of the year down to the middle of September show an increase of $467,000, or 15.7%, which is exceedingly gratifying. There is every indication of this increase being maintained through the month of October; but after November first, to the end of the fiscal year, comparison will be made with the largest earnings ever made in that period by the present Company.

The following statement showing the return on the investment in Road and Equipment from date of organization of the present company (September 1, 1909) to June 30, 1916, will prove of interest:

Years ended June 30:	Property Investment.	Income Applicable to Bond Interest, Dividends, Improvement of Property and Strengthening of Credit.*	Per Cent Income of Property Investment.
1910 (10 months)	$118,467,316.67	$1,676,496.23	1.42
1911	123,371,726.67	2,304,847.65	1.87
1912	125,721,548.08	1,813,549.01	1.44
1913	127,345,039.29	2,876,611.11	2.26
1914	128,229,157.66	2,526,172.25	1.97
1915	129,295.600.78	2,371.808.78	1.83
1916	129,933,872.64	3,177,152.10	2.44

*The "Income" shown here is determined after allowing for adjustments made through profit and loss.

The amount earned in the year just closed capitalized at 7% is equal to $32,187 per mile of road, a sum probably not half the cost of reproducing the present railroad and its equipment.

Your Directors announce with deep sorrow the death of Mr. Charles H. Conover, at Chicago, on Thursday, November 4, 1915.

Mr. Conover was a highly valued and respected member of your Board of Directors and his loss is deeply mourned.

Appropriate resolutions in respect to his memory were adopted by the Board, and a copy thereof forwarded to his family.

For detailed information as to income, balance sheet, traffic and other statistics reference is invited to the following pages.

The Board of Directors takes this opportunity to express its appreciation to the officers and employes of the Company for their faithful and efficient services.

By Order of the Board,

SAMUEL M. FELTON,
President.

CHICAGO GREAT WESTERN RAILROAD COMPANY

COMPARATIVE STATEMENT OF REVENUES, EXPENSES AND SUNDRY STATISTICAL DATA FOR THE EIGHT YEARS 1909 TO 1916 INCLUSIVE

EXHIBIT 12

FOR TWELVE MONTHS ENDED JUNE 30,	1909	1910	1911	1912	1913	1914	1915	1916	Per cent of Increase in 1916 over 1909
Average Miles of Road Operated	1,475.61	1,498.25	1,492.16	1,496,22	1,496.22	1,496.22	1,427.91	1,455.55	(a) 1.36
Freight Revenue	$7,434,148	$8,540,591	$8,820,370	$8,879,748	$9,795,074	$9,943,575	$9,645,527	$10,492,684	41.14
Passenger Revenue	2,482,104	2,642,357	2,844,471	2,891,153	3,144,284	3,205,992	3,074,050	3,280,656	32.17
Miscellaneous Revenue	887,597	968,147	1,050,371	1,113,816	1,160,620	1,200,172	1,201,108	1,294,005	45.79
Operating Revenue	$10,803,849	$12,151,095	$12,715,212	$12,884,717	$14,099,978	$14,349,739	$13,920,685	$15,067,345	39.46
Operating Revenue per Mile of Road	7,322	8,110	8,521	8,612	9,424	9,591	9,749	10,352	41.38
Operating Expenses	$9,143,701	$9,233,354	$9,537,182	$10,097,463	$10,357,209	$10,923,634	$10,450,728	$10,727,167	17.32
Taxes	350,645	364,308	384,503	406,725	439,419	499,082	580,026	553,129	57.75
Operating Expenses and Taxes	$9,494,346	$9,597,662	$9,921,685	$10,504,188	$10,796,628	$11,422,716	$11,030,754	$11,280,296	18.81
Per Cent of Operating Expenses	84.63	75.99	75.01	78.37	73.46	76.12	75.07	71.19	(a) 15.88
Per Cent of Operating Expenses and Taxes	87.88	78.99	78.03	81.52	76.57	79.60	79.24	74.87	(a) 14.80
Net Operating Income	$1,309,503	$2,553,433	$2,793,527	$2,380,529	$3,303,350	$2,927.023	$2,889,931	$3,787,049	189.20
Freight Train Mileage	3,814,296	3,935,939	3,324,432	3,065,876	2,973,434	2.873,129	2.607,354	2,780,596	(a) 27.10
Revenue Tonnage	.....	4,623,102	5,023,079	5,054,478	5,306,774	5,557,858	5,642,764	5,959,813	(b) 28.91
Revenue Ton Mileage	1,081,120,854	1,189,185,332	1,227,893,035	1,225,238,896	1,337,724,849	1,364,026,080	1,378,504,602	1,534,353,175	41.92
Revenue Ton Mileage per Mile of Road	732,660	793,716	822,896	818,890	894.070	911,648	965,400	1,054,140	43.88
Average Revenue per Ton per Mile (cents)	0.688	0.718	0.718	0.725	0.732	0.729	0.700	0.684	(a) .58
Revenue per Freight Train Mile	$1.95	$2.17	$2.65	$2.90	$3.29	$3 46	$3.70	$3.77	93.33
Average Revenue Tons per Train Mile	283.45	302.13	369.35	399.64	449.89	474.75	528.70	551.81	94.68
Average Tons All Freight per Train Mile	325.84	343.24	422.05	434.23	483.72	511.90	574.13	610.16	87.26
Tons per Loaded Car — Revenue Freight	16.07	16.59	17.17	17.66	18.14	18.56	18.77	18.87	17.42
Tons per Loaded Car—All Freight	18.47	18.97	19.81	19.25	19.53	20.02	20.38	20.86	12.94
Average Capacity of Freight Cars	28.22	31.13	33.02	34.11	34.45	34.63	35.49	35.60	26.15
Passenger Train Mileage	3,610,904	3,163,889	3,106,052	3,088,396	3,104,876	3,228,344	3,222,758	3,236,709	(a) 10.36
Passengers Carried	.....	2,398,685	2,651,371	2,500,014	2,651,096	2,817,637	2,825,496	2,809,058	(b) 17.11
Passengers Carried One Mile	138,134.435	138,735,465	149,225,662	143,642,671	153,998.072	160,199,058	157,642,318	163,106,201	18.08
Passengers Carried One Mile per Mile of Road	93,612	92,598	100,006	96,004	102,925	107,069	110,401	112,058	19.70
Average Revenue per Passenger Mile (cents)	1.797	1.905	1.906	2.013	2.042	2.001	1.950	2.011	11.91
Passenger Revenue per Train Mile	$ .69	$ .84	$ .92	$ .94	$1.01	$ .99	$ .95	$1.01	46.38
Passenger Train Revenue per Train Mile	$ 86	$1.05	$1.15	$1.18	$1.26	$1.24	$1.21	$1.27	47.67
Average Passengers per Train Mile	38	44	48	47	50	50	49	50	31.58

(a)—Indicates Decreases.
(b)—Indicates Increases over 1910.

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A Call to an Imperative Duty

Frank A. Vanderlip, of the National City Bank, in his address before the Society of Railway Financial Officers, which is published elsewhere in this issue, calls on the railroad men of this country to make for themselves a new era of railroad management and regulation. This call to make a broad, statesmanlike study of the railroad situation instead of an individual and selfish one, coming as it does from a man whose breadth of vision is extending American banking and commercial activities into Russia and through South America, should be an inspiration and a whip. It should be from among railroad men themselves that the suggestions for the solution of their great problems should come. Railroad executives have been made to feel at times that there is no longer an opportunity for the individual of extraordinary ability to exercise this ability in the management of railroads. Mr. Vanderlip points out a way in which there is an opportunity and responsibility for the best minds in the railroad world. That this opportunity is recognized and that this responsibility is being assumed, is indicated by the constructive program for better regulation which has been worked out and is being promoted by the railway executives advisory committee under the leadership of its chairman, Frank Trumbull.

The Railways and the Steel Market

With the congestion of business in the steel mills showing no relief, the railways are being confronted with a serious problem in maintaining their properties to their accustomed standards. Serious as is the increase of $5 per ton or 17 per cent in the price of rails and further greater increases in the costs of other track materials, these have been overshadowed by inability to secure early deliveries regardless of price. With the large tonnage of unfilled orders now on their books the mills are not actively soliciting domestic rail orders, as is illustrated by the report that one mill received an unsolicited order for 25,000 tons of rails by mail a few days ago. Many of the large roads placed orders last spring for their 1917 rail requirements so far as they could then determine them. Those roads which did not do this are now in an unfortunate position, for not only has the price increased, but they cannot now secure materials for delivery before next fall. While a road can ordinarily postpone a certain part of its program of rail renewals safely for a time, a continuance of this policy for any considerable period will lead to disaster. The high prices of materials and a shortage of labor have led to the postponement of much work this year. A repetition of this program during the ensuing season will inevitably be reflected in the condition of the property. The railways of this country are essential to the conduct of business, particularly during times of prosperity such as now exist, and their proper maintenance is essential to the performance of the tasks placed upon them.

The Cost of the Railway Valuation

When the federal valuation of the railways was first undertaken there were many and varied estimates of the cost of this work to the railways and to the government. Now that it has been under way for nearly three years and the field work is approaching completion on a few roads, it is possible to secure some approximate data regarding the actual expenses which these lines have incurred. The annual report of the New York, New Haven & Hartford for the fiscal year ending June 30, 1916, contains a statement that the valuation department of that road now includes about 145 employees and that $301,783.94 had been expended up to that time while $200,000 has been appropriated for the work for the following year; and no report is expected from the government until after January 1, 1918. In other words, this valuation will cost considerably in excess of $500,000 or over $250 per mile for the 2,005 miles of the New Haven. The recent annual report of the Great Northern, a typical Western road, states that $487,000, or approximately $67 per mile, has been expended for valuation, while the field work is not yet finished. It is, therefore, reasonable to assume that the preliminary cost on this road will exceed $75 per mile, and probably approach $100. This wide variation results largely from the fact that the New Haven is an old, highly developed property with numerous large and involved terminals, while the Great Northern is of recent construction, with few large terminals and similar complications. The cost of this work will also vary widely on different lines depending on the extent to which re-surveys are made by railway forces to check the results of the govern-

ment. However, considering these two roads as typical Eastern and Western properties, it is evident that this work will cost the railroads considerably in excess of $100 per mile of line; probably $150 will be more nearly accurate when all charges, including legal and other expenses incident to the final acceptance of the valuation reports, are in. At this rate the railways will be subjected to a total expenditure of from $35,000,000 to $50,000,000, in addition to the part of the expenses incurred by the government which they, as tax payers, will have to bear. No data are available for satisfactorily estimating the total expense that will be incurred by the government.

Advisory Boards for Universities

The advantages of close co-operation between the railways and the leading universities have been pointed out in these columns in the past and are pretty generally recognized in the abstract. Concrete examples of such co-operation, however, are rare enough to give considerable interest to the creation by the University of Illinois of an advisory board composed of five representatives of Illinois roads. These executive officers—C. H. Markham, president of the Illinois Central, R. H. Aishton, President of the Chicago & North Western, W. G. Bierd, president of the Chicago & Alton, Hale Holden, president of the Chicago, Burlington & Quincy, and W. B. Storey, vice-president of the Atchison, Topeka & Santa Fe—held their first meeting as a board on last Friday at Urbana, and are now organized for service. This board will deal only with the larger problems in connection with the department of railway engineering, but the channel of intercourse which they provide between the university authorities and the railways should result in further development of work that is already important. This school, in common with many other large institutions, has done much in recent years to improve its facilities, both for training students to enter railway work, and for conducting scientific investigations of value to the roads. All railway men should co-operate willingly with universities that are doing such work in order to direct their efforts along lines which will result in the greatest good.

SOME UNDERLYING FACTS ABOUT THE CAR SHORTAGE

THE freight car situation on the railways of the United States is deplorable; or rather, to state the case more accurately, the situation with respect to facilities in general is deplorable. The roads are being offered more traffic than they can handle. Doubtless, they eventually will get it all moved, but after delays, inconvenience and loss, if not actual suffering to the public. Many other classes of concerns are relatively as badly off, but the deficiencies and troubles of the railways are given more advertising than those of mine operators, manufacturers, etc. Nobody blames the manufacturer for not being able to supply the railways with cars as fast as they are ordered. Everybody knows that the manufacturer cannot deliver cars to the railroads until they are built. But many do not recognize the fact that a railway cannot deliver cars to a shipper if it does not have them, and that it cannot get them before the manufacturers have built them. Furthermore, cars cannot be built until they have been ordered, and they cannot be ordered until the railways have money with which to pay for them. The railways at present have money with which to buy cars, but they cannot now get them built fast enough to do much good. Up to fifteen months ago they could have got plenty of cars built, but then they did not have enough money with which to buy them.

The changes which have taken place in the car situation are, perhaps, best indicated by the increases which have occurred in the number of freight cars in service and in their tonnage capacity. The statistics of the Interstate Commerce Commission regarding the tonnage capacity of cars begin with the year 1903. The period from 1903 up to the panic in October, 1907, was one of rapidly increasing business and large purchases of equipment. Most of the vast number of cars ordered in 1907 were delivered in the fiscal year ended on June 30, 1908. Therefore, the five-year period from 1903 to 1908 affords an instructive basis for comparison. The increase in the total number of freight cars in service in that five years was 435,520 and the increase in their tonnage capaciy was 24,133,384 tons. Since then the railways have had some years of good business, but most of them have been bad, and therefore there was a heavy decline in the orders for equipment. This is reflected in the statistics of the Interstate Commerce Commission. Between the end of the fiscal year ended June 30, 1908, and the end of the fiscal year ended June 30, 1915, the increase in the total number of freight cars in service was only 229,003. This was 206,517 less than it was in the preceding five years. The increase in the tonnage capacity of the cars in service was only 19,318,787 tons. This was 4,814,597 tons less than it was in the preceding five years.

It is well known that in spite of the fact that the increases in the number and capacity of freight cars in the seven years ended with 1915 were much less than in the preceding five years, this latter period of seven years was almost constantly one of enormous car surpluses. Even as late as August 1, 1915, the net surplus of freight cars in the United States was 264,243.

Then with amazing suddenness came the big increase in traffic with which the railways have been struggling ever since. During the fall and winter of 1915 there was a bad congestion at the eastern ports and sporadic car shortages at different places, but there never developed throughout the country as a whole a serious situation. The railways moved a record-breaking business with a relatively small car supply. They were able to do this because of a very great increase in the efficiency with which they handled their cars. It is a familiar fact that until a few years ago the average movement per freight car per day seldom exceeded 25 miles. Statistics regarding this point for the railways of the entire country are no longer compiled, but the figures for individual roads show that many lines, and probably the railways as a whole, have made very great increases in the average miles per car per day, some of the large systems now exceeding 35 miles. While they were handling a record business last fall and winter the railways began greatly to increase their orders for equipment. The statistics of the *Railway Age Gazette* show that in the first ten months of 1915 they ordered only 67,781 cars, while in the corresponding months of the calendar year 1916 they ordered 89,323 cars. In the week ended November 4 all records for the year were broken, when the orders for freight cars aggregated 15,043.

Unfortunately, the number of cars now being ordered is no indication of the rapidity with which the present acute situation will be relieved. In the first place, the manufacturers are so deluged with orders that it will be many months before they will be able to fill those they already have, and, in the second place, the present trouble is not merely a shortage of cars, but a shortage of transportation facilities of all kinds.

If the railways now had enough cars to supply one for every one ordered it is probable that when they got them all under load their tracks and yards would become so blocked that they would be unable to move much more traffic than they are at present handling. The term "car shortage" is now, as always, merely a misnomer used to describe a condition resulting from the inability of the roads to supply

facilities enough of any kind to handle the business available.

These being the facts, how much blame ought to be visited upon the railway managements for the existing conditions? Has the country never faced similar conditions before? It did back in 1906 and 1907. Has it never been warned that they were likely to recur? It has constantly been warned of it for ten years. It has been pointed out over and over again that the policy followed by the state and national governments in regulating the railways has so restricted their earnings and increased their expenses that their net return has become inadequate. It has been shown that because of this fact the railways have become unable to raise enough capital. It has been shown that when they become unable to raise enough capital they are rendered incapable of so expanding their facilities as to make them adequate to handle the country's commerce. It has been pointed out that there were more miles of railways in the hands of receivers in 1915 than ever before in history, that the new mileage built in that year was less than in any year since the Civil war, and that in the fiscal year ended June 30, 1915, there was an actual decrease in the number of freight cars in service. How has the public responded to the presentation of such facts and to the warnings based upon them? Until recently it has to a large extent ignored them.

It is a significant coincidence that the country is confronted with the worst car shortage and congestion of traffic in its history just when the Newlands committee is getting ready to begin its investigation of the entire subject of regulation of railways. The best evidence of the need for this investigation is the present traffic situation. It is not only a natural but an inevitable result of the policy that has been followed for ten years, and unless this policy is reformed, crises such as the present are going to become more frequent and violent.

The Interstate Commerce Commission has begun this week at Louisville a general investigation of the car situation. The American Railway Association, which will meet in Denver next week, will consider the questions of increasing the per diem rate and the demurrage rate. It is proposed to advance the per diem rate to a minimum of 45 cents and a maximum of $1.25. It is also proposed to establish a demurrage rate of $2 for the first day a car is held after the 48 hours of free time have expired, $3 for the next day, $4 for the next day, and $5 for all later days. The Interstate Commerce Commission will doubtless do some good by its investigation. The increases in per diem and in demurrage rates which the American Railway Association is considering will, if adopted, expedite the movement of equipment.

But, after all, anything that either the commission or the railways will do within the next few months will merely alleviate and not remedy the situation. And what is the essential vice in the policy of regulation, which causes it to contribute toward the development of such conditions? Simply this: It so controls the rates of the railways that most of them do not in fat years earn enough money to tide them over the lean years. Consequently, in the lean years their expenditures for maintenance, and for improvements and increases of facilities, are restricted to the utmost in order to keep them out of bankruptcy, and they cannot in the fat years make large enough expenditures for maintenance and large enough investments in improvements to offset the heavy retrenchments made in the lean years. A policy which does not recognize the fact, as our policy of railway regulation does not, that every industry has to go through bad as well as good years, but which on the contrary is predicted on the assumption that rates which are hardly sufficient for prosperous years will be sufficient at any time, is bound at frequent intervals to give rise to such conditions as those with which the country is now struggling.

INTIMIDATION BY THE B. OF L. E.

THE question whether all railroads should be required to equip their locomotives with high-power headlights, which has been the subject of a hearing before the Interstate Commerce Commission for over a week, pales into comparative insignificance alongside the testimony presented at the hearing regarding the methods practiced by the Brotherhood of Locomotive Engineers to intimidate and coerce its members who are inclined to express their views on a matter of such vital importance to themselves. A most remarkable state of affairs, not entirely unsuspected by those who have been familiar with railroad matters, was disclosed when the commission decided to admit the testimony reported elsewhere in this issue, of engineers who have been expelled from the brotherhood, deprived of their insurance and ostracized by their fellow employees at the command of the chief executive of the brotherhood, for giving public utterance to opinions at variance with those entertained for their benefit by the leaders of the organization.

The railroads and the engineers who testified have performed an important public service in thus calling attention to a condition which has long been known to exist, but which it has been difficult for free American citizens who do not belong to labor unions to appreciate.

The four brotherhoods of train service employees recently gave an effective demonstration of the power they were able to exercise over the Congress of the United States. This has served to throw some light on the manner in which they have been able to exercise so potent an influence over state legislatures for several years, as well as to explain why they have been so successful in forcing concessions from the railroad managements.

The explanation given by witnesses in this proceeding of the way in which the brotherhood chiefs have been able to intimidate their members who do not approve of their legislative plans may help to explain in part the unanimity with which the members of the same organizations on several occasions have voted to throw up lucrative jobs at the behest of the same leaders. The explanation will hardly serve to increase the self esteem of the members of Congress and of the legislatures who have allowed themselves to be bluffed by organizations whose strength is derived from such methods.

The sections of the constitution and statutes of the Brotherhood of Locomotive Engineers prohibiting members from expressing an opinion against the legislative plans of the officers, which were brought out at the hearing and which the engineers who dared to express their honest opinion as to electric headlights were charged with violating, show the extent to which the members of the organization are required to subordinate themselves to the will of the labor oligarchy. Section 3 of the constitution, which was not read at the hearing, expresses the same fact in even plainer language. It provides that the grand international division of the brotherhood, composed of its chief officers, "shall have exclusive jurisdiction over all subjects pertaining to the brotherhood, and its enactments and decisions upon all questions are the supreme law of the brotherhood, and all divisions and members of the order shall render true obedience thereto."

One of the engineers who testified on behalf of the railroads, but who was rather nervous about the prospect, was reassured by "Brother Stone" that "nobody who tells the truth was ever thrown out of the brotherhood." The record does not show whether he asked Stone for any further reassurance on this point after two other engineers had testified that they had been ousted from the organization by Stone's direction on the sole evidence of the fact that they had testified before the commission unfavorable to high power headlights and that the truth of their statements had

not even been brought into question. The question of the truth or falsity of a statement on such a subject apparently comes under the "exclusive jurisdiction" of the brotherhood officers whose decision is the supreme law of the organization and its members.

The headlight hearing has also served to furnish another illustration of the close partnership that appears to exist between the botherhoods and the locomotive boiler inspection department of the Interstate Commerce Commission, whose chief officers appeared as the principal witnesses for the brotherhoods and sided with them throughout as against the railroads. President Carter of the Brotherhood of Locomotive Firemen and Enginemen, said that the brotherhoods had refused to have anything to do with the "ex parte" headlight tests conducted by the New York Central, but he wanted to have the commission conduct a series of tests of its own. As such tests would naturally be conducted by the boiler inspection department, which has already recommended the rule proposed by the brotherhoods, Mr. Carter's suggestion is rather amusing, to say the least.

KANSAS CITY SOUTHERN

THE Kansas City Southern is the only road of its group in the southwest which has continued to pay dividends on any class of stock, and most of its competitors have gone into the hands of receivers during the past few years. The Kansas City Southern's ability to continue to pay 4 per cent on its $21,000,000 preferred stock has not been because of an extraordinarily large increase in gross business. The reverse is true. Its increase in traffic has been below normal.

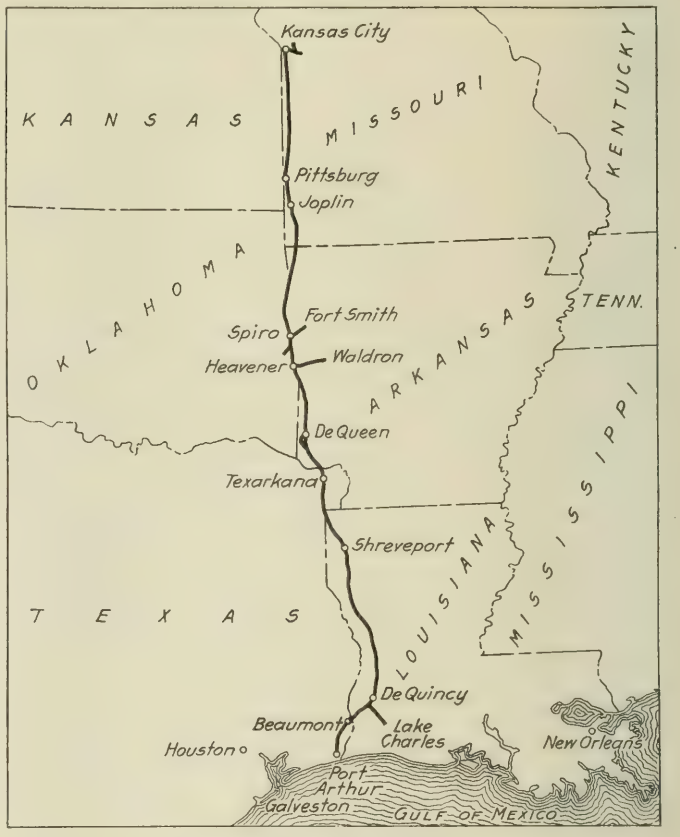
Total operating revenues in the fiscal year ended June 30, 1916, amounted to $10,584,000, comparing with $10,036,000 in 1915, with $10,993,000 in 1914, the best year in the company's history, and with $9,595,000 in 1910. It was in 1910 that a program of betterment work was begun, which is still in the process of being carried out. Compare this with the Rock Island, with operating revenues of $75,347,000 in 1916, $70,948,000 in 1915, $71,365,000 in 1913, the best year in the history of the company, and $66,221,000 in 1910. In fact, most of the Kansas City Southern's competitors will show a larger proportionate gain in gross in 1916 as compared with 1910, and with intervening years, than it does. How, then, are we to explain the fact that the Kansas City Southern earned in 1916 net income available for dividends of $1,671,000, and after paying 4 per cent on its preferred stock carried to profit and loss an amount almost equal to the $840,000 paid out in dividends.

One of the first things that strikes the attention in comparing 1916 with either 1915 or with 1910 is the transportation expenses (out of pocket cost of doing the business). In 1916 transportation expenses were $3,299,000, or less by about $99,000 than in 1915 and about $37,000 less than in 1910. The ratio of operating expenses to total operating revenues was 59.58 in 1916, 64.08 in 1915 and 65.56 in 1910. When the program of improvement was started in 1910 an operating ratio of 58 and a transportation ratio of 28, with an average revenue trainload of 650 tons and a gross business of $15,000,000, were aimed at. The management actually did a little bit better than had been aimed at in transportation ratio. It was slightly over 27 in 1916, but in this respect the management was helped by the fact that the average ton-mile rate was 7.44 mills in 1916, comparing with 6.92 mills in 1915 and 7.25 mills in 1910. In gross earnings and in trainload the estimates of 1910 have not as yet been met. The trainload of revenue freight in 1916 was 548 tons; in 1915, 542 tons, and in 1910, 361 tons.

The showing made in transportation expenses in 1916 was remarkably good because there were adverse conditions under which the management had to labor that are not shown in a simple comparison of revenue or of traffic. The total ton mileage of revenue freight in 1916 was 1,099,973,000, a decrease as compared with the previous year of 28,760,000 ton-miles, or between 2 and 3 per cent. The passenger mileage was 66,821,000 in 1916, an increase of about 2,200,000. No new locomotives were added during the year and the traffic was much more unbalanced than in other years. The total freight car mileage was 73,311,000 in 1916 as against 72,517,000 in 1915. The tonnage of revenue freight per loaded car was 21.49 in 1916 and 21.67 in 1915.

One of the great difficulties with the operation of the Kansas City Southern is that the great bulk of the tonnage moving over the northern half of the road is northbound tonnage. Conditions of the balancing of traffic on the southern half of the road are not so bad, although even here northbound tonnage predominates. Conditions were much worse than normal in 1916 because of the movement of grain to the Atlantic seaboard instead of to the gulf, and to the lack of ships for export loading at Port Arthur.

The Kansas City Southern's operations are particularly



The Kansas City Southern

interesting because they present railroad problems simplified, inasmuch as averages for the whole road are not affected by the inclusion therein of figures for the operation of a large proportion of branch line mileage. The Kansas City Southern operates 777 miles of main line running from Kansas City to Port Arthur, with only 46 miles of branch lines.

In the program inaugurated in 1910 for the improvement of the road and betterment of its operating ratio no provision was made for further considerable grade reductions beyond the four divisions already placed on a 0.5 basis. The management undertook to meet the increasing wage scales and increasing prices of materials by getting more work out of the locomotives or by substituting heavy for light locomotives, reducing the amount of fuel consumed per mile run, holding down the cost of water for locomotives in the face of rapidly rising costs per 1,000 gallons, cutting out overtime and constructive mileage through a re-arrangement of terminals, and

reducing the debit balance per diem and reclaims by increasing the average mileage per car per day. Incidentally, of course, this program necessitated a very considerable rehabilitation of the line and structures. The principal changes in this respect were revision of about 150 miles of line, the replacing of 56 to 70-lb. rail with 85-lb. rail, ballasting the whole line with gravel or rock (previous to 1910 most of the line that was ballasted was ballasted with chats or sand), improvement of drainage and widening cuts and fills, replacement of wooden trestles with fills or culverts, replacement of bridges with a change of standard from Copper E 30 loading to Cooper E 50, and fencing right of way.

There was a total of 208 locomotives in service at the beginning of 1910; at the end of 1916 there were 192 locomotives in service. During this time the company had bought 12 Mallets, 8 Pacific type locomotives, 15 Consolidations and 4 switching locomotives, all of which were equipped with superheaters. During the past year 20 locomotives were equipped with superheaters, brick arches, automatic fire doors and new piston valves. The present program calls for making these improvements to the locomotives at the rate of 20 a year. As illustrative of the way in which the problem of getting more work out of locomotives has been met, a single instance might be cited where it had first been decided to make a grade revision by cutting out a ruling grade on the division which reduced the rating of locomotives over the whole division by a considerable percentage. By putting Mallets on this district and by shortening it so that the run could be made without overtime and running the locomotive simple instead of compound over the ruling grade, the full rating for the compound operation of the locomotive could be given it over the whole district. New terminals were located at Watts, Okla.; Heavener, Okla.; De Queen, Ark., and Leesville, La. New shops were built at Shreveport, La., and Pittsburg, Kan. This made seven divisions for 773 miles of main line and did away with a great amount of overtime and constructive mileage.

In 1910 hire of equipment cost the Kansas City Southern $235,000. In 1916 this had been reduced to $110,000. The company had in service at the beginning of 1910 6,908 commercial service freight cars and at the end of 1916 4,894 commercial service freight cars. In other words, apparently by far the greatest part of the saving in car hire has been due to a greater mileage per car per day on the Kansas City Southern. All main line as the road is, it ought to have a high average mileage per car per day if the yards are properly placed and kept clear. At present the car mileage per day is between 35 and 40 miles.

Of the program of improvement started in 1910 the greater part of the ballasting has been done, the change of terminals has been completed, the grade revision has been completed, and there still remains to be done the improvement to existing locomotives at the rate of 20 per year, some further bridge strengthening, and especially important, a further reduction in the debit balance of hire of equipment.

Total transportation expenses in 1916 amounted to $3,299,000, a decrease as compared with the previous year of $99,000. The principal savings were made in the cost of fuel and in other costs of train service. The price per ton of coal was $2.05 in 1916 and $2.01 in 1915, but the miles run per ton of coal used was 12.34 in 1916 as against 12.10 in 1915, an increase of 2 per cent. The price per barrel of oil was 60.69 cents in 1916 and 64.68 cents in 1915, and the miles run per barrel of oil used was 3.07 in 1916 and 3.02 in 1915. Most of the Kansas City Southern yard engines burn oil, and the total amount spent for fuel for yard locomotives in 1916 was $147,000, a decrease as compared with the previous year of $21,000, notwithstanding the fact that the wages of yard enginemen amounted to $113,000 in 1916, an increase of $8,000 over the previous year.

The opening of the Panama canal ought to help the Kansas City Southern. If the road can get increased revenues, a further reduction still in many of the items under transportation expenses ought to be possible. The ratio of maintenance to gross, even if gross considerably increases, will probably not change greatly. Such items, however, as despatching trains, station service, yard service, and with heavier trainloads, wages of enginemen and trainmen, loss and damage to freight and injuries to persons, and damage to stock on right of way, ought to decrease.

During the year the total expenditure for additions and betterments was $981,000. There was $1,000,000 of refunding and improvement mortgage bonds sold, making a total outstanding of $18,000,000 of these bonds, of which the total authorized issue is $21,000,000. In the near future probably, therefore, the Kansas City Southern will have to provide some new means for financing its capital needs.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916.	1915.
Average mileage operated	837	837
Freight revenue	$8,094,107	$7,731,118
Passenger revenue	1,513,168	1,410,618
Total operating revenue	10,583,630	10,035,896
Maintenance of way and structures	1,132,086	1,132,078
Maintenance of equipment	1,277,530	1,185,016
Traffic expenses	334,668	336,196
Transportation expenses	3,298,504	3,397,007
General expenses	410,184	489,087
Total operating expenses	6,361,722	6,478,821
Taxes	561,990	574,316
Operating income	3,659,918	2,982,759
Gross income	3,857,676	3,159,530
Net income	1,718,468	1,131,083
Dividends	840,000	840,000
Surplus	878,468	291,083

CHICAGO, ROCK ISLAND & PACIFIC

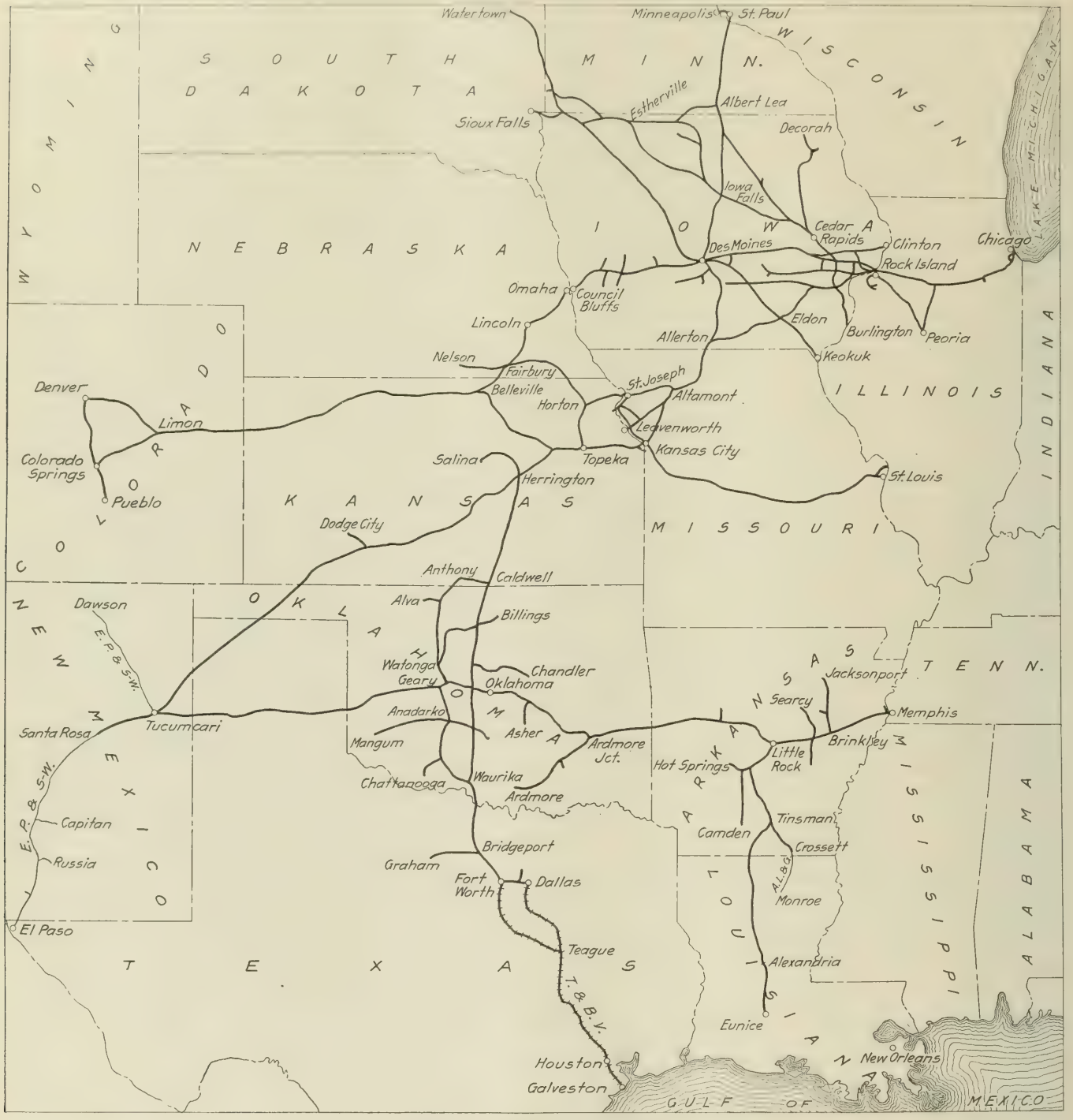
IT is unfortunate that the Chicago, Rock Island & Pacific is not in a position to raise all of the capital needed for physical improvements, but the report of the receiver for the last fiscal year shows that much is being accomplished by the expenditure of surplus current funds. A share in the general prosperity of the country, combined with effective operating economies, made quite a large sum available to the receiver for additions and betterments. For his guidance in the expenditure of this sum he had a report made by J. W. Kendrick, formerly vice-president of the Atchison, Topeka & Santa Fe and associates; a review of this report by Major Charles Hine, and exhaustive comments on the Kendrick report and Hine's review of it by the Rock Island chief operating officer, general solicitor, freight traffic manager, comptroller, general purchasing agent and assistant to receiver. The Kendrick report had advocated the expenditure of approximately $33,000,000 over a period of three years. The receiver had available and actually used $4,718,000 for additions and betterments.

Besides being limited as to a complete adoption of the recommendations of the Kendrick report by lack of capital, the receiver relied on his own judgment and the advice of his officers in departing from the program outlined by the experts. A touch of humor is lent to what is in general a sober analysis of the progress made, by the statement that the experts' report estimated an annual saving of $200,000 in the elimination of stock claims by the expenditure of $309,348 for fences; but "inasmuch as in only two years of the Rock Island's history had the annual expenditures for stock claims aggregated $200,000, the average for 10 years being $169,675, it is hardly possible to effect an annual saving of $200,000 per year in the amount paid in stock claims." In the great majority of cases the recommendations in the experts' report were followed in general, if not in detail, as far as available funds permitted.

The Rock Island made a very good showing in the fiscal year ended June 30, 1916, as is made obvious by a surplus, after making charges for all rentals and interest, of $2,957,000, comparing with a deficit in 1915 of $735,000. The study

of the operation of the property made by the experts and the adoption of many of their recommendations was instrumental in obtaining these results, but great importance also must be attached to the concluding paragraph of the report of the receiver:

"The receiver heartily commends the loyal and able service of the officials and employees under him. So far from a receivership making them lax and perfunctory in the discharge of their duties it has stimulated them to greater zeal. A sense of trusteeship has made them co-operate toward rehabilitating the properties and restoring their management to their owners. In going over the properties and coming in contact with the patrons, chambers of commerce and public officials, the receiver has found a manifestation of deep interest and friendship for the Rock Island Lines and a friendly disposition for and confidence in its local representatives. While the gratifying showing made during the fiscal year was mainly attributable to the general prosperity and increase of the business of the country, it is manifest that it required constant vigilance, loyalty, activity and satisfactory service to secure a proper participation in that increase, and very high efficiency in all departments to realize therefrom the net results obtained."



The Chicago, Rock Island & Pacific

Total operating revenues in 1916 amounted to $75,347,000, an increase* over 1915 of $4,399,000, or 6.20 per cent. Total operating expenses amounted to $54,543,000, an in-

*The actual increase was greater than this because the 1916 earnings do not include the operation of the Keokuk & Des Moines, about 232 miles, whereas the 1915 figures do include the operation of this road. Except where specifically stated, all of the comparisons made in these comments are subject to this correction.

crease of $1,022,000, or 1.91 per cent. This increase in operating expenses was the result of an expenditure of $10,518,000 for maintenance of way, or $1,049,000 more than was spent on maintenance of way in 1915, and $12,648,000 for maintenance of equipment, which was $841,000 more than was spent on maintenance of equipment in 1915, offset in part by a transportation cost of $27,225,000, a saving as compared with 1915 of $916,000. The largest single item of saving was that in cost of fuel for locomotives. Treating the Keokuk & Des Moines as if still operated by the Rock Island so as to make an accurate comparison, there was a saving of over $300,000 in the cost of fuel, in the face of an increase in the ton mileage carried and almost no decrease in the passenger mileage. In part this saving was the result of a reduction in locomotive mileage, due to the elimination of unprofitable passenger trains. In part it is estimated that it was the result of carrying out the Kendrick report's suggestion of organizing a fuel department under the supervision of a manager of mining and fuel. This officer reported, however, to the chief operating officer and not, as was recommended in the Kendrick report, to the purchasing and stores department.

More striking, even, than the saving made in fuel was the reduction in payments for loss and damage to freight. Such payments in 1916 amounted to $879,000, which was $282,000, or 24.28 per cent less than the payments in 1915. The saving, if a strictly accurate comparison were made which would include the Keokuk & Des Moines, in 1916 was over 31 per cent. The Rock Island had in operation for the greater part of the 1916 year 4,000 new box cars, and besides this, old box cars were maintained in better repair in 1916 than in 1915. The primary cause, however, the receiver thinks, of the large saving made was in the increased attention given to the entire subject of operation, including not only better equipment but also better track, better freight house operation, better loading and better organization. A supervisor of freight house operation was appointed in February, 1916, and the drop truck system recommended in the Kendrick report was adopted, and of the 1,465 trucks authorized to be bought, about one-third were put in operation. It is estimated that the cost per ton of handling l. c. l. freight in 1916 was 37.59 cents, and in 1915 37.99 cents, notwithstanding an increased wage schedule in effect in 1916.

Total freight train mileage was 16,371,000 in 1916, an increase of less than half of 1 per cent, and the number of tons of all freight moved one mile was 6,914,000,000, an increase of 7.03 per cent. The average trainload of all freight was 406 tons in 1916 as against 380 tons in 1915.

The total passenger train mileage was 17,433,000 in 1916, a decrease of 607,000, or 3.37 per cent. The passenger mileage was 953,000,000, or only a fraction of 1 per cent less than in 1915. The Kendrick report had recommended a quite drastic cutting down of passenger service and, among other things, the abandonment of the Rock Island-Southern Pacific's Golden State Limited. The receiver and his operating officers, however, decided that although this train did not pay when charged with its full share of overhead as well as out of pocket cost, its earnings were more than sufficient to pay actual expenses of operation, and it was, therefore, profitable to continue it. The state commissions prevented the abandonment of some local trains that were obviously being operated at a considerable dead loss, and in other cases the pressure of public opinion prevented the carrying out of the program of curtailment.

There was a total of $2,680,000 spent for additions and betterments to road, entailing, in many cases, increased expenditures for maintenance of way. It is interesting to note that the Kendrick report had recommended the purchase of 880 motor cars at a cost of $176,000 for the use of section gangs. The receiver decided to buy 759 motor cars for section gangs and 95 for bridge gangs and his estimates of the probable saving are approximately the same as that of Mr. Kendrick—$450,000 a year.

The Chicago, Rock Island & Pacific had been operated until December, 1915, in three districts, each in charge of a general manager. These three districts were combined to form two general managers' districts, and the direct saving in salaries and expenses is about $75,000 a year. It is, of course, too early to estimate whether there will also be indirect savings or indirect losses. Another change which should be mentioned is the reorganization of the signal department and the purchase of 18 motor cars for use by this department. An estimated saving as the result of these changes is being made of about $20,000 a year.

The table at the end of these comments shows charges made to income for all of the interest due on outstanding securities. As a matter of fact, however, the receiver was instructed not to pay the interest on the $20,000,000 5 per cent debentures and certain other interest, a total of $1,607,000 for the year, which, although shown as subtracted from income, was not actually paid. At the end of the year the company had on hand $3,468,000 cash and $2,483,000 special deposits. There are $4,100,000 loans and bills payable, interest on which the receiver has assumed. It is worth noting that the audited accounts and wages unpaid have been reduced from $6,673,000 at the end of 1915 to $5,505,000 at the end of 1916.

The table below shows principal figures for 1916 and 1915:

	1916.	1915.
Average mileage operated	8,098	8,330
Freight revenue	$50,921,932	$47,576,668
Passenger revenue	18,664,963	18,230,101
Total operating revenue	75,346,967	70,947,890
Maintenance of way and structures	10,518,065	9,468,978
Maintenance of equipment	12,648,260	11,807,657
Traffic expenses	1,745,573	1,877,152
Transportation expenses	27,224,633	28,139,317
General expenses	1,941,877	1,763,925
Total operating expenses	54,543,133	53,521,615
Taxes	3,567,851	3,353,919
Operating income	17,204,726	14,039,895
Gross income	18,611,068	15,407,811
Net income	2,957,281	734,677*

*Deficit.

NEW BOOKS

Handbook of Rock Excavation. By Halbert P. Gillette. 809 pages, 200 illustrations, 4¾ in. by 7 in. Bound in leather. Published by the Clark Book Co., New York. Price $5.

The author of this book has done much to create a proper realization of the value of cost data among engineers and contractors by his numerous writings on this subject. Entering the field of cost data a few years ago when relatively little had been written on this subject he has collected and made available for use a vast amount of information of this character which is of value to men engaged in construction work. This book and a companion book on Earth Excavation which will soon appear add much data to that already made public.

The present volume contains most of the information originally published 12 years ago in "Rock Excavation, Methods and Cost," together with twice as much new material which has been collected since that time. Accompanying the cost data are descriptions of a large number of methods of excavating and transporting rock under different conditions which give a reader the proper surroundings to enable him to analyze and interpret the figures. Considerable space is also given to descriptions of drills and other rock handling equipment required in work of this character.

The subjects of the chapters are as follows: Rocks and Their Properties; Methods and Cost of Hand Drilling; Drill Bits; Shape, Sharpening and Tempering; Machine Drills and Their Use; Core Drills; Explosives; Charging and Firing; Methods of Blasting; Loading and Transporting Rock; Quarrying Dimension Stone; Open Cut Excavation in Rubble Quarries, Pits and Mines; Railroad Rock Excavation and Boulder Blasting; Canal Excavation; Trench Work; Subaqueous Rock Excavation.

Opportunity and Responsibility of the Railroad Man*

Lessons Railroad Men May Learn from Banking Situation of Twenty Years Ago and Development Since

By Frank A. Vanderlip
President of the National City Bank, New York.

AS the financial executives of the railroads of the United States, you naturally have a good deal of pride in your business. You know that you represent an interest which is capitalized for more than $16,000,000,000. You know that a great amount of new capital ought to be going into that business every year, and it has appeared that a good deal has been going into it. You have seen American investors buy back from foreign holders $1,600,000,000 of railroad securities since the outbreak of the European war. You may take pride in the fact that our investors have shown such confidence as to buy back this great amount of railroad securities. But if you have any disposition to feel that your business is popular with investors, you may as well put that out of your minds. Do not feel proud of your popularity with investors.

We have been talking in billions about the capital invested in the business; in billions about the amount of railroad securities that investors have repurchased, but do you know that in the year 1915 the total amount of money put into new railroad stock for new railroad work was $12,950,000? Investors will loan you money, at least those of you who represent corporations that still can make a mortgage that offers security, but investors will not even loan the railroads money to anything like the extent of their financial needs. When it comes to new money going into fresh partnership with the railroads, when it comes to raising fresh capital by stock issues, your lack of popularity with the investor is shown in its true light.

Even in their efforts to borrow, the railroads have for several years had to resort to short term investments. Most of the financing for several years was done in that way, and most of the recent financing has been the refunding of maturing short term obligations, but there is no new money to take new stock issues. You still have some credit; you can borrow, but your business is without the confidence of the investor. It is a sad outlook for the biggest single business in America when that business no longer has the confidence of the investors, and will not stand the test of bringing new dollars for stock investment for the further development of railroad properties.

A few weeks ago when the President of the United States was discussing with the union labor leaders the suggestion of forced arbitration, he was told with a good deal of ringing pride that "Men cannot be subjected to involuntary servitude." Do you know you cannot subject an uninvested dollar to involuntary servitude either? The railroad business affords the best illustration of that. Fresh dollars decline to be subjected to involuntary servitude in new railroad stock investment; these dollars are going somewhere else.

There has within a year been invested $400,000,000 in new industrials in America, but practically not a dollar for railroad investment. The only new capital the railroads have obtained has been through borrowing. There are many phases of the railroad situation that are not heartening. We see forty-two thousand miles of railroads in the hands of the receivers, represented by $2,250,000,000 of securities.

And yet on top of that we have seen Congress take the extraordinary responsibility of advancing the wages of railroad trainmen. The extent of the railroad business is such that we ought to be building 200,000 freight cars a year. Last year we built 74,000; this year the orders up to date are for 60,000. The effect of this is sharply pointed out in last week's report of a car shortage aggregating 87,000 cars.

I could use figures to illustrate the position of the railroads without end, but you know these figures better than I do. I remember E. P. Ripley saying one time after a discussion about leasing a railroad, a discussion that had grown too statistical: "Let us throw the figures away and get down to business." I do not want to make a statistical speech, so we will throw away the figures and take up some of the fundamental considerations of the railroad situation.

I saw a letter the other day from Mr. Thornton from England. Some of you know Mr. Thornton. He is a very eminent American railroad man who went into the English service, and has been chosen by the British government as one of the small group of men in charge of the operation of British railroads. In that letter he told why the German army did not reach Paris, after that wonderful start, after smashing through Belgium, and after getting so near that the sound of the guns could be heard in Paris, and before Great Britain could gather herself for the attack. This letter told the reason, and the reason was the railroad. The railroad service broke down under the pressure, could not stand the strain, was not up to the enormous requirements. If the service had been fully up to the requirements, it would have changed the history of the war—in that particular case, I believe, for the worse. But that is neither here nor there. It illustrates the importance to the nation of preparedness of its railroads.

Hardening of Arteries

Most of us have reached an age where we find ourselves once in a while in a doctor's office with our coat off and a rubber bandage around our arm. A doctor is taking our blood pressure. It is high time to take the blood pressure of the United States. I tell you you will find that the United States is getting hardening of the arteries, and it is a very dangerous disease.

We have hampered the railroads by such restrictions, such interference, such an unfriendly attitude by the public, by commissions, by legislators, that investors have been afraid to give to the railroads the fresh capital, by the use of which they could alone maintain the resiliency enabling them to meet extraordinary demands. This lack of new capital has put many railroads in a position where they cannot meet the demands of excessive business pressure. We are seeing that in the situation today. But there might come demands far more severe than anything that business is putting on the railroads at the moment.

Just as certainly as a man with hardened arteries is in vital danger should he engage in some struggle that calls forth all his powers, so the United States would be in danger from its hardened arteries of transportation if the nation ever faced a struggle. That danger would be one of enormous consequences. I believe that the situation ought to be regarded by our statesmen—such as we have—and by our people—if they think—as a matter of grave national concern. Do not be confused because of the fact that we have bought back $1,600,000,000 of securities from foreign hold-

*An address before the Society of Railway Financial Officers at Washington, October 20, 1916.

ers. Even that vast repurchase of securities does not show confidence in the railroad situation. It shows confidence in the old secured debts which have been in the hands of foreign holders. It is quite possible to have a satisfactory mortgage on a very poor business. Railroads can still operate and they can and do go on increasing their debts, but it is a fact that investors are not attracted to new capital stock investment, and it is a dangerous fact that the development of the railroads has been retarded because capital does not regard the field as satisfactory. There is a lack of sympathy between the railroads and the public; there is a lack of confidence in the minds of investors, and it is well to remember, too, that investors are now having new opportunities such as have rarely, if ever, been offered to the investing public. American investors have bought since the outbreak of the war, $1,700,000,000 of foreign government securities. You will see that total grow rapidly. The greatest nations of the earth are paying more for money than first-class railroads have paid in a long time. The foreign demand for capital will increase in capacity rather than decrease. You will have to meet this new competition. The railroads will have to face not only the difficulties that they have faced in the past, but they will have to face a new set of difficulties. They will have the difficulty of being in a world where untold wealth has been destroyed; a world where the competition for capital will make the price of capital high; a world where the United States has entered at last financially as a real world factor. In our markets will come the play of competition, of a world demand for investment funds, and the railroads must meet all that in addition to the difficulties inherent in their position, which lead to a lack of fundamental confidence.

What Is the Trouble?

What is the trouble with us? What is the matter? I do not believe there is a man in this room who knows what is the matter, or who has really gotten down to thorough thinking, in a nation wide way, as to what is the matter. This railroad situation seems to me to be quite parallel, in some ways, to the banking situation twenty years ago. America, with its insular business, its system of individual banks, had not developed bankers who thought either nationally or internationally. They thought of the business that passed over their desks. They were sound money lenders, but they had not learned much about the business of banking as a science.

But they began to see that something very serious was the matter. We had recurrences of panics. Twenty years ago, you will remember, we were talking in a more or less loose way about the need for an expanding currency. That seemed to be the catch word. But few men understood the principles or the economics of the banking business. They saw something was wrong, they were groping, but there was no unity of opinion whatever. No two bankers would have made the same diagnosis or given the same prescription as to what should be done.

But the great difficulties, and the great losses that followed the difficulties, made men think. They—the whole banking fraternity—got it pretty well into their minds, that there was something wrong, and that a remedy had to be found. Men began to devote their minds to it, and that was not confined to the men in the big centers, either. There were more men, I believe, in small communities, with the time, the temperament, and the inclination to study, who contributed to the solution of that problem than could be found in the very busy offices in the great centers.

After a while certain principles began to crystallize in the minds of the bankers, but until that was done it was perfectly idle to talk about getting legislation that would be correct from an economic point of view. Until there was a body of banking opinion which was in agreement and saw clearly, which had studied the principles, which knew that we have got to mobilize our resources, which knew we ought to have in circulation bank note currency, which knew there needed to be a central bank—and that is what the banking mind knew we needed—until there was that crystallization in the banking mind, there was no progress in the confidence of the public or legislators as to what should be done. When that opinion crystallized something was done, and it was done in the right direction. I am merely using this as an illustration. What was done has been only one step, and there have got to be some others.

Railroad Men Must Be Statesmen

What I want to do is to use this as an illustration of the necessity for railroad men to think of their subject nationally, and to begin to see that there is something fundamentally wrong with our railroad situation; that the trouble is not merely with the administration of the interstate commerce law, or with that law itself; the trouble is not altogether with the hampers that various state commissions put upon you; that the trouble is not wholly that of lack of sympathy on the part of the public with your problems. You have got to get at this thing so that you think as statesmen, that you see a great economic and national problem.

I am not assuming to tell you what the answer is at all. I have not thought of it sufficiently. I do not believe there is a man in this room who has thought of it sufficiently. We have got to direct the expert railroad sentiment to the question "what is the trouble." You have got to diagnose your disease before you attempt to cure it.

You have in your Committee of Railroad Executives a starting point. They say they want federal incorporation, want to abolish state control, want to have regional subcommissions, patterned somewhat on the Federal Reserve Bank. That is a start.

I have talked to some of them about some other features of the situation that seemed to me just as fundamental, and they answer, "Don't load the wagon so heavily; it will not start." That may be true; probably you can not do everything that should be done at once. But you can think about it, you can think about it clearly and intelligently, until all of your minds crystallize, until the great body of railroad opinion crystallizes, so that we have a force of expert opinion that will begin to tell on general public opinion and then on legislation.

Now, this idea that you are going to be happy after you merely get rid of state control, I doubt. It is a move in the right direction, but remember you were not happy before you had state control.

We have, it seems to me, two perfectly incongruous ideas in our administration of this great business—first, there is the theory of regulation, regulation that is getting enormously onerous; regulation that calls for two million reports a year and prescribes every detail of the operations covered by those reports; regulation that not only fixes your rates and fixes a great part of your administration, but now regulates the wages you pay, and regulates them because of threatened strikes, not because of relative levels.

Then we adopt, parallel with this theory of regulation, the same restricted legislation prohibiting combinations that we have applied to all competitive business. Side by side with the theory of regulation, we apply this other theory and apply it with all the vigor that we do to uncontrolled competitive business; thus you are caught between two mill stones. You cannot obtain the economies in operation which a proper understanding and co-operation between railroad properties would evolve. You are estopped by one theory from obtaining the economies of combination, and, at the same time, you are grasped by the other theory and left with no freedom of competition. Is it any wonder that you are not securing money from investors for new development in a field of business so hampered? Is it surprising that we saw last year the

smallest amount of railroad construction in any year since the Civil War? Is it not a natural consequence that you cannot get money enough properly to equip your roads and to enable you satisfactorily to do your business?

What this situation needs, it seems to me, is railroad men who are statesmen. That was what the banking business needed. It was hard to find them, and it took years of severe trials to grow bankers with statesmanlike vision. You railroad men are busy with your day's work just as the bankers were; you are engrossed in the great flow of business that goes over your desks, with the normal natural problems of the day's work, and with the abnormal unnatural problems that have been put upon railroad managements by unsound public opinion and legislation. But it seems to me, and I hope I am not too critical, that you are in just the position in which we found the bankers twenty years ago—too busy to think nationally, too near to detail to really be statesmen, and to keenly study the matter as a problem in economics, a problem in government, and a problem in finance. The subject is one that railroad men must approach in a broad way. They must no longer view it as the individual problem of each road, but must study it in the light of the experience of other countries, in the light of our political institutions, and with a view to bringing about a sound state of public opinion.

Government Ownership a Tragedy

That is what has got to be done. It is certain we will not solve the railroad problem at all until you railroad men have reached some substantial agreement as to at least certain common principles which must be involved in solving it. Since I have been in this room men have said to me, "Well, I suppose we are going inevitably to public ownership." If we are, we are going inevitably to a public tragedy.

We are going inevitably somewhere. We are not going to stand still with railroads unprovided with funds, with hostile government supervision, with laws that prevent economic combinations, with a selfish public demanding lower and lower rates, and selfish labor forces demanding higher and higher wages. You are going somewhere; you are not going to stand still. Something has got to be done, and it is up to you to have a pretty clear opinion of what it is that ought to be done, because we have to look to railroad men for expert railroad opinion.

We get all sorts of criticisms about maladministration in the financial management of the railroads. A lot of that criticism is unfair, a lot of it is demagogic, and some of it is true. But what of it? At the most, taking everything that is criticized in the way of the financial administration or maladministration of railroads, it would not apply to ten per cent of the whole railroad field. How would our government officials like to be judged by the worst ten per cent of their performances?

Some things have been done that ought not to have been done. But that does not mean that the way to cure it all is to have government ownership and government operation. Nor does it mean that the way to cure it all is to have a blind government control that has no regard for the safety of the investment and creates a situation where investors will no longer put their money into the properties.

Troubles are Fundamental

The real trouble is a good deal deeper than any questions of existing legislation. The real cure is a good deal deeper than any new methods of regulation. It seems to me that the troubles are really fundamental; they are troubles fundamental to our national character, and that means fundamental to individual character.

There is a selfishness in this railroad proposition. The public is selfish about rates; labor is selfish about wages; investors, if you will, are selfish about returns; politicians are selfish about holding place. All selfishness is short sighted, but there can be no better examples, it seems to me, of short sighted selfishness than these lines of selfishness that I have enumerated.

There is the selfishness of the shipper who always wants a little lower rate. A man told me it costs 32 cents to pay the freight from New York to San Francisco on an entire outfit of clothes a man wears. That is not a very heavy tax. If men would analyze what that tax of freight means to them, they would see what an infinitesimal thing it is to give the railroad fair rates, and what a great thing it is for the nation not alone to have prosperous railroads, but to have efficient railroads, to have railroads that are up to the highest standard of service—and after all, that is what we want, and it would seem they certainly would be willing to pay for it. If we took a broad view of the matter we would cure some of the selfishness.

So, it is up to you to do what you can all the time to show to the public what selfishness really entails, not only on the railroad, but on them. I do not believe you are doing that, and I do not believe any railroad company begins to do it as it should be done. It is up to the railroads to show the public how much better off it would be if the railroads were fairly treated, so they could render efficient service under all circumstances, and be prepared to render efficient service in all emergencies.

The Selfishness of Labor

Then there is the selfishness of labor. Much of it really has its foundation in ignorance. I have a copy of a paper which came to my desk yesterday, which was really one of the most shocking publications I have seen in a great while. It is the weekly organ of some branch of railroad laborers, published in Cleveland. There was set forth in that paper detailed instructions to railroad men how to injure railroad property. The car repairer is told to insert a broken bolt when he is repairing a car. He is told in detail just how to insert the broken bolt so that when the car is on the road and gets a heavy strain it will pull out again, the train will be delayed, the car will have to go back for further repairs, and the whole incident will lead to more work and shorter hours.

This paper tells the helper of the mechanic making repairs on engines how to place a jack so it will fall out before it is ready to do its full service, and the work would have to be done over again. It suggests that when he is sent after a tool he should get the wrong tool, and keep the man he is working with waiting. The switchman is instructed how to run a car on to a frog and delay the train and make more work. There are detailed instructions of this kind all through the various fields of railroad labor, telling men how to destroy.

Could there be more dangerous selfishness than that? Could there be greater economic ignorance, worse economic blindness than for men to so completely fail to see that there is a unity in society, that there is a necessity that we all contribute, that none of us be shirkers if all society is to produce (and the production of things is what society is organized for)? There is one of the great problems of the day. What is there more important than to make men see that there is truly a unity between capital and labor, that there is truly a unity between all members of society, that we must not send a man out to do our work with a dull ax. We must give him a good tool and then when he goes to work he must not be a shirker, because shirkers will mean decreased production, and decreased production means fewer things for the people—all that is fundamental economic law.

You may at once reply, "Yes, and so are your stockholders selfish." They are, probably. They are at least free in a competitive market, and if you can call it selfishness to take an investment which they believe more secure

and in which the promise of return is higher, instead of taking one they believe is less secure, and where the promise of return is small, they are selfish, too. But that is a selfishness against which it will be harder to advance sound reasons than the selfishness of the employee who puts out rules of sabotage.

The meanest selfishness of all is the selfishness of the politician, who will trade what he knows is sound reason and judgment for place and votes. A man who will sell his vote for money is not a whit worse than the man who will sell his executive judgment for votes. That is the meanest selfishness of all.

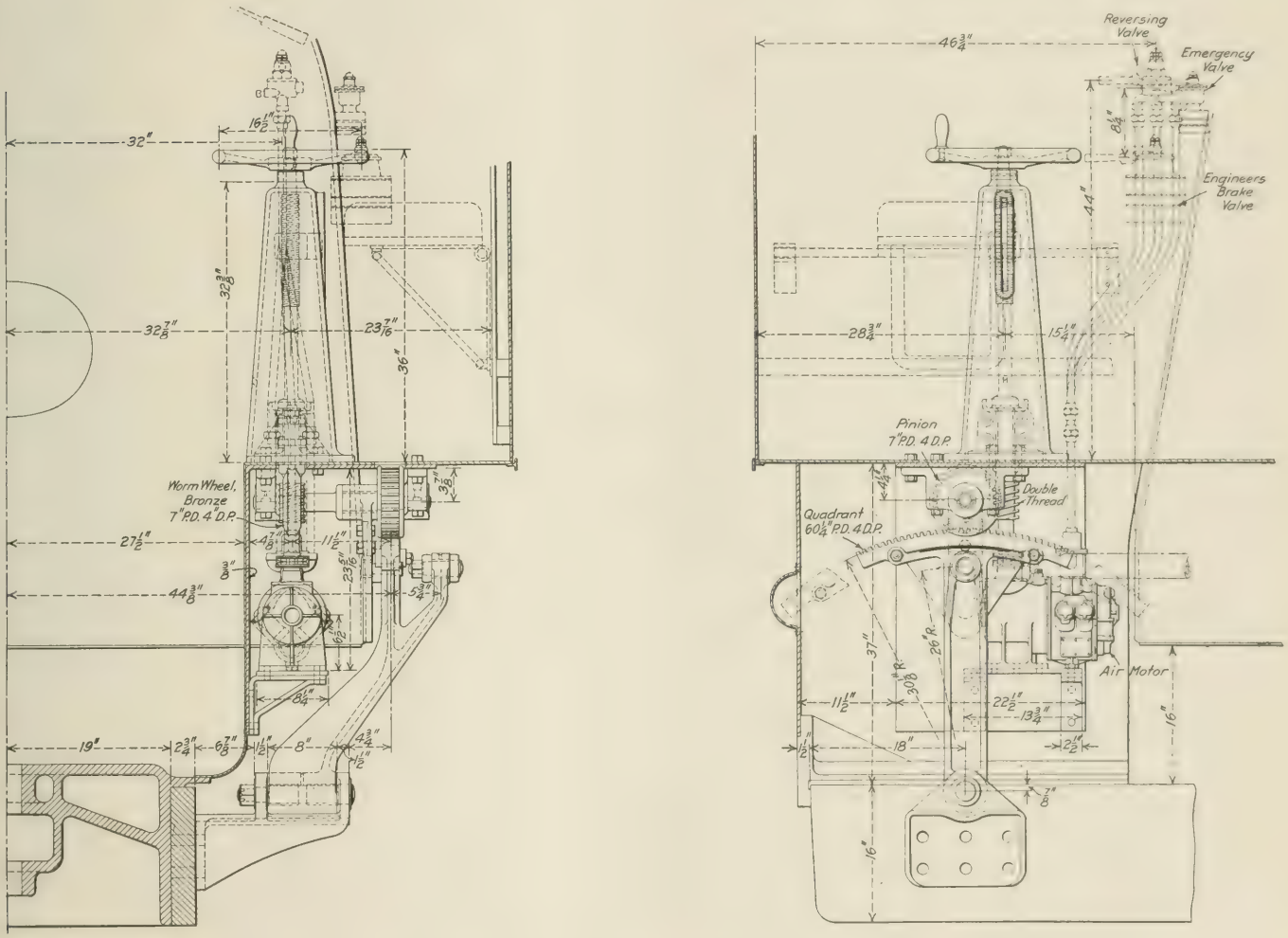
Moral Preparedness

What does it all sum up to? Do you not see it is deeper than national incorporation, and it is deeper than the action of the Interstate Commerce Commission? Do you not see that it is really a fundamental principle of intelligent citizenship, of patriotic, unselfish citizenship? That is the test of any real cure. That is what we have got to have, it seems to me, if we are to have anything like the preparedness we should have for the work that is ahead of us, and the competition that is ahead of us in this country.

We need a physical preparedness. We need a preparedness in a military way, if you will—I believe we do, far beyond anything we have got—we need preparedness in industry, and most certainly we need preparedness of the arteries that carry the life blood of the country. But above all, we need a moral preparedness that is going to see things as they are, clearly, guided by right economic thought, that is going to have the moral strength and fibre to form right judgments, that is going to have the moral strength and fibre to undergo any sacrifice to uphold right judgments, that is going to have the moral courage not to temporize, not to trade for momentary advantage. We need a moral preparedness that will give us in the end a public opinion which will demand from the Government sound economic legislation, which will demand from labor a recognition of its proper duties and responsibilities, and which will demand from capital fair and honest co-operation in its relation to employees and to the public, and for capital a just participation in the success of business.

LOCOMOTIVE POWER REVERSE GEAR

An ingenious power reverse gear for use on locomotives has been invented by M. F. Cox, assistant superintendent of machinery, Louisville & Nashville, and is in use on the eight-wheel switching engines recently built by that road. This gear consists of a vertical shaft the lower end of which contains an integral worm that meshes with a bronze worm wheel located on a short horizontal shaft. On the opposite end of the horizontal shaft is a shrouded steel pinion meshing with a segment of a steel gear. This segment and the reach rod connection form one forked steel casting fulcrumed at the bottom to a substantial bracket and steel pin. This device may be operated either by hand or other power. The illustration shows the gear arranged for operation by an air motor the main spindle of which is connected at the base of the vertical worm shaft above mentioned by means of a



Power Reverse Gear Developed on the Louisville & Nashville

flexible coupling. The motor is controlled and operated by a two-way valve conveniently attached to the boiler head within easy reach of the engineer and so arranged that the handle will be moved left to right for the forward movement of the engine, and the opposite direction for the backward movement. The wheel shown at the top of the vertical shaft is only used when it is desired to reverse by hand. It is readily removed and may be stowed away when the gear is being operated by power. The upper portion of the vertical shaft is threaded and fitted with an indicator nut which shows the engineer at a glance the length of cut-off at which the engine is running. The scale for this indicator or pointer is located in full view on the outside of the reverse gear housing. This feature, of course, is of greater importance on road engines as switches seldom, if ever, operate except in the corners. It requires 14 revolutions of the vertical shaft to bring the engine from full gear forward to full gear backward. With the air motor and 45 to 50 lb. air pressure, this can be accomplished in a few seconds. Its operation is smooth and noiseless. Its advantages are recognized over the old method often requiring 100 to 150 reversals during the course of a day and the attention of the engineer diverted from the tracks, while struggling to reverse a heavy, stiff gear.

Patent for this gear is now pending.

A THREATENED COAL FAMINE

The summary of car shortages and surpluses for September 30, the last issued by the American Railway Association, showed a net shortage 61,031 cars of which 19,872, or nearly one-third, were coal cars, and the shortage of coal cars has been steadily growing more acute since that time. Twenty-six coal companies on the Chicago & Eastern Illinois and the Chicago, Terre Haute & Southeastern have filed application in the United States District Court in Chicago for an injunction to force 142 railroads, named in the bill, to return coal cars of the C. & E. I. and the C. T. H. & S. E. for the use of mines along these roads. The bill alleges that the mines have an aggregate daily capacity of 27,000 tons and that although they could sell that amount of coal if supplied with cars, they have been able to secure sufficient cars during the past month to load an average of only 17,000 tons daily. A large operator in Illinois states that his mines were worked only 79 per cent of the working days in October, although they might have been worked full time and over-time if cars had been furnished. It is reported on good authority that coal mines in West Virginia, Pennsylvania and Ohio are operating at half-time and less.

Unusual as it may seem, in view of the above, the railroads have been carrying as much, or more coal than a year ago, in many cases with less than their normal equipment. One mid-western road which had on its line on October 15, only 17,000 coal cars, including foreign cars, out of 25,000 owned, showed an increase in the tonnage of coal hauled over a year ago of 38.9 per cent in August, 16.5 per cent in September, and 5 per cent in October. Another road in the same section of the country which has on its line but 10,000 coal cars, as compared with 16,000 owned, handled practically the same amount of coal traffic it did in 1915. A western road with 6 per cent less than its normal coal-carrying equipment increased its coal loading over a year ago, 27 per cent in August, 6 per cent in September and 17 per cent in October. A large road operating in the heart of the eastern coal fields, handled shipments of bituminous coal to the extent of 36,000,000 tons during the first nine months of this year as compared with 31,000,000 tons during the same period in 1915. Coke shipments for the same period were 10,850,000 tons in 1916, and 8,376,000 in 1915; whereas shipments of anthracite were 8,800,000 tons in 1916, and 7,600,000 in 1915.

Despite the fact that the carriers are hauling as much coal as a year ago, there is a growing scarcity of fuel throughout the country. The price of soft coal has increased over 300 per cent above the price a year ago in some places, while anthractite coal has been selling at $9.50 a ton in Chicago and $12.00 in Cleveland. Reports from most of the large cities of the country indicate that industrial plants have only a hand-to-mouth supply of coal on hand. The diminishing supply of fuel has become so alarming in Ohio that the city of Columbus has established a municipal coal yard for the purpose of securing fuel for its population, and Cleveland is considering the adoption of similar measures. The municipal electric light and power plant at Detroit would have been forced to shut down recently but for the timely arrival of Illinois coal, which ordinarily rarely reaches that market.

The common explanation of the shortage of coal is that industrial activity has increased much faster during the past year than the production of coal and additional coal-carrying equipment. Eastern steam coal no longer moves to western markets but is shipped farther east to industrial plants. The fact that Illinois coal is being shipped to Ohio, and as far east as Buffalo, is indicative of the situation. Because of the great profitableness of moving ore, lake boats which, in former years, carried eastern coal to the head of the lakes, have been making the return trip empty to save time during the past season. As a result, Illinois coal is now being shipped to St. Paul, which was formerly supplied almost entirely from Duluth and Superior. It is also noteworthy that shipments of coal from the Pittsburgh district south on the Ohio river have decreased because of low water.

The State Public Utilities Commission of Illinois has ordered all its inspectors to visit the coal mines in the state, to check up the use of coal cars for carrying other freight and to do everything possible to increase the supply of coal in Chicago and the other Illinois cities. The Interstate Commerce Commission has been holding hearings at Louisville, Ky., on the question of the general car shortage in which due attention will probably be paid to the coal situation.

Many railroads have taken extraordinary measures to conserve coal car equipment for their own lines. The Chicago, Burlington & Quincy, the Illinois Central and the Chicago & Alton have placed embargoes on shipments of coal in company-owned equipment east of the Chicago switching district. The Chicago & Eastern Illinois has placed an embargo on the movement of its coal cars to unusual destinations east of Chicago. The Louisville & Nashville has declared an embargo against the moving of its coal car equipment north of Cincinnati. As long ago as the middle of September the superintendent of freight transportation of the Pennsylvania Lines West addressed an appeal to the general superintendents of the company, pointing to the fact that on September 1, 55,361 of the 162,466 open cars owned by the Pennsylvania System Lines were located on foreign roads and urging company officials to take extraordinary measures to keep the remaining cars from leaving the road.

During this period the railroads are being operated more efficiently than ever before. Within the past five years the Illinois Central and the Yazoo & Mississippi Valley have increased the average car mileage per day from 28 to 40 miles, or 43 per cent. The Chicago, Burlington & Quincy moved all its equipment in September, 1916, an average of 36.5 miles per day as compared with 31.1 miles in the same month a year ago. Nevertheless some railroads in the country are now using coal cars for other than coal carrying purposes, such as the shipment of grain, automobiles and munitions. In the defense of this practice the railroads state that inasmuch as the coal mines cannot fill these cars the year round but merely in the fall and winter season, coal should have no preference over any other commodity.

Railway Electrical Engineers' Convention

The Ninth Annual Convention Held at Chicago Was Marked by Record Attendance and Excellent Reports

THE ninth annual convention of the Association of Railway Electrical Engineers was held at the La Salle Hotel, Chicago, October 31 to November 3, inclusive. E. W. Jansen, electrical engineer of the Illinois Central, presided.

Classification of Technical Literature

J. R. Sloan, the association's delegate on the Joint Committee on Classification of Technical Literature, presented a progress report of the joint committee. The committee is now made up of 32 delegates from technical associations in this country and is going ahead with the work of devising a standard system for the satisfactory classification of technical information. The executive committee of the joint committee has recommended that certain subjects be assigned to the different organizations most vitally interested in them, the final compilation to be performed by one central body under the supervision of an expert classifier.

ILLUMINATION

The report of this committee was divided into four parts including (1) the result of an extensive study of the problem of properly illuminating railroad yards, (2) changes in rating of train lighting lamps and the determination of standard sizes of gas filled lamps for train lighting service, (3) a progress report on the revision of the association's incandescent lamp specifications, and (4) a brief resume of the more important developments in the incandescent lamp field.

(1) Illumination of Railroad Yards.

The importance of having more safe and efficient operation of railroad yards at night has long been recognized, but relatively little study has been given to the subject of adequate artificial illumination that will permit operation approaching daylight conditions. The damage to rolling stock and freight at night should be materially reduced by providing ample and proper illumination.

The four general classes of yards whose efficiency can be more or less increased by proper artificial lighting are (1) classification yards, (2) reloading yards, in which freight is unloaded to the ground and transferred to other cars or boats, (3) repair yards and (4) storage yards. The committee considered each yard in the order named and recommended definite methods for the lighting of each type. In general the committee pointed out that the most economical installation of yard lighting would use poles for supporting the lighting units which would allow the units to be placed either 100 or 200 ft. apart and approximately 35 ft. in the air. The committee also decided to use the photometric curve as a proper basis upon which to make its recommendations rather than to specify the use of any particular lighting unit. The committee, therefore, included in its report an ideal curve showing minimum and maximum distribution of light from the fixture which would be required to give the illumination desired.

The chairman of the sub-committee on lighting railroad yards was H. C. Meloy, New York Central Lines.

Discussion. J. A. Andreucetti (C. & N. W.).—What has been done in relation to the joint conference with the American Railway Engineering Association relative to the future laying out of yards for taking care of the pole lines necessary for the illuminating system.

L. S. Billau (B. & O.).—This information is now practically completed and with such supplementary data as we may be able to secure on lighting units will no doubt be of considerable assistance to the American Railway Engineering Association committee.

C. G. Winslow (Mich. Central).—Has anything been considered along the line of providing light for signals, thus making the illumination of the semaphore sufficient to entirely do away with the signal light. There is a possibility of adding considerable value to the general yard lighting and at the same time saving the extra cost of signal lighting. In my opinion one pole-mounted light might replace three or four signals.

L. S. Billau (B. & O.).—I do not know of any case where a railroad has illuminated the signal semaphore as suggested by Mr. Winslow. The committee did not consider that phase of the question.

W. J. Davis (Am. Lighting Co.).—By placing a battery of flood lighting units at each end of the yard at a minimum height of 75 ft. and mounting them so that the beam of light would be as nearly horizontal as possible, a real flood of light would be thrown out over the yard which would give a soft, even illumination. We have found that the 1,000-watt and 750-watt lamps in the flood lighting units are satisfactory. Flood lighting, if properly installed, provides an efficient and economical system of lighting yards; it does away with the overhead system, with conduit, with poles and with excessive lamp renewals. The present systems are good, but I seriously believe that flood lighting, intelligently applied, can do the yard lighting as well, if not better, than anything previously tried.

J. L. Minick (Penn.).—The lighting of ladder tracks in a strictly classification yard becomes a matter of spot lighting each individual switch. For that reason I do not believe, from my experience, that the flood lighting unit will serve satisfactorily with that particular class of yard lighting. There are many other classes of yard service, however, where the use of a flood lighting unit would undoubtedly prove satisfactory.

G. W. Bebout (C. & O.).—How about the comparative cost of flood lighting and the series lighting system installed on steel and wooden poles?

J. L. Minick (Penn.).—In a yard at Pittsburgh, high voltage mercury-vapor lamps are installed on six 90-ft. towers. I have been told by the engineer in charge that the cost of installation runs over twice as high as the cost of the ordinary magnetite arc installation on poles and that its operating expense is also higher. One objection to the installation of towers in any yard is the fact that the layout of the yard is constantly being changed and for that reason it is highly desirable that a cheap pole construction be used which can be moved back and forth with the growth of the yard. The use of heavy steel towers is also objectionable in many cases because of the heavy permanent foundations necessary and the first cost of the towers.

J. E. Gardner (C. B. & Q.).—I have no absolute figures on the saving effected by lighting classification yards but I have been investigating hump yard lighting during the past month. I have been riding with hump riders in yards which are adequately illuminated to see just where the lights are needed and what these men would do if they did not have the lights. From this investigation I feel that the lighting of the hump in particular, not necessarily the whole classifica-

tion yard, is vitally important and I do not see how it would be possible to operate a hump with any degree of safety or efficiency if the men had to work without some kind of illumination.

Rating of Train Lighting Lamps

The introduction of the gas filled lamps brings with it a change in the method of rating. This type of lamp should not be rated in terms of mean horizontal candlepower as this value varies greatly in lamps of the same size. It was at first intended to use the mean spherical candlepower as the basis for rating. There is serious objection to this, however, as the mean spherical value of a given lamp is usually less than its mean horizontal value and consequently purchasers are very likely to assume that the candlepower of the lamp has been reduced.

It appears advisable, therefore, to recommend that this type of lamp be rated in total lumens, the total lumens being the equivalent of the spherical candlepower multiplied by 12.57. The lumen value shall be used for inspection and test purposes only, while the lamps shall continue to be sold under and known by their wattage names. So far as the train lighting schedules are concerned, the gas-filled lamp can probably be furnished eventually in sizes from 15 watts upward for the 30-34 volt range and from 25 watts upward for the 60-65 volt range. This leaves one lamp in the 30-34 volt range, and three in the 60-65 volt range of the vacuum type which are now rated in mean horizontal candlepower, but which can be rated in total lumens equally well. It is recommended that these four lamps also be rated in total lumens so as to place all of the lamps in train lighting service on the same basis of rating. A new table or schedule for train lighting lamps was presented which gave the total lumen value for the lamps now regularly manufactured, also the proposed total lumens in accordance with the changes above outlined.

The committee thought the range of the sizes in the proposed schedule sufficient to meet all the train lighting requirements and recommended that the railroads confine their requirements to the standard sizes and types as for obvious reasons it is undesirable to develop special sizes and types of lamps to meet limited demands.

In revising the existing lamps and specifications of the association the committee desires to go on record as favoring the adoption of the following:

(1) The form of specification shall consist of two parts, one covering the general text of the specifications which is not likely to require frequent revision; the other, covering the various lamp schedules which are subject to comparatively frequent changes, should therefore be prepared in loose leaf form, supplementary to the body of specifications that will permit the ready revision of any or all of the schedules without necessity for reissuing the entire specification.

(2) The lumen as the unit of light flue shall be substituted for candlepower for lamp rating purposes. It should be understood that this does not imply that the nominal rating or name (watts or candlepower) by which the lamps are designated should necessarily be changed at the same time. Incidental to rating lamps in the terms of this unit, the lamp efficiency will be expressed in lumens per watt instead of watts per candle. The latter term as a measure of lamp efficiency is a misnomer, as it actually expresses the specific consumption of the lamp. Therefore an increase in efficiency of the lamp will now show an increase in the lumens per watt, which is a more logical and proper method of expressing efficiency than by the method employing reciprocal values. This development indicates that it will be practicable to revise this specification during the coming year to include the features mentioned above and that at the next convention a reissue of the present specifications can be presented to the association. Developments in incandescent lamps during the past year have been largely in the nature of refinement in manufacture resulting in improvements in quality, better uniformity of product and in some lamp sizes higher efficiency.

The committee on this subject is L. S. Billau, Baltimore & Ohio, chairman; J. A. Andreucetti, Chicago & North Western; J. E. Gardner, Chicago, Burlington & Quincy; H. C. Meloy, New York Central; J. L. Minick, Pennsylvania; D. O. Morris, Edison Lamp Works of General Electric Company; L. C. Porter, Edison Lamp Works of General Electric Company; G. O. Moores, Baltimore & Ohio; J. R. Sloan, Pennsylvania; E. W Bender, National Lamp Works; L. C. Doane, Ivanhoe-Regent Works; W. H. Ralston, Westinghouse Lamp Company; H. Schroeder, Edison Lamp Works of the General Electric Company.

Data and Information

The report of the committee is somewhat more comprehensive and a greater number of roads are listed than in any previous report. Probably the most interesting data is that on car lighting cost. The average cost per 1,000 car miles, including all costs and all cars for the various roads, is fairly uniform and runs about two dollars. There is, however, a wide discrepancy in the values given for the cost per car month. The values given vary from $3.88 to $26.22. The increase in the number of electric lighted cars from 11,017 in 1911 to 20,841 in 1916 is especially interesting.

Of the motors reported, those using direct current represent 52.4 per cent in number and 47.4 per cent of total horsepower, the average horsepower of the direct current motors being 15.82. Three-phase motors constitute 39.9 per cent of the total number and 25.3 per cent of the total horsepower reported; the average horsepower of the three-phase a. c. motors is 19.8. The exact total of all motors reported this year amounts to 16,992 representing a total horsepower of 297,160, which is a considerable increase over last year's report in which 11,546 motors were listed totaling 183,777 horsepower.

Discussion.—E. S. M. Macnab (Can. Pac.).—The question of electric car lighting cost as shown in this report is interesting, but I would like to draw attention to some of the figures, which vary from $3.88 per car per month up to $26.20 per car per month. I would suggest a sub-committee of the Committee of Data and Information be appointed to investigate car lighting costs and go into the question thoroughly showing how the costs on the various railroads are compiled.

President Jansen—When a road reports that it lights its cars for $6 a month it is evident that there are some items that are not included. The labor would amount to more than that. Another road gives $3.88 as the cost per car per month, which in my opinion would not cover the cost of belts alone not considering battery renewals, lamps, generator repairs or labor.

J. J. Hack (So. Pac.).—The only way to arrive at the cost of operation of electric lighted cars is to take an average over a period of five or seven years.

President Jansen.—Some roads with about 1,000 cars operate them for about $12 a car month, others $11; other railroads find that the cost of operating and taking care of electrical equipment on their cars amounts to $20 per month per car. I think up to the present time if every road included all costs over a period of years, the cost per car month on account of electric lighting would be around $20. I know the Pullman Company charges $30.

J. R. Sloan (Penn.)—I fully agree with Mr. Hack that the cost ought to be figured over a period of years. Up to about four years ago our accumulated average was $49.98 per car month, but after remodeling our equipment our accumulated average to date is something like $24 per car month, which includes all the high costs of the previous

years and also includes the cost of remodeling and changing from sleeve bearings to ball bearings.

J. J. Hack (So. Pac.).—I feel that with a general run of equipment, part new and part old, if I can average $18 or $20 per car per month over a term of years, I am doing pretty good.

Compressed Air in Railroad Shops

A check of several shop power plants showed that, not deducting for the exhaust steam, the shop air compressor consumed over 30 per cent of all the steam generated by the shop power plant. This is due to several causes:

(1) The use of compressed air has been developed for various classes of shops, so that each individual shop, roundhouse, and yard that makes up a group of railroad shops has its air lines and air tools.

(2) Unlike an electric transmission system a compressed air system can have a large number of leaks without causing immediate trouble other than an increased load on the air compressor. Even with careful supervision over the pipe lines there are always leaky valves developing, valves carelessly left partially open, or leaky air hose left with the pressure on it, while the compressor runs 24 hours in the day.

(3) As shop air lines are constantly being extended it is not at all unusual for the feeders to be outgrown. This is a frequent cause of complaint, the complaint usually being that the compressor is too small, whereas, in this case, the compressor is not to blame. In planning a compressed air system, it is most important to get the mains and the reservoirs large enough not only to take care of the present, but to provide for future growth.

(4) As a usual thing, the smaller shops are dependent on one air compressor alone, which requires that this compressor run 24 hours in the day and 365 days in the year. The result is that the engineer postpones any heavy repairs on the air compressor as long as he possibly can with a corresponding increase in the coal bill for which the air compressor is often not suspected.

Electric versus Pneumatic Portable Tools

Portable tools can be divided into two classes: rotating tools such as drills, motors, etc., and reciprocating tools such as riveting hammers, etc. For the reciprocating class the electric tool, in its present stage of development, seems to have no advantages over the air tool. It can merely be said that for light work there are electric tools of this type on the market. For rotating tools the following shows some of the advantages and disadvantages of the two types:

Lightness. The pneumatic tool is considerably lighter and consequently easier to handle than the electric tool. The increased weight of the electric drill over the pneumatic varies roughly from 10 per cent in the larger sizes to 25 per cent in the smaller. However, the electric tool has the advantage that a portable electric cord is much easier to handle than an air hose. It has also sometimes developed that two men with an electric drill will accomplish more than twice as much work as one man with a pneumatic drill.

Efficiency. This is the chief advantage that the electric tool has over the pneumatic. A portable pneumatic tool speeds up the instant the load is removed, thus taking more and more power as the load is released, whereas with the electric tool the exact reverse is true. On full load the efficiency of the electric drill varies from 30 per cent in the smaller sizes to as much as 80 per cent in the larger sizes, whereas the efficiency of the pneumatic tool varies from about 18 per cent to 35 per cent, depending on the size. The whole system of generation and transmission is usually more efficient in the case of electricity than in the case of air. The instant current is turned off of the electric tool the supply of energy ceases, there are no valves, air hose, couplings and pipes to leak.

First Cost. The first cost of a pneumatic tool is less than that of an electric tool.

Trouble from Freezing. Electric tools are free from the annoyance that the air tools often give of freezing up in the winter time.

Cost of Maintenance. Accurate figures have not been obtained by the committee as to relative cost of maintenance of the two types of tools. Electric tools will not stand the abuse that pneumatic tools will, but where not abused it is probable that the maintenance of electric tools is considerably less than that of pneumatic.

The cost of leaks in air lines is usually greater than supposed. Tests for air leakage which was run at a shop and terminal plant in Chicago showed that the air leakage cost at the rate of $161.40 per month, or $1,936.80 per year. Adding 50 per cent for leakage in the air tools when the shop was in full operation, the total waste per year amounts to $2,905.20.

Electric Arc Welding

The committee presented interesting cost data which was obtained in a large locomotive shop during a period of seven months. The cost of electric power was two cents per k.w.h. The tables of cost included in the committee report showed that the average cost per locomotive for welding 2-in. flues was $8.48; for welding 5-in. flues, $5.39, and for welding smoke consumer tubes, $.37. During the months of January, February, March, April, May, June and July of 1916 there were 3,392 miscellaneous jobs performed by electric welding at a total cost of $2,966.75, which showed an estimated saving over other methods of doing the same work of $7,939.45. In the locomotive shops 1,287 miscellaneous electric welding jobs were performed at a total cost of $464.36, which showed a saving over other methods of doing the same work of $1,375.18.

The committee reported that the tendency at the present time was to standardize the welding operations in the same manner that machine shop and other operations have been standardized. Where welding operations are thoroughly standardized the work can be paid for on a piecework basis. The standardization of welding operations is comparatively simple on systems which employ a supervisor of electric welding; on other roads it is more difficult, but there the necessity for having the operation standardized is greater. Ninety-five per cent of the electric are welding done in railroad shops is on operations that can be standardized. The following factors should be determined on each job of this nature: Size of electrodes, kind of electrode, current in the arc and time required for the operation.

Electrical Operation of Railroad Shops

Centralization of power and the operation of tools either individually or collectively by means of motors has been adopted in the various departments of practically all recently equipped railroad repair shops. The heads of the mechanical departments, appreciating the reduced operating cost and the increased output obtained through these methods, have in many instances modernized their older shops, thus eliminating the use of long lines of shafting and belt drive so far as possible. For a comparatively long time it has been the practice, in modern shops, to drive the larger machines by independent motors and group the smaller machines in such a manner as not to interfere with the operation of cranes, but the disadvantages of this arrangement, as compared with the use of independent motors exclusively, are becoming more and more appreciated, so that each year the ideal railroad shop, with all shafting and belting eliminated, becomes more nearly an accomplished fact.

In making a comparison of the two modern methods of

machine operation, it might be well to summarize the advantages of each as follows:

Group Drive.—Reduction of first cost of tools and motors of about 15 per cent.

Independent Drive.—Increased output. Saving in fuel due to the elimination of frictional losses in shafting, belting, etc. Saving in labor by obviating the necessity for shifting belts, lacing belts, repairing friction pulleys on countershafting, etc. Reduction in the size of power plant required by reducing frictional losses. Ability to place any machine where desired, without reference to shafting or crane locations. Increased light, due to the elimination of shafting and belting. Elimination of shafting and belting maintenance cost. The ability to operate a single machine overtime without the necessity of operating any other machine.

All motors, whether operating continuously or partially, should be looked over at least once each day by a competent man under the supervision of the Electrical Department. It should be his duty to inspect all connections, see that bearings are properly lubricated, see that brushes are properly seated, see that commutators are clean and smooth and see that motors are kept free from dust, dirt and grease. All motors should be thoroughly cleaned and if possible blown out with compressed air at regular periods, at which time air gaps should be gaged. There does not seem to be any standard rule covering this work, as each road usually works out these details according to its own ideas.

Each railroad, if possible, should maintain at least one adequate repair shop to handle electrical repairs, as the time required to transfer material to be repaired to and from outside repair shops necessitates the carrying in stock of additional spare motors, transformers, etc., to take the place of those being repaired.

In the average railroad shop, having electrically-driven machines, the cost of repairs to electrical equipment can be considerably decreased by maintaining a repair shop in which winding of armatures, field coils, and all the miscellaneous repairs in connection with the equipment can be made, instead of having them done by outside shops. For a nominal sum a shop can be equipped with all the necessary tools and apparatus for making and forming armature coils, rewinding field coils, turning down commutators, balancing and baking armatures, etc. In one instance where identical repairs were made to two machines of the same size and type, the railroad shop did a far more substantial job than the outside shop did at a cost approximately 35 per cent less. In addition to the money saving, the time saved in making repairs, and the consequent saving in loss of production are important factors in favor of an electrical repair shop. In addition to the larger repairs on motors and control apparatus the repair shop saves considerable money by refilling fuses and putting in a usable condition such material as cutouts, switches, etc., that would otherwise be scrapped.

It has been found to require approximately six minutes per unit to thoroughly clean a 750 watt lamp and an 18-in. porcelain enameled steel reflector, from a crane trolley, this not allowing for the time necessary to move the crane to new positions. In a reasonably busy shop this must be done on overtime, and in many cases it will pay to provide a regular operator to move the crane. If the cleaner operates the crane the total cost is approximately $.75 per unit per year for monthly cleaning. If two men are necessary this figure is raised to $1.20 per unit. Small 200 watt units in bowl reflectors can be cleaned from a step ladder for $.30 to $.50 per year. From the above figures, it will be seen that the monthly cleaning is a very small per cent of the total. In the case of the 1,000 watt, gas filled unit the loss at the end of 12 months without cleaning is at the rate of $34.00 per year, while the loss incurred during the year is approximately $22.00. At the end of the first month the loss is at the rate of $9.00 per year and the loss incurred during the month $4.50. Subtracting the $4.50 from $22.00 leaves $17.50 which could be spent for monthly cleaning which costs less than $1.00. The remaining $16.50 is actually 1650 per cent interest on the money spent for cleaning.

In many buildings it is a good investment to keep the walls and ceilings painted white. This is especially true where the ceilings are moderately low and in building bays adjacent to the outer walls. In such places it is safe to say that the illumination may be increased 25 per cent by painting white. If sufficient illumination initially costs .8 per cent of the total wage, then 25 per cent of .8 per cent, or .2 per cent, can be expended each year for painting, this figuring the benefits to artificial lighting alone. Cold water paint is inexpensive and can be applied with relatively cheap labor. In many shops the walls and ceiling are now being painted white but not regularly, nor nearly as often as they should be. The white walls and ceiling are a part of the illuminating system. When an installation is made the color of the walls and ceilings is taken into account, but often forgotten when the system is in service. The maintenance should include all such items in money value for the specific conditions. The sub-committee is J. H. Wickman (Illinois Central), chairman; J. H. Edwards (Chicago, Rock Island & Pacific), J. H. Wright (Chicago, Burlington & Quincy), J. C. McElree (Illinois Central).

Train Lighting Equipment and Practice

In addition to presenting the recommendations for standards which were submitted to the M. C. B. association at the 1916 convention, the committee presented a description of head-end train lighting practice, taking up the three different systems of lighting trains with that method—the steam head-end, the axle head-end, and the system using the headlight turbine as a head-end generator.

In regard to the axle head-end system which is extensively used by the Northern Pacific, a large capacity generator is located in the baggage car and is driven by 5 in. Morse chain from the car axle. The entire train is lighted from this one machine, the cars being connected by the ordinary Gibbs three-wire connector. The committee reports that the original car equipped with this system has made 140,000 miles without a lighting failure and that the original driving chain has made 120,000 miles and is still in serviceable condition. It is estimated by Northern Pacific officers and engine men hauling the trains equipped with this system that a saving of one ton of coal per night over the head-end steam turbine system is made, which is equivalent to the saving of approximately 200 lb. of coal per hour. Another important advantage of the axle head-end system is that the steam leakage between the tender and the dynamo car is reduced to a minimum inasmuch as the pressure carried is reduced to an amount just sufficient to supply the necessary steam heat. The committee on this subject is D. J. Cartwright, Lehigh Valley, chairman; J. H. Davis, Baltimore & Ohio; E. W. Jansen, Illinois Central; C. H. Quinn, Norfolk & Western; H. C. Meloy, New York Central; J. R. Sloan, Pennsylvania R. R.; E. Wanamaker, Chicago, Rock Island & Pacific; C. R. Gilman, Chicago, Milwaukee & St. Paul; Ernest Lunn, Pullman Company.

Electric Headlight

The Committee on Locomotive Headlights had not prepared a formal report this year due to the unsettled condition of legislation affecting this subject. The chairman, however, gave a verbal report of progress during the year.

The committee is as follows: J. L. Minick, Pennsylvania, chairman; Charles R. Sugg, Atlantic Coast Line; J. J. Hack, Southern Pacific; E. W. Jansen, Illinois Central; H. R. Pennington, Chicago, Rock Island & Pacific.

Discussion.—E. S. M. Macnab (Can. Pac.).—What has been done with regard to changing the arc headlight to incandescent and has the gas-filled lamp altered the situation?

J. L. Minick (Penn.).—A number of roads are now changing from arc lamps to incandescent lamps; I see no reason why that change should not be made, usually with a considerable saving in wattage consumption. A line of incandescent lamps has been developed for locomotive headlight work either in a 6-volt or a 30-volt type and there should be no reason why they cannot be successfully applied to the equipment already in service.

C. R. Sugg (A. C. L.).—We have at present 210 incandescent headlights all equipped with 250-watt 32-volt lamps. We adopted the following procedure when ordering these headlights: We obtained three incandescent headlight equipments from manufacturers and put them on three locomotives. We then let three men have them for a while, after which we took them away from these men and gave them to somebody else. This started a fight. The men who first had the lamps wanted them back, but they were told if they desired that type of electric headlight they would have to make a written request for one. As a result, out of the 210 that we have now, about 175 were installed by special request of the engineers; in fact, it is now our practice to refuse to install them except by such special request. Every one of the locomotive engineers who have operated with the incandescent headlights says that they would not have the old electric arc lamp back under any consideration. Incandescent lamps that we now have are mostly on one division and the arc lamps on another. Where we have installed the incandescent lamps we have reduced the headlight failures considerably and I know that the maintenance cost is much less than for the arc lamps on account of the trouble we formerly had from burnt out armatures.

J. A. Andreucetti (C. & N. W.).—The North Western road has equipped today approximately 1,500 locomotives with incandescent headlights, using the 18 by 9 in. reflector.

President Jansen.—On some tests recently made by the Pennsylvania Lines West using a standard 18 in. by 9 in. reflector with a 250-watt 32-volt lamp, about six regular locomotive engineers were used as observers. These men had their eyes examined just before the test and at a speed of 20 miles an hour dropped a small sand bag when they first saw the object, nobody knowing at what point the object would show up. The average of all readings was a little over 800 ft. on the running test, but during the standing test the average of all observers was a little over 1,000 ft. The law specifies that the object must be seen at a distance of 1,000 ft., but it does not specify whether the locomotive should be running or standing still.

J. R. Sloan (Penn.).—Is the order as issued in such shape that it can be understood; does a railroad know what is required of it and if not what are the points that are undetermined?

J. L. Minick (Penn.).—From railroad men who are interested in this subject, I gather that the objection to the Interstate Commerce Commission ruling is the indefiniteness of the order. It specifies that engineman with normal eyesight shall be able, under normal weather conditions, to see an object the size and shape of a man dressed in dark clothing at a distance of 1,000 ft. There is not a single thing in that specification except the distance of 1,000 ft. that is definite. There is no normal eyesight; there are no normal weather conditions and a man dressed in dark clothing is also an indefinite description. What kind of a man, how big a man, how small a man? Is he tall or short, wide or narrow, white or black? What is dark clothing? I have put that question by letter to half a dozen of the big tailors in the United States and I have gotten just as many different answers; each one has his opinion as to what dark clothing is. My own impression is that the thing the railroads would like to bring about is some kind of a specification that is definite in its terms and which can be measured and reproduced tomorrow as well as any other time. The suggestion of the railroads has always been to go to terms of candle power. Candle power can be measured exactly, the same as voltage, steam pressure, gallons of water or any other measurable quantity. If that point can be agreed upon, the only remaining thing is to have someone in authority, determine how much candle power.

Election of Officers

The following officers were elected to serve the association during the year 1916-1917: President, C. J. Causland, Pennsylvania; vice-president, J. E. Gardner, Chicago, Burlington & Quincy; Executive Committee, western district, A. E. Voigt, Atchison, Topeka & Santa Fe; eastern district, C. H. Quinn, Norfolk & Western. The secretary-treasurer, under an amendment to the constitution adopted at this convention, will, in the future, be appointed by the executive committee instead of being elected by the association.

THE CANADIAN PACIFIC WAGE CONTROVERSY

The threatened strike of the conductors, trainmen and yardmen of the Canadian Pacific, scheduled to take place at 5 p.m. on October 25, was averted by the concession of the major points in the demands of the men.

The controversy had its inception in 1913, when the men made application for a new schedule and sent the management of the road a schedule embodying their demands. While there were certain requests for increased rates, their proposal provided more particularly for changes in the rules involving the bases for computing compensation. Some of these changes were of a drastic character, providing for a minimum day of nine hours or 100 miles, and in addition compensation for all switching, overtime and detention, the overtime and detention to be computed separately on each leg of short turn-around runs; separate payment for all preparatory and waiting time at initial terminals; separate payment for all time at objective terminals after the train is registered, and also separate payment for time held outside of yard limit boards on account of a yard being congested; payment for all switching done at junction points on the same basis as compensation for terminal switching. Many minor changes in rules were also requested, practically all of which involved some increase in pay. They also asked for a reduction in the maximum monthly mileage of main line passenger crews, an increase of branch line passenger rates to the main line figure, a raise in pay of two cents an hour for all men in yard service and special compensation of $10 a month for all train baggagemen having anything to do with the handling of mail.

The company declined to meet these requests on the ground that the changes in rules involved false bases for computing time, and that an increase in compensation was not justified owing to the business conditions then prevailing in Canada. Furthermore, all Canadian Pacific trainmen except in mountain territory had a nine-hour day and in other respects were better paid than men on American railways in the northwest. The men then applied for a board of conciliation, in accordance with the Industrial Disputes act. A board was duly constituted, one member being nominated by the company, one by the men and the third by the Minister of Labor. The majority of the board, consisting of the nominee of the company and the neutral chairman, brought in a report denying the majority of the major requests of the men but granting considerable concessions. The nominee of the men brought in a minority report, granting the requests of the men practically in full. While the company objected to certain features of the majority report, it signified to the Minister of Labor that it was prepared to put the award into effect.

This brought the negotiations up to August, 1914. Great

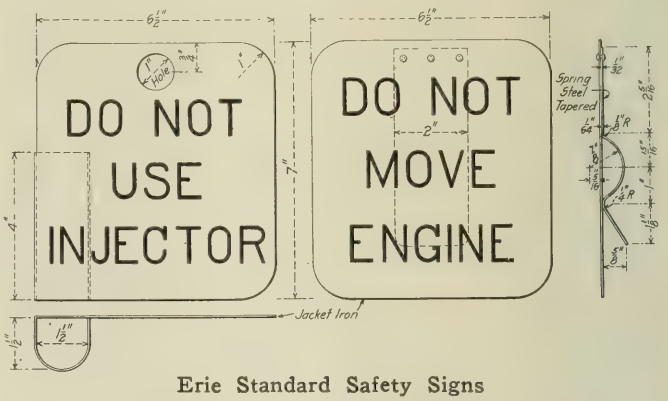
Britain declared war on Germany on August 4, 1914, and two or three days later the representatives of the men wrote the Minister of Labor stating that they were wholly dissatisfied with the report of the board of conciliation and would not accept its findings, but that in view of the fact that war had just been declared they deemed it unpatriotic to take a strike vote. They informed him, however, that their action did not bind them permanently, but merely delayed the strike vote for a shorter or longer time as they might decide. They further intimated that should the company attempt to apply the award of the board in the meantime, they would regard it as an unfriendly act. Upon receipt of a copy of this communication from the Minister of Labor, the company advised him that in view of the attitude of the men it would not apply the award of the board but would leave in effect the schedule then in existence.

Nothing further was heard from the men on the subject until September, 1916, when a general committee of conductors, trainmen and yardmen, representing the entire system, requested an interview with the officers of the Canadian Pacific. They announced that the men had finally rejected the majority award of the board of conciliation and that they desired to submit to the company their original demands of 1913 without amendment. They expressed their willingness to receive a counter proposition from the company, but intimated that no counter proposition would receive much attention unless it involved the acceptance of nine "major demands." It was suggested to them that as two years had elapsed and conditions had changed materially, it might be worth while to submit the matter again to arbitration, but they promptly refused to do this. They further asserted that as they were submitting their original proposition without amendment and as it had been passed upon by a board of conciliation, they had fully complied with the law and were at liberty to strike without the possibility of intervention by the Department of Labor. On account of the war the company's officers felt that they should do everything in reason to prevent a labor conflict and accordingly offered certain substantial concessions in addition to the award of the board. These were rejected and a strike vote was taken over the entire system. The ballot was not secret and the result showed that considerably over 90 per cent of the men voted to strike. Following the vote the company offered further concessions without avail, and the men gave notice that the strike would begin at 5 p.m., October 25.

On the ground that the men were evading the spirit, if not the letter, of the Industrial Disputes act, the company applied for a board of conciliation, and the Minister of Labor notified the men, offering his assistance in effecting a settlement. The men held that they were not violating the law and announced that a strike would take place unless the company settled the matter directly with them. The Minister of Labor, apparently not sure of his ground as to the legality of the men's position, then advised the company that it would be useless to appoint a board in the face of the obdurate attitude of the men, but that he would send a well known labor leader of modern views to Winnipeg to act as mediator in the dispute. This mediator arrived in Winnipeg on October 23, and on the same date the Prime Minister of Canada, Sir Robert L. Borden, telegraphed the men, offering his services to make for a settlement and suggesting that they and the officers of the Canadian Pacific confer with him at Ottawa, the strike to be postponed in the meantime. The men replied that it was too late to call off the strike as a majority of the committee of the unions had left for their homes, leaving instructions to the heads of the organizations to abandon the strike under no circumstances except the surrender of the company. When the officers of the Canadian Pacific were apprised of this stand, it was realized that the Canadian government could accomplish nothing. They, therefore, offered through the mediator to submit all questions in dispute to the arbitration of one individual whose decision would be final and binding on both parties. Names suggested for the position of arbitrator by the company included Sir Robert L. Borden, Sir Wilfred Laurier, ex-Prime Minister of Canada, Sir Charles Fitzpatrick, Chief Justice of the Supreme Court of Canada, and Ash Kennedy, Assistant Grand Chief of the Brotherhood of Locomotive Engineers. This offer was promptly and emphatically rejected by the men. The company was, therefore, confronted with the alternative of allowing the strike to occur or conceding the major points in the men's demands. For patriotic reasons the executive of the Canadian Pacific chose the latter course.

PROTECTION OF MEN WORKING UNDER ENGINES

The drawing shows the style of two caution signals or signs to be used in the cab of a locomotive for the protection of any person who may be working under or about the engine. These signs are made of jacket iron, 6½ in. by 7 in. in size, and the inscriptions explain themselves. These signs have recently been adopted as standard by the



Erie Standard Safety Signs

mechanical department of the Erie Railroad. The plates are painted black and the letters are white. The sign shown at the right is fastened to the throttle lever by means of the flat spring, as shown. That on the left is hung on the injector handle.

Italian Railway Returns.—For the financial year 1914-15 the Italian Treasury has had to make up a deficiency of approximately $4,000,000 in the net receipts of the state railways. This covers a period before Italy joined the allied cause, but her railways were affected by the displacement and closing of markets, and by the high prices of coal and material. The suspension of navigation in the Adriatic, and the absence of tourists, has also contributed to the deficiency.

What American Locomotives Can Do.—With an American locomotive of the Decapod type, a member of the engineering board of the Russian Ministry of Ways of Communication has established a new European record for the most heavily loaded train. He brought over the Nikolaief division of the Southern Railway a train with a load of 4,424 tons. Its length was 2,800 ft. The trip was experimental. A Russian engine was tried out against the American and the superiority of the latter was clearly established. An Odessa paper of September 5, 1916, states that a number of American freight cars are giving great satisfaction on the Ekaterininskaya Railway because of their great capacity. It is said, however, that because the American cars have their doors at the side they are unsuitable for hauling wood. The railway authorities are contemplating remodeling some of the cars and placing the doors at the ends.

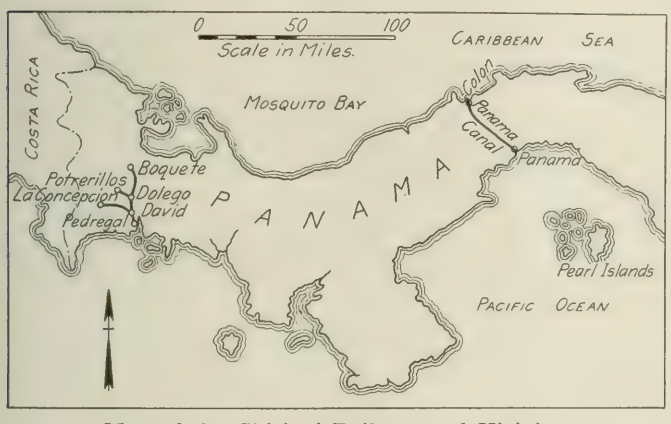
The Construction of the Chiriqui Railway*

A Description of the Interesting Methods Followed in Building a Narrow Gage Railway In Panama

By A. S. Zinn
Formerly Consulting Engineer, Chiriqui Railway, Republic of Panama.

A RAILWAY through the Republic of Panama first became a project of national importance at the time that Col. Wm. F. Shunk made a survey through this republic for the widely-discussed Intercontinental Railroad from Mexico to Buenos Aires in 1893. Soon after the separation from Colombia and the creation of the republic of Panama in November, 1903, various railroad projects were discussed by the several succeeding governments and legislation was enacted authorizing the executive to undertake certain projects. In 1910 a survey for a narrow gage railway was made from Panama City to David, a distance of 200 miles, the estimated cost of which was about $10,000,000. The project was abandoned and nothing more was done until after Belisario Porras was elected president in 1912.

It was the opinion of President Porras and his advisers that the practical way to develop the best part of the republic would be to construct a railroad from Pedregal on the Pacific Coast to David, the capital of Chiriqui province, with branch



Map of the Chiriqui Railway and Vicinity.

lines to La Concepcion, Potrerillos and Boquete. The country around La Concepcion is rich in the production of bananas, sugar and tobacco. The llanos (prairies) along the line of railroad do not only produce rice, corn and all kinds of tropical fruits, but they provide first class pasture land where thousands of horses and cattle are raised with very little trouble and expense.

The country around Boquete, at an elevation of 3,500 to 6,000 ft. above sea level, produces as good a grade of coffee as any place in the world, with about 20 large plantations under cultivation. With a few exceptions the inhabitants of the province outside of the leading towns are Indians and a mixture of Indian and Spanish. They are not progressive and they discourage any modern improvements. So, in order to induce a better class of people to settle in this country, it was believed a well equipped railroad would be a solution to the problem.

Maps, profiles and estimates for railroads in three of the most important provinces were submitted to the government. The president of the republic submitted plans and estimates of the Chiriqui project to a board of engineers appointed by Col. George W. Goethals, chief engineer of the Panama Canal. This board consisted of Captain R. E. Wood, Captain W. H. Rose and A. S. Zinn, of the Panama Canal, and it reported in favor of the construction of the Chiriqui Railway. By recommendation of Col. Goethals, the Government of Panama appointed the writer consulting engineer.

In February, 1914, the contract was let to R. W. Hebard & Co. for the engineering and complete construction and equipment of the Chiriqui Railway, ready to operate. As the government had very little money in its treasury, the President was authorized to negotiate a bond issue abroad, up to such amount as would be necessary to complete the railroad. The approval of the State Department at Washington was secured and negotiations were eventually concluded for the sale of the 30-year 5 per cent. Republic of Panama bonds at a good price.

The construction work was started in April, 1914, and carried on slowly for seven months at the entire expense of the contractors on account of the delay in financing the project, the government not being able to secure any money on the bond transaction until November, 1914. The work was then continued with a much larger force of men and the best available construction equipment, consisting of two second-hand 18-ton saddle-tank type locomotives from Panama Canal and two new 99-ton consolidation type locomotives, one 70-ton steam shovel, one wrecking crane, 12 dump cars, 20 flat cars and two motor cars. The steam shovel was only used in loading gravel ballast. All of the excavation, amounting to 410,223 cu. yd. was done by hand with the use of one yard steel dump cars pushed by hand and 2-ft. gage tracks that could be quickly laid and shifted to any position required. This method of handling material from narrow cuts and short haul fills was found to be economical on the Panama Canal and is popular with all contractors at work in the tropics where one has to contend with a great deal of rain and mud. Grading with teams and scrapers is very seldom used as it has proved to be slow and expensive.

The total length of main lines exclusive of side tracks was 57 miles. On the line to La Concepcion, a distance of 18 miles, the maximum grade is 3 per cent and the maximum curvature 6 deg. on the 32-mile line to Boquete of the maximum grade is 5 per cent and the maximum curvature 12 deg. In climbing the slopes leading up to the mountains around Boquete the average grade is 4.2 per cent and the maximum curvature 5 deg. for a distance of nine miles. On a spur track seven miles long at Potrerillos the maximum grade is 5 per cent and the maximum curvature 5 deg.

The consolidated type of engines purchased was guaranteed to haul 120 tons behind the tender, up a 5½ per cent grade, at a speed of ten miles per hour. It was found by actual test that one of these engines hauled 150 tons at a speed of 15 miles per hour up a 5 per cent grade, part of which was on a 12-deg. curve.

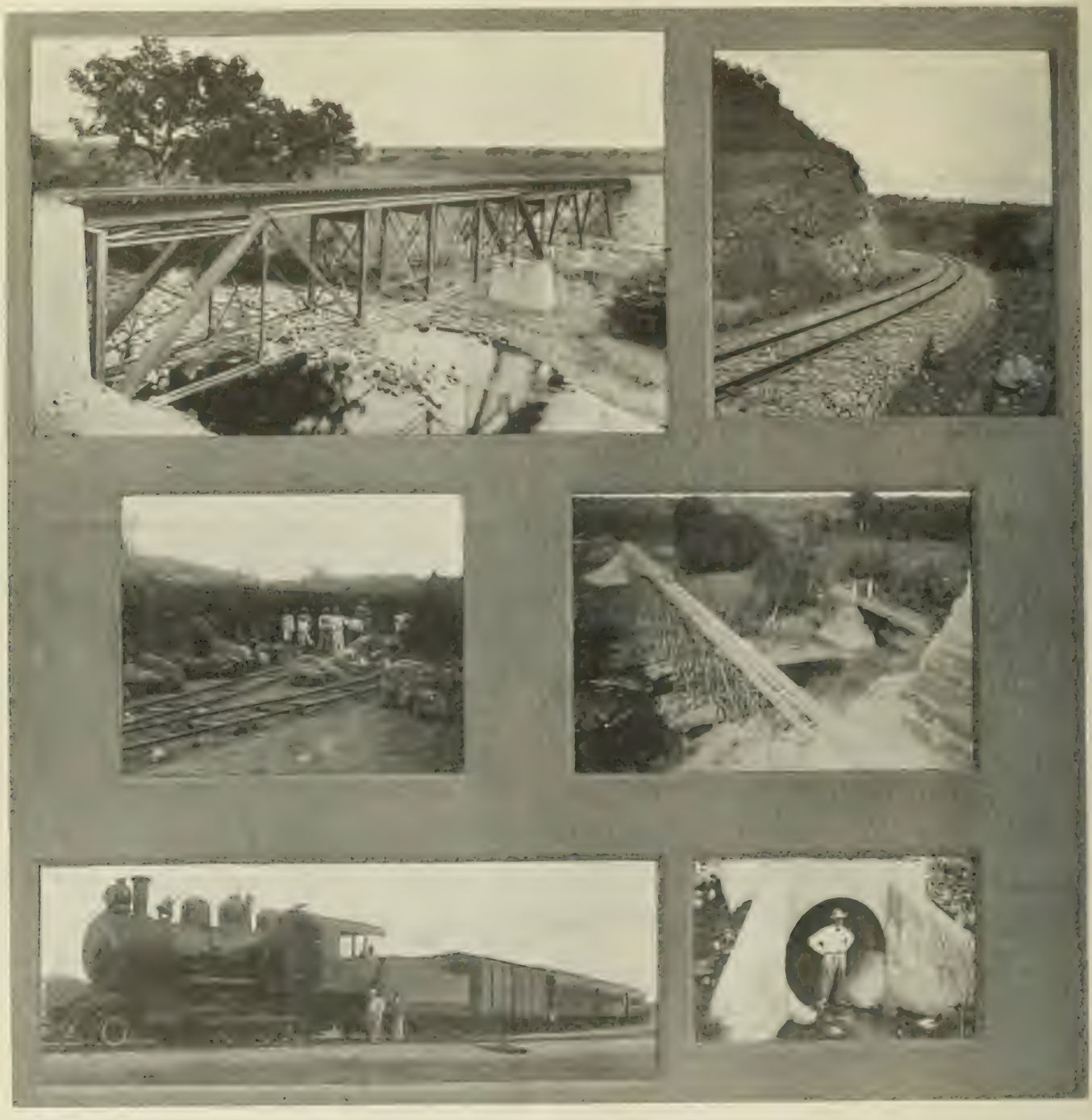
The principal considerations in the construction of a railroad in the tropics are good side-ditches and sufficient openings with well constructed culverts and bridges. The rainy season continues for eight months, during which time the rainfall in Chiriqui averages about 140 in. or about 3½ times the total precipitation in Illinois for one year. To provide for such floods safely on the 57 miles of track, it was found necessary to construct 26 steel bridges and 108

*Abstracted from a paper presented before the Western Society of Engineers, Chicago, on November 6, 1916.

culverts. The majority of the culverts were of corrugated ingot iron pipe, 24 in. to 72 in. in diameter, with concrete end and wing walls. All the large pipes under heavy fills were reinforced throughout with concrete one foot thick to prevent sagging. The balance of the culverts ranging in size from 6 ft. by 6 ft. to 10 ft. by 10 ft. were made of reinforced concrete and rubble stone masonry. All of the steel bridges were furnished by the American Bridge Company.

for unloading and loading construction material. The material was then taken up the Pacific Coast 125 miles and unloaded at the new dock at Pedregal.

The masonry for the bridges was built in advance of track work, consequently it was necessary to haul the cement and form lumber in ox carts for 5 to 20 miles over very bad roads. The rock for the concrete was crushed by hand at the bridge site. All concrete was mixed by hand and wheeled into the



Bridge Over the Rio Chirigagua on the La Concepcion Line
Excavating by Hand
A Typical Passenger Train

Typical Rock Ballasted Track
Temporary Construction Trestle Over the Rio Chirigagua
A 72-in. Corrugated Iron Culvert Reinforced with Concrete

The bridge material was shipped from New York to Colon, about 2,000 miles, where it was loaded on Panama Railroad cars, transferred to Panama, where it was unloaded on the docks, and then transferred to small barges on which it was taken out about a mile to a larger boat which was built for hauling cattle and passengers, with no modern equipment

forms, as this was cheaper than using a concrete mixer.

As soon as the track was laid to a bridge site, the heavy false work timbers for erection, made from native Mangley timber, were delivered by work-train, and as soon as erected the iron work was delivered and erected with very little delay. The culvert pipe was all hauled by ox teams and put

in place ahead of the grading. All of the concrete work for the culverts was completed after track was laid, to save money in the transportation of material.

As soon as the track was laid on the sub-grade for about 15 miles ballasting with broken stone was started. As plenty of good quality stone was found all along the line between David and Boquete, I suggested to the contractor the use of a portable crusher. He was in favor of a stationary crusher. Finally a young foreman said he believed he could use native labor to break by hand the boulders along each side of the roadbed and do it cheaper and more satisfactorily than could be done with either a portable or a stationary crusher. As an experiment he was allowed to break stone for one mile of ballast and it was found that he was correct. Consequently all of the broken stone ballast required on over 33 miles of the road was broken by hand, the big saving arising from the fact that it was piled along the roadbed in long piles, 1 ft. high by 3 ft. wide, for convenience to estimate, and saved transportation expenses, as it could be thrown in place with shovels. In the original estimate, creosoted ties 5 in. by 7 in. by 6 ft. were specified. These would come from the United States. About 168,000 were required. After the contractors had delivered about 40,000 of them, the consulting engineer recommended to the government that native ties of the best available woods be used. About 15 varieties of wood were specified, the better quality being lignum-vitae, mameyeilla, moro, mario and coroto. The principal reason for recommending native ties was that the money expended would benefit the people in the province and after four or five years they would know from experience the best kind of wood to use in tie renewals for maintenance and would not be required to wait on shipments from the United States. While some very good native ties were furnished, as a whole they were not as good as the creosoted ties, and on account of the scarcity of timber and the inexperience of the men furnishing the ties it did not only delay the work, but proved to be more expensive and caused more delays than to have shipped creosoted ties from the United States.

It was decided at first to use 70-lb. second-hand rail from the Panama Canal, but only 26 track miles could be secured that was good enough for the purpose; so the balance of the track was laid with new 56-lb. rail, both being A. S. C. E. sections. Right of way fences were built in the same manner as is customary with the natives, by stretching four barbed wires on wild plum posts. Large posts were firmly set in the ground about every 30 ft. to stand the pull on the wire, and in between about every 2 to 3 ft. small plum posts 2 in. to 3 in. in diameter, were set about one foot in the ground. These soon take root and grow rapidly, so that in a few years the posts are a line of growing trees, which not only make a very good fence, but the cost for maintenance is small. However, on account of the delay in securing the great number of posts required, and the time it took to build such a fence, I would hereafter recommend indestructible fenceposts with five barbed wires for a similar country.

Most of the cattle guards were steel surface guards with the side fences and posts made by sawing up the sheet piling used at the bridge foundations. This would not be economical in the United States, but down there, where we had no more use for the piling and the cost of transportation is high, it was economical. It cost very little to saw them and drill holes at the shops ready to deliver and erect at the road crossings.

No reverse curves were allowed. The only curves where spirals were used were at places where trains are likely to run at a speed of over 20 miles per hour. On account of the steep grades trains will not be required to run at an average speed of over 18 miles per hour; consequently the superelevation of the outer rails on curves was made to correspond.



Crossing the Rio Grande Valley on the Boquete Line with Maximum Grades of 5 per cent and Curvature of 12 deg.

During the construction period, wood was first used in the engines and later coal while the necessary number of oil tanks were being erected so as to be able to change the engines to oil burners soon after the road started operation, as it was proved on the Panama Canal and the Panama Railroad that oil was a cheaper fuel.

The original form of contract adopted was that known as "cost plus a percentage with a bonus for economy." Soon after the work started I saw the trouble and extra expense it would cause the contractors and the government to carry out such a contract 325 miles from headquarters. Under the "cost plus a percentage" form of contract, the contractors were to submit to the government for investigation and approval on the 25th of each month a complete statement of all expense incurred on account of the work for the previous month, including payrolls, canceled accounts, vouchers

and all other statements. This would mean that all the accounts pertaining to the "thousand and one" kinds of expenditures natural to a work of such magnitude and character would have to be prepared quadruplicate in English and Spanish. This would require a large clerical force for the contractors, and the government in turn would have to employ accountants to examine this large mass of data each month. This would naturally have caused confusion, misunderstanding and serious delays in effecting payments.

It was then decided to change the contract to a "Fixed Sum" form of contract, using the same estimate of cost as provided for in the original contract, together with the original specification. The government would then have the assurance and satisfaction of knowing that the railway would be completed according to specifications for a guaranteed fixed sum, and, if the cost exceeded the contract price, the contractors assume this excess for their account.

The estimated cost or "Fixed Sum" was $1,628,141, or about $32,563 per mile. Later it was decided to build the Petrerillos line of seven miles, build a 410-ft. span wagon bridge, repair several wagon roads and bridges and construct 50 miles of telephone and telegraph lines to aid traffic and operation. This additional work was done at actual cost, with 5 per cent of the cost to go to the contractors for doing the work. This additional work brought the total cost up to a little over $2,000,000.

The contract time for completion was May 1, 1916, but on account of the extra work and heavy rains it was not completed until July 1, 1916.

The completed railroad is as well constructed and equipped with rolling stock, shops and station buildings as the average railroad in the United States. The cars are of sufficient capacity to handle the traffic and the railway as a whole will answer all purposes for which it was built as well as a standard gage railroad would. The saving in cost in construction and equipment of a narrow gage railroad compared with standard gage is not as great as many engineers may believe. The principal saving is in the cost of ties, ballast, excavation and bridges, the total saving being approximately 6 per cent.

CENTRAL AND WESTERN ASSOCIATION OF CAR SERVICE OFFICERS

The Central and Western Association of Car Service Officers held its semi-annual meeting at the Grand Pacific hotel, Chicago, on November 1. L. M. Betts, car accountant of the Belt Railway of Chicago, and vice-president of the association, presided. The meeting was devoted principally to the consideration of committee reports, the most important of which was that of the Per Diem committee. This committee offered the following formula for determining monthly the reclaim allowance for terminal switching between carrier roads under Per Diem Rule 5 of the American Railway Association:

1. Reclaim statements shall include only cars on which per diem is paid by the switching line. The statement shall show initials and numbers of cars, date received, date delivered and the number of days on line; the number of days on line to be determined by subtracting the date of receipt from the date of delivery.

2. On cars received from and returned to the same road, making a loaded movement in one direction and an empty movement in the opposite direction, the switching road may reclaim for the total number of days per diem actually paid, with a maximum of —— days per diem on any one car, except that when the average detention of all cars under this paragraph equals or exceeds five days, the reclaim on such cars will be an arbitrary of five days per diem on each car.

3. On cars received from and returned to the same road, making a loaded movement in both directions, the switching line may reclaim for the number of days per diem actually paid, with a maximum of —— days on any one car, except that when the average detention of all cars under this paragraph equals or exceeds ten days, the reclaim on such cars will be an arbitrary of ten days per diem on each car.

4. An arbitrary amount of —— days per diem may be reclaimed by the switching line on all cars:

   a. Picked up empty and delivered loaded.
   b. Received loaded and not returned to the delivering line.
   c. Returned empty to road received on account cancellation of order or error on part of delivering road, including cars unfit to load.

5. An exception shall be made on cars loaded with livestock (not including emigrant outfits), on which reclaim may be made by the switching line for the actual per diem paid with a maximum of —— days per diem on any one car. No reclaim will be allowed on such cars when handled under Paragraph 4, Section D.

6. Cars shall appear on the reclaim statement for the month in which they are disposed of. No supplementary reclaim shall be made on account of error in the date of interchange, as shown on reclaim statement, discovered after reclaim has been settled. Supplementary reclaims for cars omitted from regular reclaim statements shall be figured as new statements. Reclaims made by carrier lines for cars included on reclaim statements by switching lines in error, shall be on the basis of the actual amount of reclaim allowed on such cars.

Note.—The days left blank in the above formula are to be determined jointly by the railroads according to local conditions.

A resolution was passed by the association approving the formula presented by the committee, and referring it for consideration to the Association of Transportation and Car Accounting Officers with a recommendation that the American Railway Association be requested to make it mandatory.

A resolution was also passed reaffirming the action of the association on April, 1916, when a recommendation was made to the Association of Transportation and Car Accounting Officers for a change in Per Diem Rule 5 which would recognize a separate basis for settling reclaims with purely switching lines as compared with reclaims between carrier roads performing switching service. This resolution will be brought to the attention of the senior association.

The Committee on Office Methods and Accounting presented a report on methods of determining the proper rate to be applied on cars home-routed via the shortest and most direct route and the matter of handling per diem claims after records have been destroyed, in accordance with the Interstate Commerce Commission ruling. As the committee made no definite recommendations as to either of these subjects they were referred back to the committee for further consideration.

The question of a proposed increase in the per diem rates was referred to the proper committee for consideration until the next meeting.

No report was made by the Committee on Pooling Freight Equipment, but W. E. Beecham, secretary of the association, discussed the subject at length. He does not favor pooling freight cars, but is a strong advocate of the creation by the railroads of a national car distributing agency with authority to force the movement of cars into parts of the country where they are most needed.

THE WAR BONUS IN IRELAND.—Although the railways in Ireland are not under the control of the government, and therefore do not have their net receipts guaranteed, they are paying their men a war bonus which, of course, comes out of the pocket of the shareholders.

Some "Inside Workings" of the B. of L. E.

Engineers Describe Treatment of Brotherhood Members Who Oppose the Organization's Legislative Plans

SENSATIONAL testimony regarding the methods of the Brotherhood of Locomotive Engineers in dealing with its members who disagree with the legislative plans of its officers was presented at a hearing before Examiner-Attorney Hines of the Interstate Commerce Commission at Washington last week on the commission's order requiring the railroads to adopt high-power headlights.

W. H. Rother, an engineer employed on the Cleveland, Cincinnati, Chicago & St. Louis, testified that he had been tried and acquitted by his local division of the brotherhood, No. 492, at Indianapolis, on charges preferred by Grand Chief Engineer Warren S. Stone of violation of the "laws" of the brotherhood in testifying before the Interstate Commerce Commission that he regarded electric headlights as dangerous. After his acquittal, Grand Chief Stone had recalled the charter of Division 492 and organized a new division in its stead, excluding Rother, together with those who had voted for his acquittal, and those who had refused to obey an order to refrain from associating with Rother.

J. T. Heller, another Big Four engineer, testified that he had been expelled from Division 143 of the brotherhood on charges preferred by Stone because of his testimony before the Interstate Commerce Commission.

A. E. Martin, also a Big Four engineer, said that he had been excluded from Division 546 and ostracized by his fellow members for acting as Rother's attorney at his trial, and that the only evidence presented against Rother was a copy of his testimony before the Interstate Commerce Commission.

D. P. Keller, an engineer employed on the Pennsylvania Railroad, testified that he had been tried and acquitted by his local division, No. 74, on charges preferred by order of Grand Chief Stone because he had expressed an opinion unfavorable to electric headlights in the presence of a member of the Pennsylvania legislature, and that he had afterward been expelled on charges preferred by Stone because he had joined the Pennsylvania Mutual Beneficial Association. He also testified that he had sent to the Interstate Commerce Commission a copy of a circular addressed by Mr. Stone to members of the brotherhood, threatening them with expulsion if they interfered with the plans of the brotherhood in connection with headlight legislation.

D. P. Trostle, an engineer on the Philadelphia & Reading, testified that H. E. Wills, legislative representative of the Brotherhood of Locomotive Engineers, and A. G. Pack, assistant chief inspector of locomotive boilers of the Interstate Commerce Commission, had warned him while in the hearing room of the Interstate Commerce Commission on October 30 that he would be violating the laws of the brotherhood if he testified unfavorably to high-power headlights.

These engineers were allowed by the Interstate Commerce Commission to present their testimony only after a vigorous objection by Mr. Stone and W. S. Carter, president of the Brotherhood of Locomotive Firemen and Enginemen, and after the hearing had been interrupted for a day while the commission deliberated over a statement filed by counsel for the railroads, outlining the character of the evidence they proposed to introduce. After the testimony had been allowed, Mr. Stone admitted the principal facts alleged and identified copies of letters which he had written bearing on the cases.

The Brotherhood "Law"

The sections of the "Constitution and Statutes" of the Brotherhood of Locomotive Engineers under which members have been expelled for giving testimony before the Interstate Commerce Commission are given herewith:

"Members Interfering with Board—Penalty."

"Sec. 11. Any member or Division refusing to sustain the official acts or instructions of the Legislative Board, or who circulates or signs any petition, or who, by verbal or written communication to railroad officials or others, calculated to injure or interfere with legislative matters offered by the Legislative Board or at any time makes suggestions to railroad officials or to state legislators that may be detrimental to the interests of the B. of L. E. or any train service organization, shall be expelled, when proven guilty, as per Sec. 49 of the Statutes."

"Interfering with National Legislative Matters."

"Sec. 12. Any member or Division who, by verbal or written communication to anyone calculated to injure or interfere with national legislative matters, offered by our Legislative Representative at Washington or Mexico, or at any time makes suggestions to anyone that may be detrimental to the interests of such legislation, shall be expelled, when proven guilty, as per Sec. 49 of the Statutes."

Nearly a score of engineers running fast passenger trains on roads entering New York City testified that, in their opinion, electric headlights would be a positive menace to safety of operation in their territory because they obscured signals and temporarily blinded engineers who had to face such headlights approaching from the opposite direction. Some of them had had experience with electric headlights on their own engines, others had faced them on electric trolley lines paralleling their own lines, and all of them had been present at tests with electric headlights made on the New York Central recently. In addition, 45 locomotive engineers and 13 road foremen of engines and locomotive inspectors presented to the commission through counsel for the railroads a petition that they be allowed to testify, but the commission declined to change the ruling it had previously made limiting the number of witnesses to 20 for the railroads and 20 for the brotherhoods.

A report of the testimony given at the hearing before the commission on October 30 and 31 and November 1, was published in last week's issue. The attorneys for the roads asked the commission to modify its headlight order, which has been postponed to January 1, 1917.

Rother's Testimony

On Thursday, November 2, William H. Rother took the stand and said he had testified before the commission at its hearing in Washington on September 30, 1915, after which charges had been preferred against him by order of Grand Chief Stone for conduct unbecoming a member and violation of the rule of the organization forbidding members to oppose legislation advocated by the brotherhood. Stone and Carter immediately entered a protest against the continuance of this line of testimony and Examiner Hines decided to submit the question to the commission at the noon recess. Mr. Stone admitted that he had preferred charges against Rother, but insisted that "the dirty linen of the B. of L. E. should not be brought before the commission," and that "the brotherhood can take care of its own private affairs." He said if he had made a mistake his international officers would take care of him, and if Rother had any grievance the courts could take care of him. He said the railroads had brought to Washington as witnesses "every man who has a suit against the brotherhood or who is in disrepute with the brotherhood for violation of its laws." Mr. Carter said the organizations had found it necessary to enact laws for disciplining their members, particularly in connection with legislative matters, and he insisted that Rother's testimony be stricken from the record. He also insisted that the commission should not even be allowed to see the testimony unless he was allowed to make a statement in connection with it.

D. E. Minard, assistant general counsel of the Erie, asked permission to submit a formal statement outlining the testimony to be offered and giving the reasons why it should be admitted. Late in the afternoon the commission announced a ruling that counsel for the railroads might file a statement for the record of testimony they desired to offer regarding "the intimidation or threatening of any witnesses in this investigation." The hearing was then adjourned until 7:30 on Friday evening.

Before the adjournment, Mr. Stone continued to object to the introduction of testimony regarding "the inside workings of the organization." Mr. Carter asked if the commission would read the testimony before deciding the matter. When informed that the commission had read it, he made a formal request for the privilege of putting in a statement. The statement filed on Friday morning by counsel for the railroads, C. C. Paulding, solicitor of the New York Central; D. E. Minard, assistant general solicitor of the Erie, and S. B. Lloyd, assistant general counsel of the Pennsylvania, is as follows:

Statement of Evidence by Railroad Counsel

"Counsel offer to prove:

"That two witnesses, W H. Rother and John T. Heller, who testified in this proceeding, before this commission, in Washington on September 30, 1915, and who were members of an organization known as the Brotherhood of Locomotive Engineers, were subsequently, and in December, 1915, charged at the instance of W. S. Stone, the grand chief of said brotherhood, with a violation of a specified rule of said organization, in giving such testimony. That each of such witnesses was tried before the respective division of such organization of which each was a member, and the proof adduced against each upon such trial was a copy of the testimony given by him in Washington, and the fact that he so testified. That one of said witnesses, namely, Heller, was found guilty of violation of the said rule of the said brotherhood in so testifying and was expelled from said organization. That the other witness, Rother, was acquitted after such trial and by a vote of the division to which he belonged, of the charge made, and that subsequently W. S. Stone, said grand chief, ordered that on account of such vote and such acquittal, the charter of the division should be surrendered. That the charter was taken away, and that a new charter was issued to a new division in the same city, and that the witness Rother, the men who voted to acquit him, and six others, who were friends of his, were omitted from said new division, and have ever since been denied the right to become members of the same or any other division.

"Counsel further offer to prove that on Monday, October 30, 1916, two men, namely, D. P. Trostle and W. M. Prutzman, who were present in the room of the commission, as witnesses in this proceeding, on behalf of the railroads, and who are members of the said brotherhood, were advised of the fate of the above named witnesses, Rother and Heller; that each are liable to expulsion, and that the names of all those members of the said brotherhood who were present in Washington as witnesses on behalf of the railroads, were being taken and would be sent to Cleveland, the headquarters of said brotherhood, for action.

"The purpose of this testimony is to fully advise the commission as to the facts, and as to the circumstances and conditions under which the witnesses who have testified, and who may testify in this proceeding, have given or may give their testimony, to show the earnestness and sincerity of such witnesses, and of each of them, in giving their testimony in the face of threatened punishment which awaits them, or such of them as are members of the said brotherhood; and to invoke for such witnesses the protection of the commission, in so far as such protection may properly be extended, in preventing punishment to them for the testimony given.

"It is contended that the foregoing testimony and other tesimony which can be offered as to the penalties which have been enforced against other members of the said organization on account of the protests made by them in prior proceedings upon the subject, is relevant as bearing upon the whole subject under consideration, more particularly as bearing upon the claim that has been so frequently and confidently made by those favoring the rule under consideration, that all the employees favored the adoption of the rule, and as showing the reason why such claim was and is so confidently made."

When the hearing was resumed on Friday evening, Examiner Hines announced that the commission had concluded that while it is not interested in the rules and regulations of private organizations, in order to properly weigh the evidence, "it is interested in being advised with respect to deterrent influence brought to bear upon witnesses." It, therefore, denied the motion to strike out the testimony. Mr. Carter again asked the privilege of making a statement and was told that any officer of the brotherhood could be put on the stand to meet the testimony offered by the railroads.

W. H. Rother was recalled and continued his testimony regarding his expulsion from the organization. His trial was held at Indianapolis on December 27, 1915. The day before he had been shown a letter from Stone to the chief engineer of Division 492, H. McHale, directing that charges be preferred against him. Mr. McHale had done so and he had been notified by being served with a copy of a letter signed by Mr. McHale, together with a notice to appear at the next meeting for trial. The letter was as follows:

"To the Officers and Members of Division 492:

"You will note communications from our Grand Chief Engineer W. S. Stone, relative to Bro. W. H. Rother of Division 492, in opposing the 'power headlight bill' before the Interstate Commerce Commission and the unpleasant task he imposes on Division 492.

"So I see no reason for delay in this matter and I do not think it right to ask any brother to do something that I do not like to do myself.

"I here prefer charges against Bro. William H. Rother for violation of Section 12, page 87, of the laws governing legislative boards, violation of obligation and unbecoming conduct."

Alexander E. Martin, a fellow member of the division, acted as Rother's attorney and out of about 180 members of the division only 17 voted. Of these 11 voted not guilty and 6 guilty, and Rother was declared acquitted. Mr. Rother said that the chairman of the investigating committee had stated that as far as Mr. Rother's veracity was concerned, it could not be questioned. He had then read the charges and the only evidence offered was a copy of Rother's testimony at Washington, together with a letter from Mr. Stone. "The only thing that was said," Mr. Rother testified, "was that the mere fact of my being at Washington was sufficient to expel me."

On the following Sunday, when he and several other members went to the lodge hall, they found that the charter of the division was gone. They afterward heard that Stone had ordered it revoked and a new division was organized, No. 546, from which Rother, Martin, the 11 members who had voted to acquit him, and six others who had refused to obey an order not to associate with Rother, in accordance with the brotherhood's "silence vote" were excluded. Mr. Paulding then read into the record the following letter signed by W. S. Stone, per W. P. Dougherty, chief clerk, dated January 7, 1916, and addressed to the secretary-treasurer of Division 492:

"We received your letter of December 28, relative to the case of Brother Rother, and as we furnished the division with ample evidence of this brother's guilt, it is very evident that the time has arrived when it is impossible to get the division to comply with the laws; therefore, effective this date, the charter of Division 492 is suspended and we will ask you to forward the charter, books, rituals, seal, etc., to the Grand office."

This letter was identified by Mr. Stone.

When they heard that the new division was being organized at Indianapolis, a committee of Rother's friends called on Mr. Stone, but he refused to see them. They then changed the locks on the division hall and retained possession of it.

Rother was cross-examined by Mr. Stone, but the subject of his trial was avoided. Stone asked if he had not been promoted to the position of special headlight inspector since his testimony before the commission. Rother said he had been promoted to that position, in addition to his duties as engineer, in January, 1915, long before his testimony. He also answered in the negative to questions by Stone as to whether he had not denied being in New York at tests conducted by the New York Central and as to whether he had not made the statement that he would rather buy an electric headlight out of his own pocket than be without one.

"Is it not a fact," asked Stone, "that after the question came up in regard to your testimony, that you repeatedly said to different engineers on the division that if I had asked the proper questions you would have testified in favor of the electric headlight?"

"No, Sir," replied Mr. Rother, "I did not, for you were not present when I was questioned."

Mr. Carter also cross-examined the witness and made much of the fact that his duties were to see that the headlights used by the Big Four are in good condition.

A. E. Martin, who had acted as Rother's attorney, corroborated his statement that his testimony before the com-

mission was the only evidence against him. He also testified about finding the charter gone, and hearing about the new division being organized. He and two associates then called on Stone at his office and asked for information. They were shown a letter to Stone written by the chief engineer of Division 492. "The letter read in part," said Mr. Martin, "that Brother Rother had been exonerated and something will have to be done and done quick, and I guess it was done quick, because at the next meeting there was no charter."

He had pleaded with Stone to return the charter but had merely been told to put his request in writing, and Stone had issued 175 transfer cards to the members of Division 492, leaving out 17. Stone asked if the 17 "insurgents" had not continued to hold regular meetings in the hall. Mr. Martin said that they did, but that the members of the new Division 546 had a suit in the state courts asking for the appointment of a receiver for the furniture of the division hall. The 17 members then filed a cross-complaint demanding the restoration of their rights and the money they had paid into the division treasury.

John T. Heller of Indianapolis, an engineer on the Big Four, also said he had testified before the Interstate Commerce Commission last year and, on charges preferred against him by Stone in a letter to Division 143, was tried and expelled from the organization. He said that the only evidence offered against him was a copy of his testimony before the commission. He had witnessed the tests at New York and said he would not want to ride behind an electric headlight in that territory; that it was bad enough on his own road, where he had operated an electric headlight for 20 years. His run is principally on a single track, he said, but engineers of freight trains that he passed at one point had made complaints about the effect of his light. He had also had trouble with electric lights on automobiles and interurban cars running parallel to his track. Asked if he thought an electric light would be a safe device in the vicinity of New York, he said:

"No, if you had tracks and business like you have got down there where we made those tests, we would all be in the dark. We wouldn't get in in time to come back."

Witnesses Warned During Hearing

David P. Trostle, an engineer on the Philadelphia & Reading, testified about conversations he had had with H. E. Wills, legislative representative of the Brotherhood of Locomotive Engineers, and A. G. Pack, assistant chief boiler inspector of the commission, immediately after the hearing on October 30.

"A lot of brotherhood men were all talking about coming here," he said, "and the rumor was that they were here to cut the brotherhood men's throats. I went to Brother Wills and asked him about this and he says, 'No, Sir.' He says, 'Of course, all this conversation goes to Brother Stone' and we walked over to the other side of the room and Brother Wills introduced me to Mr. Peck, or Pack, whatever his name is, and one subject brought on another and he says, 'you know you have no right to interfere with the legislative matters of the brotherhood.' I says, I am aware of that, but this is a free country and I am under no king ruler. As long as I tell the truth I will not be thrown out of the brotherhood. Brother Stone says that nobody that tells the truth was ever thrown out of the brotherhood."

On the following day he said he had spoken to Mr. Stone about it and Stone had assured him that if he told the truth on the stand, "nothing would happen to him."

"Did you take it from that that you were being intimidated?" asked Stone.

"No, Sir," replied the witness.

Mr. Wills declined to cross-examine the witness. Mr. Pack asked if the witness had not come to him and said he was "between two fires." Mr. Trostle assented.

"I called your attention to the by-laws and I told you that you knew as much about it as I did," said Mr. Pack. "Yes," replied the witness. He said that neither Mr. Wills nor Mr. Pack had talked to him in a threatening manner. Asked by Mr. Stone how he happened to go to Washington he said he had been asked by a road foreman of engines because he had once had to stop his train, about a year ago, when the general manager was aboard, because he could not see a signal on account of the effect of a trolley car headlight shining in his eyes. He said he had been told that he did not have to go and that he was testifying voluntarily.

Mr. Keller's Story.

O. P. Keller, who runs on the Broadway and Manhattan Limited trains of the Pennsylvania between Manhattan Transfer and Harrisburg, said that his lodge, Division 74, at Harrisburg, had taken a vote on the power headlight question in 1913 when the brotherhood was trying to secure the passage of a headlight bill in the Pennsylvania legislature and that the majority of its 145 members had voted against the high-power light. His first trial on charges preferred against him by Mr. Stone came as the result of a conversation in the lobby of the Pennsylvania legislature in 1913 with Charles Reese, secretary of the brotherhood's Pennsylvania legislative board. He said he had gone into a hearing room where about 100 or 125 locomotive engineers were giving testimony against high-power headlights, that he had taken no part in the proceedings, but that afterward, while outside in the lobby, he had gotten into an argument with Reese by saying that it was unfair to "force something on the engineers they didn't want."

"In the meantime," he continued, "while we were arguing there, Senator Beidleman, from our town, came in and heard the argument. Senator Beidleman said to Reese, 'You are a damned liar, you told me that all of the men on the Pennsylvania Railroad or in this state were in favor of high-power headlights and here are my own people, living in my own town, that are not in favor of the power headlights and because you told me that lie, I am not going to vote for the headlight.' Then Mr. C. E. Reese writes a letter to Mr. Stone, of which I have a copy at home, that I interfered with the legislation on the high-power headlight, and I never said beans about it, and so they preferred charges against me and Reese. They couldn't find anything against me and acquitted me. Then Mr. Strode wrote a letter to Mr. Stone that our men were against the high-power headlight and he said it did not matter whether 1 per cent or 90 per cent wanted the headlight, it has got to come."

Mr. Keller also produced a copy of the following letter, written to him as chief engineer of Division 74 by Mr. Stone under date of July 14.

"I am in receipt of your letter of July 4 in reference to the charges preferred against Brothers McClintock and Martin by the Executive Committee of the Pennsylvania Legislative Board, and also have a letter from the Secretary-Treasurer in which he informs us that the committee found these members not guilty. This is a new idea to me, for I have always understood and have always ruled that the members present at the meeting when the member was brought to trial, after both sides of the case were presented, decided the guilt or innocence of the accused, but it appears in this case that the Investigating Committee had taken that duty upon themselves. There is no question but what the action in the McClintock and Martin cases was a white-wash pure and simple, and if the members of Division 74 think we are going to accept it, they are very much mistaken.

"You say in regard to the charges preferred against Brothers Keller and Bliss: 'I want to tell you that I am one of them, and I would like to tell you that 95 per cent of the men on my division do not want an electric head-light because the Pennsylvania Railroad is too much congested, because we have from four to six tracks, and in yards as high as fourteen to sixteen and thirty tracks entering train sheds, which would make it impossible for men to see the signals, therefore causing them to have accidents, not because they wanted to but because the lights will blind you so you cannot see. I am speaking from experience as I run up against trolley cars between different points, and positively you can't see any signal when these lights shine in your face. It does not say that if men of the B. of L. E present bills in the legislature that is detrimental to me or it will make a criminal out of me, that I have no right as a citizen to protest against such legislation.'

"When you joined this organization you took an obligation to abide by all the rules and regulations. One of them is the will of the majority,

and you must abide by that as long as you retain membership in the organization regardless of your personal opinions. You have no right either as an individual or member of the organization to any way interfere with the legislation introduced for or being supported by the legislative representatives of our organization, and I want to say to you, before we are through with this, you and some more members of Division 74 who feel that they are a law unto themselves, will find that they are mistaken. We have had about all of this kind of work that we will tolerate from Division 74, and can assure you that if they do not comply with the law both in spirit and letter, we will not hesitate to use our authority and let the next convention decide it."

Mr. Keller said he did not know anything about the proposed order of the Interstate Commerce Commission until last January, when he read of it in the Engineer's Journal, and that he had immediately written a letter to the commission, asking it to give careful consideration before requiring the high-power light. He told the commission that the engineers on the Pennsylvania did not want it, but were afraid to testify because if they did so they would be expelled from the brotherhood. He had mentioned the fact that many cities have prohibited the use of high-power automobile lights. "If you have an automobile yourself," he said, "you can realize the situation." He had also enclosed a copy of the circular written by Stone, warning members not to interfere with headlight legislation. Mr. Stone identified the circular and said he would say the same thing today. Mr. Stone asked if he had not written the letter to the commission after having been expelled from the brotherhood and Mr. Keller said that he had been expelled for joining the Pennsylvania Mutual Beneficial Association.

"Which was an organization to disrupt the B. of L. E., was it not?" said Stone.

"No, sir, that is only a notion of yours," replied Mr. Keller.

Mr. Keller also said that the organization was not a labor organization. Mr. Stone asked if it did not have a grievance committee to get men reinstated.

"Well, Mr. Stone," said Mr. Keller, "I get as many back individually as your organization when they get in trouble."

"That is because you stand in with the company, isn't it?" asked Mr. Stone.

"I had better stand in with the corporation I work for than to stand out with them," replied the witness.

Mr. Stone asked if the headlight bill had not been recommended by a majority of the brotherhood's divisions in the state.

"It is a question in my mind whether it is honestly done," replied the engineer.

"Under the law, it would have to be before they could legally present it, would it not?" asked Mr. Stone.

"No, I would not like to say that, there is so much trickery going on today."

J. A. Foertsch, an engineer on the Philadelphia & Reading, was asked by Mr. Stone how the engineers had been picked who had gone to New York for the tests. He said his superintendent of motive power had called him on the 'phone and asked him if he wanted to go to the test and testify at Washington, saying it was entirely optional whether he should go or not. He had been asked in a similar way to get six men to go to Harrisburg that objected to electric headlights, but that they were not required to go. Mr. Stone asked if he had not found out by experience that a railroad employee had better agree to what the officers wanted. The witness replied that there were a good many men on his road who had disagreed with the officers and were still in service.

The engineers running on railroads entering New York City who testified were unanimous in opposing the high-power headlights in multiple track territory with many signals. One engineer said he would be glad to ride behind an electric headlight if none of the passing engines were so equipped. Mr. Keller said that, while he had never operated a locomotive equipped with an electric headlight, he encountered trolley cars equipped with electric headlights almost every evening and that the light shining in his eyes made it impossible for him to see anything for a time. The motormen often turned out the lights out of consideration for him, he said, but he has experienced the same trouble on account of automobile lights on the adjacent highways. He runs as fast as 70 miles an hour at times and said that under such conditions he did not want anything to distract his attention from the signals. In fact, he said, he could see his signals better if there were no headlight. He also described his experience at a test on the New York Central, saying that he could not see classification signals or rear end markers on passing trains, and that once when a passing train got between him and three electric headlights on three engines in a group, he was unable to see it at all. He said that if dimmers were used on his line when passing other trains or stations, it would have to be on so much of the time that there would be no object in having the high-power light or else he would forget to use the dimmer.

Similar testimony was presented by other engineers, who said they had been given an opportunity to go to New York to the test and also to go to Washington to testify, but that in both cases they had been given the option of staying away. J. R. Ewing, an engineer on the Pennsylvania, said: "I came here voluntarily for the purpose of protecting myself and the public against a device that means death." Most of the witnesses said that when running at high speed they would be unable to bring their trains to a stop within 1,000 feet, in case they did see an object on the track, especially as in most cases they would not care to put on the brakes until they were sure there was real reason for doing so. On cross-examination Stone and Carter endeavored to secure admissions that the witnesses were testifying under some sort of compulsion. They also emphasized the fact that the witnesses had not in most cases operated locomotives equipped with electric headlights.

F. T. Bentley, superintendent of motive power of the Chicago & North Western, which uses electric headlights, testified that the high-power lights were satisfactory under certain conditions, but that he did not approve of them for congested suburban territory, such as that of his road in Chicago and of the eastern roads running into New York and Philadelphia. He suggested that the commission modify its order to impose only a minimum requirement, for example, a light which would enable an object to be seen on the track at a distance of 300 feet, or about the distance obtained with a 250-watt electric light equipped with dimmers. This would enable the roads that desire to use high-power lights to do so without requiring the roads in congested territory to use them. He said the engineers on his road were entirely satisfied with oil lights in switching service.

After the 20 witnesses allotted to the railroad had testified, Mr. Minard said that about 80 engineers had gone to Washington voluntarily and had expressed a desire to tell the commission what they thought of the attempt to impose the high-power headlight on all railroads and he presented a written petition on behalf of 45 engineers and 13 road foremen of engines and locomotive inspectors, representing a combined service of 1,063 years as engineers and 338 years as firemen, asking the privilege of being heard. Mr. Minard said that their testimony was especially important as in all the hearings on the headlight question the statement had been made that the railroads could not get engineers to testify against the high-power headlight. Mr. Carter said that the brotherhoods could not afford to be placed in the position of objecting to additional witnesses being heard, but that the railroad attorneys were presenting the petition with a view to injunction proceedings if the commission should decline to hear the additional testimony. He asked the commission to conduct additional hearings at Chicago and St. Louis and to take the testimony of engineers in those cities who had had experience with high-power lights. Mr. Minard said that the request was not made solely for the record. He asked that the question of giving these engineers an opportunity to be

heard be submitted to the commission at once. The question was submitted to the commission and the petition was denied. The attorneys for the railroads entered a formal exception.

When the question arose as to whether the hearing should be adjourned to enable those present to go home for election, Mr. Stone and Mr. Carter objected to any adjournment, saying that many of their witnesses had come from a long distance and that, while they would like to vote themselves, they would prefer to stay and finish the hearing. Counsel for the railroads were in favor of adjourning. Mr. Carter said jocularly that the railroads could get their witnesses home in time to vote as they were principally eastern men, while some of the brotherhood witnesses could not get home in time. It was decided that the hearing should be continued.

Brotherhood Testimony

Frank McManamy, chief inspector of locomotive boilers of the Interstate Commerce Commission, took the stand on Saturday afternoon as the first witness for the brotherhoods. He said that before recommending to the commission the rule requiring a headlight which would enable a dark object the size of a man to be seen for a distance of 1,000 feet down the track, he had made such investigation of the subject and such tests as time permitted and that he had examined the headlight laws of 31 states, mostly in the west and south. Most of these laws, he said, were drawn in such a way as to require electric headlights, while some specifically prescribed electric headlights. About half of them were based on a prescribed candlepower requirement and about half prescribed the distance at which an object could be seen. He had chosen the distance basis, because he said this made the rule enforceable, as apparatus for the measurement of candlepower was too cumbersome for inspection purposes. He emphasized the fact that the order permits the use of dimmers to reduce the intensity when passing stations or other trains and he felt that the rule had been drawn in such a way as to meet all normal conditions of weather, operation and climate. He described a number of tests conducted on the Chicago & North Western with electric headlights, in which he had no difficulty in reading signals. He also described the tests conducted on the New York Central on September 28, saying he thought the conditions were not entirely favorable, especially as to the observation of men on the track, as they were partially obscured by shadows and curves. However, he thought this was the least important feature of the tests because he thought the lights used were of even greater intensity than that required. He said that it was raining intermittently during the tests, that he had not been consulted in detail about the arrangements for the tests, and that he had been given no opportunity to inspect the lights on the night of the test. He said he had experienced no difficulty in reading signals. Asked if he thought that the railroad officials who opposed electric headlights were mistaken, he said he did think so or he would not have recommended the rule, but that he had preferred to get his material from roads on which headlights are used rather than from the roads that do not use them.

Under cross-examination by R. S. Sharp, president of the American Gas Accumulator Company, Mr. McManamy denied that the commission's order discriminated against acteylene headlights and said that any light could be used that met the requirements. He said the commission had never stipulated electric headlights. Asked if he was opposed to any change in the rule, Mr. McManamy said he was not if it could be shown that change was in the interest of safety.

Mr. Sharp asked Mr. McManamy if he had been or was now a member of the Brotherhood of Locomotive Engineers. Mr. McManamy said he did not think he was called upon to answer the question.

John McManamy, assistant chief inspector of locomotive boilers, described his experience at the tests at New York and said that he had found no difficulty in reading signals, but that he thought the lights were not in proper condition. He also described his experience as a locomotive engineer operating behind an electric headlight and said he had had no difficulty.

A large number of engineers employed on western railroads that have used electric headlights for years testified as witnesses for the brotherhoods and expressed a preference for electric headlights, saying they had never had any difficulty in reading signals and that they believed that the high-power light was a safety device. They also said they had never experienced any difficulty because of phantom signal indications caused by the reflection from signal roundels. An engineer on the Chicago & North Western said that their lights were focused so that the beam of light strikes the track at a distance about 300 feet in front of the engine so they do not shine directly into the eyes of an engineer on the opposite train. One engineer testified that the electric light tends to obscure a signal light when it is close to it, but that it does not occur until after there has been an opportunity to read the signal correctly from a distance.

The brotherhoods completed their case Tuesday afternoon without giving any rebuttal testimony to the charges of intimidation and coercion.

R. B. Kendig, chief mechanical engineer of the New York Central, and D. F. Crawford, chairman of the Headlight Committee of the American Railway Master Mechanics' Association, and general superintendent motive power of the Pennsylvania Lines West, gave rebuttal testimony for the railroads on Wednesday morning. Mr. Crawford stated that he would never take the responsibility for putting electric headlights on any road and that the danger increased in the proportion to the density of traffic, the number of trains and the number of signals. He stated that a proper rule would prescribe the minimum that would be suitable under the most congested conditions and allow each road to use more intense light if desired.

Oral arguments will be heard in Washington on November 27.

CLASP BRAKES FOR HEAVY PASSENGER EQUIPMENT CARS*

By T. L. Burton
Equipment Department, New York Central

The first requirements of a power brake are to stop the vehicle to which it is applied in the shortest possible distance, consistent with maximum rail adhesion, during emergency braking, and in the minimum distance, consistent with accuracy and smoothness, during service braking, all of which is largely dependent upon the type of equipment employed, the manner in which it may be operated and the braking ratio (percentage of brake power) that can be successfully used.

The braking requirements for present day heavy steel passenger car equipment can best be appreciated by a careful analysis of the records of a number of passenger train brake tests with the earlier light wooden cars and the heavy steel equipment of today, and for those who care to make such an analysis the paper† which was presented by S. W. Dudley at the February, 1914, meeting of the American Society of Mechanical Engineers is unqualifiedly recommended. For ready reference, however, it might be interesting to state that in 1902 an exhaustive series of brake tests was made on the Pennsylvania Railroad, under the supervision of A. W. Gibbs, with trains consisting of one

*This paper is to be presented and discussed at the Railroad Section of the annual meeting of the American Society of Mechanical Engineers, New York, Friday morning, December 8, 1916.

†For an abstract of this paper and the discussion which followed, see the issues of the *Railway Age Gazette* for February 13, 1914, page 311, and February 20, 1914, page 352, respectively.

locomotive and comparatively light wooden cars, in which stops were made from a speed of 60 m. p. h. with emergency brake applications in approximately 1,000 ft. In 1903 similar tests were made on the Central Railroad of New Jersey, under the writer's supervision, in which passenger trains consisting of what was then considered modern equipment, were stopped from a speed of 60 m. p. h. in an average distance of 970 ft. Early in 1905 another series of tests was made on the Pennsylvania Railroad with equipment similar in weight and construction to that used in the 1902 and 1903 tests with substantially the same results.

The emergency braking ratio in the Pennsylvania Railroad and the Central Railroad of New Jersey tests did not exceed 125 per cent of the car weight, and a reducing mechanism was employed for automatically reducing the braking ratio during the stops, so that the mean effective ratio was approximately 100 per cent. Based upon results obtained in the three brake tests just referred to, a distance of 1,000 ft. was considered a desirable theoretical emergency stop from a speed of 60 m. p. h. for a passenger train having the ordinary "high speed brake."

In the fall of 1905, closely following the second test of the Pennsylvania Railroad, similar tests were made on the New York Central, under the supervision of C. H. Quereau. The locomotive and cars used in this test weighed, however, considerably more than the ones used in previous tests, and the emergency stops from 60 m. p. h. were over 1,200 ft., in cases where the air brake equipment and braking ratio were substantially the same as had formerly produced approximately 1,000 ft. stops with lighter equipment. Results of the New York Central test immediately established the fact that as the weights of the individual vehicles of which the train was composed increased, the braking ratio would have to be increased, if the length of the stop was to be no greater than was formerly made with lighter equipment, and to meet the requirements of the heavier locomotives and cars the air brake manufacturers immediately developed an air brake equipment with which could be had a

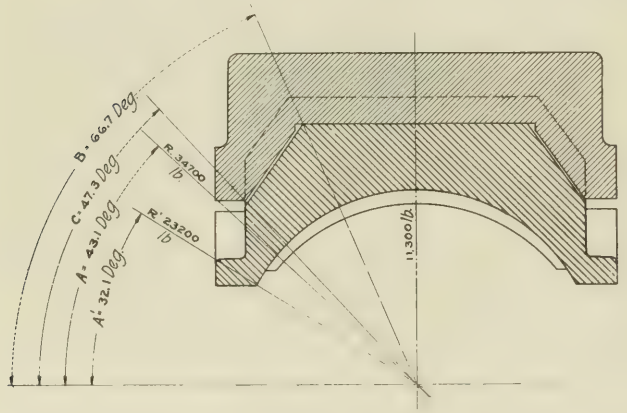


Fig. 1—Force Action on a 5-In. by 9-In. Journal; Car Weighs 150,000 Lb.

higher braking ratio than was obtainable in previous tests with lighter locomotives and cars.

In 1908 another exhaustive series of tests was made on the Southern Pacific with still heavier locomotives and cars, in which it was found that a distance of over 1,300 ft. was required for stopping the heavier trains from a speed of 60 m. p. h. with no greater emergency braking ratio than was formerly required for making a 1,000 ft. stop with the lighter equipment.

In 1909, R. B. Kendig conducted still another brake test on the Lake Shore & Michigan Southern with trains consisting of locomotives and cars closely approximating present day equipment in weight, for which was required an emergency braking ratio of 180 to 200 per cent of the car weight for producing approximately a 1,200 ft. stop from a speed of 60 m. p. h. These tests demonstrated to the entire satisfaction of all who participated in them that the emergency braking ratio for heavy steel cars would have to be not less than 180 per cent of the car weight if the emergency stops were to be made in no greater distance than formerly required for the lighter cars.*

Realizing that 180 to 200 per cent braking power applied to one side of a car wheel would probably produce ill effects on journals, brasses, trucks, etc., the writer had made a

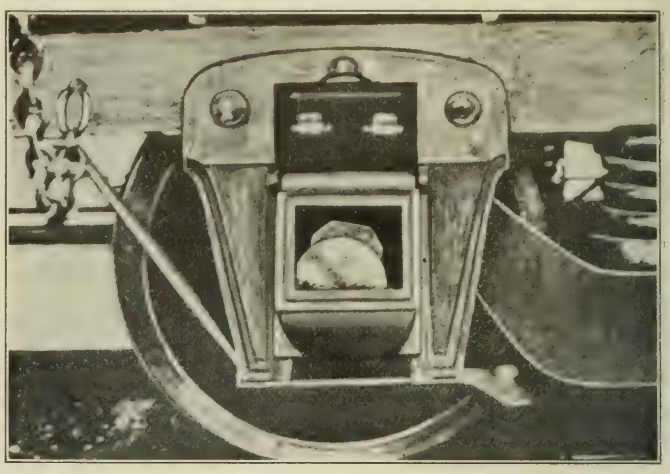


Fig. 2—Tilting and Displacement of Brasses and Journals with Single Shoe Brake; Four-Wheel Truck

careful and thorough analysis of the force action on car journals as affected by high braking forces. It is unfortunate that these analyses are of a character and magnitude which precludes the practicability of reproducing them in a paper of this kind, for they show conclusively the undesirability of applying to one side of the wheel a braking ratio of sufficient magnitude for stopping the modern heavy steel equipment in no greater distance than formerly required for stopping the lighter wooden equipment. A summary of these analyses is, however, shown in Figs. 1 to 5.

Fig. 1 shows a section of an M. C. B. 5-in. by 9-in. journal brass and wedge under a 150,000-lb. car with an average nominal journal load of 11,300 lb. Lines R and R^1 (Fig. 1) show the resultant of all loads acting on the journals with a single shoe brake, arranged in accordance with the M. C. B. recommendations for such a brake, and with an emergency braking ratio of 190 per cent. (R and R^1 are for different locations of wheels and direction of rotation.) It will be observed that the lines of action, R and R^1, are at a considerable distance below the supporting point between brass and wedge; that is, angle A is less than angle B and to push the journals out of the brasses during emergency braking is a natural thing to expect under the conditions stated.

Fig. 2 shows the actual displacement of journals and brasses under service conditions closely approximating those described in Fig. 1. While this photograph is made from a four-wheel truck, the brake arrangement, nominal journal load, braking ratio, etc., are, as previously stated, substantially as shown in Fig. 1.

As resultant R is affected in direction and magnitude by the distance from horizontal center line of wheels to center

*It is not the intention to show by the above references to brake tests the distance in which trains may be stopped in service. In conducting brake tests variations in equipment by which stopping distances are affected are necessarily reduced to a minimum, otherwise the results would not be comparative. The stopping distances referred to should, therefore, be used only as a basis of comparison for different equipments, and it should not be assumed that such stops would be reproduced in actual train service. On the contrary, it may safely be assumed that the stops with service trains should be much longer than test records show.

of brake shoes at face, Fig. 3 was made to show a summary of the analysis of the force action on journals with brake shoes suspended 10 in. from rail (8 in. below wheel centers), which is lower than M. C. B. standard. The braking ratio employed in this case is approximately 160 per cent of the car weight. Angle *A* is still less than angle *B* and displacement of journals and brasses may be expected to result therefrom.

Fig. 4 is a photograph taken at the end of a stop with the car from which the summary analysis shown in Fig. 1 was made, and seems to confirm the analysis so far as concerns the effect of the braking load on journals. There seems to have been an open question in the minds of some as to whether the displacement of journals and brasses is controlled by the difference in angles *A* and *B* or *A* and *C;* that is, the points between which the brass is supported by the wedge seems to have been debatable, but a comparison of Figs. 1 and 2, and 3 and 4 should justify the statement that they are supported in their normal position only by the horizontal surface contact with the wedge, and if angle *A* is less than angle *B* the journals will be displaced.

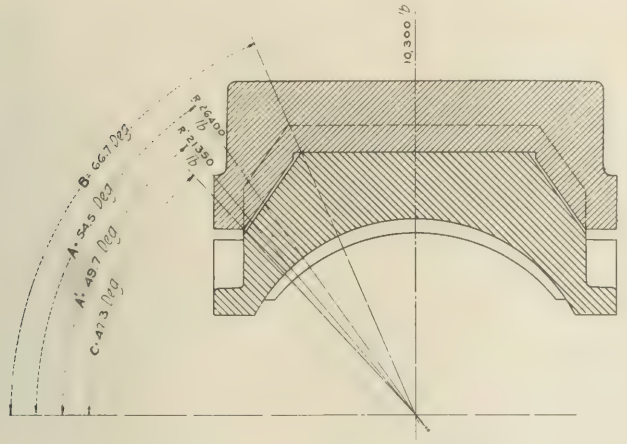


Fig. 3—Force Action on 5-In. by 9-In. Journal; Car Weighs 138,500 Lb.

To further check these conclusions an analysis was made of the force actions on a 5-in. by 9-in. journal of a 142,000-lb. car having six-wheel trucks, and a nominal journal load of 10,600 lb., with a service braking ratio of 85 per cent of the car weight and the arrangement of foundation brake gear the same as in Figs. 3 and 4. A summary of this analysis is shown in Fig. 5, from which it will be observed that angle *A* is practically 5 deg. less than angle *B,* and in testing the cars out in road service, it was observed that some journals were displaced during service braking while others were not. The analysis as summarized in Fig. 5 and the observations relating thereto strengthen the belief that if angle *A* is less than angle *B* the journals will be displaced. Also that where angles *A* and *B,* as determined from drawings, practically coincide there may be sufficient variations due to wear or construction of truck and brake details or rocking of brasses and wedges to change either of these angles sufficiently in service to cause the journals to be displaced or maintain a state of equilibrium.

It must be admitted that the high shoe loads applied to one side of the wheel only will produce undesirable results on journals and brasses as shown in Figs. 1 to 5 inclusive, and in addition thereto, it would seem from the discussion which is to follow that the conditions previously described are seriously objectionable from the viewpoint of train braking.

Consideration has been given to a change in brass and wedge design for the purpose of minimizing displacement of journals as referred to in the preceding discussion, but if this is done, it will still be quite difficult to stop the heavy steel car in substantially the same distance formerly required for the lighter wooden car. While on the other hand, it has been conclusively demonstrated that with a properly designed and constructed clasp brake the maximum available rail adhesion can be utilized in train braking, thereby reducing the emergency stops to a question of adhesion rather than permissible braking ratio. It is, therefore, the writer's opinion that a suitable design and make of clasp brake should be used on modern steel passenger equipment, the advantages of which are, briefly stated, as follows:

Safety

In case of danger, requiring an emergency brake application, a much shorter stop can be made with the clasp brake than with a single shoe brake, other conditions except those affected by the brake gear being the same in both cases.

If properly designed, manufactured and installed, there is no occasion to disconnect any part of the clasp brake rigging between shopping of cars. The probability of the brake becoming inoperative through a failure to properly replace cotters when disconnecting the brake with the car in transit and the loss of brake pins resulting therefrom is reduced to a minimum.

A thin brake shoe, or the loss of a brake shoe, does not in all cases necessitate cutting out a brake to save the brake beam.

If the clasp brake is properly designed, manufactured and applied to the car it will be practically impossible to adjust the rigging so as to impair its efficiency or interfere in any way with its proper operation.

The axles and truck frames, in addition to performing their usual functions, become safety hangers for the major portion of the brake rigging, thus reducing to a minimum the possibility of derailment that might be caused by brake

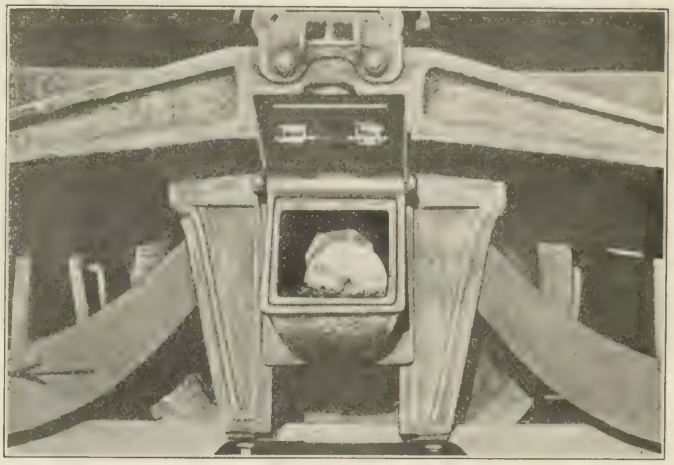


Fig. 4—Tilting of the Truck and Displacement of Brasses and Journals at Stop with a Single Shoe Brake; Six-Wheel Truck

rigging dropping on the track in case of failure of the truck brake gear.

While the possibility of disconnected brake parts dropping on the track is greatly reduced in comparison with the single shoe type of brake gear, the danger is further reduced on account of the clasp brake parts being much lighter than those of the single shoe type.

Rough versus Smooth Train Handling, Accuracy in Making Stops, Etc.

Many modern passenger trains are, on account of the inherent shortcomings of the "single shoe" type of brake, extremely difficult to handle smoothly. Careful investigation

of the complaints of roughly handled passenger trains indicate that most of these troubles are due largely to non-uniform braking power and the *time in which it is developed,* as a result of improper piston travel.

In service braking at low speeds, whether for the purpose of stopping from such speeds or for completing stops from high speed, such as making a *second brake application* as the stopping point is approached, the brake power should be light and the retardation resulting therefrom must be developed slowly, or simultaneously on all cars, if smooth handling is to be insured. Smooth service stops from all speeds are also contingent upon the flexibility of the brakes.

The seriousness of slack action shocks are greater than in former years on account of the greater average weight of cars and increased length of trains, and the chances for producing them are much greater with the single shoe brake than was formerly the case with lighter cars and shorter trains.

Contrasting the desired rate at which the braking power should be developed at low speed, making service or emergency stops from high speed in a minimum distance necessitates developing a high nominal braking power, and in addition thereto it must be developed rapidly. The rate at which both service and emergency braking power is developed is largely dependent upon piston travel, and with a view to producing the best results under all conditions the automatic brake is built on the principle of maintaining, as near as practicable, 8 in. piston travel at all times and

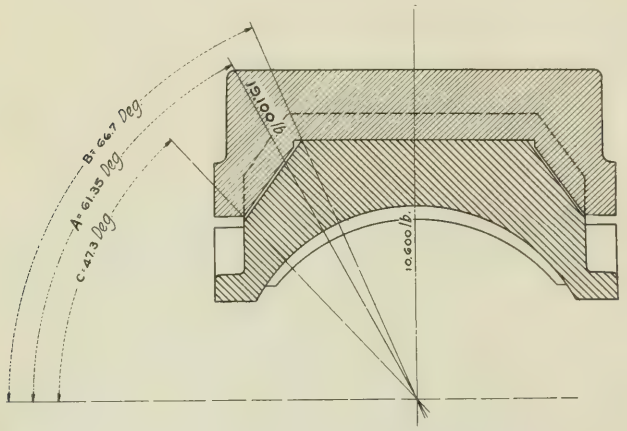


Fig. 5—Force Action on 5-In. by 9-In. Journal, with Service Brake Application; Car Weighs 142,000 Lb.

under all conditions. As an example, if, during service braking at low train speeds, the piston travel resulting from 10 lb. brake pipe reduction is only 5 in. instead of 8 in. (with some brake riggings it is 5 in. or less) the braking power will be fully 100 per cent greater than with the predetermined standard piston travel of 8 in., and with the shorter travel a 10 or 15 lb. reduction will practically equalize the auxiliary reservoir and brake cylinder pressure, thereby materially reducing the flexibility of the brake. While the vibration of the car may cause the 5 in. piston travel to increase to practically normal before the stop is completed, it will not do so except when stopping from high speed. Moreover, if the travel does increase before the stop is completed it will contribute nothing to smooth handling, as the shock will have occurred while the travel was short.

Other things being equal, the clasp brake will develop a higher percentage of braking power than the single shoe brake during heavy service or emergency applications, but for light service braking at low speed the brake power developed from a given brake pipe reduction is much less with the clasp brake than with the single shoe brake, and it is developed at a much lower rate, thereby insuring smoother train handling than can be had with the single shoe brake.

The results just cited are due to the fact that with the single shoe brake the piston travel is practically proportional to the cylinder pressure developed, whereas with the clasp brake, with a shoe on each side of the wheel, the horizontal wheel or shoe movement relatively to the brake cylinder is reduced to a minimum, and such movement if produced from any cause will have no effect on the piston travel. Moreover, with the clasp brake the shoes are located sufficiently close to the horizontal center line of wheel centers to obviate the *pulling down* of truck frames and variations in piston travel resulting therefrom.

The removal of worn shoes and their replacement by a given number of new shoes without readjustment of slack, as is frequently done on long runs, will not affect the piston travel with the clasp type of brake to the same extent as would occur with the single shoe type of brake.

The only remedy that can be offered for the difficulties arising from improper piston travel, which so seriously affects the braking power resulting from a given brake pipe reduction and the rate at which it is developed, is to apply a truck and body brake gear that will substantially insure uniform piston travel under all conditions of speed and cylinder pressure. The use of the clasp type of brake rigging with body brake gear to suit will, to a large extent, accomplish these results and restore the flexibility of brake operation which existed prior to the adoption of extremely heavy cars and long trains of the present day equipped with single shoe brakes.

Improved Riding Qualities of Equipment

The high brake shoe loads developed on one side of the wheels with a single shoe brake produce a binding effect between pedestals and oil boxes, which interferes with the proper action of the truck springs during an application of the brakes, and when the shoes are hung low, as is necessary with the ordinary six-wheel truck and single shoe brake, the pulling down effect of the truck defeats in many cases the purpose of the truck equalizing springs. This binding between pedestals and oil boxes and the increased load on truck springs cause the car to ride hard when brakes are applied. These evils do not exist with the clasp brake.

Elimination of Hot Boxes

With the single shoe type of brake rigging it will be observed that the high pressure exerted by the shoe on one side of the wheel causes the tilting of brasses sufficiently to lift one side of the brass a considerable distance away from the journal (see Figs 3 and 4) so that a wide space is open for waste to be caught between the brass and the journal when the brake is released and the brasses and journals resume their normal position. Investigation has shown that waste has been found wrapped around the journal, and that the collars on the axles are forced against the sides of the boxes. Further, these effects are not confined to emergency applications, but will also be noted in service applications of the brake and are all in the direction of producing hot boxes, while the unequal distribution of braking power and binding between boxes and pedestals has a tendency to cause slid flat wheels.

Decrease in Maintenance Cost and Brake Shoe Cost

While the principal advantages inherent in the clasp brake, of greater flexibility in service braking, etc., are outlined in the foregoing and the primary consideration for its adoption must be the increased emergency efficiency over the single shoe type of brake, providing as it does for the possibility of greatly shortened stops, with a lesser tendency to slide wheels, and consequent increase in safety, the clasp brake will also, due to the principles involved in its design and construction, show a decided decrease in cost of maintenance, not only in the brake rigging itself, but a substan-

tial decrease in the cost of brake shoe material for equal amounts of energy dissipated.

Cost of Train Operation

Investigation has developed the fact that with the single shoe type of brake on modern passenger equipment cars and the piston travel adjusted to proper limits, approximately 35 per cent of the available tractive effort of the locomotive was consumed in pulling the train against the effect of brake shoes dragging on the wheels with the brakes released. (See M. C. B. Assn. Proceedings, 1910, page 97, paragraph 3.) With the clasp type of brake and the resulting increased shoe clearance, this loss is eliminated, leaving better maintenance of schedules and corresponding decreased cost of train operation.

Conclusions

In considering the application of clasp vs. single shoe brakes to the modern heavy steel passenger car of today the advantages of the former over the latter, as enumerated above, are but secondary to the primary question to be settled, namely: Are the present day trains to be stopped from given speeds in no greater distance than was required 10 to 15 years ago for stopping the lighter wooden cars? If so, the question of whether or not an efficient clasp brake should be used on such trains is conclusively settled. The collision energy of the heavy steel passenger train as compared to the lighter wooden train has increased directly in proportion to the increased weight, and in geometrical proportion to the increased speed, in cases where speeds have been increased, to say nothing of the increased density of traffic. It would, therefore, seem that the use of a clasp brake is essential in successfully controlling the speed of present day or future passenger trains, and without regard to nominal increase in first cost or multiplicity of parts of brake gear resulting therefrom.

The foregoing discussion on the relative performance of the clasp and single shoe brake is with the distinct understanding that the former is designed upon a scientific engineering basis and is constructed and installed in accordance with the principles involved in the design, for while the claims made for the clasp type of brake have been conclusively demonstrated by exhaustive tests and road service, it has likewise been demonstrated that where the clasp brake is improperly designed or carelessly manufactured and installed the results obtained in service are in many respects less desirable than with the single shoe brake.

WASHINGTON CORRESPONDENCE

Another Shreveport Case

The Interstate Commerce Commission has before it another case partaking of the characteristics of the Shreveport case, involving discrimination against interstate shippers caused by lower rates for intrastate transportation made by the authority of a state. In this case the lower rates were made by the general assembly of North Carolina, which, in October, 1913, adopted an act by which a schedule of rates was prescribed for the transportation of traffic between points in that state The governor of the state was empowered to appoint a special commission to review the rates established and to recommend such changes as it thought necessary in order to place the rates on the proper level. The commission was appointed and after investigation suggested some changes, which were adopted. The revised rates were approved by the governor, who proclaimed them effective on October 13, 1914. The railroads published the rates proclaimed, which are still in effect, under protest directed in writing to the governor of North Carolina and to the Interstate Commerce Commission.

The present case was brought before the Interstate Commerce Commission by a complaint of the Chattanooga Sewer Pipe & Fire Brick Company, which manufactures sewer pipe and fire clay products at Chattanooga, Tenn. The complainant alleged that the rates on sewer pipe from Chattanooga to North Carolina points were much higher than the rates applicable locally within the state of North Carolina, which were available to one of its principal competitors located at Terra Cotta, N. C., and that it was, therefore, unable to dispose of its product in North Carolina at a profit. The railroads conceded that the rates from Chattanooga to North Carolina points ought not to be higher than the rates in North Carolina for equal distances and that the difference, if any, from a transportation standpoint, is in favor of the transportation from Chattanooga. The complainant said it was immaterial whether the uniformity of rates sought was brought about by increases in the North Carolina state rates or by reductions in the rates from Chattanooga.

The commission in a decision just issued finds that the relation between the interstate and the state rates subjects the complainant and its traffic and the city of Chattanooga to undue prejudice and disadvantage, but says that, as the present record affords no basis for a finding as to the reasonableness of the rates which should be applied, a further hearing will be ordered on that question.

Car Supply Investigation

Formal and informal complaints having been filed with the Interstate Commerce Commission from all sections of the country concerning the supply, exchange, interchange and return of freight cars, the commission announced on Saturday that it had decided to broaden its investigation of the car shortage situation, which was the subject of an informal conference at Louisville before Commissioner McChord on November 3 and 4, into a general investigation covering all phases of the subject in all sections of the United States. A formal order was issued for such an investigation "concerning the supply, exchange, interchange and return of freight cars and all rules, regulations and practices relating thereto, with a view of issuing such order or orders as the commission may deem appropriate."

A copy of the order was served upon all railroads and a hearing was ordered to be held at Louisville on Wednesday of this week before Commissioner McChord. Further hearings in various parts of the country are to be announced later.

The hearing before Commissioner McChord last week was called particularly for the purpose of hearing from shippers and representatives of the lines reaching the Atlantic seaboard and the Gulf whose facilities have been so heavily taxed by the abnormal volume of export traffic. At the hearing Commissioner McChord suggested that the railroads endeavor to agree among themselves regarding methods which would tend speedily to ameliorate the present conditions. To this the railroad representatives replied, after a conference, in a communication stating that the immediate action desired by the commission in the present situation may best be obtained by request upon A. H. Smith, president of the New York Central; Fairfax Harrison, president of the Southern, and R. H. Aishton, president of the Chicago & North Western, chairmen of the conference committees representing, respectively, the eastern, southern and western lines, to meet with Commissioner McChord with a view to designating a committee with power to represent the carriers in dealing with the commission. The railroads have already indicated one remedy for the present conditions by filing tariffs with the commission, effective on December 1, on the recommendation of the committee on relations between railroads of the American Railway Association, providing for a graduated increase in demurrage rates, together with a modification of the average agreement. Such a plan was proposed to the commission about a year ago, but the commission declined to accept it on short notice in view of the opposition of the shippers.

The general investigation undertaken by the commission will give the railroads an opportunity to renew their arguments for some plan which will tend to discourage the use of freight cars as warehouses.

Two Undelivered Votes

If President Wilson expected that the four pens with which he signed the Adamson law and which he is understood to have presented to the heads of the four brotherhoods, were to be used in marking Democratic ballots, he was disappointed in at least two instances. W. S. Stone, grand chief of the Brotherhood of Locomotive Engineers, and W. S. Carter, president of the Brotherhood of Locomotive Firemen and Enginemen, were too busy in Washington looking after their rule requiring the railroads to equip their locomotives with high-power headlights to go home and vote. The railroad attorneys requested an adjournment of the headlight hearing over election day, but this was opposed by Stone and Carter, who said that while they did not like to lose their votes they were more anxious to finish the hearing. The hearing was, therefore, continued all day Tuesday. Possibly the brotherhood leaders felt that they were paired with the railroad lawyers. Mr. Carter made the point that if the hearing was adjourned the engineers who had come to Washington as witnesses for the railroads, being from eastern roads, could get home in time to vote, while the brotherhood witnesses, being from western roads, would not have time to go home anyway. It is said that a straw vote of the 78 engineers from the eastern roads, taken while on their way to Washington, showed that exactly half of them were for Hughes and the other half for Wilson; but when Wilson's reelection was reported during the hearing Wednesday, all the noise came from the brotherhood side of the room.

Illinois Passenger Fares

The Interstate Commerce Commission Wednesday issued a supplemental order in the Business Men's League case for the purpose of making more specific its decision ordering the railroads to remove the discrimination against St. Louis & Keokuk caused by two cent fares in Illinois, while the interstate fare is 2.4 cents. The original order was confined to the territory intermediate to Chicago, St. Louis and Keokuk. The supplemental order holds that any adjustment of fares as between St. Louis or Keokuk and Illinois destinations generally, which would permit the defeat of lawfully established interstate fares through purchase of tickets upon combination of state and interstate rates, would continue the illegal burden on interstate commerce. It would seem that order requires railroads to advance passenger fares throughout Illinois.

The Super-Zeppelin.—The following are the leading particulars of the super-Zeppelin L 33 which was brought to earth in England on September 23: Length, 680 ft., total weight with crew and officers 50 tons; six 240 horsepower engines with a speed of 1,600 revolutions per minute, three engines being placed in one gondola and one in each of the others; estimated quantity of petrol carried 2,000 gallons, and gas capacity of the envelope 2,000,000 cubic feet. The vessel carried seven or eight guns, including five Maxims and sixty bomb droppers.

Rubber Insulation of Wire.—Numerous tests have been made by the United States Bureau of Standards in connection with an investigation to determine the effect of dry heat on the physical properties of the rubber insulation of wire. This work is being carried out in collaboration with the testing department of the Pennsylvania Railroad and other laboratories identified with the American Society for Testing Materials, the object being to develop an accelerated test for insulated wire that will indicate the probable life of the wire insulation under normal service conditions.

SANTA FE TICKET OFFICE AT LOS ANGELES

The Atchison, Topeka & Santa Fe has opened a new city ticket office at Los Angeles, Cal. While, of course, the office equipment is designed primarily to meet the requirements of a busy city ticket office, an attempt has been made to use Mexican adaptations of Spanish architectural designs in such a way as to suggest the spirit so often associated with the Southwest. The walls are of weathered red wood and the counters and wainscoting are finished in dull black enamel. The floor is of marble. There are several paintings of scenes in the Grand Canyon and the Yosemite valley.



Interior View Santa Fe Ticket Office at Los Angeles

The Greek cross and circle of the Santa Fe trade-mark is used effectively as a decoration on the columns and in the mosaic of the floor.

The office is located in the Consolidated Realty building, and we are indebted to J. J. Byrne, assistant passenger traffic manager, for the accompanying illustration.

Electric Operation on the Argentine Central.—The opening of the new electric service on the Argentine Central Railway, between the two stations of Retiro and Tigre, was recently undertaken by the President of the Republic. The scheme was projected as far back as 1910, when the company received a favorable report from its consulting electrical engineers in London. The government gave its consent in the following year, and in 1913 orders for the machinery, rolling stock and equipment were placed. The length of the route is about 17 miles, and the third rail system is used. The rolling stock, only a portion of which has arrived in Argentina owing to the war, will consist of 105 coaches—of which but 72 have been received—50 trailer coaches and 55 motor coaches. Each electric coach is fitted with control gear, enabling it to be driven from either end. Each motor is rated at 250 horsepower. The rolling stock is arranged on the unit system each unit consisting of one motor coach coupled to one trailer. A train consists of from one to six units.

General News Department

The management of the Wellsville & Buffalo, following a conference with the New York State Public Service Commission, announces that freight trains will be continued in service until November 17.

The Grand Trunk has accepted an award, made by the governmental Board of Conciliation, increasing the pay of track repair laborers 25 cents a day, and to advance the pay of track foremen 20 cents a day.

In the Federal Court at Montgomery, Ala., November 1, Benjamin F. McKee, found guilty of complicity in the robbery of a train of the Louisville & Nashville, at Greenville, Ala., in July, 1915, was sentenced to 25 years imprisonment.

"Barber pole" signs have been painted on all Southern Railway crossing gates in accordance with the standard recommended by the American Railway Association. The stripes are alternate black and white, eight inches wide, running at an angle of 45 degrees.

The Queensboro subway, extending from the Grand Central Terminal, New York City, across the East River about two miles, to a terminus in Long Island City, has been extended northward from its eastern terminus to the Plaza at the east end of the Queensboro bridge (Sixtieth street) about two miles; and the running of trains over the extension was begun on Sunday last.

The Southern Pacific has extended its pay relief allowance for its employees who are in actual army service with the National Guard until December 31, 1916. While such employees are serving in the army, the company allows to those married full pay; to those unmarried, with families dependent upon them for support, three-quarters to full pay, according to controlling circumstances; to those unmarried, without dependent families, half pay.

As railway employees are not allowed to strike as a body in Mexico, the men in the repair shops along the northeastern Mexican roads, recently hit upon the novel idea of striking in small groups at a time until everybody was out. The chief grievance of the men, it is said, is that they were paid in paper notes. As this currency flucuates greatly the men insisted upon being paid in gold. Their demands were refused by the Carranza authorities, and the strike ensued.

The Louisville & Nashville has issued instructions to passenger conductors providing for the convenient sending of telegrams by passengers on trains. Passengers may hand telegrams to conductors, porters, sleeping car conductors, flagmen or brakemen and they will be delivered to the agent at the first open telegraph office. The trainmen are to note on such telegrams the date, the number of the train and their initials. It is assumed, apparently, that all such messages will be sent collect.

The Pennsylvania Railroad, reporting that in the eight months ending September 1 thirteen people lost their lives and 104 were injured at grade crossings on the lines of the Pennsylvania System, says that the drivers of no less than *twenty-three* motor cars smashed their machines into the sides of trains that were actually part way over the crossings. Four lives were lost in this way and fifty-one persons were injured. Six motorcycles, two bicycles, and four horse-drawn vehicles were similarly driven into the sides of trains.

According to a statement issued by Thomas W. Hulme, general secretary of the Presidents' Conference Committee on the Federal Valuation of the Railroads, valuation work was under way September 30, 1916 on railways with a total length of 132,832 miles. On these roads the field inventory has been made of track on 82,394 miles of road; 57,836 miles with respect to bridges; 54,857 miles with respect to buildings; 54,846 miles with respect to signals, and 89,828 miles with respect to telephone and telegraph property. Also 27,341 miles of line have been inspected with reference to "adjacent similar lands."

Local agents of the Baltimore & Ohio from western cities are this week making a tour of inspection of the company's export facilities on the Atlantic seaboard—Baltimore, Philadelphia and New York. Similar trips are to be arranged on the company's lines for the agents in every city, so that they may have an opportunity to learn at first-hand how the traffic which passes through their offices is handled in the large centers of the east. J. K. Graham, superintendent of station service, is in charge of the party.

To reduce to a minimum grade crossing accidents caused by automobilists crossing ahead of passenger trains, the Northern Pacific has printed circulars under the caption "A Word of Caution to Motorists" which have been sent to all secretaries of state in the northwest with the request that they be distributed when new license plates are sent out. The circular cites government statistics showing the great number of casualties resulting from grade crossing accidents, and figures showing the general carelessness of most automobilists.

An interesting commentary on the present unusual activity among the car builders lies in the tremendous amount of lumber necessary to complete the car orders already placed, aside from those now pending. The situation is resulting in the demand upon the general lumber market for huge quantities of yellow pine, Douglas fir and oak. While no authoritative figures have been compiled, it is estimated that approximately 18,000,000 ft. of lumber will be required to fill contracts for new cars placed within the last week or ten days, and fully another 10,000,000 ft. for the orders now being quoted upon.

Beginning on January 1, 1917, the Grand Trunk will issue annual passes to employees 15 years in the service. If a man is married the pass will include his wife. Each pass will be good over either of the Eastern Ontario or Western lines, according to the respective territory on which the man is employed. Employees who have been twenty years in service will receive annual passes for themselves and wives good over the entire system. Former employees, now on the pension or superannuation rolls will be considered, as regards length of service, the same as employees, and these former employees will be accorded the same pass privileges.

A new dining car has been placed in service on the Illinois Central with improved sanitary features. This car is provided with an efficient ventilating system for the kitchen which prevents all dust and cinders from entering the car and still provides proper ventilation. The receptacle for milk and cream is kept clean by means of a continuous flushing arrangement, and the fish is kept in a separate refrigerator. There is a fan to drive cooking odors to the rear platform, keeping them out of the dining room. The car has no platforms and there are tables for thirty-six passengers. Cars of this type cost about $30,000 each.

The Grand Trunk Railway of Canada calls attention to the fact that last Friday (October 27) was the sixtieth anniversary of the inauguration of railroad communication between Montreal and Toronto. On October 27, 1856, the company ran its first through train between these cities. The Grand Trunk was incorporated in 1852, and the first section, from Montreal to Brockville, 125 miles, was completed in November, 1855. The first train consisted of three first-class and three second-class coaches. The eastbound train left Toronto at 7 a. m., and the westbound left Montreal at 7:30 a. m., and the running time was 14 hours (334 miles). The first train from Toronto was greeted on arrival in Montreal by thousands of visitors. The Point St. Charles shops were turned into a great banquet hall with seating accommodation for 4,400 guests and every table was crowded. Speeches were made by the Governor-General, the Governor of the State of Maine, and other notabilities. Five months after the opening of the road between Toronto and Montreal night trains were put on.

REVENUES AND EXPENSES OF RAILWAYS

Month of July, 1916

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Staten Island Rapid Transit Co.	11	$46,919	$41,516	$91,718	$8,604	$5,988	$694	$34,972	.....	$1,726	$51,985	$39,732	$5,000	$34,732	—$27,204

Month of August, 1916

Alabama Great Southern	309	$331,252	$118,127	$494,687	$46,359	$89,478	$14,175	$129,165	$3,458	$12,537	$295,172	$199,515	$17,064	$182,451	$69,581
Ann Arbor	294	161,213	64,074	240,643	26,032	36,821	5,598	94,868	577	8,272	172,167	68,477	13,400	54,791	8,816
Atlanta & West Point	93	56,453	42,463	114,706	13,221	19,203	6,630	32,033	1,898	4,834	77,819	36,888	6,706	30,152	13,375
Atlanta, Birmingham & Atlantic	640	201,632	54,673	276,885	45,227	48,159	14,076	94,900	19	9,476	211,857	65,029	13,100	51,929	.....
Atlantic & St. Lawrence	167	148,620	33,902	194,734	32,497	26,679	4,191	75,591	.....	4,206	143,164	51,570	9,895	41,671	50,023
Atlantic City	170	95,611	331,114	439,691	25,884	45,267	8,090	167,064	115	663	247,065	192,626	10,000	182,626	11,647
Atlantic Coast Line	4,746	1,747,611	648,641	2,605,923	378,712	515,901	57,397	902,883	6,778	71,710	1,929,933	675,990	160,000	515,231	426,919
Baltimore & Ohio	4,539	8,100,653	1,629,305	10,550,229	1,330,423	1,997,370	190.565	3,462,904	80,001	221,104	7,282,074	3,268,154	355,873	2,910,769	—295,940
Bangor & Aroostook	632	176,604	64,844	257,396	43,087	48,605	4,012	74,127	3,574	12,773	185,658	71,738	13,600	58,078	14,483
Bingham & Garfield	36	282,850	2,869	287,601	28,345	27,674	1,094	34,894	58	3,178	95,243	192,358	9,706	182,652	68,184
Boston & Maine	2,298	2,926,651	1,718,172	5,170,366	591,060	598,790	43,864	1,914,864	30,178	118,818	3,297,573	1,872,793	168,850	1,703,943	433,613
Canadian Pacific Lines in Maine	234	53,568	22,765	84,099	30,907	16,607	5,698	32,443	.....	3,542	89,197	—5,098	9,100	—14,198	3,203
Carolina, Clinchfield & Ohio	283	120,873	20,771	151,002	12,413	28,740	14,623	38,740	.....	11,399	105,552	45,450	14,250	31,200	—78,634
Carolina, Clinchfield & Ohio of S. C.	18	4,204	1,337	5,924	408	80	1,967	2,336	.....	855	5,646	279	750	—495	—5,735
Central of New Jersey	684	1,992,309	723,683	2,942,710	232,431	494,110	33,073	1,036,204	16,776	76,476	1,886,864	1,055,846	140,087	915,759	—4,998
Central Vermont	411	249,562	116,062	401,618	79,766	60,454	8,776	156,470	1,207	8,782	315,454	86,164	15,565	70,549	8,006
Chicago & Eastern Illinois	1,136	1,085,492	294,521	1,486,641	235,593	335,378	22,649	499,847	8,044	40,326	1,139,090	347,551	62,400	285,114	84,409
Chicago & Erie	270	656,860	58,810	761,517	78,641	63,811	18,089	258,440	1,937	15,661	432,040	329,478	22,230	307,247	118,091
Chicago, Burlington & Quincy	9,369	7,084,697	2,299,530	10,216,369	1,222,733	1,457,061	137,515	2,638,943	82,448	183,176	5,721,877	4,494,492	381,026	4,113,466	1,437,726
Chicago, Detroit & Can. Gd. Trunk Jctn.	60	58,109	23,124	99,603	22,013	13,400	1,710	46,376	.....	1,482	84,981	14,622	3,487	11,135	—13,955
Chicago Great Western	1,496	999,454	353,187	1,472,429	223,226	237,352	47,194	446,443	10,351	33,330	997,758	474,671	45,744	428,134	143,622
Chicago, Indianapolis & Louisville	622	534,665	176,940	765,069	74,321	124,861	21,454	225,714	573	16,916	463,074	301,995	29,465	272,494	75,277
Chicago, Peoria & St. Louis	255	118,870	29,889	157,053	22,731	35,625	5,906	62,251	.....	5,642	132,154	24,898	6,000	18,898	—717
Chicago, Rock Island & Pacific	7,653	4,790,241	1,929,398	7,230,707	1,010,600	1,133,449	133,940	2,227,172	47,579	151,389	4,689,492	2,541,215	292,066	2,247,241	1,037,395
Cincinnati, Hamilton & Dayton	622	803,464	121,088	1,044,531	141,833	129,549	15,505	344,049	3,675	17,387	648,238	396,293	30,763	365,452	108,354
Cincinnati, Indianapolis & Western	322	145,641	52,087	219,493	31,043	28,596	6,976	77,579	451	6,261	150,760	68,733	9,441	59,292	.....
Cincinnati, New Orleans & Texas Pacific	337	728,192	189,842	975,328	80,640	234,936	23,248	248,361	7,457	17,875	612,518	362,810	33,000	329,761	161,321
Coal & Coke	197	75,617	19,579	98,919	20,943	27,063	1,014	28,527	.....	2,767	80,313	18,606	5,000	13,606	—5,029
Colorado & Southern	1,102	550,134	199,893	807,337	101,240	143,983	14,418	214,643	4,818	22,977	502,079	305,258	38,500	266,752	115,698
Cripple Creek & Colorado Springs	87	98,072	32,384	132,504	12,953	15,849	2,519	34,660	.....	3,650	69,632	62,872	7,603	55,269	2,008
Cumberland Valley	164	224,123	70,807	311,410	40,047	31,785	4,557	84,700	746	8,096	168,581	142,829	5,960	136,783	16,538
Delaware & Hudson Co.—R. R. Dept.	886	1,774,542	435,031	2,354,162	192,702	485,438	29,222	781,471	24,661	75,542	1,589,037	765,125	58,650	706,475	—120,283
Delaware, Lackawanna & Western	955	3,095,617	816,618	4,349,332	540,844	667,091	71,878	1,363,346	37,970	84,201	2,758,883	1,590,448	232,500	1,357,835	147,665
Denver & Rio Grande	2,577	1,688,877	494,590	2,360,603	317,868	365,044	40,725	557,760	36,786	75,259	1,393,442	967,161	92,000	875,107	130,740
Detroit & Mackinac	383	76,286	36,188	120,894	13,170	18,997	1,926	37,590	613	2,740	75,036	45,858	8,009	37,848	18,041
Detroit & Toledo Shore Line	81	129,337	.....	130,147	8,765	7,483	1,667	34,969	.....	3,030	55,913	74,234	6,800	67,434	17,355
Detroit, Grand Haven & Milwaukee	191	177,000	66,000	290,032	39,675	36,346	6,102	132,857	1,122	4,971	220,994	69,138	3,963	65,128	—33,129
Detroit, Toledo & Ironton	441	179,932	17,986	212,478	23,596	33,061	4,573	84,282	.....	6,099	151,610	60,868	6,000	54,868	14,474
Duluth, South Shore & Atlantic	601	210,087	115,414	361,604	64,891	42,778	7,786	108,060	4,430	8,199	236,145	125,459	19,000	106,453	10,997
Duluth, Winnipeg & Pacific	191	118,357	20,817	143,147	15,157	16,579	2,004	45,734	641	5,030	85,145	58,002	7,157	50,845	15,054
Elgin, Joliet & Eastern	800	1,099,444	46	1,169,411	104,880	287,703	6,646	323,665	.....	19,425	742,000	427,411	39,604	387,807	—56,393
Erie	1,988	4,452,554	931,423	5,936,210	539,881	1,167,185	93,288	2,059,911	41,917	133,761	4,023,082	1,913,128	194,147	1,718,785	—360,853
Fort Worth & Denver City	454	341,656	155,794	523,365	63,254	86,928	7,463	130,761	3,035	12,894	304,334	219,031	16,900	202,131	62,367
Georgia	307	177,302	79,449	277,888	25,775	41,951	13,055	95,677	107	8,831	185,398	92,490	4,865	87,591	53,488
Grand Trunk Western	347	623,000	163,000	839,172	76,838	142,383	18,534	259,074	8,621	14,451	519,902	319,270	36,637	282,626	63,112
Great Northern	8,051	5,814,941	1,468,197	8,014,034	958,270	932,959	96,363	1,978,614	89,762	116,995	4,114,899	3,899,135	495,975	3,402,856	779,828
Gulf & Ship Island	308	135,757	33,893	178,912	16,976	30,112	3,434	47,348	344	8,332	106,545	72,367	7,140	65,222	8,251
Gulf, Colorado & Santa Fe	1,938	1,071,116	322,375	1,460,614	270,296	198,805	26,597	459,829	.....	44,492	998,449	462,165	59,591	401,688	397,635
Hocking Valley	350	654,266	100,064	815,692	78,322	185,784	8,212	209,771	.....	22,093	504,181	311,512	41,350	270,162	—5,555
International & Great Northern	1,160	581,691	219,348	859,097	120,117	165,629	21,854	310,186	4,968	29,843	630,178	228,920	30,000	198,745	222,237
Lehigh & Hudson River	97	175,771	5,920	208,521	29,196	36,149	1,426	71,192	.....	4,585	142,548	65,973	5,000	60,973	3,283
Los Angeles & Salt Lake	1,154	617,262	289,289	992,725	88,149	146,276	30,203	256,511	20,099	19,633	558,850	433,876	50,173	383,688	21,084
Louisiana & Arkansas	279	106,827	18,863	130,110	27,154	17,650	3,635	35,674	.....	3,993	88,106	42,004	8,195	33,790	4,618
Michigan Central	1,803	2,458,160	1,152,973	4,072,693	511,902	595,775	62,845	1,285,230	55,830	68,177	2,579,759	1,492,934	140,000	1,351,858	332,579
Mineral Range	120	88,942	3,913	95,243	20,400	16,835	398	36,664	.....	1,576	75,873	19,370	3,300	16,070	—11,536
Minneapolis, St. Paul & S. S. Marie	4,227	2,189,304	697,629	3,129,035	287,750	365,276	52,650	815,859	18,393	65,166	1,602,522	1,526,513	137,842	1,388,671	501,762
Missouri, Oklahoma & Gulf of Texas	134	23,351	610	24,206	3,236	2,614	1,584	10,261	.....	1,631	19,328	4,878	188	4,691	4,737
Missouri Pacific	3,931	2,408,053	514,174	3,160,222	574,948	605,359	77,617	994,496	9,679	68,853	2,319,436	840,785	109,000	729,879	267,941
Mobile & Ohio	1,160	821,540	126,776	1,008,177	122,671	244,277	33,870	336,556	2,442	31,558	771,375	236,802	38,201	198,496	46,468
Nevada Northern	165	171,713	12,839	189,551	22,829	13,512	717	29,440	75	4,872	71,445	118,107	6,309	111,798	39,049
New Orleans, Texas & Mexico	191	82,268	16,382	101,588	18,854	18,879	5,658	28,734	.....	5,828	77,953	33,635	1,381	22,254	—3,155
New York Central Railroad	6,093	11,961,229	5,199,312	10,957,827	1,962,752	3,369,266	290,843	5,826,970	273,941	396,950	12,120,723	7,837,105	699,245	7,135,771	1,899,325
New York, Chicago & St. Louis	571	1,076,858	167,731	1,302,569	123,597	296,986	49,427	492,265	5,505	28,707	996,371	306,198	42,000	264,139	—5,291
New York, Ontario & Western	568	478,316	346,657	969,811	121,344	121,711	9,137	297,224	.....	17,374	565,893	403,918	27,000	376,884	29,505
New York, Susquehanna & Western	140	191,515	46,463	268,904	21,756	31,390	2,183	114,598	.....	7,153	177,041	91,863	14,100	77,762	5,988
Norfolk Southern	908	256,333	127,251	411,977	60,451	66,306	9,834	135,233	132	18,510	290,466	121,511	12,528	108,674	14,291
Northwestern Pacific	507	253,348	206,042	506,677	55,455	44,533	5,067	142,630	856	8,782	256,717	249,959	18,155	231,506	34,248
Oregon Short Line	2,247	1,799,735	486,887	2,455,169	281,979	201,017	32,727	502,434	34,889	59,448	1,107,475	1,347,694	225,600	1,122,008	279,109
Oregon-Washington R. R. & Nav. Co.	2,053	1,245,291	436,359	1,827,624	317,200	169,777	49,459	526,387	25,163	71,828	1,156,912	670,712	95,000	574,598	—13,083
Panhandle & Santa Fe	670	419,602	110,092	550,409	69,562	80,059	3,949	118,165	.....	11,230	282,479	267,929	12,452	255,477	165,496

August Gross Earnings $1,418

The Interstate Commerce Commission's statement for the month of August, summarizing the railroads' monthly reports of operating revenues, shows average gross receipts of $1,418 per mile, as against $1,190 for August, 1915. Operating income averages $476 per mile, as compared with $375.

Street Car Disaster at Boston

At the drawbridge over Fort Point Channel, Boston, Mass., near the South Station, on the evening of November 7, a street car crashed through the gates and fell into the water, landing on the bottom of the channel in a nearly vertical position with many passengers crowded into the bottom end. Forty or more persons were killed, most or all of them being drowned. The conductor and the motorman jumped off and saved their lives.

Test of Adamson Law

The Union Pacific filed suit in the Federal Court at Omaha last Wednesday to test the constitutionality of the "eight-hour" law recently passed by Congress. Thomas S. Allen, United States District Attorney, and four Union Pacific trainmen, representing the different railroad brotherhoods, were made parties defendant. The bill of complaint alleges that the law is unconstitutional because it is not a proper regulation of interstate commerce, because it violates the guarantees of the fifth amendment to the Federal Constitution, and because it is unworkable as applied to existing conditions.

Locomotive Tests at University of Illinois

The Engineering Experiment Station, of the University of Illinois, has entered into a co-operative arrangement with the International Railway Fuel Association, and the United States Bureau of Mines, to conduct tests with various sizes and grades of coal used for fuel. The Baltimore & Ohio has lent one of its newest Mikado type locomotives for the purpose. Samples of coal to be used will be taken from Illinois mines and will be graded according to present commercial sizes, ranging from the so-called slack and run-of-mine up to the commonly used "2 by 6 lump." Later tests will be made with pulverized coal, blown into the fire-box by means of a specially designed blower. Tests will be made with both hand firing and automatic stoker firing

The Louisville Freight Car Conference

The informal conference on freight car shortage held at Louisville, Ky., on November 3 and 4, by Commissioner McChord, was followed by a formal conference beginning November 8. The first day was devoted to an examination of the Kentucky and Ohio coal operators, the representatives of public utilities, the grain shippers and the malleable iron, brick and clay manufacturers of the Middle West and the South. All testified that the car shortage was acute and that it was seriously cutting down the production of their plants; and in some cases threatening a suspension of business altogether. L. A. Anthony, superintendent of Car Service of the Boston & Albany, was examined. He admitted that his road had 28 per cent more cars than it owned; this because eastbound traffic is much heavier than westbound. Every effort is made to return foreign cars. In the first five days of November his road received 9,774 cars and delivered to connections 9,539. There is no congestion at Boston as no cars with export lading are accepted unless vessel room has been arranged for.

At the informal hearing last week, officers of the Louisville & Nashville, the Illinois Central and the Burlington were examined. It was disclosed that the railroads are not returning cars to the owning roads, thus violating car service rules 1, 2, 3 and 4 of the American Railway Association. The Louisville & Nashville defended its embargo on the movement of coal in its own cars north of the Ohio river, showing that on October 28 it had in its possession only 39 per cent of its own coal cars and, counting foreign cars on its line, had only 51 per cent of the number of coal cars owned by it. It also presented statistics of the American Railway Association for October 1, showing that individual roads in the West, Northwest, Southeast and, especially, in the South had, counting foreign cars, less cars than they owned, the percentage on the Louisville & Nashville being 65. The roads in the remainder of the country generally showed above 100 per cent, New England averaging 122.

The commission has prepared ten questions for the carriers to answer in addition to the 17 published in the *Railway Age Gazette* last week. These ask for the average car mileage per day for the last four years, average shortage and surplus cars during that period; monthly loading reports by commodities, for August, September and October, this year and last; the total number of cars at terminals and industrial centers on September 30, in the last three years, classified as to loaded and empty cars, commodities carried, and detention of cars for various specified purposes, giving the number of days the cars were held under demurrage; tabulated statement of cars interchanged in September, this year and last, separating the loads from the empties; statement of cars used in interplant or intermill movements on September 30, this year; statement of any delays in unloading at local stations, with reasons; and the number and average tractive power of the locomotives owned, November 1, this year and last.

Chicago to New York at 114 M. P. H.

Victor Carlstrom, flying in a 200 hp. Curtiss biplane, and making the journey under the auspices of the New York Times, arrived in New York City on Friday morning, November 3, completing a journey from Chicago in about 26 hours, including 14 hours at Hammondsport, N. Y., where he stopped over night. Carlstrom planned to make the journey through in a single day but was obliged to alight at Erie, Pa., because of a leak in a gasolene pipe; and the delay thus occasioned necessitated breaking the journey at sunset. The rate of speed, through, averaged 114 miles an hour; and from Hammondsport to New York, the average was 134 miles an hour. For most of the way there was a favoring wind. The aviator flew at from 2000 ft. to 8000 ft. above the earth most of the way. He left Chicago at about daylight on Thursday morning, and the time and distances, as reported by the New York Times are as follows:

Left Chicago (Eastern Time)	7:09:30 a. m.
Arrived Erie	11:27:00 a. m.
Left Erie	2:34:00 p. m.
Arrived Hammondsport	4:24:00 p. m.
Left Hammondsport	6:35:00 a. m.
Arrived New York	8:56:00 a. m.

	Time.	Miles
Chicago to Erie	4:17:30	452
Erie to Hammondsport	1:50:00	200
Hammondsport to New York	2:21:00	315
Flight time	8:28:30	967

Railroad Conditions in Mexico

The National Railways of Mexico, now called the Constitutionalist Railways, show signs of life on all the important divisions. Jose Cerrucha has been appointed director general, succeeding Alberto Pani, now in the United States as a member of the peace commission.

Considerable betterment work is being done in the way of putting in new ties and ballasting. Equipment is very scarce. It is estimated that more than 20,000 cars have been destroyed and 500 locomotives made useless. In addition to this, several hundred locomotives are in the shops.

The trains between Matamoras and Laredo carry second-class cars, no sleepers; the locomotives are in bad condition. Only day cars are run on the line between Tampico and Monterey, and the locomotives are in bad condition. The engines on passenger trains between Laredo and the City of Mexico are in good condition. Trains are being operated between Laredo and Torreon, by the Penoles Mining Company with its own locomotives. The Oliver Transportation Company is running trains from Eagle Pass to the City of Mexico, carrying in supplies and bringing out cotton.

The line from San Luis Potosi to Tampico is in the hands of bandits most of the time, and the equipment is in bad condition. The line from Eagle Pass, by way of Paredon, to Saltillo, runs first and second-class cars daily, but no sleepers. The locomotives are in good condition, but the cars are in bad shape. The roadbed along the line from Paredon to Torreon is in good condition, but the cars are in bad shape. The engines are in fair condition. About four trains are run each way every week. The International from Torreon to Durango is in the hands of the bandits. An occasional military train makes its way through.

The line from Torreon to Chihuahua is also in the hands of bandits. This is the case with the line from Torreon to Zacatecas. The line from Zacatecas to Aguas Calientes runs trains by

daylight only. The engines are in fair condition, but the passenger equipment consists of box cars. On the line from San Luis Potosi to Aguas Calientes the track is in good condition and second class cars are run. The locomotives are in fair shape. The track is in good condition on the line from Aguas Calientes to the City of Mexiço. The locomotives are in fairly good condition. Mixed trains have first and second-class passenger cars but no Pullmans.

The line from the City of Mexico to Laredo uses the sleeping cars of the Mexican (Vera Cruz) Railroad. The track of the line from Guadalajara to the City of Mexico is in good condition and this road runs passenger trains composed of one sleeper and first and second-class cars. The sleeper belongs to the Mexican (Vera Cruz) road. Other cars are in bad condition. The line from Guadalajara to Manzanillo is in bad shape. It takes two days to make the trip, for it is not safe to run at night. Equipment is in bad condition.

The line from Tolca to the City of Mexico is operated by the El Oro Mining Company and is in good condition. The Cuernavaca division is out of commission except for the passage of military trains as far as Cuernavaca. The balance of the line is in the hands of the Zapatistas.

The Mexican (Vera Cruz) is being put into fine condition. The line from Pachuca to the City of Mexico is sometimes held by Legalistas and sometimes by Carranzistas. As may be imagined, it is in bad condition.

The Interoceanic, from the City of Mexico to Pueblo and thence to Vera Cruz, is three-fourths of the time in the hands of reactionaries. The line is in bad condition and four-fifths of the cars and engines have been destroyed.

The line from Pueblo to Oxaca is out of commission except for an occasional military train. This line is in the hands of the reactionaries nearly all of the time. The equipment is in deplorable condition, but the track and bridges are in fair shape.

The Southern Pacific runs mixed trains by daylight from Nogales to Tepic, requiring four days for the journey. The track is in good condition with the exception of bridges destroyed and repaired. Engines are in fair condition.

Emergency Boarding Train

The Lehigh Valley has stationed at Easton, Pa., a complete emergency train, to be used to house and feed workmen at out of the way places on occasions of important repairs or serious troubles due to washouts and the like; and it is a sleeping as well as an eating establishment. The company bought two sleeping cars from the Pullman Company, and fitted up two coaches as additional bunk cars. A coach was stripped of its seats and a metal trough placed along either side at waist height for convenience in washing hands and faces.

Two former coaches have been equipped with longitudinal tables and two rows of seats for a dining car, and between them is a kitchen car, made from an old dining car. This is now equipped with additional range, steam-tables and refrigerator. Easton is the headquarters of the railroad's commissary department.

Association of Railway Electrical Engineers

The eighth annual convention of the Association of Railway Electrical Engineers was held at Hotel LaSalle, Chicago, October 31 to November 3. The following is a list of the exhibitors at the convention:

Adams & Westlake Company, Chicago.—Straight and drop handle car brake, roundhouse headlight and lighting fixtures. Represented by W. J. Piersen, A. S. Anderson, G. L. Walters and J. F. Stender.

American Pulley Company, Philadelphia, Pa.—Axle pulleys. Represented by J. S. Pratt and J. F. Forrest.

Anderson Manufacturing Company, Albert & J. M., Boston, Mass.—Plugs and receptacles. Represented by B. G. Durham.

Benjamin Electric Manufacturing Company, Chicago.—Reflectors and lighting fixtures. Represented by H. E. Watson, G. B. Weber, A. E. Lubeck and R. C. Mons.

Central Electric Company, Chicago.—Okonite wires and cables, D. & W. products. Ralco receptacles and plugs, Maxolite reflectors, fans and other car lighting fixtures. Represented by J. M. Lorenz, L. G. Martin, D. Woodhead, E. C. Wilson, R. N. Baker and A. L. McNeil.

Consolidated Railway Electric Lighting & Equipment Company, New York—Electric car lighting equipment and regulator panels and dynamo. Represented by Thos. L. Mount, W. R. Hungerford, L. J. Kennedy and D. N. Balderston.

Crouse-Hinds Company, Syracuse, N. Y.—Condulets, panel boards and round house headlights. Represented by A. F. Hills, C. H. Bissell, E. G. Smith, F. F. Skeel, C. Dubsky, F. C. Otto, C. W. Crowfoot, Chas. Gurney and J. Amos.

Cutter Company, George, South Bend, Ind. Switchboards and lighting fixtures. Represented by O. B. Duncan and F. L. Carl.

Edison Storage Battery Company, Orange, N. J.—Storage batteries. Represented by H. G. Thompson, W. F. Bauer, F. V. McGuinness and H. M. Roberts.

Davis Lighting System, Chicago.—Flood lights. Represented by W. J. Davis, F. M. Evans and W. O. Turtle.

Electric Service Supplies Company, Philadelphia, Pa.—Golden Glow headlights and Darling-Henrici headlight turbo generators. Represented by C. J. Mayer, J. W. Porter, L. H. Darling, T. H. Henkle and O. Mueller.

Electric Storage Battery Company, Philadelphia, Pa.—E. S. B. axle lighting equipment including truck and body hung type generator, panel switchboard, two cell unit storage battery lead lined tank of slotted crate construction and rubber jar two cell unit. Represented by G. H. Atkin, J. Lester Woodbridge, H. M. Beck, H. E. Hunt and O. R. Shortall.

Fairbanks Morse & Co., Chicago.—Sectionalized alternating and direct current ball bearing motors and parts. Represented by M. O. Southworth, K. P. Brown, A. A. Tayler and F. M. Coundit.

Franklin Railway Supply Company, New York.—Stone-Franklin axle generator and regulator. Represented by Floyd Coffin, H. D. Rodman and Henry Kloos.

General Electric Company, Schenectady, N. Y.—Railway headlight set. Represented by B. F. Bilsland, S. W. McCune, Jr., J. Scribner, C. C. Bailey and J. Van Kerekhove.

Gould Coupler Company, New York.—Regulating panel, body hung generator and lead battery accessories. Represented by G. R. Berger, W. F. Bouche, P. H. Simpson, J. O. Ashton and M. R. Shedd.

Harter Manufacturing Company, Chicago.—Lighting fixtures. Represented by G. A. Harter, W. M. Soffe, D. E. Warrel and D. M. Ayers.

Hart & Hegeman Manufacturing Company, Hartford, Conn.—Paiste switches and taplets. Represented by H. L. Everest, Jr., W. W. Winship and F. C. Church.

Ivanhoe Regent Works of General Electric Company.—Lighting fixtures.

Kerite Insulated Wire & Cable Company, New York.—Wire and cables. Represented by Azel Aimes, P. W. Miller, W. Fenley and J. A. Hamilton.

National Lamp Works of General Electric Company, Cleveland, Ohio.—Mazda lamps. Represented by L. C. Kent and C. W. Bender.

National Metal Molding Company, Pittsburgh, Pa.—Metal molding, Sherardized conduit, Flex-steel conduit, outlet boxes and a complete line of fittings for these devices. Represented by H. C. Moran and J. A. Bennett.

Oneida Steel Pulley Company, Oneida, N. Y.—Steel pulleys and corrugated steel bushings. Represented by N. G. Stark.

Pyle National Company, Chicago.—Type K and Type H incandescent headlights. Represented by Luther H. Steger, J. E. Kilker and J. Will Johnson.

Pyrene Manufacturing Company, New York.—Fire extinguishers. Represented by G. R. Henderson, F. P. Murphy, W. H. Yetman and H. V. Flora.

Safety Car Heating & Lighting Company, New York.—Underframe axle equipment, regulating devices and car lighting fixtures. Represented by C. A. Pinyerd, A. C. Moore, G. F. Hulse, J. H. Rodger, J. L. Marsh and W. H. Reader.

Schroeder Headlight Company, Evansville, Ind.—Incandescent headlights, 32-volt incandescent generators and headlight case. Represented by G. M. Price.

Sangamo Electric Co., Springfield, Ill.—Ampere hour meters, alternating and direct current Watt hour meters. Represented by A. B. Southwick, C. H. Koehler, C. H. Hurtt and E. Wray.

Thompson Electric Company, Cleveland, Ohio.—Thompson Safety cut out hangers.

United States Light & Heat Corporation, New York.—Car lighting generators, panels, batteries and various parts of lighting apparatus. Represented by R. C. Haley, H. A. Mathews, G. D. Ladd, W. L. Bliss and A. W. Donop.

Western Electric Company, New York.—Enclosed power switches, lamps and lamp guards. Represented by J. C. Binning, George H. Porter, and T. J. Rider, Jr.

Westinghouse Lamp Company, New York.—Mazda locomotive headlight lamps. Represented by W. H. Rolandson, A. N. Brown and J. G. Harvey.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.—Motors and generators. Represented by R. L. McLellan, R. J. Ross, Chas. Robbins, W. H. Patterson, H. D. McKinney and H. W. Clark.

Willard Storage Battery Company, Cleveland, Ohio.—No-wash type train lighting batteries and accessories. Represented by L. Sears, E. L. Meyers, I. R. Wentworth and L. B. Knight.

Correction

The report of the convention of the Maintenance of Way Master Painters' Association, appearing in the issue of October 20, page 705, referred to a statement by A. H. Sabin, of the National Lead Company, regarding the use of litharge in a red lead paint to resist water, Mr. Sabin's statement referred only to the addition of litharge to a red lead containing originally less than two per cent of litharge, and the brief abstract of the statement in the issue of October 20 did not make this point clear.

Western Railway Club

The regular monthly meeting of the Western Railway Club will be held at the Hotel Sherman, Chicago, at 8 o'clock Monday evening, November 20. The usual get-together dinner will be

held in the Italian room at 6:30. H. J. Bell, safety inspector of the Chicago & North Western will give an illustrated talk on "Railway Safety."

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Brown Palace Hotel, Denver, Colo.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Next convention, December 5-8, 1916, Engineering Societies' Bldg., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Wm. H. Connolly, 1319 Columbia Road, Washington, D. C. Next convention, November 14, 1916, Washington, D. C.

NEW ENGLAND RAILROAD CLUB.—W. E Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 419 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Next annual meeting, January 16, 1917, Waldorf-Astoria Hotel, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next meeting, November 9-10, La Salle Hotel, Chicago.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco. Annual meeting, November 15, Brown Palace Hotel, Denver, Colo.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The railroads carrying grain to Philadelphia have been obliged to impose embargoes because of the crowded condition of the elevators and tracks in that city.

Early next month the Transportation Association of Chicago will occupy new quarters on the top floor of the Royal Insurance building. About 4,000 sq. ft. of space will be used, which will contain a gymnasium and shower baths, pool and billiard tables, a lounging and a reading room.

The National Industrial Traffic League held its annual meeting at Hotel Sherman, Chicago, on November 9 and 10. Among those scheduled to speak at the annual banquet on the first evening of the convention were Frank Trumbull, chairman of the Chesapeake & Ohio, and Julius Fleischmann, president of the Fleischmann Company, Cincinnati, Ohio.

The Southern Railway delivered at its new export coal tipple at Charleston, S. C., during the first year of its operation, nearly 150,000 tons of coal. Steamships taking coal from the pier for movement overseas numbered 98; 7 taking cargo, 14 cargo and bunker, and 77 bunker only. Of the cargoes, 14 went to Cuba, 6 to South America, and 1 to Spain. The export movement amounted to 63,123 tons, while 40,086 tons were bunkered. There was a coastwise movement of 46,255 tons, making a total of 149,464 tons. In addition 2,066 tons of iron ore and 2,114 tons of coke were exported.

An indictment, filling 153 pages, was recently returned by a federal grand jury, charging Herbert Herzstein with 20 offenses in misbilling shipments of grain products from Clayton, N. M., to Texline, Tex., and there reconsigning them to their final destination, using a combination of the local freight rates applicable upon shipments from Clayton to Texline, and then the local rates applicable in Texas to the point of final delivery. Herzstein is one of the largest shippers of grain and seed in New Mexico. There are several cases of alleged misdescription included in the list of alleged misbilling charges.

Traffic officers of the transcontinental railroads have been holding conferences with representatives of the western shippers in an effort to bring about some kind of an agreement as to a basis of freight rates to the Pacific Coast terminals and to the intermountain territory to be presented to the Interstate Commerce Commission in connection with the proposed new series of hearings in the transcontinental rate case. The carriers wish to advance rates to the Pacific Coast, in compliance with the commission's order requiring them to remove the discrimination against intermediate points because of the absence of water competition at the coast terminals due to the abatement of traffic through the Panama Canal.

The roads in the Trunk Line Association have adopted a new form of bill-of-lading to be used after the end of November, containing valuations to be used in shipping live stock. The maximum values for animals carried at the normal freight rates are as follows. (These valuations have been adopted also in Southern and Western territory):

Horses, mules, jacks, etc.	$150	Sheep	$5
Colts, one year	75	Goats	5
Oxen, bulls, steers	75	Mare and foal	225
Cows	50	Cow and calf	70
Calves	20	Wild animals	250
Hogs	15		

When the value given by the shipper exceeds that specified in the table, an addition of 2 per cent will be made to the rate for each 50 per cent or fraction of additional value.

The Public Utilities Commission of Illinois suspended on October 26 the new suburban passenger rates which the Chicago, Rock Island & Pacific had announced to be effective in the Chicago district on November 1. On October 27 the commission began hearing protests of the Morgan Park, Washington Heights, Beverly, Longwood, Brainerd and Gresham improvement associations against the new rates. Residents of the Calumet region

of Chicago have petitioned the Commission to compel the Illinois Central to reduce fares charged on suburban service out of Chicago; to electrify the road; and to replace the wooden coaches now used in suburban service with steel coaches.

J. F. Porterfield, general superintendent of transportation of the Illinois Central, at Chicago, Ill., recently issued a bulletin which contains the following statement regarding car shortage: "Middle-western and southern railroads are again confronted with a serious car shortage. In order to increase the number of available cars the Illinois Central and the Yazoo & Mississippi Valley have within the past five years increased the average miles moved per car per day from 28 to 40 miles, or 43 per cent, which means that they have placed at the disposal of the shipping public some 1,325 additional cars per day. Our patrons released 25 per cent of loaded cars within 24 hours after being placed, 38 per cent within 48 hours, and 37 per cent within 72 hours or more. If all cars on these lines were loaded and released the day placed we should have for service about 1,000 additional cars daily. The conservation of equipment by confining it to the legitimate transportation activities would make a car shortage almost impossible."

A 23-hour train between Chicago and New Orleans will be placed in service by the Illinois Central on November 15. It will leave Chicago daily at 12:30 p. m., and arrive at New Orleans at 11:30 a. m., and will leave New Orleans at 12:30 p. m., arriving at Chicago at 11:30 a. m. A train will leave St. Louis at 4:30 p. m., with through sleeping cars, to connect with this train at Carbondale, Ill., and northbound this connection will arrive at St. Louis at 7:20 a. m. The train will be all-steel throughout and electric lighted, and will consist of Pullman sleepers, a dining car, a drawing room sleeping car, a buffet car and a composite drawing room compartment and observation car. The buffet car will contain a barber shop with four chairs and a shower bath. Ladies' maid service will be provided for the entire train and telephone service will be available before departure from Chicago and New Orleans. The new train will be called the "Panama Limited." The former train of the same name will continue in service under the title of the "New Orleans Limited."

The historical collection of the Traffic Club of Chicago, recently put on display in the parlors of the club in the Hotel La Salle, contains 515 separate exhibits, most of which pertain to railroad matters and more particularly to the activities of the traffic department. The collection was gathered by the Historical Committee under the direction of John T. Stockton, Chairman, and includes many books, newspaper clippings, pictures and railroad documents of historical interest. One interesting exhibit is a train time table prepared by the Chicago & North Western for a special train which was run for Dom Pedro, Emperor of Brazil, and dated April 19, 1876. Another is an entry of merchandise imported by George Ermactinger in a canoe commanded by Ignace Picket from Sault Ste. Marie, in 1817. Other unusual exhibits are a three-dollar bill issued by the New Orleans, Jackson & Great Northern at Canton, Miss., on July 1, 1862, a five-dollar bill issued by the Madison & Indianapolis, dated December 27, 1842, and an order for the transportation of the Seventy-second Illinois Volunteer Infantry, U. S. A., dated 1865.

The New York, New Haven & Hartford has issued an embargo against all freight from its western connections except perishable freight, live stock, goods for the United States Government or for the railroad company, news and book print paper and coal and fuel oil; also on all freight in less than carload lots, regardless of the point of origin, when destined to Bridgeport, New Haven, Waterbury, Plainville or Hartford, with the same exceptions as above; also all freight to be exported from New York except as shippers show that steamship space has been contracted for. The New Haven road is now unloading about five thousand cars a day, which is 10 per cent more than at any previous time. The company reports that on November 6 there were 49,068 cars on the line, an increase of 2,777 cars since October 15, and the current daily movement through the different gateways and terminals is over 13,000 cars. The road has at the present time 975 cars under demurrage, averaging about five days per car; is holding 558 cars at destination ready to place when unloading tracks are relieved of cars ahead; is holding 1,915 cars set out at intermediate stations and terminals, and is confronted by an accumulation on connecting lines of 2,921 cars. This represents a total of 6,369 standing cars which are of no benefit to shippers or consignees, and which deprive other industries of that number of cars.

Freight Rate Advances in Central Territory

The roads in the Central Freight Association have issued new freight tariffs, to take effect December 1, making increases in both interstate and intrastate rates. The tariffs cover all of the six classes, but do not affect coal, stone and other commodities carried at commodity rates.

Panama Canal Traffic

In July of this year, the month of greatest traffic since the reopening of the Panama Canal in April, the aggregatae length of the 149 ships passing through the Canal was 53,905 ft., or approximately ten miles. The ships of the United States engaged in foreign trade numbered 3,135 on June 30, 1916, according to a report of the Department of Commerce. Their aggregate gross tonnage was 2,194,470, which is double the tonnage at the end of the preceding fiscal year. The net tonnage, reckoned as approximately seven-tenths of the gross, would be about 1,540,000 tons. The number of American ships passing through the Panama Canal in the fiscal year ending June 30, 1916, was 238, and their aggregate net canal tonnage was 737,169. Of these, 93 with 350,966 net tons were in the United States coastwise trade and 145 with 386,203 net tons, in the foreign trade. In the preceding fiscal year a much higher proportion of the American ships passing through the Canal was in the coastwise trade.

The Car Situation on the Southern Pacific

W. R. Scott, vice-president and general manager of the Southern Pacific, recently issued a statement on the freight car situation, which follows in part:

"In the period from 1910 to 1914, inclusive, the Southern Pacific bought 14,843 new freight cars to provide for the future, almost 6,000 of this number being box cars, over 3,300 refrigerator cars, almost 2,000 flat cars, 425 stock cars and 900 automobile cars. From 1910 to the closing months of the calendar year 1915, there had been practically no increase in freight traffic in the country. In the fall of 1915 the officials of the Southern Pacific concluded there was going to be a material improvement in the business situation, and therefore in December placed an order for 3,500 freight cars with builders of the east, this representing an addition of ten per cent to the equipment of the company. Delivery of these cars was promised in June and July of this year.

"The volume of business from the Pacific Coast has predominated eastbound through the year for the past several years. As a result of the closing of the Panama Canal and of the congested condition existing along the Atlantic Seaboard, the situation has been accentuated. On May 1, 1916, the total number of cars of all ownership on the Southern Pacific lines represented an equivalent of only 82 per cent of that line's own equipment. Telegrams were repeatedly sent to all lines owing us a balance, requesting the return of the cars and pleading the urgency of the situation. Some assistance has been rendered by the eastern lines, and on September 1, the total number of cars of all ownership on Southern Pacific rails represents an equivalent of 86 per cent of the cars owned by that line.

"The cause of the extreme shortage of equipment on the Pacific Coast at this time is due to the large increase in business on the coast and the eastbound movement this year compared with last year. For instance in the months of June, July and August there was an increased loading of 45,000 cars over the same period last year.

"A very material improvement in the situation could be made during the acute stage if all shippers and consignees would arrange to work on Sundays. It should be borne in mind that when no work is done on Sundays it means that one-seventh of the equipment is not used. Car builders who were to furnish the new equipment ordered last December have promised that the cars will begin to come forward within a short time. In order to relieve the situation on the coast as efficaciously and as promptly as possible the Southern Pacific has had these cars billed as empty, paying commercial freight rates thereon to the Pacific Coast."

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Commission has further suspended from November 12 until May 12, proposed increased rates on citrus fruits and pineapples, c. l. and l. c. l., from Florida points to destinations in southeastern territory.

The Commission has suspended from November 10, and later dates, until March 10, the proposed cancellation of existing commodity rates on iron and steel articles, c. l., between Chicago and related points and various points in Western Trunk Line territory.

The Commission has received from the Arizona Corporation Commission a complaint in connection with the transcontinental rate case, against the practice of the railroads in charging higher rates to Arizona from eastern points than for the longer haul to California points.

The Interstate Commerce Commission has suspended from November 5 until March 5, proposed increased rates on lumber in carloads from points in California to all points in Colorado on the Chicago, Burlington & Quincy, east of Brush and Sterling. The present rate is 40 cents and the proposed rate is 50 cents per 100 lb.

The Commission has issued a summary statement regarding the present practices of the larger roads in connection with the compilation of commodity statistics. The summary is issued for the dissemination of information on the subject and has been prepared from the returns made by carriers in response to a series of inquiries issued by the Commission, returnable on March 1.

Rates from Copperhill, Tenn.

Tennessee Copper Company v. Southern Railway et al. Opinion by Commissioner Meyer:

The complainant is engaged in mining and smelting copper ores and in the manufacture of sulphuric acid at Copperhill, Tenn. These cases involve the reasonableness of carload rates on certain traffic to and from its plant. The commission finds unreasonable: Rates on nitrate of soda in carloads from Charleston, S. C., and Savannah, Ga., to Copperhill, Tenn.; on pig lead in carloads from Copperhill, Tenn., to Atlanta, Ga., and on sheet lead in carloads from Atlanta to Copperhill.

It does not find unreasonable:

Rates on nitrate of soda in carloads from Pensacola, Fla., and New Orleans, La., to Copperhill; a rate of 82 cents per 100 lb. on nitric acid in carloads from Great Falls, S. C., to Copperhill, Tenn.; a rate of $1.80 per ton on coke in carloads from Josephine and Dorchester Junction, Va., to Copperhill; rates on lumber, logs, poles and crossties in carloads from Murphy, N. C., and Ellijay, Sweet Gum, and McCullough Ga., to Copperhill; rates on lead dross and pig lead in carloads from Copperhill to Baltimore, Md., and other points and on sheet lead in carloads from Baltimore and some such points to Copperhill; rates on copper bullion in carloads from Copperhill to Baltimore, Md., and Perth Amboy, N. J., and to certain Virginia and South Atlantic ports; and rates on interstate shipments of coal in carloads from groups A, B, and E, on the Louisville & Nashville, to Copperhill. (41 I. C. C., 336.)

STATE COMMISSIONS

The Public Utilities Commission of Illinois held a hearing on October 27, to consider the petition of the Belt Railway of Chicago for an increase in transfer rates. The present rate is $3 for the transfer of loaded cars and half that amount for empty cars. The increase asked is 50 cents and 25 cents respectively. The hearing was continued until this week.

The Public Utilities Commission of Illinois has granted the railroads of the state a rehearing, scheduled for November 3, on its recent ruling with reference to the distribution of grain cars. The railroads complain that they are unable to distribute cars in accordance with the ruling, which requires that they be apportioned to shippers on the basis of the number used in the last four years.

PERSONNEL OF COMMISSIONS

John M. Atkinson, chairman of the Public Service Commission of Missouri, has resigned and will engage in the practice of law in St. Louis.

COURT NEWS

The Federal grand jury at Salisbury, N. C., on November 2, returned indictments for violations of the law on two counts against the Carolina, Clinchfield & Ohio for granting concessions to a shipper by extension of credit on freight bills and on two counts against the Clinchfield Coal Corporation for receiving such concessions.

Assessment of Damages

In an action by an employee against a railroad for personal injuries under the employers' liability act, the Georgia Supreme Court held that it was error to charge the jury that "the value of the earning capacity of the plaintiff would have to be reduced to its present cash value"; it should have been that "the plaintiff's loss by reason of his decreased earning capacity should be reduced to its present cash value."—L & N. (Ga.), 89 S. E., 620.

Physical Connection Between Tracks

As the authority of the Alabama Railroad Commission to order physical connection between railroads to or through the same town or city, under Code 1907, Sec. 5535, depends on the sufficiency of business to justify the construction and maintenance of the connection, the Alabama Supreme Court holds that the commission has no jurisdiction to order such connection in the absence of evidence of this fact.—Railroad Commission v. L. & N. (Ala.), 72 So., 397.

Lookout for Trespassing Children

In an action for personal injuries sustained by a person who was struck by a train, the West Virginia Supreme Court of Appeals holds that it is reversible error to instruct the jury that it is the duty of the engineman and fireman to keep a constant lookout for children that may be trespassing on the track. It is only necessary that they should keep a reasonable lookout.—Stuck v. K. & M. (W. Va.), 89 S. E., 280.

Treating Condemnation Commissioners Invalidates Their Award

In a proceeding to condemn land for a railroad right of way the commissioners to assess damages were "treated, fed and entertained" during their investigation, and one of them was given a bottle of liquor by one of the parties having an interest in the case. The Virginia Supreme Court set aside the award, without regard to any actual influence on their award. The court applied the same rule as that applicable to juries, whose place the commissioners take in such a proceeding. Judgment for the defendants was reversed.—New River, Hudson & Western v. Honaker (Va.), 89 S. E., 961.

Crossing Accident—Contributory Negligence

A train was coasting down grade at 35 miles an hour. The driver of a buggy, knowing of the presence of tracks and of the likelihood of trains being late, drove on to a crossing in a leisurely way, with the buggy curtains closed, so that he could not easily see an approaching train, and he was run down and killed. In an action for his death the Iowa Supreme Court held that, though the fireman saw the deceased drive onto the crossing, but too late to stop the train, liability could not be predicated on the theory that the fireman must have anticipated that because his buggy was rattling over frozen ground the deceased would not hear the train. Moreover, the deceased was guilty of contributory negligence, barring recovery.—Duggan v. C. M. & St. P. (Iowa), 159 N. W., 228.

Natural Results of Injuries

A track laborer sued a railroad, alleging that he had fallen twice as the result of working in replacing ties, with a dull pick supplied by the railroad, the falls causing tuberculosis of the shoulder joint. There was expert medical testimony that it would take in a man of the plaintiff's age from 14 to 24 months to develop the condition in which the plaintiff was found when he was taken to the hospital seven or eight months after the accident; that the condition could not have been produced by the falls; the tubercular germ must first be in the body, and that accidents do not produce germs. The Supreme Court of the State of Washington held that the tuberculosis was not the natural and probable consequence of the railroad's negligence, and it was entitled to a non-suit.—Anton v. C. M. & St. P. (Wash.), 159 Pac., 115.

Change of Watercourse

A railroad by agreement with the adjoining land owner and for adequate consideration rightfully turned the course of a stream of water. The West Virginia Supreme Court holds that, in the absence of a contract to do so, the railroad is not liable thereafter to observe the action of the water, and to protect the banks or take other timely measures to prevent its encroachment on the adjoining land. It is the owner's duty to do so, and if he suffers damage by erosion, he cannot recover from the railroad. The bridge originally built by the railroad company across such a water course had decayed or been washed away by high waters, and by reason of the land owner's negligence in failing to protect the bank on his land the channel of the stream had been greatly deepened and widened. It was held that the whole burden of rebuilding the bridge and approaches thereto would not be enjoined on the railroad, but it might be required to join with the land owner in rebuilding the bridge and to pay or contribute thereto such sum as would have been required to build and maintain the crossing and bridge as if the conditions were the same as when it built the original crossing and bridge over the water course and right of way.—Briscoe Home Trustees v. Ohio River (W. Va.), 89 S. E., 727.

Limitation of Liability—Georgia Rule

The agent of a company which had for a number of years shipped marble by railroad (most of it at a valuation of 20 cents per cubic foot, and some at a valuation of 40 cents) applied to the agent of a railroad company for a freight rate on rough building marble between two points in Georgia, and obtained a rate based on a valuation of 20 cents. He filled out a bill of lading on a blank which he had received from the railroad, stating the value to be 20 cents per cubic foot. He loaded the car which was furnished, and, under the regulations of the State Railroad Commission, obtained a rate of freight less than if he had placed a higher valuation on the marble. There was nothing further sufficient to show that the contract was a mere effort to limit liability, including that for negligence. The shipper later brought suit for damages to the marble alleged to have arisen from the railroad's negligence. The Georgia Supreme Court holds that the plaintiff was estopped from recovering a value beyond that fixed; and that the evidence did not authorize a finding that this was a mere arbitrary prearrangement to limit liability.—Atlanta & West Point v. Fairburn Marble Co. (Ga.), 89 S. E., 817.

Effect of Condemnation—Damages

When a railroad company locates its road and gives a bond to secure damages, the bond being accepted by the land-owner or approved by the court, title to the right of way passes to the railroad company, and the owner is confined to his remedy on the bond. The company acquires right to exclusive possession, to fence it in, to build over the whole surface of the land, to raise and maintain any appropriate superstructure, including necessary foundations, and to deal with it within the limits of railroad uses as absolutely and as uncontrolled as an owner in fee. The plaintiffs in condemnation proceedings to determine the damages to land were owners of three contiguous tracts, which were valuable as coal property, and could be worked to the best advantage as a single proposition. A railroad company condemned a right of way over the smallest of the tracts; and in this tract it was most advantageous to have the opening to the mine. Because of this condemnation access from the mine to the nearby river was interfered with. The Pennsylvania Supreme Court held that in assessing damages the three tracts should be considered as one proposition, but the particular and special advantages accruing to and affecting the value of the land by reason of the presence of the railroad and the facilities offered by it should be considered. Ferguson v. Pittsburgh & Shawmut (Pa.), 98 Atl., 732.

Automobile Crossing Accident—Contributory Negligence

In consolidated actions by the owner and driver of an automobile for injury to the car and a passenger in it for personal bodily injuries at a crossing, it appeared from the owner's testimony that he approached the crossing until within 5 or 6 feet of the rail, and there stopped for one of the passengers to alight and pay his fare. There was no contradiction that from the point of the accident, in the direction from which the engine and tender came, the track was perfectly straight, with a clear, unobstructed view for 900 feet. The owner said that after letting off the passenger, before starting across the track, he looked and listened in both directions, and neither saw nor heard the approaching engine; that he then started across and was in the middle of the track when he saw the engine about 30 feet from him; that he then shoved the throttle up and the car jumped 4 or 5 feet, and he jumped out and thus escaped. The Virginia Supreme Court considered that it was simply incredible that the driver of the car could have stood within 5 or 6 feet of the nearest rail and looked over a straight, unobstructed distance of 900 feet without seeing an engine that was within 30 feet of him as soon as he moved the very few feet necessary to put him in the middle of the track. The passenger could not rely on the driver, but had to look for the approach of the engine. Both were guilty of contributory negligence, and judgment for the plaintiffs was reversed and the cases ordered dismissed.—Virginia & Southwestern v. Harris (Va.), 89 S. E., 887.

Right to Transport Passengers Carrying Liquor Into Dry State

In a suit for injunction by the state of West Virginia against the Baltimore & Ohio, the question was whether the state may restrain common carriers from allowing passengers to carry suit cases or other containers containing intoxicating liquors as unchecked personal baggage on the ground that the allowance of that privilege to passengers enlarges the opportunity for violation of the constitutional and statutory laws prohibiting the manufacture, sale and gift of such liquors. The West Virginia Supreme Court of Appeals holds that the statute of 1913, as amended in 1915, does not expressly or impliedly inhibit common carriers from transportation of passengers carrying with them, in their own personal custody, packages of intoxicating liquors, labeled in accordance with section 31 of the statute. Section 7 of the statute impliedly authorizes such transportation, by the use of terms from which legislative intent to do so is plainly inferable; and section 31 thereof, expressly recognizing and excepting the common-law right of a citizen to bring intoxicating liquors into the state, for his personal use, and prescribing the manner of doing so, without denying him the use of any of the means of travel ordinarily available, impliedly authorizes the use of such methods of travel in the carriage of such liquors. The court said: "If a railroad company cannot legally carry a passenger with a labeled liquor package in his possession, no other common carrier can do so. No steamboat could do so. No ferry could transport such a person across a river. No transfer omnibus, hack, cab, taxicab or other common conveyance could carry him on the streets of a city or town. Nor could he employ a private conveyance to carry him. He would be compelled to walk or furnish his own means of conveyance, however great the distance might be. To obtain what the statute allows him to have, a citizen in the interior of the state might have to walk or go by carriage, or on horseback, 100 or 200 miles, and then be refused passage across a ferry." Demurrer to the bill was sustained.—State v. Baltimore & Ohio (W. Va.), 89 S. E., 288.

Railway Officers

Executive, Financial, Legal and Accounting

W. B. Groseclose has been appointed assistant to the president of the Manufacturers' Railway, with office at St. Louis, Mo.

Arthur Coppell has been elected vice-president of the Denver & Rio Grande, with headquarters at New York. Mr. Coppell is a member of the board of directors.

F. W. Green, who resigned recently as general manager of the Louisiana & Arkansas, has been appointed assistant to J. M. Herbert, first vice-president of the St. Louis & Southwestern, with office at St. Louis, Mo.

David A. O'Brien, vice-president and general manager of the Rio Grande at Brownsville, Tex., has been elected president and general manager, assuming complete control of the road. James A. Browne, vice-president and treasurer, has been elected vice-president. John Gregg has been re-elected secretary and auditor.

W. C. Moore has been appointed freight claim agent of the Seaboard Air Line, with headquarters at Portsmouth, Va., reporting to the president, and W. G. Loving has been appointed attorney in charge of personal injuries, with headquarters at Portsmouth. On account of the promotion of W. L. Stanley, the office of general claim agent has been abolished, and the duties heretofore incumbent upon that office will be performed by the freight claim agent and the attorney in charge of personal injuries.

Benjamin Thomas Wood, whose appointment as assistant to the president of the St. Louis-San Francisco, with office at St. Louis, Mo., has just been announced, was born December 31, 1878, at Springfield, Mo. After attending the common schools of this city he entered high school from which he graduated in 1896. He took employment with the Kansas City, Fort Scott & Western as a stenographer to the division superintendent at Kansas City, Mo., in April, 1897, holding this position until January, 1899, when he became secretary to the general superintendent of this same road. From 1902 to 1904 he was secretary to the vice-president and general manager of the St. Louis-San Francisco, and was then made secretary to the third vice-president of the Chicago, Rock Island & Pacific at Chicago, Ill. After serving as secretary to the president of this same road for a short while he was made chief clerk to the president in January, 1905, which latter connection he held until December, 1909. From that time to May, 1911, he was chief clerk to the president of the Chicago & Eastern Illinois and from May, 1911, to November, 1913, he was assistant to the vice-president of the St. Louis & San Francisco. In November, 1913, he was appointed second assistant to the chief operating officer of this same road and later advanced to the office of assistant to the vice president. His present promotion became effective October 3, 1916.



B. T. Wood

George W. Lamb, second assistant controller of the Louisville & Nashville, at Louisville, Ky., has been appointed assistant controller, with office at Louisville, vice A. J. Pharr promoted. H. F. Thompson has been appointed second assistant controller, succeeding Mr. Lamb. G. B. Reeves has been appointed auditor of disbursements, with office at Louisville, vice R. E. Sewell retired from active service; and G. R. White has been appointed assistant auditor of disbursements, with office at Louisville, vice D. J. Duane retired from active service.

Alexander J. Pharr, whose appointment as controller of the Louisville & Nashville, with headquarters at Louisville, Ky., has already been announced in these columns, was born at Trion, Ga., and was educated in the public and private schools of Atlanta. After completing a business course he entered the service of the Atlanta & West Point and the Western Railway of Alabama in March, 1890, as stenographer in the auditor's office. He subsequently held various positions, including that of chief clerk, until 1893, when he became cashier and paymaster of these roads. In July, 1900, he entered the service of the Great Northern as accountant in the office of the assistant general superintendent at Spokane, Wash; later he became cashier of that road at Butte, Mont., and in December, 1901, entered the service of the Louisville & Nashville as accountant in the comptroller's office; shortly afterwards he was promoted to general bookkeeper and chief clerk. On September 1, 1910, he was appointed assistant controller, which position he held at the time of his recent appointment as controller of the same road, as above noted.

Walter Lawrence Stanley, who has been appointed assistant to the president of the Seaboard Air Line, with headquarters at Atlanta, Ga., as has already been announced in these columns, was born May 24, 1871, at Wytheville, Va. He graduated from Wytheville Male Academy, also from Emory & Henry College, and in 1890 and 1891 attended the University of Virginia. From 1893 to 1898 he served as attorney for the Norfolk & Western, and then entered the claim department of the same road. In September, 1901, he became claim agent of the Seaboard Air Line and in December, 1904, he was promoted to claims attorney. On November 30, 1907, he was appointed general claim agent, which position he held at the time of his recent appointment as assistant to the president of the same road, with headquarters at Atlanta, in charge of public relations and taxes.



W. L. Stanley

Operating

J. K. Yohe, Jr. has been appointed assistant trainmaster on the Susquehanna division of the Delaware & Hudson.

Richard J. McDonald, road foreman of engines on the Chicago & Alton at Bloomington, Ill., has been appointed trainmaster, with office at Roodhouse, Ill., succeeding T. F. Shuman, resigned.

H. J. Humphrey, superintendent of car service of the Canadian Pacific, Eastern lines, at Montreal, Que., has been appointed superintendent of the Farnham division, with office at Farnham, vice J. H. Boyle, transferred.

W. M. Neal, assistant superintendent of the Canadian Pacific Eastern Lines, has been appointed acting superintendent car service, vice H. J. Humphrey, transferred, and L. J. Skelly has been appointed assistant superintendent, Montreal Terminals division, with office at Outremont, vice Mr. Neal.

J. P. Russell, general superintendent of the Virginia & Carolina Southern, at Lumberton, N. C., has resigned. J. Q. Beckwith has been appointed assistant to the general manager. The position of general superintendent has been abolished and the duties of that office have been assigned to the assistant to the general manager.

C. G. Lunday, superintendent of the Louisiana & Arkansas, at Stamps, Ark., has been appointed general superintendent in charge of operation and maintenance. F. W. Green, general

manager, has resigned, and the office of general manager has been abolished. F. L. Beal, valuation engineer, with office at Stamps, has been appointed superintendent.

W. C. Hudson, superintendent of the Washington division of the Southern Railway, at Alexandria, Va., has been appointed superintendent of the Asheville division, with office at Asheville, N. C., vice F. S. Collins and G. R. Buddin, trainmaster at Alexandria, has been appointed acting superintendent of the Washington division, with office at Alexandria.

A. W. Woodruff has been transferred from assistant superintendent of the Nebraska division of the Union Pacific with headquarters at North Platte, Neb., to assistant superintendent of the Wyoming division with headquarters at Ogden, Utah. It was incorrectly reported in our issue of October 20, page 713, that he had been made trainmaster at Ogden, Utah, succeeding A. W. MacDuffie, appointed assistant superintendent at Omaha.

Gordon Lee Hurley, whose appointment as superintendent of the Macon, Dublin & Savannah, with headquarters at Macon, Ga., has already been announced in these columns, was born on October 7, 1880, at Lumpkin, Ga., and began railway work in April, 1895, as a messenger on the Seaboard Air Line. He learned telegraphy and subsequently served consecutively as operator, train despatcher and chief despatcher. In August, 1914, he entered the service of the Macon, Dublin & Savannah as trainmaster, which position he held at the time of his recent appointment as superintendent of the same road, as above noted.

P. J. Flynn, whose appointment as superintendent of the Buffalo division of the Lehigh Valley, with headquarters at Buffalo, N. Y., has already been announced in these columns, was born in Ontario county, New York. He was educated in the public schools and at Canisuis College, Buffalo. In April, 1884, he entered the service of the Lehigh Valley as a messenger boy and subsequently served successively as clerk, assistant yardmaster, brakeman and conductor until January, 1893, when he was appointed yardmaster at Manchester, N. Y. He served later as assistant trainmaster at Sayre, Pa., and Geneva, N. Y., and as yardmaster at Sayre. In 1905 he went to the New York, New Haven & Hartford, as general yardmaster at Worcester, Mass., and later served at Providence, R. I. He returned to the service of the Lehigh Valley as yardmaster of the Buffalo division in February, 1907, and later he was made trainmaster of that division, which position he resigned to take up terminal work for the Grand Trunk. He subsequently served as manager of terminals of the Grand Trunk Pacific and the Canadian Northern, and now becomes superintendent of the Buffalo division of the Lehigh Valley, as above noted.



P. J. Flynn

Harry D. Earl, whose appointment as general superintendent in charge of transportation and maintenance of the Midland Valley, with office at Muskogee, Okla., has just been announced, was born March 28, 1879, at Martin, Ohio. He received a common school education, and in June, 1896, began railway work at Amherst, Ohio, in the operating department of the Lake Shore & Michigan Southern. He was later for one year operator on the Toledo, St. Louis & Kansas City, now the Toledo, St. Louis & Western, and went with the St. Louis Southwestern in September, 1898, as an operator at Sherman, Tex. Later he was transferred to Commerce, Tex., and was then consecutively promoted to train despatcher at Commerce and Mt. Pleasant, chief despatcher at Mt. Pleasant, and for three years, from June, 1907, to April, 1910, he was trainmaster at Tyler, Tex. He was promoted to assistant superintendent of the same line at Tyler in April, 1910, and was advanced to a division superintendency, with office at Mt. Pleasant, Tex., in 1911. He remained in this latter capacity until October 16, 1916, when his present appointment became effective.

John Adolph Streyer, whose appointment as general manager of the Macon, Dublin & Savannah, with headquarters at Macon, Ga., has already been announced in these columns, was born on October 27, 1874 at Macon, Ga., and was educated in the public schools. He began railway work on October 1, 1890, as a messenger with the Georgia Southern & Florida. From February to October 1891, he was clerk in the storeroom; then to January 1894 was clerk in the general freight agent's office and later served as assistant chief clerk in the claim department of the same road. From May 1894, to October 1898, he was in mercantile business at Macon, and then returned to railway service as traveling freight agent, on the Macon & Birmingham, and later served as traveling freight agent on the Atlanta & West Point and the Western of Alabama, at St. Louis, Mo. In February 1901, he became commercial agent of the Macon & Birmingham, at Macon and the following October was appointed general agent in the freight and passenger department at the same place. One year later he was appointed general freight and passenger agent of the same road at Macon, remaining in that position until February 1904, when he was appointed general agent of the Macon, Dublin & Savannah, at Macon. The following March he was promoted to general freight and passenger agent, and in April 1914, was appointed traffic manager which position he held at the time of his recent appointment as general manager of the same road as above noted.

Traffic

Archibald Fries, whose appointment as freight traffic manager of the eastern lines of the Baltimore & Ohio System, with headquarters at Baltimore, Md., has already been announced in these columns, was born on February 27, 1864, and was educated in the public schools at Cincinnati, Ohio. He began railway work in 1880 as an entry clerk on the Ohio & Mississippi, now a part of the Baltimore & Ohio System, in the transfer station at Storr's, Ohio, and subsequently served consecutively as cashier and chief clerk at the same place. From January, 1890, to November, 1897, he was successively chief clerk, rate and claim clerk, accountant, chief clerk and acting manager of the Continental Fast Freight Line; then, to October, 1898, he was chief clerk in the general freight department of the Baltimore & Ohio Southwestern. In October, 1898, he was appointed general agent at Cincinnati, and in January, 1899, became assistant general freight agent of the same road. From March, 1911, to January, 1913, he was also assistant general freight agent of the Cincinnati, Hamilton & Dayton. In January, 1913, he was appointed general freight agent of the Sharpsville Railroad; the same year he was appointed general freight agent of the Baltimore & Ohio at Pittsburgh, Pa., and now becomes freight traffic manager of the eastern lines of the Baltimore & Ohio System, as above noted.



A. Fries

C. B. Sipes has been appointed commercial freight agent of the Baltimore & Ohio with headquarters at Akron, Ohio, vice D. H. Streett, promoted.

L. J. Rowell has been appointed general freight and passenger agent and freight claim agent of the Apalachicola Northern, with office at Port St. Joe, Fla., vice T. M. True resigned.

Henry Foulkes, for the past 13 years in the United States railway mail service, has been appointed mail traffic agent of the Delaware, Lackawanna & Western with office at New York City.

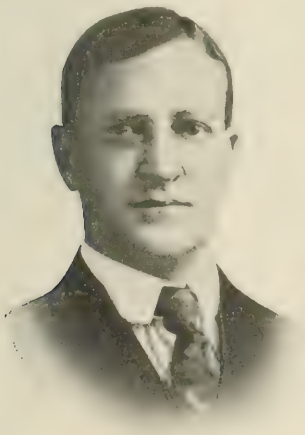
W. R. Askew, who has been appointed general freight agent, eastern lines of the Baltimore & Ohio System, with headquarters at Baltimore, Md., was born on November 30, 1873, at Baltimore. Mr. Askew began railway work in January, 1888, as a messenger in the freight offices of the Baltimore & Ohio, and later held various positions in the general freight department. From September, 1899, to February, 1907, he was rate clerk, and then to January, 1913, he served as chief rate clerk. On January 1, 1913, he was appointed division freight agent of the same road, with office at Baltimore, which position he held at the time of his recent appointment as general freight agent of the Baltimore & Ohio System, at Baltimore, with jurisdiction over the territory east of the Ohio River except the Pittsburgh, Connellsville, Wheeling and Ohio River divisions and excluding the territory between Moundsville and Wheeling. Mr. Askew's entire railway service has been with the Baltimore & Ohio.



W. R. Askew

R. L. Butt has been appointed general freight agent of the Danville & Western, Blue Ridge Railway, Augusta Southern, Tallulah Falls Railway, Hartwell Railway and the Lawrenceville Branch Railroad, with headquarters at Atlanta, Ga.

Tom Giles Beard, whose appointment as general freight agent of the Southern Pacific, Texas Lines, with office at Houston, Tex., has recently been announced in these columns, was born in Bristol, England, on January 2, 1863. On coming to America in 1884 he took employment with the Louisville & Nashville, as clerk and stenographer to the assistant auditor. From 1885 to 1886 he held the same position with the master of transportation of the Louisville, New Orleans & Texas, now a part of the Illinois Central, and from 1886 to 1887 he was stenographer and operator in the superintendent's office on the East Tennessee, Virginia & Georgia. In 1887 he became connected with the Houston & Texas Central, and after 1892 was consecutively stenographer, rate clerk, chief clerk in the general freight department and assistant general freight agent. In 1903, he was appointed assistant general freight agent of the Galveston, Harrisburg & San Antonio, the Galveston, Houston & Northern, the Texas & New Orleans and the Southern Pacific Steamship Lines jointly. From 1904 to 1912 he was general freight agent of the Texas & New Orleans, and from 1912 to 1916 he was assistant general freight agent of the Southern Pacific Lines in Texas, in charge of general solicitation. His appointment as general freight agent became effective on October 15.



T. G. Beard

R. C. Kennedy, southwestern passenger agent of the Cleveland, Cincinnati, Chicago & St. Louis, at St. Louis, Mo., has been appointed assistant general passenger agent, with headquarters at St. Louis. J. C. Emig, industrial agent at Cincinnati, Ohio, has been appointed assistant general freight agent, with office at Cincinnati; H. J. Burgee, division freight agent at Chicago, Ill., has been appointed assistant general freight agent, with office at Chicago; S. A. Townsend, division freight agent at St. Louis, Mo., has been appointed assistant general freight agent, with office at St. Louis, and their former positions have been abolished. Effective November 1.

Philip Meininger, whose appointment as general freight and passenger agent of the Baltimore & Ohio Chicago Terminal, with office at Chicago, Ill., has been announced, was born at Cincinnati, O., on July 9, 1876. He received a common school education in this city and in 1891 entered railway service with the Ohio & Mississippi, now a part of the Baltimore & Ohio Southwestern, as a messenger boy. Later he became stenographer to the general baggage agent and engineer maintenance of way in turn. In 1896 he was promoted to chief clerk to a division superintendent on this same road. From 1898 to 1900 he was secretary to the engineer maintenance of way on the Baltimore & Ohio Southwestern at Cincinnati, O., and then became secretary to the division superintendent at Chicago, Ill. He was then promoted to chief clerk to the general superintendent of the Baltimore & Ohio and the president of the Baltimore & Ohio Chicago Terminal. In 1911 he was assigned to special work with the title of chief clerk, which position he held until his present appointment became effective October 15, 1916, succeeding P. F. Finnegan, promoted.

O. S. Lewis, who has been appointed general freight agent of the Southwest district of the Baltimore & Ohio System, with headquarters at Cincinnati, Ohio, was born on March 8, 1873, at Lawrenceburg, Ind. He was educated in the public and high schools, and began railway work as a clerk in the accounting department of the Kentucky Central at Covington, Ky. From January, 1892, to the following November he was in the accounting department of the Chesapeake & Ohio at Richmond, Va., and in the office of the agent of the same road at Cincinnati, Ohio. From November, 1892, to May, 1896, he was in the accounting department of the Ohio & Mississippi, now a part of the Baltimore & Ohio System, and then to November, 1906, served successively as agent of the Baltimore & Ohio Southwestern at Lawrenceburg, Ind, and chief clerk to the division freight agent at Vincennes, Ind. Mr. Lewis served until September, 1912, in the general freight office of the same road at Cincinnati, and then to January, 1913, was division freight agent of the Cincinnati, Hamilton & Dayton at Dayton, Ohio. In January, 1913, he was appointed division freight agent of the Baltimore & Ohio Southwestern at Cincinnati; in September, 1915, he was promoted to assistant general freight agent of the Baltimore & Ohio Southwestern and the Cincinnati, Hamilton & Dayton, and now becomes general freight agent of the Southwest district of the Baltimore & Ohio System at Cincinnati, Ohio, as above noted.



O. S. Lewis

Engineering and Rolling Stock

William B. Smith has been appointed road foreman of engines on the Boston division of the Boston & Albany, with office at Beacon Park, Allston, Mass.

Edwin G. Foster, assistant engineer of the Buffalo, Rochester & Pittsburgh, has been appointed valuation engineer, with headquarters at Rochester, N. Y.

George W. Corrigan, roadmaster of the Southern Pacific at

Hornbrook, Cal., has been appointed division engineer of the Stockton division with office at Stockton, Cal.

William H. Vance, engineer maintenance of way of the Louisiana & Arkansas, at Stamps, Ark., has been appointed chief engineer and his former position has been abolished.

M. F. Clements, assistant engineer on the Northern Pacific, in charge of track elevation at Spokane, Wash., has been appointed engineer of bridges with office at St. Paul, Minn., succeeding H. E. Stevens, promoted.

B. J. Farr, general foreman of the Grand Trunk, who was recently promoted to master mechanic, with office at Battle Creek, Mich., graduated from high school at St. Albans, Vt., in 1893, and immediately entered railway service with the Central Vermont as a machinist apprentice. Later he was promoted to erecting shop foreman, and general foreman of the shop with this same company. In 1907 he resigned this latter connection with the Central Vermont to accept a position on the Northern Railway of Costa Rica, where he remained until 1909. About this time the opportunity to acquire broader railroad experience presented itself, and he resigned to enter government service on the Panama Railroad at the time the Panama Canal was being constructed. He served in various capacities with this company until 1914, when he returned to the United States and entered the service of the Grand Trunk as general foreman in January, 1915. His present appointment as master mechanic became effective October 1, 1916.

William A. Duff, whose appointment as assistant chief engineer of the Canadian Government Railways with headquarters at Moncton, N. B., has already been announced in these columns, was born on April 20, 1877, at Hamilton, Ont. He graduated from the University of Toronto in applied science in 1901, and began railway work in the same year as draughtsman and acting resident engineer on construction on the Vancouver, Victoria & Eastern, in British Columbia. In 1902 he was appointed assistant engineer on the Grand Trunk Railway at Hamilton, Ont.; the following year he went to the Kenwood Bridge Company as draughtsman at Chicago, Ill., and in 1905 he went in the same capacity to the Canadian Bridge Company at Walkerville, Ont. In 1907 and 1908 he was chief draughtsman in the bridge department of the Transcontinental Railway at Ottawa, Ont.; then until 1913 was assistant bridge engineer of the same road. He was appointed engineer of bridges of the Canadian Government Railways at Moncton, N. B., in 1913, which position he held at the time of his recent appointment as assistant chief engineer.



W. A. Duff

Purchasing

C. D. Clapp has been appointed purchasing agent of the Mississippi Central, with office at Hattiesburgh, Miss.

J. P. Harrison, assistant purchasing agent of the Louisville & Nashville, at Louisville, Ky., has been appointed purchasing agent, succeeding P. P. Huston, retired. H. T. Shanks has been appointed assistant purchasing agent.

M. E. Towner, special representative of the Whitman & Barnes Manufacturing Company, at St. Louis, Mo., has been appointed purchasing agent of the Western Maryland with office at Baltimore, Md., succeeding H. M. Burgan.

George W. Hayden, assistant to the chief purchasing officer of the St. Louis-San Francisco with office at St. Louis, Mo., has resigned to go to the New York, New Haven & Hartford as supervisor of materials and supplies with headquarters at New Haven, Conn.

OBITUARY

George R. Brown

George R. Brown, formerly and for 13 years general superintendent of the Fall Brook Coal Company's Railroad, and originator of "Brown's Discipline," died suddenly on November 5, at Rochester, N. Y. He was born on September 9, 1840, at Southport, N. Y., and was educated in the common schools and at Waverly Seminary, Waverly, N. Y. In 1864 he began railway work as a telegraph operator on the Fall Brook road, now a part of the New York Central, and subsequently served until 1886, successively, as train despatcher and assistant superintendent. In the spring of 1886 he was appointed general superintendent of the same road and served until May, 1899. He was then, to February 5, 1902, second vice-president and general manager of the New York & Pennsylvania Railroad, with headquarters at Canisteo, N. Y. From February, 1902, to July, 1904, he was receiver and general manager of the same road.



George R. Brown

"Brown's Discipline," which has made this modest man's name known everywhere, means nothing more than the administration of the discipline of trainmen and other railroad employees by normal methods, without the employment of suspensions as punishment. Its adoption and persistent perpetuation on the Fall Brook was a notable event, because, first, suspensions were so common—nearly or quite universal—on all of our principal roads and, second, because the common practice of suspending men for 30, 60 or 90 days was everywhere recognized as a plan having serious disadvantages, while yet the task of managing five hundred or a thousand trainmen without the use of suspensions (as a proper means of impressing authority on men of dull minds or consciences) was generally looked upon as a very difficult one. Mr. Brown was peculiarly fitted for this function of the railroad superintendent, in that he was of sufficiently cold and judicial temperament to seek efficient men and to expel the inefficient, with regard solely to the good of the service, while yet he had the human sympathies which made him temper justice with those amenities which promote a true esprit de corps. His system was not a negative one; the use of admonition and reprimand in place of harsher measures was not his only reform; he paid an annual premium of $60 to each freight conductor making a satisfactory record.

The Brown system (without the premiums) was adopted by many roads, and in 1899 the list included 30 or more companies; but some large roads have persistently maintained that a part of their trainmen—perhaps a very small part—were so dull, or tough, or reckless, or ignorant, or unprincipled that, for serious infractions of the rules, the only satisfactory punishment (where the offense did not seem to warrant dismissal) was a loss of money. Direct fines are thought to be out of the question, and suspension is the only other means of touching the pocket. A large number of roads still have "discipline without suspension" and others employ suspended or deferred suspensions, or other modifications.

The good results of the entire abolition of suspensions on the Baltimore & Ohio were the subject of an article in the *Railway Age Gazette* of January 16, 1914; and a similar report concerning the Chicago, Burlington & Quincy appeared June 12 of the same year.

Experiences like those here described, together with some of the same tenor on other roads, confirm the view of those who declare suspensions to be illogical, behind the times and often unjust; and they justify the verdict that Brown did a pioneer work of lasting value.

Equipment and Supplies

LOCOMOTIVES

The Birmingham Southern is inquiring for two six-wheel switching locomotives.

The St. Louis Southwestern is contemplating the purchase of a number of locomotives.

The Missouri, Kansas & Texas is in the market for 25 Mikado and 10 Pacific type locomotives.

The East Orange Lumber Company, Enterprise, Ore., has ordered one Mikado locomotive from the Baldwin Locomotive Works.

Worth Brothers Company, Coatesville, Pa., has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

The River Terminal Railway, Cleveland, O., has ordered two six-wheel switching locomotives from the Baldwin Locomotive Works.

The General Refractories Company, Hitchins, Ky., has ordered one four-wheel switching locomotive from the Baldwin Locomotive Works.

The British Government has ordered 100 more light tank locomotives from the Baldwin Locomotive Works in addition to the 395 mentioned in last week's issue.

The Texas, Oklahoma & Eastern has ordered one Prairie type locomotive from the American Locomotive Company. This locomotive will have 18 by 24-in. cylinders, 46-in. driving wheels and a total weight in working order of 111,000 lb.

Coates & Tweed have ordered four six-wheel switching locomotives from the American Locomotive Company. These locomotives will have 19 by 26-in. cylinders, 50-in. driving wheels and a total weight in working order of 111,000 lb.

The El Paso & Southwestern has ordered 10 superheater Pacific type locomotives from the American Locomotive Company. These locomotives will have 27 by 28-in. cylinders, 73-in. driving wheels and a total weight in working order of 315,000 lb.

The Western Pacific has ordered five superheater Mallet type locomotives from the American Locomotive Company. These locomotives will have 23½ and 37 by 32-in. cylinders, 57-in. driving wheels and a total weight in working order of 429,000 lb.

The Italian State Railways were reported in last week's issue as having ordered 40 consolidation locomotives from the American Locomotive Company. These locomotives will have 21¼ by 27½-in. cylinders, 53½-in. driving wheels, a total weight in working order of 147,000 lb., and will be equipped with superheaters.

The Minnesota Steel Company, Duluth, Minn., has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works and one eight-wheel switching locomotive from the American Locomotive Company. The latter locomotive will have 23 by 28-in. cylinders, 50-in. driving wheels, a total weight in working order of 203,000 lb., and will be equipped with a superheater.

FREIGHT CARS

The Norfolk & Western is inquiring for 4,700 cars.

The Norfolk Southern is in the market for 150 cars.

Swift & Co. will build 300 refrigerator cars in its own shops.

The Wabash-Pittsburgh Terminal is in the market for 1,000 freight cars.

Armour & Co. will build 500 additional refrigerator cars in its own shops.

The New York, Philadelphia & Norfolk is inquiring for five caboose cars.

The Carolina, Clinchfield & Ohio has revived an inquiry for 100 automobile cars.

The Atchison, Topeka & Santa Fe is reported as having placed an order for 500 tank cars.

The Chicago, Indianapolis & Louisville will soon issue inquiries for 500 box cars.

The Cambria & Indiana has ordered 1,000 hopper cars from the Cambria Steel Company.

Morris & Co. has ordered 250 refrigerator cars from the Haskell & Barker Car Company.

The Union Pacific has ordered 1,500 box cars from the American Car & Foundry Company.

The Pierce Oil Corporation has ordered 200 tank cars from the American Car & Foundry Company.

The Consolidation Coal Company has purchased 800 coal cars from the United Coal Corporation.

Cosden & Co., Tulsa, Okla., has ordered 200 tank cars from the American Car & Foundry Company.

The Illinois Central has ordered 400 Hart convertible ballast cars from the Rodger Ballast Car Company.

The Los Angeles & Salt Lake has ordered 1,000 automobile cars from the Ralston Steel Car Company.

The Diamond Gasoline Corporation has ordered 10 50-ton, 8,000 gal. capacity tank cars from the American Car & Foundry Company.

The Minneapolis, St. Paul & Sault Ste. Marie has ordered 800 box and 200 automobile cars from the Haskell & Barker Car Company.

The Delaware & Hudson is reported in the market for 118 steel underframes for hopper cars, 25 for stock cars and 25 for refrigerator cars.

The Pennsylvania Equipment Company, Philadelphia, Pa., is in the market for several second-hand caboose cars and a number of rock cars.

Russian Government.—The report that the Russian Government has revoked the order for 4,000 gondola cars recently given the Bettendorf Company has been emphatically denied.

The Philadelphia & Reading has ordered 1,000 hopper cars from the Cambria Steel Company, 500 from the Pressed Steel Car Company and 500 from the Standard Steel Car Company.

The Southern Railway, reported in last week's issue as having ordered 1,313 gondola cars from the Pressed Steel Car Company, has also ordered 200 stock, 100 caboose and 1,265 box cars from the Lenoir Car Works.

The Louisville & Nashville was incorrectly reported in last week's issue as having ordered 2,000 gondola cars from the Pressed Steel Car Company. These cars will be built, 1,000 in the company's own shops and 1,000 by the Mount Vernon Car Manufacturing Company.

The Baltimore & Ohio, reported in last week's issue as having ordered 2,000 box cars from the Mount Vernon Car Manufacturing Company, has also ordered 375 box cars from the Ryan Car Company and an additional 375 box cars from the Mount Vernon Car Manufacturing Company. It is also in the market for 5,000 cars in addition to these orders.

PASSENGER CARS

Charles M. Schwab has ordered a private car from the Pullman Company.

Wells, Fargo & Co. is reported as inquiring for 30 express refrigerator cars.

The New York Central, reported in last week's issue as having ordered 50 coaches from the Pressed Steel Car Company, 25 coaches from the Barney & Smith Car Company and 25 baggage cars from the Pullman Company, has also ordered 125 bag-

gage cars from the American Car & Foundry Company and 75 coaches from the Standard Steel Car Company, a total of 300 passenger train cars. This company reported in the *Railway Age Gazette* of October 13 as building a number of dining cars in its own shops, is building only 3 cars and not 4 as incorrectly reported in that issue.

IRON AND STEEL

The St. Louis & San Francisco will purchase 56,000 tons of rails.

The Delaware & Hudson has ordered 400 tons of bridge work from the Phoenix Bridge Company.

The French Government is reported as having ordered 50,000 tons of rails from the Bethlehem Steel Corporation.

The Chicago, Burlington & Quincy has ordered 25,000 tons of rails for 1917 delivery from the Illinois Steel Company.

The Great Northern has ordered 30,000 tons of rails and fastenings from the Illinois Steel Company for 1918 delivery.

The Southern Railway has ordered 500 tons of steel from the Virginia Bridge & Iron Works for car repair shops at Spencer, N. C.

The New York & Long Branch has ordered 1,000 tons of steel from the McClintic Marshall Company for a bridge over the Manasquan river.

The Russian Government is reported to have ordered 50,000 tons of rails from the Bethlehem Steel Corporation for the Trans-Siberian Railway.

The Kansas City Terminal has given an order to the American Bridge Company to fabricate 25,000 tons of structural steel for a bridge over the Missouri river and approaches at Kansas City, Mo.

The Chicago, Burlington & Quincy has ordered 3,000 tons of structural steel from the American Bridge Company for a freight house at Chicago to be built in connection with the Chicago passenger terminal improvements.

MISCELLANEOUS

The New York, Chicago & St. Louis has awarded a contract to the Roberts & Schaefer Company, Chicago, for the installation at Brocton, N. Y., of a 300-ton capacity, reinforced concrete and steel locomotive coaling plant, designed to coal on two main line tracks, and a passing track.

The Pittsburgh & Lake Erie has awarded the contract to the Roberts & Schaefer Company, Chicago, for a large 900 ton capacity, reinforced concrete and steel fireproof coaling plant for installation at Haselton yard, near Youngstown, Ohio. This plant will be designed with four pockets and arranged to coal locomotives on four tracks; one of the bins being equipped with a "Rand S" measuring coal loader for recording all coal issued to foreign engines. The plant will be extensive in that duplicate track hoppers and automatic electric elevating equipments are part of the design.

SIGNALING

The Public Service Commission of Maryland has authorized the issuance by the Western Maryland of notes aggregating about $67,000, all to be paid within 5 years, to provide automatic block signals on the line between Colmar and Greenwood, 66 miles. This installation will complete the automatic signals on all the single track main line between Baltimore and Pittsburgh.

The Missouri, Kansas & Texas is to install an electro-mechanical interlocking plant at Eanita, Okla. The machine will consist of a 24 lever Saxby & Farmer frame with twenty-two working levers, and a six-lever style "S-8" electro section. The electric features of this plant consist of seven style "S" 110 volt home signals, three styles "S" 10 volt distant signals and four model 13 electric switch movements for the operation of four isolated switches and one electric dwarf signal of the slot arm type. The material for this installation will be furnished by the Union Switch & Signal Co.

Supply Trade News

Hugh E. Creer, formerly connected with the sales department of the Union Railway Equipment Co. of Chicago, Ill., has been appointed special representative of the Camel Company, with headquarters at Chicago, Ill.

Fay E. Possom, formerly connected with the sales department of the Grip Nut Company, Chicago, Ill., has been elected vice-president of the Safety First Manufacturing Company, western representative for several different railway specialties.

Harrison dust guards, manufactured and sold by the Harrison Railway Specialties Company of Chicago, Ill., have been specified on the 5,000 New York Central cars recently ordered. Dust guards to equip 16,750 cars have been sold by this one company in the past two and one-half months.

The American Locomotive Co., has closed an order for 1,000,000 time fuses for the British Government, the contract providing for renewals at the option of the purchaser on another 2,000,000 fuses at the contract price. The order will be divided with the Westinghouse Air Brake Company, which company also shared the 2,200,000 fuse order placed with the locomotive company last summer and now nearing completion.

William Cooper Cuntz, general manager and director of the Goldschmidt Thermit Company, New York, died on November 2, at Auburndale, Mass., where he was on a visit for the benefit of his health which was impaired by an operation for appendicitis a year ago. Mr. Cuntz was born in Hoboken, N. J., in 1871. He attended the Hoboken Academy and Stevens Institute of Technology, graduating in 1892 with the degree of mechanical engineer. He then became connected with the Pennsylvania Steel Company of Steelton, Pa., first with the bridge and construction department and later with the sales department, which he represented in Boston, Philadelphia, London, England, and in Steelton. He was at one time assistant sales manager at Philadelphia and later sales agent with headquarters at Steelton. In 1910 he was appointed by President Taft a delegate to the International Railway Congress at Berne, Switzerland. In the same year he severed his connections with the Pennsylvania Steel Company to become a director and general manager of the Goldschmidt Thermit Company, New York. At the time of his death he was also a director of the Goldschmidt Detinning Company.



W. C. Cuntz

The United States Circuit Court of Appeals for the sixth circuit has affirmed the decree of the District Court of the United States for the eastern district of Michigan, sustaining the patent of James D. Carey, president of the Cleveland Dock Engineering Company, in his design of a reinforced concrete dock, in a suit brought by the Detroit Iron and Steel Company. This decision was rendered October 13, 1916, and sustains the priority of Mr. Carey's patent as originally developed in the construction of a dock for the Cleveland Furnace Company, Cleveland, and since used in other structures.

C. J. Burkholder, formerly general road foreman of engines of the Kansas City Southern, has accepted a position with the Economy Devices Corporation as mechanical representative in western territory, with headquarters at Kansas City. Mr. Burkholder was born May 8, 1875. His entire business life, up to

his recent appointment, has been spent in railroad work. Starting in the roundhouse of the Pennsylvania Railroad at Tyrone he was later locomotive fireman on the same road. Leaving the Pennsylvania he went as locomotive fireman for the Union Pacific and was later promoted to locomotive engineer. He resigned from the Union Pacific and went as locomotive engineer to the Kansas City Southern, northern division. He was in turn promoted to traveling engineer, train master and general road foreman of engines, holding the last position at the time of his recent appointment.

TRADE PUBLICATIONS

ELECTRICAL APPLIANCES.—The Fargo Manufacturing Company, Poughkeepsie, N. Y., has recently issued a folder relative to its solderless connectors for solid or stranded wires and cables.

GAS ENGINE.—Bulletin 34-x, recently issued by the Chicago Pneumatic Tool Company, deals with Giant gas engines. The booklet describes in detail the engine and its various parts and is well illustrated.

ADJUSTABLE REAMERS.—Catalogue G recently issued by the Kelly Reamer Company, Cleveland, Ohio, is entitled Kelly Production Tools and is a catalogue of the reamers, adjustable high speed blades and similar tools made by the company.

THE LOS ANGELES & SALT LAKE.—The passenger traffic department of this company has issued a booklet entitled "The Organ and the Bells," illustrated with photographs and describing the scenic and historical attractions of Salt Lake City, Utah, and Riverside, Cal.

KEEPING CARS IN SERVICE.—This is the title of a booklet recently issued by the American Steel Foundries Company to show the advantages to be gained by the application of Economy cast steel draft arms to wooden underframe cars. The booklet contains several illustrations showing the Economy arms and their application.

TRUCKS AND TURNTABLES.—This is the title of catalogue No. 124 recently issued by the Whiting Foundry Equipment Company, Harvey, Ill., dealing with the companies line of charging, dump, core oven and other foundry cars and turntables for use at crossings over which these cars are run. The book is well illustrated with views of the cars and turntables.

"PECKY" CYPRESS.—The Southern Cypress Manufacturers' Association, New Orleans, La., has issued a small 44-page booklet describing "Pecky" Cypress, which contains a large amount of information regarding this peculiar timber, its development and its uses. This book is prepared in an unusually interesting manner, and is well illustrated with photographs of this timber and its uses.

MACHINE TOOLS.—Catalogue No. 51 recently issued by the Newton Machine Tool Works, Inc., Philadelphia, gives specifications, dimension tables and illustrations of the Newton cold saw cutting-off machines. The booklet also contains a number of illustrations showing machines in actual service and a supplementary section is devoted to various milling, slotting and drilling machines.

SMALL TOOLS. Catalogue No. 9, recently issued by the Pratt & Whitney Company, Hartford, Conn., is a complete catalogue of the small tools manufactured by the company. The booklet has over 300 pages and gives data and price lists of the company's taps, dies, milling cutters, reamers, punches, drills and miscellaneous tools. About 40 pages are devoted to tables of standard threads, thread dimensions and tap drill sizes, decimal equivalents, etc.

PAINT GUN.—The Spray Engineering Company, Boston, Mass., in Bulletin No. 310 describes the "Spraco" paint gun, a hand tool for use in applying all kinds of liquid coatings. The complete equipment consists of the paint gun proper connected by flexible hose to a portable unit combining in a compact rugged form the material container, air dryer and strainer, pressure control attachment, and pressure gage. The equipment is adapted for use in shop or field and may be adjusted for spraying the highest grade of varnishes and lacquers, as well as heavy asphaltum and structural paints, producing finely finished surfaces without streaks or brush marks. It is also adapted to applying heavy durable coatings to rough structures.

Railway Construction

AMYVILLE RAILROAD.—According to press reports from Amyville, Pa., this company has been incorporated in Pennsylvania with $50,000 capital to build a five-mile line out of Amyville.

BALTIMORE & OHIO.—Improvement work has been started at the Garrett (Ind.) freight yards on the Chicago line of the Baltimore & Ohio. The yards are being enlarged to increase the capacity of eight tracks in the westbound yard and four tracks in the eastbound yard to 100 cars each. The work will cost about $75,000 and will be carried out by company forces.

CUMBERLAND & WESTERNPORT (ELECTRIC).—This company, which operates an electric line connecting Cumberland, Md., with Westernport, is relocating 4,000 ft. of the line to secure easier grades and improve the alinement. The work is being carried out with company forces, and includes the construction of one steel bridge 24 ft. long, and a concrete wall 700 ft. long and 7 ft. high. Two power plants are also under construction.

FLORIDA & ALABAMA.—This road has been extended from Munson, Fla., north to Whittey, Ala., 20 miles.

GREAT NORTHERN.—The Eleventh district of the Butte division has been extended from Bynum, Mont., to Pendroy, nine miles.

HOLSTON RIVER LUMBER COMPANY'S LINE.—A contract has been given to the Vaughan Construction Company to build a 11-mile standard gage lumber railroad to the Clinch mountain district in Virginia. The work includes building a 200-ft. steel bridge. E. M. Allen, president, Darlington, Md., and H. T. Ballah, chief engineer, Abingdon, Va. (July 7, p. 47.)

LEWISTON, NEZPERCE & EASTERN.—Operation of a part of this road commenced November 1. This line when completed will run from Lewiston, Idaho, to Nezperce, Idaho, a distance of 75 miles. At present, however, only that part running from Lewiston to Tammany, a distance of 11 miles, and from Vollmer to Nezperce, Idaho, about 14 miles, will be operated. It is expected that the balance of the road, that part extending through Waha, Ilo, and Forest, and thence to Vollmer, will be finished next year.

NEVADA-CALIFORNIA-OREGON.—The Feather River branch has been extended from Clio, Cal., to Davies Mill, 2.67 miles.

PENNSYLVANIA ROADS (ELECTRIC).—According to press reports from Perkasie, Pa., plans are being made for building an electric line from Perkasie southeast to Doylestown, about 12 miles.

RIO GRANDE RAILWAY.—This company, operating 22 miles of line between Brownsville, Tex., and Point Isabel, Tex., has two surveying parties in the field locating a new route from Brownsville, Tex., to the gulf, the purpose being to renew water shipping through Brazos on Santiago harbor to Point Isabel.

SCHUYLKILL RAILWAY COMPANY (ELECTRIC).—This company is making surveys, it is said, for a proposed extension from Mahanoy City, Pa., to Tamaqua, about 14 miles. The work will include building a long viaduct and several small bridges.

TENNESSEE ROADS.—According to press reports, New York, Nashville, Tenn., and Chattanooga interests have under consideration the question of building a line from Nashville, Tenn., southeast to Chattanooga, about 125 miles. D. B. Carson, Nashville, Tenn., and W. H. Hillyer, Atlanta, Ga., are said to be interested.

RAILWAY STRUCTURES

BESSEMER, ALA.—Construction of a modern, new freight station, between Seventeenth and Eighteenth streets, has been authorized by the Alabama Great Southern. The building will be of reinforced concrete and brick with sanitary plumbing, low pressure heating systems, steel windows and freight house doors, and wood block floor. The freight house will be 33 ft. by 205 ft. There will also be a platform 350 ft. and platform house will be served by necessary tracks. It is expected that construction will begin at once.

COTTER, ARK.—The St. Louis, Iron Mountain & Southern has just purchased the materials necessary for remodeling and adding another story to its passenger station here. The improvements will cost about $7,000 and the work will be done by the company's own forces.

DECATUR, ILL.—Plans for a small brick machine shop with steel trusses, to be constructed here, are under way by the Wabash. No contracts have been awarded, nor is it known how soon bids will be called for. The cost will be approximately $9,000.

KANSAS CITY, MO.—The Kansas City Terminal has awarded a contract to the Arkansas Bridge Company, of Kansas City, Mo., for the erection of a steel bridge over the Kaw river. Actual construction has just commenced. The bridge will require about 25,000 tons of steel, and will cost approximately $3,000,000. There will be two 300-ft. and one 135-ft. truss span over the Kaw river, and one 117-ft. and one 147-ft. truss span over the various railway tracks; also there will be a number of smaller girders for the various approaches totaling more than 800 feet. The superstructure will be of steel, with timber decking and foundations of reinforced concrete.

MILFORD JUNCTION, IND.—Work has been started by the Baltimore & Ohio on the building of seven steel bridges with concrete foundations between Milford Junction, Ind., and La Paz, 21 miles, on the Chicago main line.

RINGTOWN, PA.—A contract has been given by the Philadelphia & Reading to P. J. Campion, Mahanoy City, Pa., for the construction of two reinforced concrete box bridges. One will be 4 ft. by 4 ft. by 186 ft. long, to be constructed over Long Dark Run, and the other will be 12 ft. by 14 ft. by 50 ft., built over private road. When these structures are completed the existing steel viaduct, which is located south of Ringtown, Pa., on the Catawissa branch, will be filled in.

ROCHELLE, GA.—The Seaboard Air Line and the Ocilla Southern are building a union passenger station at Rochelle.

ROCHESTER, N. Y.—The Pennsylvania Railroad will build an outbound freight house, 30 ft. wide and 240 ft. long at Rochester, to cost about $50,000. The present freight house will be used as an inbound receiving station and additional tracks to hold 40 cars will be constructed between the two stations.

TILSONBURG, ONT.—Regarding the report that the Grand Trunk will build a new steel bridge at Tilsonburg, an officer writes that plans have not yet been made to carry out the work. If this improvement is made the work will be done by company forces.

TUSCALOOSA, ALA.—The Alabama Great Southern has just completed and placed in service a modern freight station at Tuscaloosa in the heart of the business district. The station is 30 ft. by 196 ft. and has facilities for accommodating both inbound and outbound freight. Team track facilities for handling car load freight have also been constructed. The old station, situated some distance east of the principal business section, will be maintained to serve shippers and receivers in that immediate vicinity.

THERMALENE DEFINED.—Thermalene is a gas, the discovery of which was recently announced from Zurich, Switzerland. It is used for welding and cutting in the same manner as acetylene is used with oxygen. It is produced by the decomposition of calcium carbide with water and is enriched or compounded with the heated vapors of crude oil. There are several claims made for it. It is heavier than air, specific gravity 1.1, and it is said it can be used at a lower pressure than the other gases. It is not explosive when liquefied, and its explosive range is narrow, the explosive ratio from 12 per cent to 30 per cent air. It can be liquefied at a pressure slightly over 1,400 pounds and at the ordinary atmospheric temperature. An excess of oxygen is not required in the welding flame, so that there need not be any reduction of the carbon in the iron or steel that is being welded, thus producing a soft weld. It is generated automatically in a portable apparatus as needed and delivered to the torch at 15 pounds pressure. The special feature in its production is the use of cartridges of material, consisting of alternate layers of calcium carbide and sawdust soaked in oil. It is necessary to wash, purify and cool the gas. The introduction of this gas into the iron and steel industries of the United States will be watched with interest.—*Iron Trade Review.*

Railway Financial News

BUFFALO & WELLSVILLE.—This road was to have discontinued operations on November 1, as announced in these columns previously. Following an informal conference with the New York Public Service Commission, Second district, the management agreed to continue service until November 17. Another conference will be held with the commission on November 15.

CHICAGO, BURLINGTON & QUINCY.—Ralph Budd has been elected a director, succeeding R. A. Jackson, resigned. George D. Slade has been elected a director, succeeding W. T. Clough, deceased.

CHICAGO & EASTERN ILLINOIS.—Suit has been brought by the Farmers Loan & Trust Company to foreclose the Evansville & Terre Haute first general mortgage securing $3,145,000 outstanding 5 per cent bonds.

CLARKSVILLE RAILWAY.—This road, which runs from Tallulah Falls to Clarksville, and which was recently sold under foreclosure, has notified the Georgia railroad commission that it desires to tear up its tracks and go out of business. The commission has notified the railroad company that the commission has no power to grant such a petition and that the company would have to surrender its charter to the legislature to relieve it of the necessity of operating its road.

DENVER & RIO GRANDE.—The Wall Street Journal, in its issue of November 4, prints the following:

Arthur Coppell, when asked after the board meeting Thursday what was the significance of his election as vice-president of the Denver & Rio Grande, said:

"My election as vice-president of the Denver & Rio Grande emphasizes the freedom of that property from the control of any one interest. The Denver & Rio Grande is now being operated, and will continue to be operated, as an independent property. It is the theory of election of directors that all stockholders should be represented, and it is, of course, the duty of each director to act solely in the interest of the property for which he is trustee.

"In this connection it is to be said, in order to correct mistaken impressions to which certain recently published reports have given currency, that seven of the directors elected at the last annual meeting of the stockholders were the choice of the two largest stockholding interests in this country, viz., Gould and the Missouri Pacific Railway—say three and four respectively—and they, as well as the other four directors, were unanimously elected.

"My own and Mr. McAlpin's connection with the property, of which my father was for many years chairman, rests mainly (apart from my individual holdings) upon the fact of my being the proxy of the Dutch administration, the latter representing the very considerable holdings of stock in Holland, and being the second largest stockholder in the company.

"I may add that I am informed that the report repeatedly published of late to the effect that the Missouri Pacific has disposed of its holdings of Denver & Rio Grande stock is without foundation."

GREAT NORTHERN.—A. Barton Hepburn, chairman of the Chase National Bank, of New York City, has been elected a member of the board of directors of this company, succeeding R. A. Jackson, resigned.

RIO GRANDE.—This company has passed under the control of David A. O'Brien and associates. The board of directors was reorganized as follows: David A. O'Brien, chairman, and James A. Browne, John Gregg, Albert Browne, Louis Coboline and R. M. Johnston, members.

ST. LOUIS & SAN FRANCISCO.—Lee, Higginson & Co., Boston, and the Guaranty Trust Company, New York, have formed a syndicate to sell the $8,516,000 St. Louis & San Francisco prior lien 5 per cent bonds left with the reorganization committee.

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The result of the election was long in doubt, but it now seems certain that President Wilson has won. A question which naturally arises, on reviewing the returns, is as to where the "labor vote" was on election day. After the passage of the Adamson law the heads of the railway labor brotherhoods lined up with the head of the American Federation of Labor in support of Mr. Wilson. It was assumed that this meant that the "labor vote," meaning by that, of course, the organized labor vote, would be swung to Mr. Wilson. But it was the votes of agricultural communities in the west that elected Mr. Wilson. Almost all the states in which there is a large organized labor element was carried by Mr. Hughes by large majorities. It was ever thus. The "labor vote" is always the cause of a lot of noise and apprehension, but it never is an important factor on election day. In fact, experience indicates that organized labor is more of a liability than an asset in politics. There are so many people who dislike its methods and suspect its motives that when it comes out in open support of a candidate it is likely to drive more votes from him than it will attract to him. The returns indicate that Mr. Wilson was elected in spite of the Adamson law and the organized labor vote, not in any degree because of them.

Where Was the Labor Vote?

In the comments on the Toledo, St. Louis & Western and Chicago & Alton annual reports, which appeared in these columns November 3, it was stated that interest on all classes of the Clover Leaf's bonds was charged out of income and paid in the fiscal year ended June 30, 1916. This was a mistake. As a matter of fact, interest on the collateral bonds of 1917 of the Clover Leaf, secured by the deposit of Chicago & Alton stock, was not paid. The annual report which the receiver, who is also president of the company, made to the stockholders showed the interest on these collateral bonds, as well as other interest, as a charge to income, and there was no statement attached to the income account to show that the interest on the collateral trust bonds was not paid; neither was there any note to this effect attached to the balance sheet. We find on investigation that in the annual report which the receiver made to the Interstate Commerce Commission it was shown on the income account that, although a charge was made to income for the interest on the collateral trust bonds, this interest was not being paid. On the balance sheet filed with the Interstate Commerce Commission there was also an item showing $1,097,197.50 "interest matured unpaid." This includes interest on the collateral trust bonds. In other words, in the report made to stockholders it would appear that the receiver was paying all the interest that was due, while in the report made to the Interstate Commerce Commission it is plainly shown that the receiver is not paying interest on one issue of bonds. The report to the Interstate Commerce Commission is in accordance with the facts and the report to the stockholders is not.

A Correction of a Misleading Statement

The outstanding features of the proposed plan for the reorganization of the Chicago, Rock Island & Pacific are the assessment of $40 per share on the stockholders of the old company by which $30,000,000 cash is to be raised, and the exchange of the $20,000,000 outstanding debentures for an equal amount of 6 per cent preferred stock. Stockholders of the old company are to receive $40 par value of new 7 per cent preferred stock, on which interest is cumulative up to 5 per cent, for their payment of $40 in cash. The dividends on the 6 per cent preferred stock are also cumulative up to 5 per cent. The subscription for new preferred on the part of holders of the old stock is made compulsory if the stockholder wishes to retain his stock, or rather to exchange his stock for a like amount of stock in the new company. Proposals have been discussed for creating a new open mortgage, under which permanent financing could be done from time to time as conditions required. If such a mortgage were to be made the holders of the present refunding 4 per cent bonds would have to agree to exchange these bonds for new ones secured by the new mortgage since the mortgage securing the old refunding bonds does not permit the placing of any other mortgage on the property while the refunding 4's are out-

Chicago, Rock Island & Pacific Reorganization

standing. The inducement which will probably be held out to holders of these refunding 4's to exchange will be to offer them a new bond bearing 4½ per cent interest. Conditions in the investment market have changed so materially in the last few years that bankers and railroad executives are generally of the opinion that a road ought to have a flexible means of financing which would permit either the sale of bonds at an interest rate high enough to be attractive to investors, or the sale of stock. As it was, and still is, under the Rock Island's refunding mortgage, that company had to do any large piece of financing by the sale of stock. It would appear not only to the interests of all other securityholders but to the interests of the holders of the refunding 4's that a new mortgage be created and the refunding 4's exchanged for new 4½ per cent bonds.

General Interest in Better Railway Regulation

One of the most significant indications of the widespread recognition of the defects in present methods of railroad regulation caused by the conflicts between federal and state jurisdiction is the fact that the National Industrial Traffic League, at its annual meeting last week in Chicago, went on record as favoring the centralization of regulation in the hands of the federal government. The league is by all means the most important and most representative organization of shippers in the United States, in so far as traffic matters are concerned, and the traffic managers of industrial companies and of commercial organizations who compose its membership are in a better position than any one else except the officers of the railways to observe the unsatisfactory results of the attempt to divide the regulation of interstate commerce between the federal authority and that of 48 states. The position taken by the league will therefore undoubtedly carry a great deal of weight in connection with the investigation about to be undertaken by the Newlands committee. Another significant fact in connection with the proposed inquiry is the interest being taken by the Chamber of Commerce of the United States in the plans for bringing about a better co-ordination of our system of railroad regulation. A special meeting of the national council of the chamber to be held at Washington this week is to be devoted mainly to the discussion of railroad questions and a special committee of the chamber is to make a study of the subjects to be considered by the Newlands committee. The chamber is the most important and most representative organization of business men in general in the country and the efforts it has put forth to aid in the solution of the important problems facing the railways not only indicate a recognition of the vital public interest in these questions but should have an important effect on the manner in which they are settled.

THE RENEWED THREAT OF A STRIKE

AS repeatedly predicted in this paper, developments are showing that the passage of the Adamson law has not settled the controversy between the railways and their employees in train service.

Immediately after that law was passed, the executives of the railways submitted it to the scrutiny of a committee composed of a number of their ablest lawyers. This committee reported that in its opinion the law is unconstitutional, and that if it is constitutional there is the gravest doubt as to the interpretation which should be put upon it. One of the main points in doubt is as to whether the law does or does not absolutely abolish the mileage basis of compensation. The compensation of employees in train service is now reckoned on the dual basis of miles and hours. The Adamson law says eight hours shall be taken as the basis for reckoning daily compensation, and mentions no other basis whatever. The men contend that the roads should still use the basis of mileage as well as hours. In other words, if a man runs 100 miles in four hours he should be paid a day's wage; if he runs 120 miles in seven hours he should be paid 20 per cent more than a day's wage; if he takes nine hours to run 100 miles he should be paid a day's wage and an hour's overtime, etc. Counsel for the railways say that for the railways to take any basis but hours for reckoning compensation might turn out to be a violation of the law and subject them to its penalties.

This being the attitude of their counsel, the roads have proceeded at once in all parts of the country to take the act into court, first, to test its constitutionality, and, second, if it is held constitutional, to get an interpretation of it that will protect them from incurring its penalties. The natural procedure to adopt is that of seeking an injunction to suspend enforcement of the act while it is in litigation.

To this procedure the leaders of the brotherhoods violently object. After a meeting with the Conference Committee of the Railways in New York last Monday the brotherhood chiefs indicated that unless the railways let the law go into effect on January 1, there will be a strike.

There is but one answer, it would seem, which, in the circumstances, the railways can make to this threat. That answer is that no proper and legal effort will be spared by them to secure a test and an interpretation of the law in the courts at the earliest possible moment, that if the courts think proper to suspend the operation of the law it will be suspended; and that if because of this the employees decide to strike they will simply have to strike. The railways offered arbitration of the dispute, and it was refused. While under our law arbitration is voluntary it is also true that under our law every corporation as well as every individual is entitled to its day in court. It is peculiarly necessary that the railways in this instance should insist on having their day in court before the law goes into effect, because even if they tried to comply with it they could not do so with any certainty that they were not actually violating it.

The situation has some phases which make it much better than that which existed when a strike was threatened before. Developments immediately preceding the time when the original strike order was to go into effect indicated that in all parts of the country there were thousands of men who did not want to strike; and there is reason to believe that the labor leaders would now experience great difficulty in getting a strike vote which would be anywhere near unanimous. In other words, a strike in train service, while a serious matter, would be nowhere near so serious a one as most people thought six months ago. A strike to maintain the Adamson law would be regarded with especial disfavor by the men, because there are thousands of them, especially in passenger service, who fear that strict enforcement of that measure would increase their hours or reduce their pay, and who therefore would welcome its repeal. Again, President Wilson has repeatedly and solemnly committed himself to legislation to prevent strikes, and has promised the country to bring the subject to the attention of Congress early in its next session. Forewarned is, or ought to be, forearmed. The country having been brought to the very verge of the precipice last September, it will hardly tolerate procrastination in dealing with the threat of a strike this time. The nation recognizes the fact that legislation on this subject would not be primarily or mainly for the protection of the railways, but for the protection of the public itself.

If there were no point in question regarding the law except its constitutionality the attitude of the labor leaders would be unreasonable enough, but everybody knows that, altogether aside from its constitutionality, there are the widest differences of opinion as to its meaning. The threat of the labor leaders to cause a strike unless the law is put into effect by the roads is simply a threat to cause a strike unless the roads apply the law *according to the labor leaders' interpretation,* and take

their chances on incurring its penalties. The cheek shown by the labor leaders in assuming this attitude is perfectly consistent with all the other amiable and beautiful qualities they have manifested throughout this controversy. Less than two months ago the railway managements met unflinchingly the threat of a strike after the strike order actually had been issued. They will meet these latest threats in the same manner.

THE SUPERINTENDENT'S NEW FRIENDS

THE division superintendent is a most important officer. He is the king of his little kingdom and the good results of his efficiency or the losses from his inefficiency are larger and more striking than in the case of some other officers. His quality is one of the most important things for the general manager to give attention to. These statements, to be precise, might need some little qualification, but the subject has been discussed at length in the past—for example, by C. H. Markham at Memphis last August—and we shall assume that the reader understands what is meant. It is the safety-first meeting, recently held in Detroit, and reported in the *Railway Age Gazette* October 27, which has brought this subject to notice. The leading speakers at that meeting—leading both because of the force of their speeches and the extent and value of their experience—repeatedly emphasized the conclusion—the result of their extensive observations, that the whole success of their propaganda, whether safety-first, safety-all-the-time, or safety unqualified, depended on two things—supervision and instruction. The corollary of this is that the safety of railroad operation depends on the man who is responsible for the supervision and instruction of the trainmen, trackmen, shopmen and others who carry on the work—and for whose benefit, primarily, the safety-first movement exists.

Another phase of the same thing came out in the uniform testimony of these experienced observers and critics, that the superintendent should always be the permanent chairman of the safety-first committee. Besides being, presumably, fully as capable as any other man on the division, he has the most comprehensive motive. In a sense, he is more concerned to prevent loss of lives and limbs than the owners (of the lives and limbs) themselves; for his reputation hinges in part on their preservation. The individual employee, on the other hand, sometimes forgets the details of his responsibility for himself and is too shortsighted or selfish to realize fully his responsibility for his fellow employee. The impression that one gets from the discussions of these safety specialists is that the virtue and worth of the efficient and wholly competent superintendent are not adequately appreciated; that the waste and demoralization due to the presence of a second-grade or third-grade man in this position are not fully realized; and this impression undoubtedly is well founded.

These specialists are careful and impartial observers. Their observations ought to lead to a good deal of thoughtful consideration of the superintendency. Such consideration would be followed by an elevation of the superintendent's work generally, or at least would more clearly define the ideals of the position. Managers giving attention to the matter would further strengthen the arms of strong superintendents and would arouse themselves to supplant—or educate—the weak ones.

The superintendent is peculiarly liable to the dangers of isolation. He can cover up many of his errors, thereby depriving himself of salutary criticism, and can take to himself the credit for the good work done by others. If he does this he weakens his conscience.

To constantly grow, and to accomplish the best things, he ought to study the good work (and the bad work) of other superintendents. He cannot learn his duties in school or college, and unless he is exceptionally brilliant as a student of books, this is his main resource. But he can do this comparing only with difficulty. Thus he may become narrow. The fact that this study is difficult is no reason, however, why the task should be given up. In so important a matter as the supervision of 5,000 or 10,000 men, scattered, perhaps, over a whole state, studying the work of one's fellow officers is a good deal of a problem. Facts must be systematized and the fundamentals must be made as prominent as is the constitution of a State in relation to the current statutes. If the superintendent, because of the multiplicity of his duties, and the variety and gravity of his operations, finds it difficult to clarify and carry out his ambitions, he has all the more incentive to make the fundamentals of his work a part of his very life, drilling himself in them day and night. And the significance of the utterances of these safety-first men is that in these new critics the American railroad superintendent may find a most useful aid in perfecting himself. They will point out the value of his good work, and will condemn his mistakes or his laziness, in a way that will be refreshing, if he will give them the opportunity. Heretofore he has labored under drawbacks in this matter. Comparing oneself with others does not always evolve the highest wisdom.

The superintendent is subjected sometimes to a good deal of neglect on the part of his general manager, largely because no good way to educate him has been found. So simple a thing as systematic appointment of understudies is neglected everywhere. We are not unmindful of the shining exceptions to these general statements, nor of the fact that in blaming a manager for not properly educating his superintendents we are blaming him for something that is impossible unless he began five or ten years ago; but the fact is everywhere acknowledged.

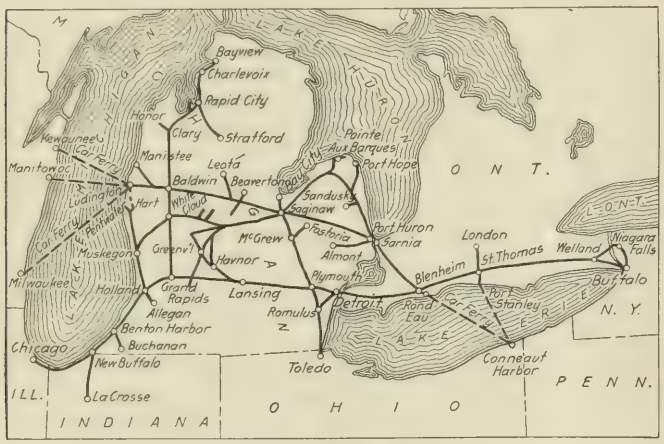
Everybody knows also, that a superintendency often makes on its incumbent the most extreme demands. Like a railroad presidency or the presidency of the United States, some of its problems may baffle the best man in the world. But the course to be pursued is pretty plain, nevertheless; and in seeking to do one's best, in any line of endeavor, few elements are more important than a frank, friendly, firm, intelligent outside critic. In the comments of the safety sharps the superintendent can find such criticism. Sometimes, also it is a good thing if the critic has considerable power. Most of the safety-first men have not much authority; but some of the most interesting passages in their discussions are those which tell of how they have got the general manager's signature attached to their letters and circulars. This is not a suggestion to the superintendent to drive the safety man to the higher authority; rather it is a hint to examine all safety proposals with a good degree of care. If such proposals are inherently good and worthy of execution, the superintendent ought to be able to see their merits as well as anybody else.

PERE MARQUETTE

THE Pere Marquette has been in the hands of receivers since 1912. At times it must have seemed an almost hopeless task to the bankers and reorganization committees to try to work out any satisfactory plan of readjustment. State regulation has been a mill-stone around the neck of the property, and a very diversified top heavy funded debt added to the difficulties, but at last the Michigan Public Service Commission has agreed to approve a reorganization plan calling for the issue of $105,000,000 securities, with a reservation that "it will not be inferred that the commission is of the opinion that the property of the Pere Marquette Railroad Company has a value of $105,000,000 measured by any legally recognized standards. The commission is clearly of the opinion that it has not such pres-

ent value. . . ." Nevertheless the commission approves the issue of the $105,000,000 of securities whereby the debts of the old company are to be refunded or converted into a liability contingent on earnings and $16,000,000 of new money is to be raised, but this is to be accomplished only at the cost of pretty heavy bankers' commissions. If the Michigan railroad commissioners would seriously study the elements which go to make up this cost of reorganization they would find that one element which bulked large was the risk that bankers and their clients are being compelled to take by the commission's willingness to let new money come into the state only on condition that at any future time the state railroad commission can, if the reorganization should prove to be quite successful, order rates reduced on the ground that after all $105,000,000 was too great a capitalization on which to earn a fair return.

The total funded indebtedness, including equipment obligations and receiver's certificates, of the old Pere Marquette was $81,143,000, and the total outstanding securities, including stock and bonds of the Canadian lines, which are not to be disturbed in the reorganization, was $113,340,000, and annual fixed charges amounted to $4,127,000. The total funded indebtedness of the new company is to be $36,325,000, and the total outstanding securities, including stock, $105,000,000, with $1,688,000 fixed charges and $1,181,000 annual preferred dividend charges which are cumulative. In the fiscal year ended June 30, 1916, total



The Pere Marquette

net income available for interest charges, rentals and hire of equipment was $6,210,000. Rentals amounted to $665,000 and the debit balance of hire of equipment to $749,000. This left approximately $3,110,000 available for interest and dividends. With interest amounting to $1,688,000, and cumulative dividends to $1,181,000, there would have been a surplus of about $241,000 after paying interest charges on the new bonds, 5 per cent on the new prior preference stock and 5 per cent on the new preferred stock.

The fiscal year ended June 30, 1916, was the best from the point of view of earnings of any in the history of the Pere Marquette. The company, operating 2,249 miles of line, earned total operating revenues of $21,210,000, an increase as compared with 1915 of $3,182,000. Nearly two-thirds of this increase was saved for net. The net operating income in 1916 was $6,053,000, an increase over 1915 of $1,981,000. The ratio of expenses to operating revenues in 1916 was 68.51, and in 1915 74.57.

In commenting on the 1915 annual report of the Pere Marquette the *Railway Age Gazette* said that the amount spent for maintenance in 1915 was possibly smaller than would be required on an average annually over a series of years. Frank H. Alfred, general manager for the receivers, disagreed with this statement, pointing out that an average expenditure for maintenance of way of $900 per mile was possible on the Pere Marquette because such a large proportion of it was branch line mileage which did not justify much expenditure for renewals and upkeep. As a matter of fact, in 1916 maintenance of way expenditures were just about what Mr. Alfred had predicted. In 1916 the Pere Marquette spent $878 per mile for maintenance of way, the total expenditure for the road being $2,007,000. This compares with $2,000,000 spent in 1915.

On the other hand maintenance of equipment charges were very much larger in 1916 than in 1915, the total in 1916 being $4,268,000, an increase of 22.19 per cent. In part, of course, this is due to a greater mileage made by rolling stock, but even on a per mile run basis the charges were higher in 1916 than in 1915. Maintenance per freight car mile, excluding retirements and depreciation, was 1.034 cents in 1916 and 0.708 cents in 1915. Maintenance, exclusive of retirements and depreciation, of locomotives per mile run was 10.877 cents in 1916 and 10.848 cents in 1915. Maintenance of passenger cars per mile run, exclusive of retirements and depreciation, was 1.35 cents in 1916 and 1.201 cents in 1915. Besides this there was a large charge to operating expenses for retirements of freight cars, the charge on this account in 1916 being $126,000 as against $19,000 in 1915.

In holding down transportation expenses the management was very successful. The total number of tons of revenue freight carried one mile was 2,345,121,000, an increase over 1915 of 270,560,000. The number of passengers carried one mile was 207,168,000, an increase of 7,436,000. Transportation expenses in 1916 amounted to $7,338,000, an increase of $315,000 over 1915. The average trainload of revenue freight was 519 tons, an increase of 54 tons as compared with 1915, or 11.57 per cent. To some extent the management was helped by a better balanced traffic. Loaded freight car mileage increased by 12.24 per cent, but empty freight car mileage actually decreased by 13.17. One item of saving in transportation expenses was in fuel. Revenue locomotive mileage increased 3.58 per cent, but there was a decrease in the number of tons of coal consumed. Another economy which should be mentioned is a decrease of $57,000 in the amount paid for loss and damage to freight. There was 12,000 less claims presented in 1916 than in 1915 and the ratio of payments to freight revenue decreased from 2.01 to 1.29. The operating receiver of the Pere Marquette, Paul H. King, has devoted a good deal of time to studying the attitude of the public served by the road and the problem of getting the good will of this public. His success in reducing loss and damage to freight is only one of a number of instances in which he has been successful along these lines, both to the immediate profit of the road and to its future benefit.

There was a net charge for additions and betterments to road of $259,000, and the retirement of equipment, mostly freight cars, made a net credit of $314,000, to the figure at which the equipment was carried on the books. Betterment of equipment consisted of such improvements as 668 cars equipped with steel center sills, 3,368 cars equipped with safety appliances, 304 cars equipped with steel ends, 27 locomotives equipped with superheaters and 24 with new fireboxes.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Mileage operated	2,249	2,286
Freight revenue	$15,098,256	$12,562,623
Passenger revenue	4,129,019	3,938,086
Total operating revenue	21,210,053	18,028,210
Maintenance of way and structures	2,007,172	2,000,282
Maintenance of equipment	4,268,058	3,492,973
Traffic expenses	381,311	379,125
Transportation expenses	7,338,105	7,022,741
General expenses	492,361	500,859
Total operating expenses	14,530,425	13,444,014
Taxes	626,275	511,715

Operating income	6,053,354	4,072,481
Gross income	6,209,965	4,267,018
Net income	254,558*	1,419,265*†

*This is after the deduction of all interest charges of the old company. Actually the receiver only paid a small part of these interest charges in each year.
†Deficit.

NEW BOOKS

The Rise of Rail-Power in War and Conquest, 1833-1914. By Edwin A. Pratt. P. S. King & Son, Ltd., Orchard House, Westminster, London, Eng. J. B. Lippincott Company, Philadelphia. 404 pages. Bound in cloth. Price $2.50.

This is a book of unusual interest, which American railway men will find especially timely now that discussion is beginning of the part that railways must play in preparedness.

Mr. Pratt treats his subject from the historical point of view, detailing the uses that have been made of railways in modern warfare. He goes into considerable detail concerning the gradual evolution of the military railway organizations in England, France and Germany, which proved so effective at the outbreak of hostilities in 1914. He also has a thesis, namely, the necessity for preparation in time of peace. A nation to use its railways most effectively in time of war must perfect an operating and construction organization in advance and by all means must it clearly define the relative authority of military and railway officers, bearing in mind that railways can be efficiently operated by railwaymen alone.

American readers will be particularly interested in being reminded that it was in our own Civil War that railways first came into their own in war time. Naturally enough, no palms were taken for efficiency in the operation of railroads in the first few months of the conflict, but as time went on a construction and operating organization was developed that was the envy and example of the Germans in the Franco-Prussian War and the model for France and other countries in later years.

There has been much discussion as to the first armored and ambulance trains. Mr. Pratt shows clearly that both ideas were first made actualities in the Civil War. In fact he declares that: "It was the American Civil War that was to elevate railway destruction and restoration into a science and to see the establishment, in the interests of such science, of an organization which was to become a model for European countries and influence the whole subsequent course of modern warfare."

The author gives considerable space to the Franco-Prussian War, the importance of which was not so much the efficient uses made of railway transportation as it was that the complete demoralization of French railway transportation and the inefficiency of the German organization compelled both sides to develop more efficient methods. The uses of railways in the Boer and the Russo-Japanese wars are also treated in detail.

Strategic railways come in for a good share of attention, especially those of Germany and France. Military railways are dealt with in connection with the Crimean War, the Russo-Turkish War of 1877-8 and the various campaigns in the Sudan.

One of the most striking chapters in the book deals with the German-African Empire. Mr. Pratt has tried to show that Germany actually hoped to gain eventually almost the entire continent of Africa. He shows that each of the colonies she already had was more than anything else an armed camp well supplied or in process of being supplied with railways built for aggressive military purposes.

Mr. Pratt carries his story only to the outbreak of the present war in Europe. It is somewhat unfortunate that he has been unable to tell us anything of the uses made of railways during mobilization and in later months. There seems an omission, also, in that the subject of electrification from the military point of view has not received consideration.

Letters to the Editor

SKILLFUL USE OF THE WHISTLE

CHICAGO.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Your correspondent "D. W. E." in a communication published in the *Railway Age Gazette* of March 17, seems to refer to an interesting experiment made many years ago by the then general superintendent of the Fitchburg Railroad, now a part of the Boston & Maine. The account came to me, as mechanical editor of The Railway Age, at first hand and was published in the issue of October 19, 1894. For the reason that it shows that some of us were thinking on the subject over 20 years ago—though it seems we have not got very far since—the whole story may be of interest. It was written over the signature "The Inspector," as follows:

"A whistle is a more or less useful adjunct to every locomotive. But the degree of its usefulness under present conditions depends largely upon the engineer who operates it. The dozen or more signals contained in the whistle code of every railroad have each a distinct significance; and, as a rule they are substantially the same for all roads. It, therefore, opens up a few avenues for speculation when it is considered that a person outside the pale of the railroad fraternity, though he may have heard these signals every day for years is yet usually unable to distinguish their meaning. The reason is not far to seek. As a matter of fact each engineer and train crew have adopted a series of signals known to themselves, perhaps, but not down in the code. It occasionally happens, and has a few times happened with disastrous results, that the train crew, or some member of it—say a man doing duty as a flagman—has misunderstood the 'old man's toots.'

"Ever since the time when one of Stephenson's embryonic locomotives ran into a farmer's wagon and smashed a few dozen of eggs, and thereby suggested the advisability of some means of sounding a warning when approaching a highway crossing, there have been those who wondered if the same results could not be accomplished in a less obnoxious way. The substitute is, however, still wanting. I am, therefore constrained to believe that the whistle is all right, and that the fault lies with the man who sounds it. Let us see.

"Among the signals upon the established code is one meaning 'release brakes.' This came into vogue when only hand brakes were used. Its derived meaning is a warning that the train is ready to start. It is given by two long blasts of the whistle. I should say that this is the way it is put down upon the code. As a matter of fact it is usually given by two short 'toots.' This actually means something entirely different, but the train crew and others usually understand and no harm is done. But why not follow the code? Again, what is a long sound upon the whistle? Some roads specify 'not to exceed ten seconds.' Others say 'not less than one second.' I am borrowing an illustration from a gentleman with whom I was talking the other day when I cite the instance of a builder who asked ten of his workmen to bring him each a long and a short board and who upon taking account of stock found he had twenty different lengths of boards. Ask each one of a company of fifty people to rise and remain standing for one minute. There will be fifty different records, varying from ten to fifty seconds. It is not fair to expect an engineer with a multitude of other matters demanding his attention to be more accurate in his guess—that is the proper word—than those people whose whole mind is concentrated upon the subject.

"Neither is it proper to trust the safety of a train load of

passengers to a guess upon a guess. If the engineer guesses the duration of the blasts of his whistle about right, and the receivers of the signal guess its meaning aright, it is all right. However, the element of human fallibility remains.

"I know of but one attempt to eliminate the personal element from this equation. This has been done in a quiet manner, and so far as I know has never before been mentioned in print. Mr. W. D. Ewing, general superintendent of the Fitchburg road, has for a long time been laboring with his engineers to teach them the proper use of the whistle. His foundation idea has been that the sounds should be of such relative duration that there should be no possibility of mistaking a long whistle for a short one, or vice versa. He is also a disbeliever in unnecessary noise. The plan first employed was to define a long and a short whistle. The limits decided upon were one second for a long whistle and one-quarter of a second for a short one. This was drilled into the minds of the engineers until some restive representatives rebelled on the ground that it was too late in life to begin a musical education. But the net result was good. The next step was an ingenious mechanical device designed to teach by audible evidence the length of a second. It is operated by a battery on the principle of a 'buzzer.' A switch controls the connections in such a manner that one or more short sounds, one or more long sounds, or combinations of the two, are given. The duration of the long sounds is one second, and of the short sounds one-fourth of a second. Located temporarily in the different roundhouses upon the system, the little machine has indelibly impressed upon the minds of many engineers the length of a second.

"The final outcome is not yet fully developed. The principle is determined upon, and there is a keen competition among the officials and employees of the Fitchburg road to see who will first get the device into practical shape. It is a family affair. The idea is to so perfect this machine that the pressing of a button or the turning of a handle, as in the engineer's brake valve, will cause the whistle to give the proper combination of sounds. The personal element is to be absolutely obliterated. The pressing of one knob will give one or more short sounds of the whistle, one or more long sounds, or any predetermined combination of the two. I think Mr. Ewing is on the right track."

I still think he was. The experiment of asking a number of people to guess how long a minute is, to which reference is made in the account, was a preliminary part of Mr. Ewing's work—performed as a game at a church social, as I remember it. Your correspondent is right as to the length of the signals he mentions. FRANCIS W. LANE.

DRED SCOTT DECISION RECALLED

BOSTON, MASS.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have just been reading in the *Railway Age Gazette* of October 27, page 742, how the Interstate Commerce Commission has acquiesced in the cold and arbitrary action of the post office department in changing the rates which the government is to pay the railroads for carrying the mails. What are we coming to? Is our paternal government at Washington getting so strong, fat and self-sufficient that even the right of petition has become worthless?

I was brought up in a railroad office from a child, my father having been in the railroad service long before I was born. Many facts of railroad life therefore came within my consciousness at a very early age. I cannot say exactly that I drew them in with my mother's milk, or that I learned them at my mother's (or father's) knee, but I got a good many of them by looking over my father's shoulder.

And one of the first of these facts that astonished me was that the Congress of the United States deliberately fixed the compensation to be paid the railways for carrying the mails, without giving the officers of the railways the least voice in the matter. As a boy I had ideals of justice, and this fact was one of the worst jolts that those ideals suffered.

The recent high-handed action of Post Master General Burleson, in imposing the space rates on the railroads for 98 per cent of their mail service, when Congress intended that the change should be made only on a few experimental lines, revives this early memory.

I write to you simply to recall the fact that this attitude of the Government, treating the railroads as sixty years ago it treated Dred Scott, as having no rights which anybody is bound to respect, is a long settled condition. Mr. Burleson has the authority of years behind him, and, evidently, he realizes it.

In spite of this petrified condition of our governmental machinery the spirit of progress does show signs of life now and then. Congress, nowadays, goes through the motions, occasionally, of giving the railways a brief hearing. But a spirit that has prevailed for 50 years is not going to be easily vanquished. If you expect to down Mr. Burleson, you had better keep on your job 24 hours every day. A. X.

[Dred Scott was a slave.—EDITOR.]

MR. ELY AND THE WIDE FIREBOX

NEW YORK.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The obituary notice of Theodore N. Ely, appearing in your issue of November 3 contains the following statement, quoted from the *Railway Age Gaette* of July 7, 1911:

"It was Mr. Ely who took the first step, alone, against the protests of many by whom he was surrounded, that has led to the development of the large locomotives of today. While builders and engineers considered that the end had come, that the locomotive had reached the limit of its power, because of the restrictions current construction put upon the size of the firebox; Mr. Ely lifted his whole boiler into the air, set his foundation ring on top of the frames, widened his firebox and gave the machine a new lease of life. Many and dire were the predictions made as to the instability of the new design. But we all know the result. It did not upset, but ran with unexampled smoothness; and, with construction revolutionized, the whole country followed in his wake. This is but a single example of his work."

While the application of the design referred to, on the Pennsylvania Railroad, is correctly stated as being the "work" of Mr. Ely, the clear implication of the above statement is that it was original with him. In the interest of historical accuracy, as well as in justice to James Milholland, who was one of the most able locomotive designers of his time, I feel obliged to call attention to the fact that such implication is absolutely incorrect and unwarranted.

As a matter of fact, within my personal knowledge, it was Mr. Milholland, and not Mr. Ely, who first, in the language of your article, "lifted his whole boiler into the air, set his foundation ring on top of the frames, widened his firebox, and gave the machine a new least of life." My present recollection is that this was first done in the 4-4-0 engine "Vera Cruz," of the Philadelphia & Reading, with the construction of which I was personally familiar, and which was put in service not later than, and perhaps earlier than, the year 1859. Illustrations of this engine, fully showing the construction referred to, will be found on Plate 53 of American and European Railway Practice, by A. L. Holley, New York, 1861, and it was also illustrated in an issue of the London Engineer of 1860, the exact date of which I do not recall.

I have no desire to detract from the high and well merited reputation of Mr. Ely, but, if he were with us today, I am entirely certain that he would neither claim, nor wish to be credited with, the design of Mr. Milholland.

J. SNOWDEN BELL.

Refrigeration of Perishable Freight in Transit*

A Discussion of the Efficiency of Different Types of Refrigerator Cars and Results of Tests Made on Them

By M. E. Pennington
Food Research Laboratory, Bureau of Chemistry, United States Department of Agriculture

THE people of the United States are as dependent upon refrigerator cars for their food supply as are the people of England upon her ships. The English refrigerated food ship is the result of a systematic evolution; the American refrigerator car, like Topsy, has "just growed." The United States has now well over 100,000 refrigerator cars belonging to railroads. It costs at least $1,500 to build

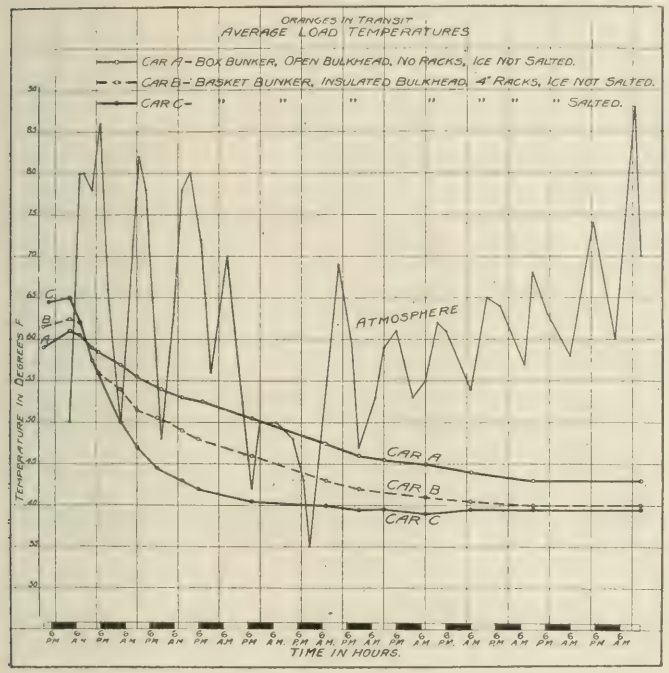


Fig. 1

a refrigerator car, and most of them are in need of rebuilding after five years of service. With such an investment and cost of maintenance, and with the responsibility of transporting fresh food to the people, we may well inquire into the efficiency of the car for the work it is performing, and into the expense involved.

The United States Department of Agriculture, through the Bureaus of Plant Industry and Chemistry, has, for some years, been studying the temperatures required to preserve perishable produce in transit. The department has obtained definite information on fruits, vegetables, dressed poultry and eggs. It is now determining the most efficient and economical means of transporting these perishables. The problem is of great importance to the shippers, to the railroads, and to the consumer as well.

The efficiency of the refrigerator car depends upon such factors as the quantity and kind of insulation, the type and the capacity of the ice bunkers, the size of the car, the temperature of the entering load, the manner of stowing the packages, the circulation of the cold air from the ice bunkers, and the freedom of the insulating material from moisture. The economy of operation depends on such factors as the weight of the car in relation to the weight of the load, the amount of ice required to cool the product in transit, or to maintain the initial temperatures of the precooled load, and the length of life of the car. All these, and other questions are the subject of investigation in the Department of Agriculture in connection with the study of the preservation of the good condition of perishables while in transit. Apparatus and methods of investigation had to be developed to obtain the necessary data. Gradually there has been evolved an arrangement of electrical thermometers which can be installed not only in appropriate locations in the car but within the packages, and even inside an orange, peach, chicken or fish. The wires from these thermometers run out between the packings of the door, and the terminals are permanently or temporarily

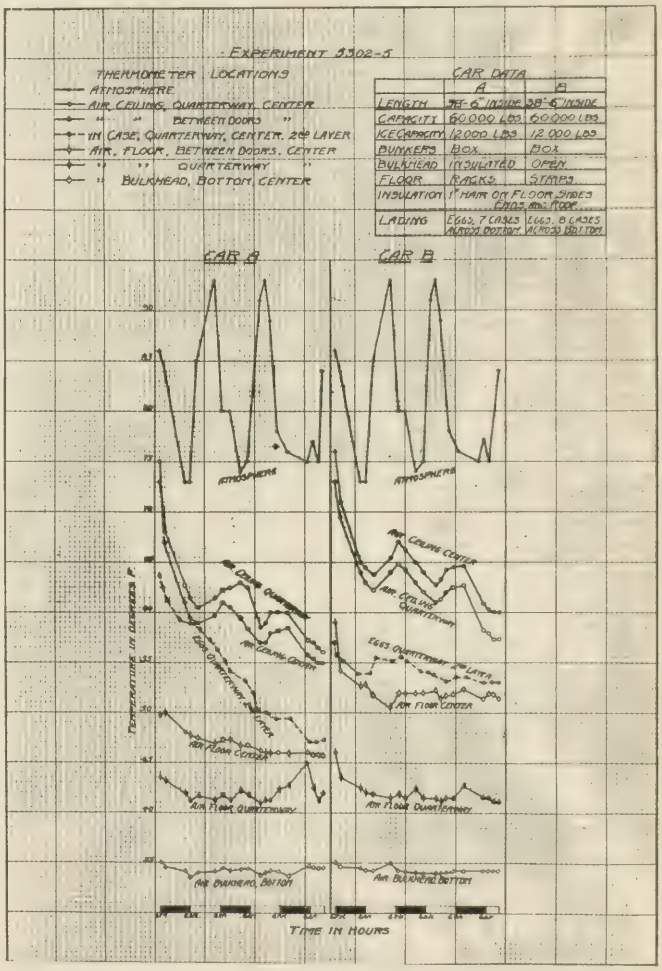


Fig. 2

attached to the indicators installed in an accompanying caboose.

To complete this investigation will require years of detailed study. Certain fundamental facts, however, have been established and are outlined in this paper. For example, the distribution of the cold air from the ice bunker throughout

*This paper was presented before the Traffic Club of Chicago, October 6, 1916.

the car is vital to the preservation of the lading. The circulation of the air is produced and maintained by the difference in weight of warm and cold air. The actual difference between the weight of a cubic foot of air at 65 deg. F. (1.18 oz.) and 32 deg. F. (1.27 oz.) is only 0.09 ounces. Experiments with stationary precooling plants, cooled by ice or by ice and salt, have shown that the best and most economical results are obtained by hanging a basket of suitable ice capacity close to, but not actually free from the walls of the room, and closing off the basket by an insulated bulkhead open about 12 in., both at the top and bottom, to permit entrance and exit of air. In this way a large surface of ice is exposed to air contact and the air is compelled to travel over the entire column of ice before it escapes. The insulated bulkhead prevents the absorption of heat from the commodity and from the car, varying in quantity according to the distance from the ice. The bulkhead also facilitates a steady ascent and progression of the warm air in the car toward the top of the bunker. To further facilitate the distribution of the cold air throughout the space, floor racks 4 in. high have been installed.

Now let us see what practical results such a combination

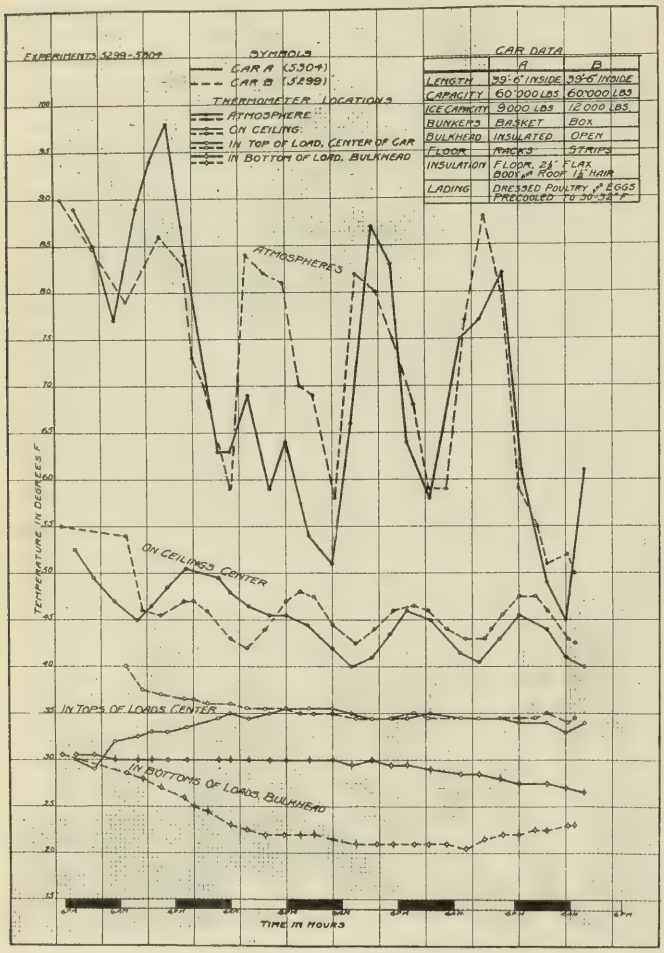


Fig. 3

produces when applied to a refrigerator car which is, in other respects, of the usual type. Fig. 1† shows the average temperatures in three cars of oranges in the same train in transit between Los Angeles and New York, each car containing 462 boxes of fruit. Car *A* had the box bunker and open, or slatted, bulkhead so commonly seen in present day refrigerators. The lading was placed directly on the floor. Car *B* had a basket bunker, insulated solid bulkhead, and a rack 4 in. off the floor. Car *C* was of the same construction as car *B*, but the ice was mixed with 9 per cent salt the first day and 5 per cent of the added ice on the second. The temperature of the load in car *A* averaged 54.4 deg. F. The temperature of the load in car *B* averaged 49.5 deg. F., while car *C*, in which salt had been added to the ice, not only cooled the oranges more quickly but reduced the average temperature

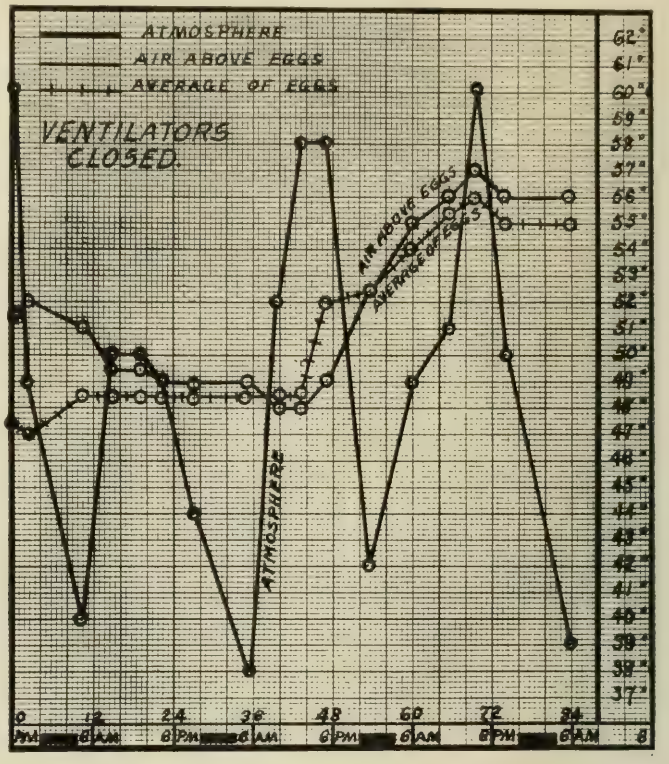


Fig. 4

of the load to 45.4 deg. F., a gain of 9 deg. F. as compared with car *A*. The amount of ice placed in the bunkers in car *A*, including that remaining in them at destination, was approximately 23,200 lb. In car *B* the ice amounted to 18,675 lb., a saving of more than two tons. Car *C*, which had been salted, had 22,750 lb. of ice, still a little less than car *A*.

The results obtained with car *C* open up great possibilities in the better distribution of such extremely perishable products as strawberries, raspberries and cherries, widely produced under conditions which generally preclude proper precooling before loading into the car. The insulated bulkhead prevented the frosting of the lading next to the bunker, and the floor rack provided a quick runway for the very cold air, which soon lost its temperature of 20 deg. F., or even less, by the absorption of the heat of the lading and of the car.

Such results with the basket bunker, insulated bulkhead and floor rack, combined, naturally raise the question of the relative value of each of the three factors in producing and maintaining circulation, and gaining the available refrigeration from the ice. Experimentation shows that a rack on the floor of the car hastens the cooling of the load, and affords very decided protection to the lower layer of goods against both frost and heat. The floor rack alone, however, is far less efficient than the combination of the basket bunker and insulated bulkhead with floor rack. The addition of insulation to the bulkhead increases circulation and the lading is more rapidly and completely cooled than when the bulkhead

†The study of fruits and vegetables is being conducted by the Bureau of Plant Industry under the supervision of H. J. Ramsey. I am indebted to him for the data on oranges and also such other facts concerning the transportation of fruits and vegetables as are brought out in this paper.

is either not insulated or is open. For example, Fig. 2 shows two cars of similar size and construction, one of which was provided with a floor rack and an insulated bulkhead, the other as commonly used. Both were loaded with eggs. The car with the insulated bulkhead and the floor rack reduced the average temperature of the load 17 deg. F. in 64 hours. The load in the ordinary car showed a reduction of 7.5 deg. F. during the same period. The average temperature of the car with the insulated bulkhead and the floor racks was 5.5 deg. F. lower than the ordinary car. That it is not advisable to cease improvements with the floor rack and the insulated bulkhead is indicated by experiments which show

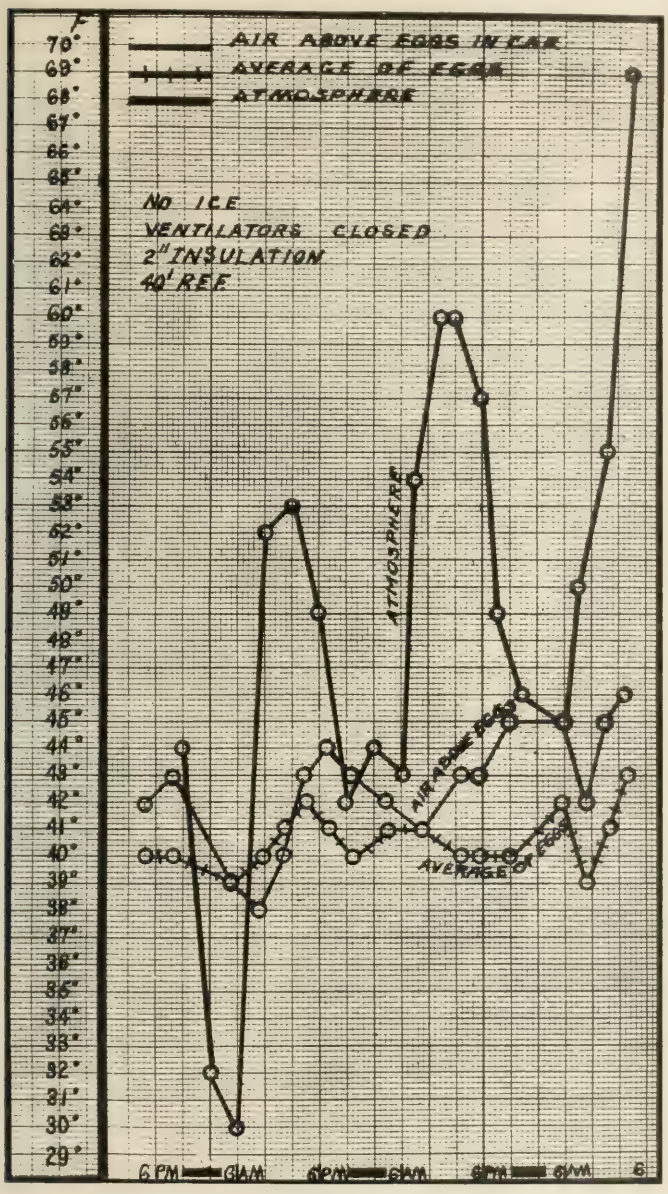


Fig. 5

that the quick cooling by ice and salt safely performed with the basket insulated bulkhead and floor rack is not possible without it. The pocketed cold air at the box bunker, which is always observed with bunkers of the box type, causes frosting of the goods against the bulkhead even when that is insulated.

The failure of refrigerator cars to maintain even temperatures throughout the load has been a serious menace to extremely perishable products. In order to produce temperatures at the top of the load between the doors—commonly the warmest place in the car—low enough to carry dressed poultry safely, it has been necessary to freeze the birds at the bunker. While freezing in transit does not injure the food value of dressed poultry, it does lower its money value at certain seasons or in some markets. Better air circulation tends to equalize temperatures, as shown in Fig. 3. In the car with the box bunkers and open bulkhead (car *B*), where the load was placed on floor strips, the package at the bunker on the floor froze solidly (23 deg. F.) during a four-day haul, although the package on the top of the 4 ft. load was 35.4 deg. F. A similar car (car *A*), except that it had a basket bunker with an insulated bulkhead and a floor rack, maintained an average temperature of 29.3 deg. F. at the bunker and 34.1 deg. F. in the package on the top of the load between the doors. In the one case the average difference between the warmest and coldest points in the car was 12.3 deg. F.; in the other 4.8 deg. F.

The reduction of the temperature on top layers can be increased by better and more judiciously applied insulation, especially in the roof of the car. Most of the cars in service have the same amount of insulation throughout, regardless of the additional straw on the roof during the heat of summer, and on the floor when frost protection is necessary. Experiments are now under way to determine just how much insulation it is advisable to have in roof and floors as well as in the body of the car. At present the work indicates that there is scarcely a refrigerator car in the country which is sufficiently well insulated to be an economical as well as a safe carrier of perishables.

A large proportion of the refrigerator cars now in service have one inch of insulating material over the entire car. Some have two inches throughout, and a few, comparatively, have had especial care bestowed on the insulation of the roof and the floor. The lack of sufficient insulation, especially on the roof of the car, has been responsible for the fact that the top layers of such fruits as peaches, strawberries and cherries are so different in quality from the rest of the carload that they must be sold as separate lots. The higher temperature of the upper half of the car has led the shippers to urge longer cars, that they might extend rather than heighten the stacks of packages. As a result of this, and also in line with a general increasing of the capacity of all cars, the refrigerator has been lengthened, regardless of the fact that heat transmission increases directly as the number of square feet of surface enclosing the car space. For example, a car whose roof, floor, walls and ends aggregate 1,170 sq. ft., and which is 33 ft. between linings, has the same amount of temperature protection with 2 in. of insulation as a car with 2.5 in. of insulation whose surfaces aggregate 1,407.5 sq. ft., and whose length between linings is 40 ft. 6 in. To determine the economical size of a refrigerator car in relation to the height of the lading, the consumption of ice, the total weight of the car and its initial cost is an economic problem of importance. Studies to obtain such information are now in progress.

The most obvious results due to increased insulation are, first, better protection to the lading against both heat and cold, and, second, a saving in the use of ice. The modern trend in the handling of perishables is to include a precooling as a preparation for shipment, and it is a highly desirable practice from all viewpoints. When the goods enter the car at a temperature conducive to preservation, it is the business of the car to maintain that temperature. The goods need no further refrigeration, and the ice in the bunkers is required only to overcome the heat leakage through the walls. The difference in performance of a car with one inch of insulation, as compared with a similar car, except that the latter was provided with 2 in., is shown in Figs. 4 and 5. Both cars were loaded with eggs and closed without putting any ice in the bunkers. The weather at the loading point was cool enough to ensure a cool car. The possible dangers—against which the insulation was to protect—lay ahead. Fig. 4,

showing the performance of the car with one inch of insulation indicates very plainly that it could not protect the eggs. Fig. 5, on the other hand, shows that 2 in. of insulation, even with higher atmospheric temperatures, delivered the eggs at destination at practically the same temperature as they entered the car, and the maximum variation was but 4 deg. The one inch car needed 10,000 lb. of ice—the 2 in. car needed none. Is it any wonder that wide-awake shippers are picking out their refrigerator cars more and more carefully?

York. A similar car provided with basket bunkers, insulated bulkheads, and a floor rack had 18,675 lb. Neither load was precooled.

That precooling of the lading means fewer icings in transit is a matter of common knowledge. That by hard freezing of the goods, they not only do not require additional chilling in transit, but actually furnish refrigeration to the car, is not so commonly recognized. Fig. 6 shows the temperatures in transit of 20,000 lb. of poultry, which went into the car at

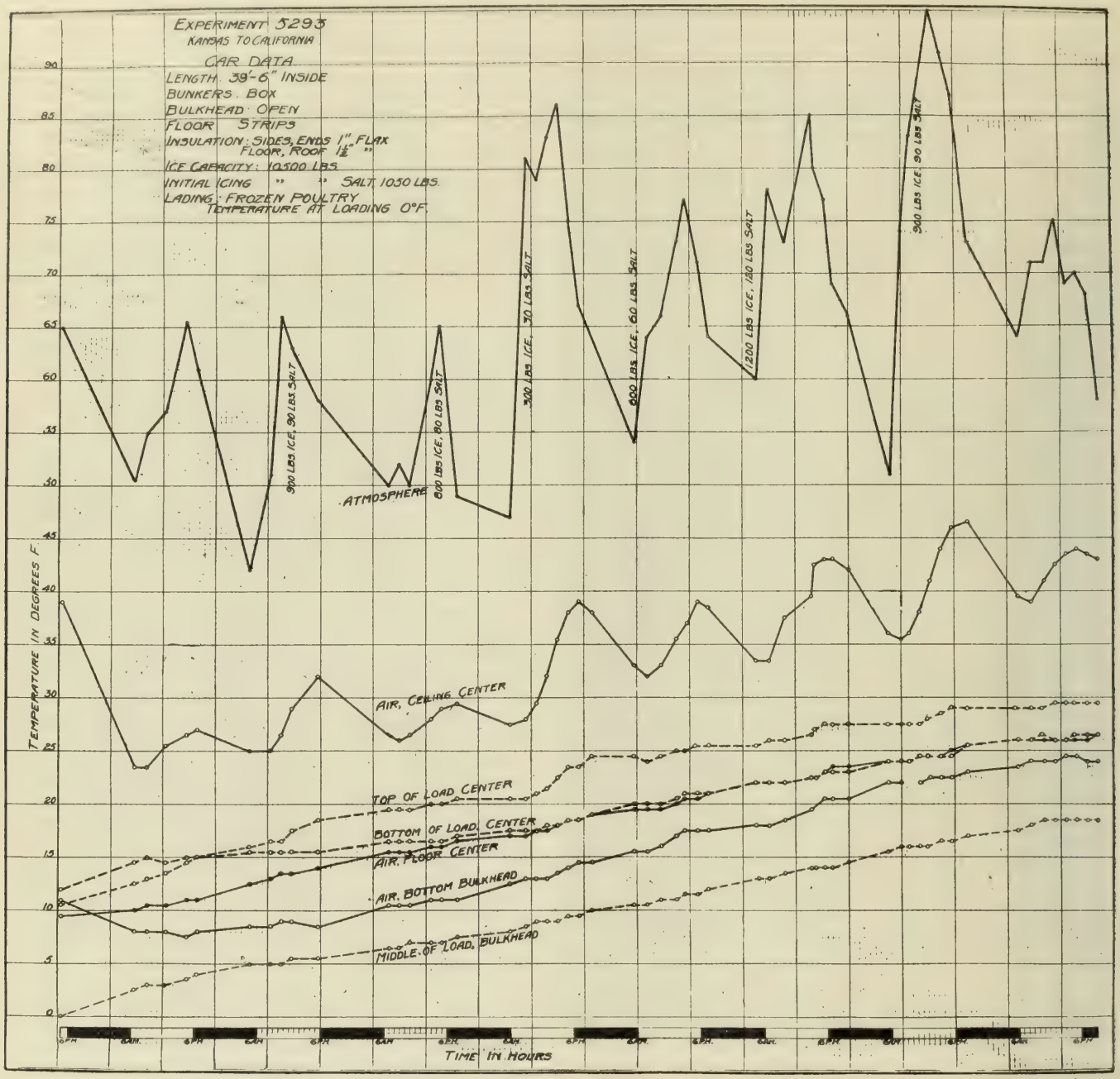


Fig. 6

Experimentation indicates that marked economies can be effected in the consumption of ice in transit aside from the question of insulation. Raising the load off the floor, inducing a circulation of air in the car, and bringing a large surface of ice into contact with the air, tends to reduce the amount of ice used. As stated in another connection in this paper, a carload of oranges in a car having box bunkers with open bulkheads, and without a rack on the floor, had 23,200 lb. of ice put into the bunkers between Los Angeles and New

zero F. The railroad icing record shows that 4,700 lb. of ice was added during the eight-day haul and 470 lb. of salt. Other experiments, under comparable conditions, show that nearly 5,000 lb. of ice is used by cars carrying 20,000 lb. of poultry chilled to 30 to 32 deg. F. during a four-day haul, or approximately twice as much.

The temperature records show that the poultry grew gradually warmer, faster on the top and bottom of the load, where the heat leakage from roof and floor was most pronounced,

and most slowly in the center of the load, where the packages protected one another. The chart also shows that the amount of salt added during transit is insufficient to maintain the temperatures produced on the initial salting, when the full 10 per cent of the weight of the ice was present. It must be remembered that the salt bores through the ice and escapes as brine more rapidly than the bulk of the ice melts, hence it is in constantly decreasing proportion. Icing and salting rules take no account of this fact. It is quite obvious that different rules must be formulated if efficiency is to be secured. This problem, like all the other problems confronting the shipper and the carrier who are engaged in getting perishables to market in good condition, can be solved only on the basis of exact knowledge. That knowledge the United States Department of Agriculture, in co-operation with the shippers and the railroads, is now endeavoring to acquire and to pass on to all whom it may benefit.

RAILROADS ASK INJUNCTION AGAINST ADAMSON LAW

Suits have been filed in the United States district courts by several railroads during the past week attacking the validity of the Adamson "eight-hour" law, and asking injunctions to prevent its enforcement or the filing of suits against the roads for failure to comply with its provisions. In each case the United States district attorney in the district in which the suit was filed and the general chairmen of the four brotherhoods of train service employees on the roads involved are made defendants. Suits have been filed by the Union Pacific, Atchison, Topeka & Santa Fe, Louisville & Nashville, Chicago & Eastern Illinois and Chicago Great Western; and Receiver J. M. Dickinson of the Chicago, Rock Island & Pacific has filed a petition asking for the instructions of the court regarding compliance with the law. It is understood that many roads throughout the country are preparing to take similar action individually.

The petition filed by the Atchison, Topeka & Santa Fe on November 9 in the United States district court at Kansas City, which seems to be typical of the others, attacks the law on the following grounds:

"Complainant says that said act if valid would increase the wages paid by this company to many of its employees to the extent of at least several hundred thousand dollars during the period prescribed by section 3 of said act (but how much more it is impossible to state because it is impossible to know what section 3 means) and would seriously hamper this complainant in framing contracts with its employees in train service. But complainant says that said act is unconstitutional and void for the following reasons:

"Said act is not a regulation of commerce among the states or with foreign nations and is not a means reasonably or appropriately related to any regulation of such commerce.

"Said act does not constitute a legislative judgment that the things required by section 3 thereof are proper, but on its face shows that it merely creates a temporary and experimental status for the purpose of enabling Congress and the President to observe at the expense of this complainant and other railroad companies the effect of the experiment so as to decide in the future whether any such requirements (if constitutional) are proper or not.

"Said act unreasonably and arbitrarily deprives this complainant of its liberty of contract and thereby as well as by compelling this complainant to pay increased wages deprives this complainant of its liberty and property without due process of law.

"Said act is incapable of application to the subject matter with which it deals and is therefore unworkable, and, while imposing enormous penalties for its violation, supplies no rules or standards whereby this complainant can know how to comply with the act; so that complainant though acting in the utmost good faith would be subjected in any effort to comply with the statute to destructive penalties; and by reason of such unworkability and uncertainty said act is not an appropriate exercise of any power possessed by Congress and is not due process of law.

"That the classification of railroads made in said act and the exemption from the operation thereof of certain designated railroads is unjust, unreasonable and arbitrary, and deprives complainant of its property and rights without due process of law; that said act unduly, unjustly and arbitrarily favors certain railway employees who now receive high rates of pay for their services and seeks to compel this complainant to discriminate unjustly and arbitrarily in favor of those employees and against many others who have no less right to equal treatment.

"Said penal clause was enacted and made drastic so as to force compliance with said act through fear of the penalties and punishment therein prescribed and to prevent an orderly resort to the courts for a just determination of the rights of the complainant, and said penal clause, as well as the other provisions of said act, are violative of and contrary to the provisions of the fifth amendment to the Constitution of the United States."

The petition points out that the compensation and working conditions of its train employees have been fixed by agreement with the employees and that "none of said agreements contemplates that an employee shall work a fixed number of hours per day; that all of said agreements contemplate, and the peculiarities of railroad train service necessitate, that employees engaged in the operation of a train shall remain on duty until the train reaches the terminal where such train employees reside or can be accommodated with lodging between trains," and where the crews may be transferred and where the train and locomotive may be handled. "In other words," the complainant says, "said employees are and must be required to perform the piece of work assigned to them, so that their work is measured primarly by mileage and not by hours" and that except in local passenger and freight service and work train service the employees do not necessarily work every working day, but frequently have lay-overs of a day or more between trips, sometimes regular and sometimes irregular.

It is also pointed out that the agreements provide many different measures, standards and rules for reckoning the compensation of employees and that in any one agreement the various measures, standards and rules used are related to each other and each constitutes in part the consideration for the others; that in many of the agreements the primary basis of compensation is mileage; that in some there is provision designed to insure additional pay if a trip requires more than 10 hours or has made an average speed of less than 10 miles an hour, but that in other contracts based upon mileage there is no provision for pay by hours except in cases where the schedule time of the run is exceeded or where a specified average speed is not maintained; that in many cases the contract provides for a fixed monthly wage, but that "whatever the method of reckoning the compensation, the thing paid for is the piece of work, to-wit, the trip."

Whatever the primary basis of compensation may be, the petition states, there are coupled with it various supplementary measures and standards of reckoning compensation, such as those relating to delays at terminals, incidental switching, loading and unloading livestock, loading and unloading material, being detained between trips at a terminal other than the home terminal, and being tied up between terminals.

The petition then outlines the history of the recent controversy resulting from the demands of the train employees and shows that changes which the Adamson law purported to make in the standards and measures of reckoning com-

pensation differed radically from those demanded by the brotherhoods. And, "that the court may understand more clearly the extent to which said act operates to interfere with this complainant's liberty of contract and hampers it in the performance of its public obligations and deprives it of its property, the reasons why said statute is incapable of application to the subject matter and the entire absence of any legal standard whereby complainant could regulate its conduct in an effort to comply with said act and avoid the penalties," several pages of the petition are devoted to an explanation of the present standards and measures for reckoning compensation and the rules and conditions affecting employment. This includes an explanation of the dual basis of miles and hours and the methods for computing overtime, showing that the conductors and brakemen in through and irregular freight service are paid on a straight mileage basis at varying rates per mile on different parts of its system, and with varying rules as to the payment of overtime and other incidental service, and that the total compensation actually received by these employees per trip is substantially in excess of the rates per 100 miles because, generally speaking, the trips exceed 100 miles, because of the monthly guarantee of 3,500 miles and because of extra pay for overtime and by reason of various allowances. It is also shown that conductors and trainmen in local and mixed train service on many roads are paid a fixed monthly salary in addition to receiving pay for overtime and that there are special bases for certain runs. Similar explanations are given of the varying bases of compensation in passenger and work train service and various tables are presented to show the rates paid in different classes of service.

Because of these varying conditions, the petition says, "that by reason of the fact that none of its train service is or can be operated on the basis of a fixed day's labor and that the wages paid vary according to numerous conditions which change from day to day, there is no such thing as a standard day's wage in railroad service" and that, therefore, the act "is not capable of application to the subject matter but is unworkable and fails to prescribe any standard whereby complainant and other railroads can be guided."

Among the particulars in which the provisions of the Adamson law differ from the demands made by the employees, it is pointed out that the act did not purport to make any change in respect to yard switching or hostling service, but was confined solely to service in the operation of trains; that the act did not provide, as was demanded, for the retention of any rates of pay or rules more favorable to the employees than the standards attempted to be enacted by the act; that it purported to apply its requirements to passenger service as fully as to all other sorts of road service, whereas the demands wholly excluded passenger service; that the act did not provide for the retention in cases where it now exists or for the establishment where it does not now exist of a mileage unit of 100 miles or less as a measure or standard of compensation, but provided a standard eight-hour work day as the only measure or standard for reckoning compensation. It was also pointed out that the act made no provision for the maintenance of any average speed per hour or for the mileage standard of reckoning compensation in any particular.

The petition continues:

"Complainant says that the wages of said employees are and have been substantial, and in many instances high and that said wages are now higher than they have ever been before; that said wages vary greatly as to different classes of employees and as to employees in the same class, and that the rates of wages on one railroad differ in a great many particulars from the rates of wages on other railroads of said employees performing similar services.

"That section 3 of said act, if capable of application, is a mere arbitrary increase in wages without reference to the question whether existing wages are high or low, and with respect to any train crew gives the greatest increase to the employee who now enjoys the highest wages and the lowest increase to the employee now enjoying the lowest wages.

"If said section 3 can be given practical effect, the result will be, in a large part of this complainant's train service, to compel the complainant, in respect of runs which require more than eight hours, to pay for the portion of any such runs made in the first eight hours thereof an amount of wages substantially greater than the complainant is required by the agreements with its employees to pay for such portion of such runs, and to pay for the remaining portion of such runs additional compensation which complainant is not required to pay by such agreements; and complainant believes the result will be to increase by many hundreds of thousands of dollars the amount which this company will have to pay to its said employees for such service."

It is stated that it is the duty of the district attorney, unless enjoined, to institute against complainant innumerable prosecutions for penalties and imprisonment for alleged failure to comply with the act and that, unless they are restrained, numerous suits will be instituted against complainant by the employees to recover alleged extra compensation to which they will claim they are entitled by virtue of the act and that only by the injunctive process can the railroad be fully protected in the exercise of its rights, and that the granting of the injunctive process will prevent a multiplicity of suits and prosecutions. The petition, therefore, prays that the defendants and all employees in complainant's service who may be represented by them, may be restrained preliminarily until final hearing and perpetually thereafter from instituting any prosecution under this act and that it be adjudged to be unconstitutional and void. The court is asked to issue not only a writ of injunction, but subpoenas against the defendants to appear and answer the bill and that a temporary restraining order be served upon them immediately.

The complainant is willing, pending the court's final determination, as to the validity of the act, to take such steps as may be approved by the court for the purpose of preventing any employee from suffering loss by reason of the temporary injunction and asks that the court indicate what steps it shall take by way of keeping special accounts, giving bond or otherwise, for the purpose of assuring complete protection to all its employees. If the injunction be denied, the complainant says, and it be compelled, under fear of the penalties provided, to adopt at its own peril some construction of the act and if the act shall subsequently be declared to be invalid, the loss sustained by it will be wholly irreparable.

Copies of the original demands of the train employees, of President Wilson's address to Congress urging the passage of the law, and of the text of the Adamson law are included as exhibits, together with statements of rates of pay of various classes of employees.

W. G. Lee, president of the Brotherhood of Railroad Trainmen, issued a statement on Saturday saying that "any railroad that attempts to cancel the present schedule of hours and pay or refuses to put the eight-hour day into effect will find itself with a strike on its hands on January 1, law or no law." He continued:

"The power that was given us last spring, when 400,000 employees of the railroads voted to strike unless the railroads granted our demands, is just as good now as it was then, and will be invoked if necessary. What the Supreme Court does with the law is no concern of ours. We have demanded fair working hours and we are going to get them."

WORLD'S DEEPEST MINE.—The deepest mine works in any part of the world are in Brazil. One of the mines of St. John Del Ray Mining Company, Limited, has reached the vertical depth of 5,826 ft., and since the vein shows no sign of losing its size or value, the company is considering means of continuing to a vertical depth of 7,626 ft.

New Union Passenger Facilities at Dallas

A Complete Layout for All Roads Is Now Practically Completed Which Will Replace Five Old Stations



A Front View of the New Station

THE new Union Station and auxiliary passenger facilities at Dallas, Tex., which have been under construction for the past two years are now completed; they were placed in service on October 8, although the formal opening occurred on October 14. This project represents an expenditure of over $5,125,000, of which, approximately, $1,125,000 is for the station building alone. This terminal provides passenger facilities for all of the eight railroads entering Dallas, which is a city of approximately 140,000 population.

Up to the present time there have been five separate stations at Dallas, four of which were located relatively close together, while the fifth was about a mile distant. The Missouri, Kansas & Texas and the Texas & Pacific occupied individual stations. Until the discontinuance of train service into Dallas recently the Trinity & Brazos Valley was a tenant of the St. Louis Southwestern. The Chicago, Rock Island & Gulf and the St. Louis, San Francisco & Texas were tenants of the Gulf, Colorado & Santa Fe, while the Texas & New Orleans used the station of the Houston & Texas Central.

This condition led to agitation by business interests of Dallas as early as 1907 for a union station for the use of all lines. This agitation led to the preparation of plans for two separate stations which would accommodate all of the roads except the St. Louis Southwestern. However, these plans were not satisfactory to the citizens of Dallas and negotiations were finally begun with the purpose of constructing a union terminal for all roads. An agreement to this effect was consummated late in 1911.

To carry on this project, the Union Terminal Company was organized in March, 1912, the stock of which is owned equally by the Gulf, Colorado & Santa Fe, the Chicago, Rock Island & Gulf, the Missouri, Kansas & Texas of Texas, the St. Louis, San Francisco & Texas, the Houston & Texas Central, the St. Louis Southwestern, the Trinity & Brazos Valley, and the Texas & Pacific. These lines include all of the roads entering Dallas with the exception of the Texas & New Orleans, which will use the union station facilities as a tenant of the Houston & Texas Central. Since the organization of the terminal company the Trinity & Brazos Valley has discontinued the trackage arrangement by which it operated trains into Dallas and it will not use the station although still participating in its ownership. The construction of these new facilities has been carried on under the direction of the terminal company organization and the terminal will be operated in the same manner.

The location finally adopted was chosen after a careful consideration of several sites. It possesses a number of advantages for its use as a terminal property. A considerable amount of land was leased from various railways already on the ground and about 10 acres of property, largely improved with business blocks was also purchased at a cost of $1,750,000.

By purchasing about 80 acres of land lying between the site of the station and the river it was possible to obtain the vacation of the streets intersecting the site between Calhoun street and the Oak Cliff viaduct. A portion of this property acquired along the river front has been ceded to the city for wharfage purposes with the agreement that no streets are to be opened across the tracks at grade. As a result of these arrangements there is only one grade crossing over the tracks of the terminal company in the two miles included within the limits of this work, and this is an unimportant street. There are also only three overhead viaducts over the tracks, one of which, the Oak Cliff viaduct, was built previous to the construction of the terminal; another at Commerce street is now being erected at the joint expense of the city, the county, and the terminal company, and the third has been constructed by the North Texas Traction Company carrying the electric trains over the tracks of the terminal company.

The site selected for the station is also convenient to the business district of Dallas and is readily reached from it as well from the part of the city across the Trinity river known as Oak Cliff. It is convenient to all of the railways. The main lines of the Katy, the Cotton Belt, and the Rock Island, the latter carrying the Frisco from Ft. Worth and Denison as a tenant, originally crossed the site of the new station while the Texas & Pacific crosses the north end of the station ground. The Santa Fe and its tenant, the Frisco (from Paris, Tex.) reach the station over a connection with the terminal tracks at Santa Fe Junction two miles south of the station. The Houston & Texas Central now uses the Katy tracks for a distance of about 5 miles through the city, while the trains of the Texas & New Orleans have been diverted from the Houston & Texas Central tracks to those of the Santa Fe at Central Junction and now come onto the terminal tracks at Santa Fe Junction.

About 80 passenger trains arrive and depart from Dallas

daily, all of which come on the terminal tracks at the two ends. Most of the trains of the Missouri, Kansas & Texas, the Houston & Texas Central and the Texas Pacific run through the city while one train of the St. Louis & San Francisco also runs through to Ft. Worth. Dallas is a terminal for all of the other roads.

The union terminal project includes the union station building and tracks, complete coach and engine facilities, and a belt line extending from a crossing with the Santa Fe tracks nearly two miles south of the station to a connection with the Katy tracks, a short distance north of the Texas & Pacific crossing. A double-track and a single-track connection with the Santa Fe on 12 deg. 30 min. curves are provided at the east and two single-track connections with the Texas & Pacific north of the station. One of the latter connections required a single track through truss span 150 ft. long with a pile trestle approach over the Trinity river which span must be converted into a lift span whenever required by navigation in accordance with the terms of the government permit.

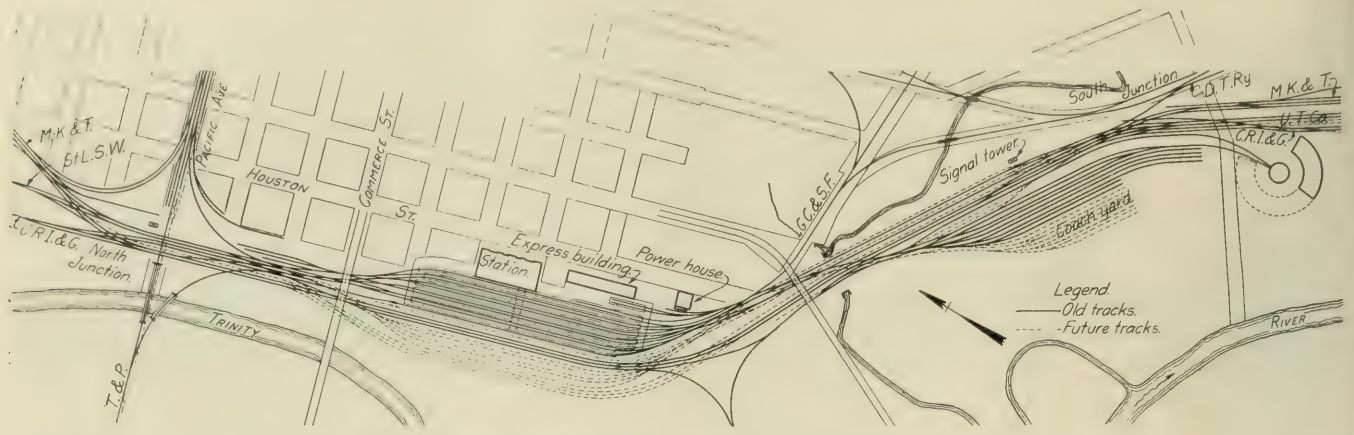
At present two tracks have been built from Santa Fe Junction to Cadiz street although the embankment has been graded for four tracks. Two freight tracks have also been built outside those of the terminal company for the use of the Rock Island, replacing two tracks removed to make room for the Belt line. From Cadiz street northward two tracks for freight movements are provided in addition to the two passenger tracks.

The Passenger Terminal

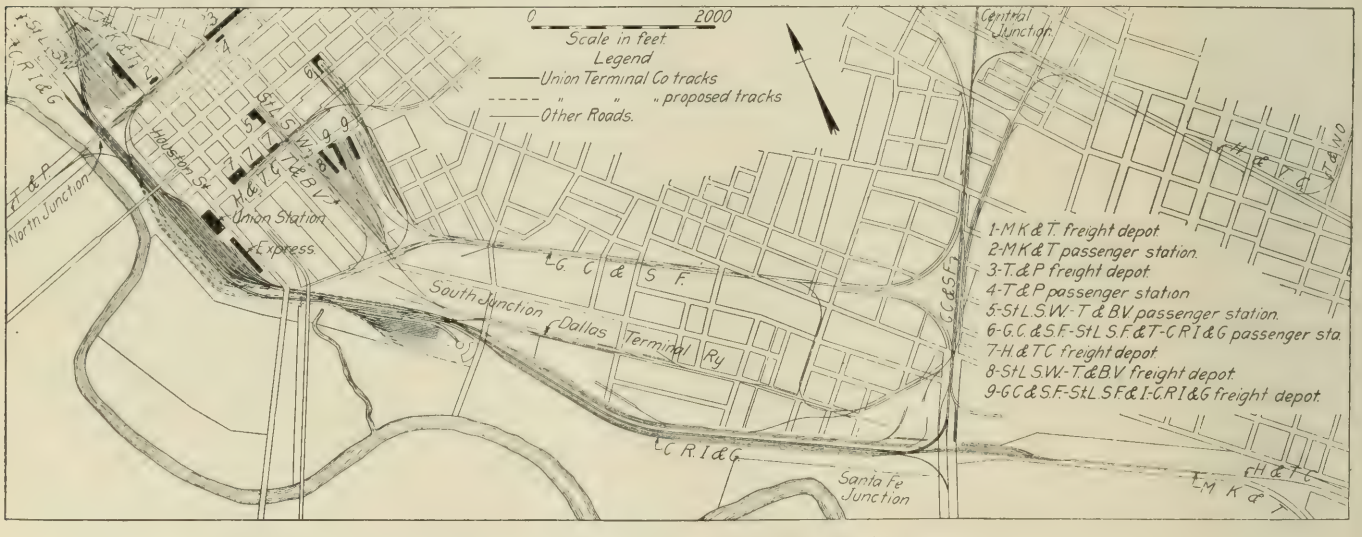
The most important feature of the terminal development is the station, which is located on the west side of Houston street, one of the important thoroughfares of the city. A considerable portion of the site adjacent to the street was occupied with buildings, including one four-story and several three-story warehouses, a 750,000 bu. elevator, and a five-story flour mill. All of these buildings had to be wrecked to make room for the terminal.

Much of the land near the river and particularly that occupied by the tracks and train sheds was low and subject to overflow from the Trinity river freshets, which are liable to occur in any season. To raise the tracks above the high-water level of the river it was necessary to bring in over 700,000 cu. yds. of embankment material. The maximum height of the embankments was 32 ft.

To obtain this material advantage was taken of an opportunity to secure a borrow pit without expense to the company by arranging with the owner of a gravel pit overlaid with 8 to 10 ft. of earth to strip this pit and use the overburden in the filling. This pit was located across the Trinity river from the station site with a maximum haul of two miles and an average haul of only 1¼ miles. A construction track was built from the station to this pit independent of the operated lines and two steam shovels and 30-yd. all-steel Western air dump cars were installed. The shovels worked continuously night and day from October, 1914, to September, 1915, except for the time when the pits were flooded by high water.

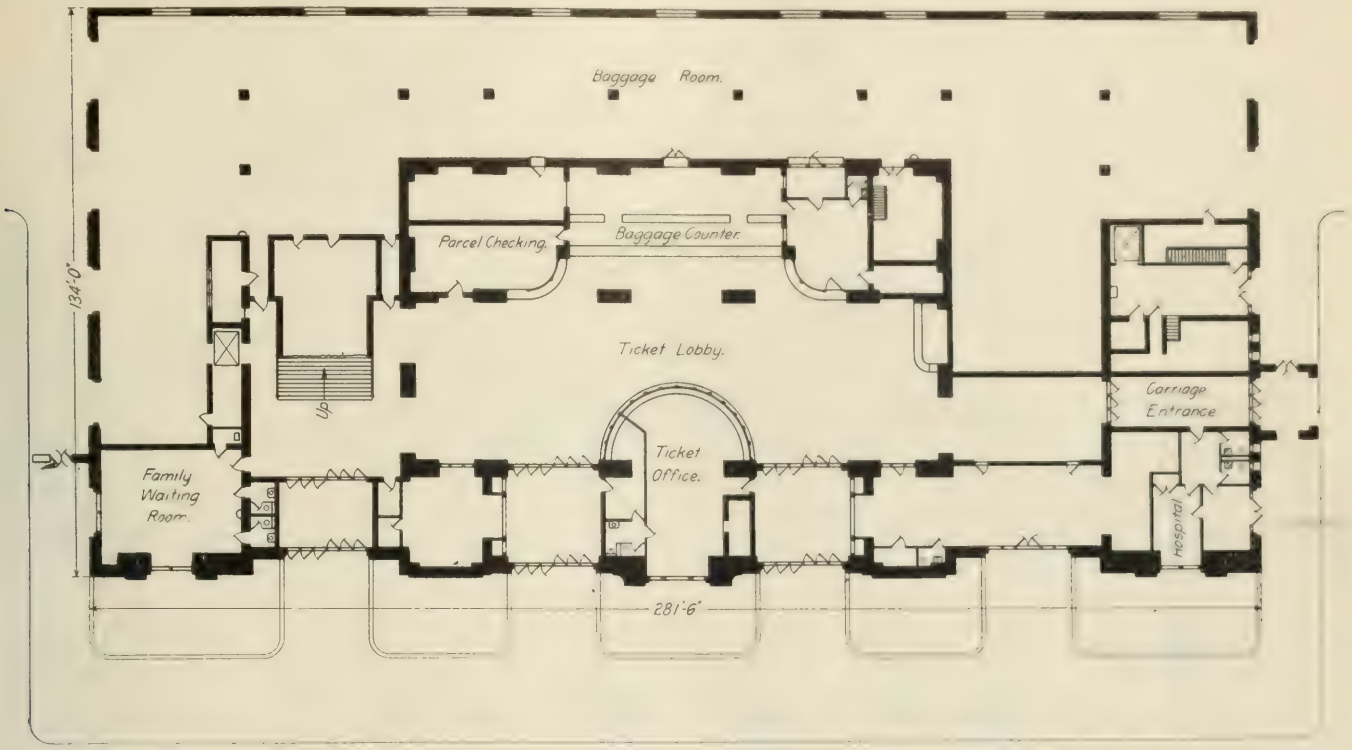


Track Layout in the Vicinity of the Station



Track Layout, Showing Entrance to New Union Station

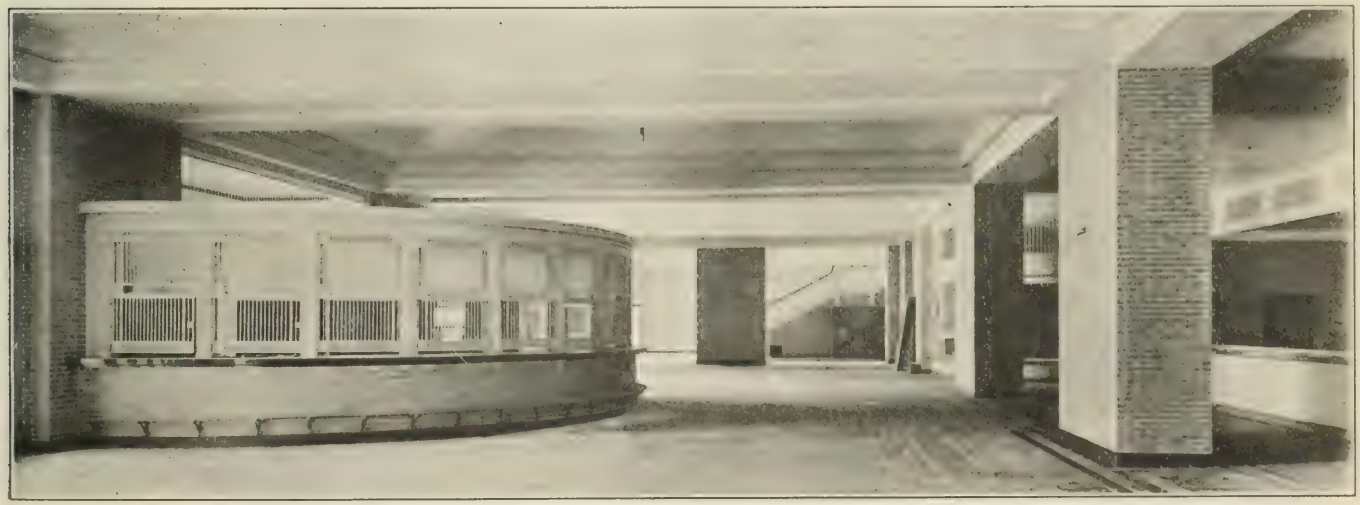
The station building faces on Houston street and is set back 35 ft. from the street line. It is of the Adam type of architecture. The main portion is 281 ft. 6 in. long, and 134 ft. wide and is three stories in height. Extending back over the tracks from the west side of the main building is a passageway to trains or concourse 39 ft. 8 in. wide and 191 ft. 8 in. long. In the corner between this extension and the main building, and extending over the first track, is a concourse 133 ft. 6 in. long parallel to the building and 61 ft. wide. Provision has been made for the extension of this concourse over other tracks as the demand for waiting room space becomes greater.



First or Street Floor Plan

The building is of attractive design. The exterior walls are of massive construction with a Vermont granite base 6 ft. high on the front faces and concrete with a wire brush surface on the rear face. Above this base the exterior faces on all four sides of the building are of Tiffany white combed enameled brick and terra cotta, which absorbs the glare and gives an attractive matt finish to the building. The exterior walls are further set off by an ornamental balustrade around the top of the building. The structure is supported on concrete foundations extending an average depth of 28 ft. to blue limestone.

Where the building extends over the tracks, as in the concourse and the train passageway, all exposed steel surfaces are incased in concrete as a protection against the action of locomotive gases.



The Ticket Office and Baggage Counter on the First Floor.

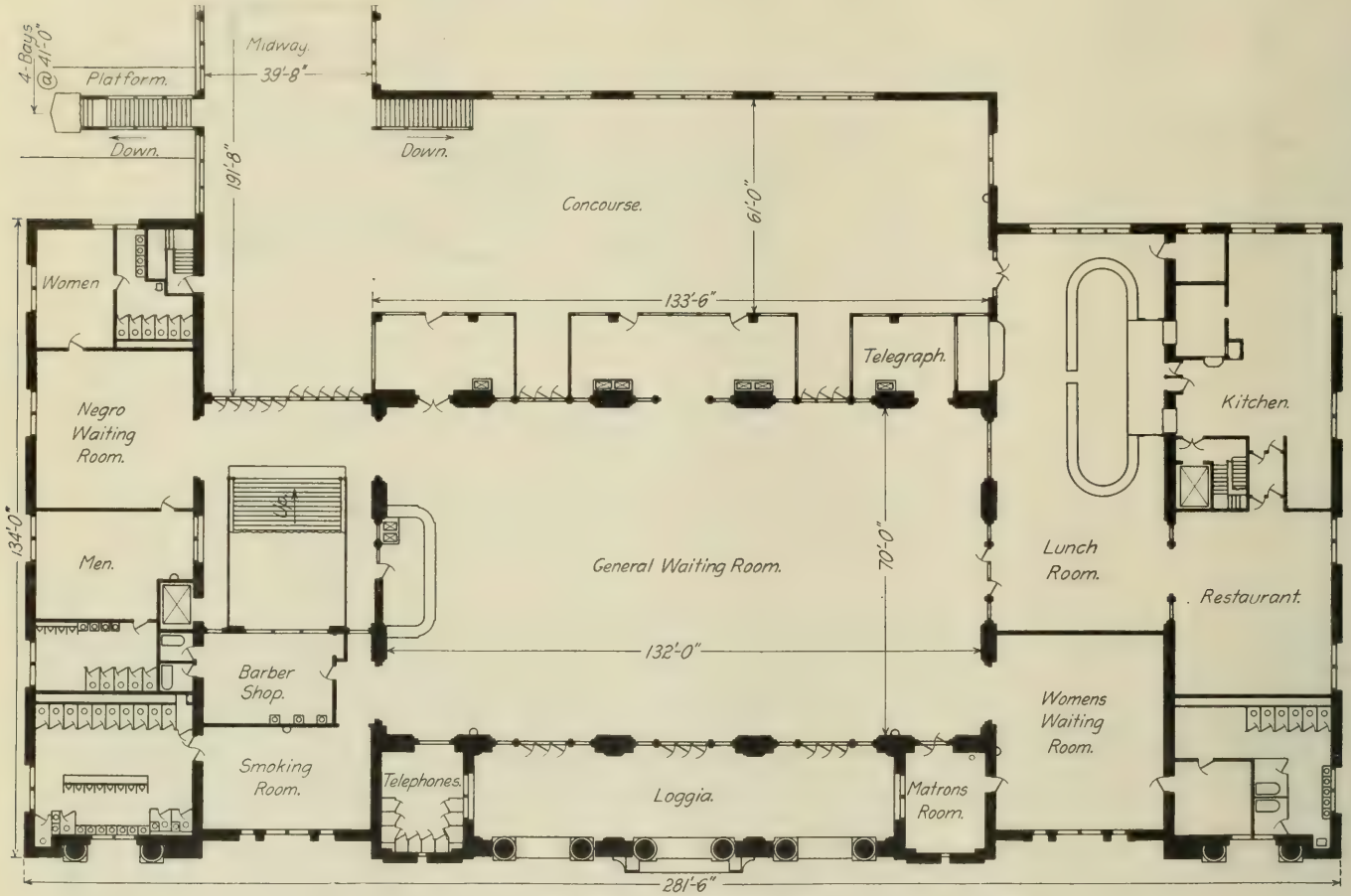
The front of the building is set off by a loggia at the elevation of the second floor, with massive pillars on the line of the front base each of which is flanked with two terra cotta columns. A balustrade between the pillars supports flower boxes.

The main entrance to the station is on Houston street and consists of four groups of six doors each, leading through

vestibules directly into the ticket lobby. Entrance from carriages is at the north end, passing through a corridor leading into the same lobby. The carriage entrance is protected from the weather by a large ornamental iron and glass marquis. A driveway is provided at the opposite end of the building for the delivery of baggage direct to the baggage room.

The ticket lobby occupies all the central portion of the first floor. The ticket office is located between the two central main entrances and has a semi-circular face containing 14 ticket windows. Directly across the lobby from the ticket office is the baggage checking counter with the parcel check stand immediately at the left. The baggage handling and storage facilities occupy the west part of this floor and extend the entire length of the building. The baggage room has been given special treatment. The floor in this room is of mastic, while the walls are attractively finished by using a high to the vaulted plastered ceiling. This room is finished in buff brick with white terra cotta trim. The metal trimmings and doorways are of ornamental cast iron. The room is provided with 16 large double seats at the outer ends of which are placed radiators enclosed in cast iron grills. Three large arched windows afford access to the loggia on the Houston street side and an equal number on the opposite side of the room lead to the concourse. At the south end of the waiting room an information bureau is located, at one end of which is a telegraph office.

In the south corner on this floor is the barber shop and beyond the white men's smoking and toilet rooms. The smoking room is finished in buff pressed brick and the toilet room with a white marble wainscot and plaster above. In the corresponding location in the opposite end of the building are the white womens rest and toilet rooms. The negro gen-



Second Floor Plan Showing the Waiting Room and Concourse

dark red paving brick wainscot with lighter colored brick above.

The newsstand and drug store are located on opposite sides of the ticket office. An emergency hospital and a first-aid room are located in the northeast corner of the building, while in the corresponding location at the opposite end is a family waiting room.

Directly opposite the south entrance leading from Houston street a broad stairway leads to the second floor and directly to the train gates, thereby eliminating the necessity of a traveler going into the ticket lobby or the waiting room unless he has business to transact. Estimates have shown that about 70 per cent of the passengers at Dallas will go to and from trains without passing into either the ticket lobby or the waiting room.

To the north of the stairway on the second floor is the main white waiting room 132 ft. long, 70 ft. wide and 48 ft. eral waiting room, men's room, women's room and toilet rooms occupy the western part of the south end of the building. The general waiting room contains a lunch counter for negroes. The lunch and dining rooms for white persons are located directly off the main waiting room at the north end of the building. They are finished with Verde antique and white marble wainscot and plaster above.

Two entrances lead from the waiting room into the concourse, which is particularly well lighted with an almost continuous row of glazed sash along the track side. The room is finished with buff brick with a plaster ceiling above. No seats are provided in the concourse. Directly at the head of the stairs and also opening from the concourse is the passageway to trains which is also without seats. Train gates are located at the heads of the stairways leading to the platforms below.

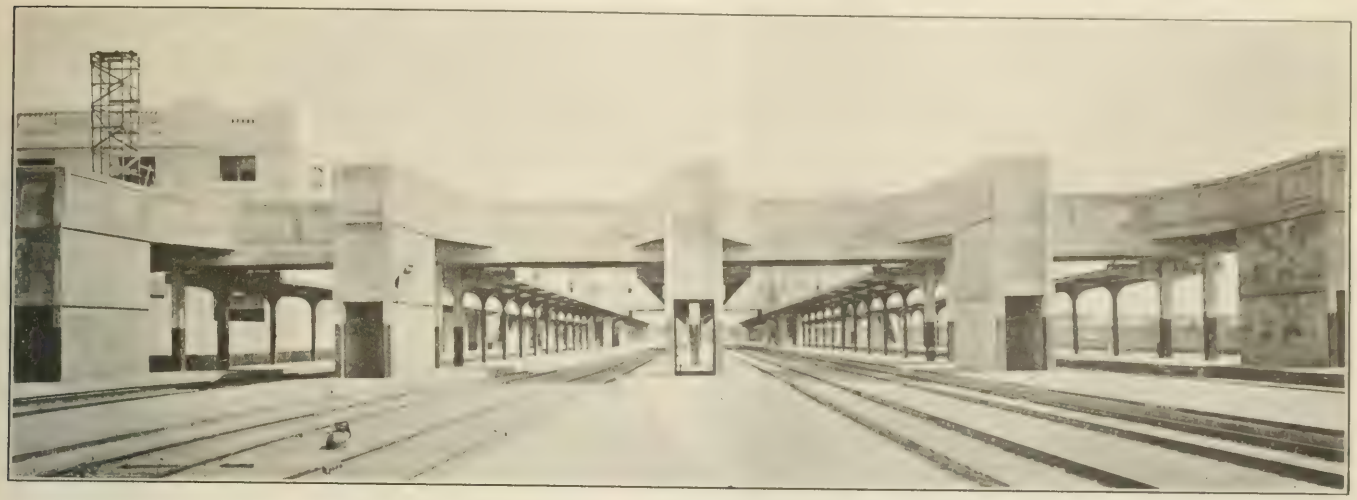
Tile floors are provided in all of the public rooms through-

out the building except the concourse, train passageway and loggia, where concrete floors have been placed. The lighting of the principal rooms is direct by means of electroliers and side wall lights. Indirect lighting is used in the offices and smaller rooms. Artificial ventilation is provided throughout the building.

While baggage is handled on the first floor of the station all express is diverted to a separate building 320 ft. long and 56 ft. wide, located along Houston street south of the station. This building is also of white Tiffany brick and white terra cotta in harmony with the station and is one story high except for a length of 42 ft. 6 in. at each end, where an additional story is added for office purposes. At the north end of this building 200 ft. is assigned to the Wells Fargo Express Company and the remainder to the American Express Company. A trucking platform extends along the track side of the building for its entire length. Two stub tracks have been built along the south or American Express end of the platform, while one additional track extends almost the entire length of the building.

A separate building has been provided immediately north of the main station for the use of trainmen, with individual lockers for each trainman laying over at Dallas. A power house has also been built of concrete a short distance south of the express building.

The track layout at the station consists of 10 through tracks along platforms in addition to the three sub-tracks at the express building and three freight tracks which pass around the rear of the station. The platforms are of red vitrified brick with the top six inches above the top of rail. "Safety" clearance lines marked by alternate white bricks are inserted in the platforms. The platforms are provided



The Platforms and Baggage Elevators



Interior of the Waiting Room

with butterfly sheds of steel construction roofed with Federal cement tile.

An enclosed overhead trucking viaduct 15 ft. wide extends over the tracks near each end of the platforms, 300 ft. each side of the passenger thoroughfare. Elevators connect these viaducts with each platform and with the track level at the building end of the viaduct. This construction is provided for use in handling baggage and express to and from trains without interfering with the movements of passengers or trains. An emergency crossing of the track at grade is also provided at the north end of the platforms for use when the elevators may be out of service temporarily.

Other Facilities

Coach and engine terminal facilities have been built at Cadiz street, about three-fourths mile south of the station.



The Train Concourse

A seven track coach cleaning and storage yard with service buildings has been provided. A twelve-stall brick roundhouse in which two stalls have been set aside for shop purposes has also been built at this point, resting on a 21-ft. fill. An 85 ft. through turntable of American Bridge Company design has been built with a concrete pit and circle wall. A brick boiler house is installed with two boilers, space being left for two additional boilers whenever needed. Other facilities at this point include a steel stand-pipe 24 ft. in diameter and 45 ft. high for water service and a coaling platform and ash pit.

The main tracks are laid with 90-lb. A.R.A. type A rail on



Rear View of the Station Showing the Train Concourse

creosoted ties, fully tie plated and supported on gravel ballast. Manganese construction was used throughout the terminal for frogs, switch points and crossings. A total of 45 crossings, 36 slip switches and 80 simple switches were required.

Two interlocking plants have been built. The larger one, with 103 levers, is located at the Texas & Pacific crossing and controls the intersection of that line with two freight and two passenger tracks, the connections of the Rock Island, the Cotton Belt, and the Katy, with the terminal tracks and the north entrance to the station. The other interlocking tower, with 86 levers, is located south of the North Texas Traction viaduct and controls the south entrance to the station and the crossing of the Katy freight tracks over those of the terminal company. These towers are of reinforced concrete construction. Both plants are Union Switch & Signal Company electro-pneumatic installations. The main tracks of the terminal company are also equipped with automatic signals throughout.

This entire terminal project has been built under the direction of C. H. Dana, chief engineer of the Union Terminal Company, with F. D. Griffin, engineer of outside construction, and W. P. Weathers, engineer of buildings. The station building was designed by Jarvis Hunt, architect, Chicago. Because of the provision in the laws of Texas prohibiting the issuance of bonds except on the basis of a valuation of property actually built, it was necessary to construct this terminal on a cost plus percentage basis, the contractor financing the work and being reimbursed from time to time from the proceeds of bond issues authorized after partial valuations had been made by the railroad commission. J. W. Thompson, of St. Louis, was the general contractor.

NATIONAL INDUSTRIAL TRAFFIC LEAGUE

The annual meeting of the National Industrial Traffic League was held at the Hotel Sherman, Chicago, on November 9 and 10. In adopting the report of the executive committee the league registered its opposition to government ownership or operation of common carriers and favored exclusive federal control of regulation, provided this can be accomplished in a way that will permit the same degree of protection, and speedy determination of, wholly intrastate matters as now obtained. It also favored increasing the membership of the Interstate Commerce Commission, the federal incorporation of railroads and the federal regulation of the issuance of securities, an amendment of the Act to Regulate Commerce so that its terms will apply uniformly to all common carriers, the extension of the time within which claims can be presented to the commission from two years to three years, and further amendment of the act to give shippers the broadest possible right of appeal. The league expressed its opposition to any amendment to the act granting the commission power to prescribe minimum rates, to any change in Section 12 of the present act to regulate commerce, and any change whatsoever in the present law respecting the suspension of tariffs.

The committee on Car Demurrage and Storage urged the league to register a protest against the tariffs filed by the carriers to become effective December 1, increasing demurrage charges. Following the adoption of this report the league drew up a resolution requesting the Interstate Commerce Commission to suspend the demurrage tariffs so that the shippers may have an opportunity to be heard against them. The report of the committee not only opposed increased demurrage charges but favored an increase in the per diem rate, with the recommendation that the whole subject be referred to the commission.

The league expressed its disapproval of the proposed changes in the rules of practice, Nos. 3 and 13 of the Interstate Commerce Commission outlined in a circular of the league, published in the *Railway Age Gazette* of October 6.

The Special Committee on Railway Leases and Sidetrack Agreements has been given authority by the Executive Committee to file a petition of intervention with the Interstate Commerce Commission, asking for a general investigation of railway leases in accordance with the commission's own motion, which has never been acted upon.

The Official Division of the Classification Committee reported that the Official Classification Committee did not favor following its two suggestions: First, that some effort be made to arrange the time to be devoted to each subject before the committee, based upon the length of time which the

petitioners express themselves as requiring previous to the hearing; second, that the Western Classification Committee's plan of assigning certain subjects for certain days be followed.

The Special Committee on Concealed Loss and Damage Claim Forms reported that the Interstate Commerce Commission had given its tentative approval of the forms agreed upon jointly by the committee and a committee of the Freight Claim Association. Members were urged to make use of the forms and thus give proper co-operation to the carriers.

The Southern Division of the Classification Committee reported that it had reason to believe that the Southern Classification Committee would soon be recognized on lines substantially similar to those of the Western Classification Committee. At the recommendation of the committee the league passed a resolution urging the Southern Classification Committee to establish suitable carload ratings on commodity descriptions similar to those in the Official Classification.

The Committee on Express reported that in revising express receipts to conform with the Cummins Amendment to the Commerce Act, the express companies had planned to revise Section 7 of the proposed express receipt so that claims might be filed within four months. The express committee of the league, however, insisted upon a six months provision and the matter has been left to the decision of the Interstate Commerce Commission.

The Weighing Committee reported that it was negotiating with the American Railway Association for provision in the National Code of Weighing Rules establishing a tolerance of 300 lb. in connection with the tare weight of box cars, and a further provision that when a car is weighted light and loaded on request of the shipper or consignee, and a difference between the marked and actual weight is more than 300 lb. is disclosed, there will be no charge against the shipper or consignee for the weighing service. The committee pointed out such a rule would result in more frequent reweighing and stenciling of box cars, and necessarily in more accurate stenciled and net weights, such as desired by both carriers and shippers.

The Western Division of the Classification Committee reported that the Western Classification Committee was opposed to its suggestion that present, as well as proposed ratings, be included in dockets in conformity with the present practice of the Official and Southern Classification Committees.

It was the opinion of the Freight Claim Committee that where shipments are loaded on team tracks and the agent is notified it should be his duty to furnish a checker and give a clear receipt for the freight so loaded, and this opinion was endorsed by the league.

The officers of the league were re-elected as follows: President, G. M. Freer, manager traffic department, Cincinnati Chamber of Commerce; vice-president, W. H. Chandler, manager transportation department, Boston Chamber of Commerce; secretary and treasurer, O. F. Bell, traffic manager, Crane Company, Chicago. The following members were added to the executive committee: R. D. Sangster, C. W. Egger, Charles Rippin, W. P. Trickett and J. S. Davant. J. C. Maddison is no longer a member.

Frank Trumbull, chairman of the board of the Chesapeake & Ohio, and Julius Fleischmann, president of the Fleischmann Company, Cincinnati, Ohio, addressed the league at its annual banquet on November 9. The address of Mr. Trumbull is published elsewhere in this issue of the *Railway Age Gazette.*

Minimum Wage in Victoria.—The minimum wage for railway men in Victoria has been increased from 8s. 6d ($2.04) to 9s. ($2.16) a day.

THE NEED FOR BETTER REGULATION*

By Frank Trumbull,
Chairman of the Railway Executives' Advisory Committee.

In order that we may intelligently consider other things, may I mention first the thing which I have no doubt is perfectly clear to you but one which is not always remembered; that is, the essential difference between the railway business and other industries. The essential difference is that railroads are subject to minute regulation and, therefore, to an artificial limitation on their profits. The railway investors of this country are quite willing, I think, to take their chances with other people in the ups and downs of supply and demand, of labor questions and so on; but they have to take one additional risk that other people do not have to take and that is limitation on their profits.

Perhaps I can give you no better illustration of it than to mention the boat service through the Panama canal. Our government has spent $350,000,000 on that piece of work—splendid from an engineering standpoint—and has passed a law quarantining the canal against railroad-owned boats. Another law provides that when railroads lower rates to meet the competition of boats, if the boat competition is subsequently removed, the railroads cannot raise their rates unless for some other reason than the elimination of water competition and that other reason, whatever it may be, must, in turn, be sanctioned by the Interstate Commerce Commission.

Now, what has happened? If any group of men had put $350,000,000 of private money into an enterprise that pays so poorly in direct return as the Panama canal has so far done, they would be tabooed in financial circles.

What happens next? When boats running through the canal can make more profit somewhere else, they take to their heels and get into other trade. They are subject to no limitations about where they shall run, while the railroads are fixed; are subject to many limitations and are not permitted to raise their rates.

I shall not argue at length the matter of limitation on railway profits but simply give you one more illustration: There is at the moment a shortage of coal and in some districts, at least, soft coal is selling at the mines at five or six dollars a ton—three or four times the ordinary price. Think of the profit this must yield to somebody, but more than that, think of another phase of it; namely—sooner or later these increasing costs of all kinds of material and supplies will find their way into railway expenses.

It is true that the railroads of the United States are more prosperous this year than ever before in their history but the profit for the fiscal year ended June 30, 1916—before deducting interest on bonds or dividends on stock—was less than six per cent return on the value of railway property used by the public. This profit on about 225,000 miles of road, excluding the smaller lines, was only about 17 times the profit of one private corporation, the Ford Motor Company.

You will observe that I am speaking of the railroads as a whole, for everything conspires to make it incumbent upon all of us to study the railway problem in its entirety and not piecemeal.

There has been a great deal of talk about financial mismanagement of certain roads but if you will sum it all up, you will find it relates to less than 10 per cent of the mileage of the country. The things criticized happened years ago and I believe are not happening at all today, but a great deal of fresh capital is needed, primarily for your benefit, and there is practically no appetite for fresh railway investments. One very serious phase of railway financing is that for some time there has been no financing by new issues of stock. Roughly speaking, the debt of American railroads in the hands of the

*An address delivered at the annual dinner of the National Industrial Traffic League, Chicago, November 9.

public is about ten billion dollars with a foundation of about six billion dollars of stock. How long would your banker be hospitable to you if you were borrowing ten dollars for each six dollars you put into your business and were continually asking him to lend you more on subordinate security without increasing your own participation and risks? If capital, which is fluid, flows in other and more attractive directions than toward the railroads, what is the answer?

We have recently had a remarkable example of railroad regulation. I refer to the Adamson law. I am prepared to make at least one definite statement about it—that no one, either a Congressman, railroad official, labor leader or anyone else, knows just what the law means. If the act is found to be unconstitutional, it is, of course, not a law at all and the railroads, investors, employees, shippers, the traveling public would be relegated to the position which existed before, and collective bargaining would undoubtedly be re-established. If the law is found to be constitutional, it will still have to be interpreted in several particulars so that it may be intelligently obeyed by both the railroads and the employees. Even when this is done, there opens up a long vista of possibilities, both for investors, employees and for the remainder of the one hundred million people of this country. For example, if Congress has the power to prohibit a decrease in wages, has it the power to prohibit increases? If it has the power to regulate wages, must the wages be just and reasonable, as railroad rates are required by law to be? Will Congress determine what are just and reasonable wages for all railway employees instead of for trainmen only? Will Congress attempt to regulate wages directly or through a commission? If through a commission, will its findings be mandatory alike upon the employees and upon the companies? Is railway capital "enlisted" in the public service and will railway employees also be "enlisted"? If Congress or a commission raises railway wages, will it raise the rates simultaneously or will investors have to wait for tedious hearings before various commissions? Can new capital be coerced into involuntary servitude and, if not, how will new facilities be provided—particularly if wage demands are to be acceded to without investigation? Will the equivalent be made up to investors by guarantees or by taxation, or how? These are only a few of the many interesting questions that will undoubtedly logically follow the entry of Congress into the field of regulation of wages, and logically all kinds of industries engaged in interstate commerce may sooner or later become involved in a similar problem.

The evolution of all these questions is emphasizing more and more the desirability of unifying our system of railway regulation. Railroad officials and directors accept the principle of regulation. Now that they are in accord with the people of the country on that subject, surely all of us can get down to business and consider the whole subject from the standpoint of the public interest. The railroads know that they cannot hope to stand for or permanently succeed in anything that is not in the interest of the public. Efficiency of railway administration is demanded and expected. Surely it must also be in your interest that railway regulation shall be efficient. How can any business be efficient if it is subject to the intrusion upon one authority of 48 other separate state authorities—or even 12 or 13 on single railway systems?

Railway officials are quite willing that future issues of railway securities shall be supervised, provided prompt and efficient action can be had. Money market conditions are, as you know, so fickle that delays would be costly, for hiring money is like hiring other things and occasionally a serious delay might bring an otherwise solvent company into bankruptcy. Railway officials all feel, however, that supervision of securities should be in one place, that is, in Washington and not in 48 different states. At present 19 or 20 states are attempting to deal with this question and no two of them are alike in their requirements. The easiest and most efficient way to accomplish the desired end is by federal incorporation of every railroad engaged in interstate commerce.

I know that nothing could appeal to this audience more than a brief discussion of efficiency. You know that, as a whole, railway facilities of this country are not keeping pace with the expansion of trade. It would be money in your pockets if free capital could by some transformation become eager to engage in the railway business. Railway investments ought, in your interest, to be tempting. Naturally, the first thing to which any business man turns his attention nowadays is the cutting out of waste. In the last 10 years particularly some of the most alert minds of our country have been intensively studying railway economies. Perhaps they have not reached perfection but surely there is much to the credit of American railway officials in this brief statement of fact: American railways have the lowest capitalization per mile, the lowest rates and the highest wages in the world. And this in the face of the present rising costs which are yielding enormous profits to thousands of other industries. You expect, and have a right to expect, that the railroads of this country shall be operated honestly and economically. You have also a right to expect and to demand in your own interest that railway regulation shall not be wasteful. Every unnecessary burden on the railroads must inevitably be reflected either in higher rates, poorer credit or poorer service. Surely poorer service is not in your interest. We believe that Congress ought to exercise its power to take entire charge of these instrumentalities of commerce and to really regulate them in your interest and in the interest of the remainder of the public. There is no way of proving it, but I honestly believe that one hundred million dollars a year is being wasted by the present methods of regulation. But assume that it is not more than fifty million dollars a year; ought that not to be saved for somebody—for you, for the investors, for better facilities or for employees? The Interstate Commerce Commission has decided some time since that the passenger traffic of this country is not paying its share of the cost of transportation and yet it is impotent under our dual system of regulation to make its own declaration really effective.

We believe that regulation should be unified so as to make it effective and also to fix in your behalf, as well as our own, the responsibility which is now so scattered as to be practically non-existent. Our state lines are not the frontiers of 48 separate countries but we are one nation—a hundred million people nearly all speaking the same language and all entitled to the same opportunities. Railway administration ought to always keep in close touch with the people and so ought railway regulation. This can easily be accomplished by regional commissions working under one unified law. If the strength of the national banks can be mobilized, railway efficiency can also be mobilized regionally for the encouragement of investors and for your benefit. Our trade is expanding but it cannot expand as it ought to do, either at home or abroad, unless our transportation facilities are put under one flag instead of 49.

Fortunately, Congress has appointed a joint committee of the House and Senate—five Senators and five Representatives —known as the Newlands committee, which is to inquire into the whole subject of railroad regulation. Its hearings are to commence in Washington on the 20th of this month. An opportunity will be offered to all interests to be heard and it will add very much to your comfort and security if its conclusions shall be constructive, as I believe they will. The proper treatment of our railroads has come to be our foremost domestic problem. What we need on this subject is light, not heat. You and I doubtless prefer not to take public office but we can all serve our country by co-operating in perfecting our lines of transportation so that the business of the country may go unvexed in all directions—north, east, south and west.

National Association of Railway Commissioners

President of the Organization Opposes Exclusive Federal Regulation; Change in Fiscal Year Recommended

THE twenty-eighth annual convention of the National Association of Railway Commissioners was begun at Washington on November 14, with an unusually large attendance. President Robert R. Prentis, who has just resigned as chairman of the Virginia Corporation Commission to become a member of the state supreme court, presided and in his opening address made a vigorous attack on the proposal for curtailing the regulating powers of the state railroad commissions and for centralizing the regulating authority at Washington. He said that the adoption of the Newlands resolution by Congress, providing for the forthcoming investigation of railroad regulation itself indicates "the very great progress that has been made in the deliberate and concerted effort to destroy the state commissions as regulating bodies, including the taking over by the federal government of exclusive jurisdiction to regulate intrastate rates."

Chairman B. H. Meyer of the Interstate Commerce Commission, who followed Mr. Prentis, said that he welcomed the Newlands investigation, which should serve to those engaged in the work of regulation and to those affected by that work "as an inventory serves a merchant," and he urged closer co-operation between the state railroad commissions and the interstate commission in cases of overlapping jurisdiction.

Exclusive Federal Regulation Opposed

"There is a fully organized movement" said Mr. Prentis, "having for its ultimate object nothing less than the absolute elimination of the states and the state commissions from all jurisdiction over the intrastate rates of the railroads." He continued in part as follows:

"At the time Judge Reagan drew the act to regulate commerce such a proposition would have been promptly rejected as plainly violative of the United States Constitution. Recent decisions of the Supreme Court of the United States, however, have encouraged the view that under the commerce clause of the Constitution the Congress may have the power to take actual control of all rates upon the new theory that railway rates are so intimately related to, and so directly affect, each other as to make it impossible properly to regulate interstate rates without at the same time taking control of intrastate rates.

"The officials of the great transportation lines of the country, always restive under any and every sort of control, are behind the movement. They have enlisted the support of a large number of newspapers and magazines, employed able counsel, and have prepared for the great controversy which such a proposition precipitates. The danger is that they may win at the first onslaught, but if so it will be only because those who believe such a change unwise are in a state of absolute unpreparedness. If the question is to be fairly and fully discussed and presented to the Congress, poorly as they are prepared therefor, it must be done by the state commissions. Therefore this is the work to which the present hour summons us.

"If the effort shall succeed then questions regarded as settled from the foundation of the government will be unsettled, and the great accomplishments of the states of this union for the last 30 years in their endeavor to exercise efficient control over the public service corporations which they have created and fostered, will have become unavailing and obsolete.

"For 30 years the federal and state governments have been enacting laws and administering them with the view of exercising efficient control over the rates and practices of the railroads. A long catalog of the benefits which have arisen from such regulation can easily be made. Forty-six states of the union at great expense have organized commissions for the purpose of controlling intrastate rates, and exercising their constitutional powers hitherto conceded to them. The proposition is to take over all the important jurisdiction of these local commissions and concentrate the power in two federal commissions in the city of Washington. Then, knowing that the Interstate Commerce Commission is already overwhelmed with its work, and apparently realizing the utter futility of expecting central commissions in Washington to deal effectively with all of the many and varied questions that arise locally all over the country, it is proposed to establish regional boards in various sections of the country which shall be subordinate to the central authority at Washington. In other words, they see that just as soon as they tear down the existing system they must immediately commence to rebuild a vast hydro-headed administrative bureau, with two big heads and many small ones, which will correspond in many particulars with the very organization we already have.

"It is impossible for us to escape the conclusion that if these suggestions shall be adopted the cause of public regulation will be practically just where it was 30 years ago. It seems to me that experience has demonstrated that all the powers of all the states combined with all the powers of the federal government must be exercised if public regulation is to be effective.

"Since the decision of the Shreveport case (Houston East & West Texas Railway Co., Etc., vs. United States, 234 U. S. 342), which apparently authorizes the Interstate Commerce Commission to remove discriminations between localities and shippers by requiring railway companies to make intra and interstate rates conform, it is difficult to understand the immediate need for adding to the powers of the federal commission as to removing such discriminations. Already the Interstate Commerce Commission has in several cases administered the very relief which the carriers claim should be afforded by new legislation, and it is claimed already has jurisdiction to correct the very evil which is alleged to exist. It is, of course, exceedingly important that there shall be no conflict of jurisdiction between the federal and the state authorities, and I am sure that I give expression to the sentiment of a very large majority of the state commissioners when I say that they and this association are now, and have always been prepared to co-operate with the federal authorities in the fullest possible degree for the purpose of avoiding such conflict."

Mr. Prentis then referred to the large increases in railway earnings, saying that, however great the perplexities and difficulties that have beset the railway managers within the past 12 years, they have but suffered as other men have suffered, and that their business has only been affected in the same way that other business enterprises have been affected from year to year and from period to period. "Are we not then justified," he asked, "in claiming that the lack of prosperity in past years should not be attributed to excessive regulation nor to the inadequacy of rates, considered as a whole, but chiefly to lack of business, because the recent results prove that with the same facilities reasonable profits have been made during the past fiscal year, and this, it will be noted, only because of the increase in the traffic and in spite of alleged excessive regulation and adverse legislation."

"It is undoubtedly true that the greatest immediate need

of the railroads, and therefore a need of the country, is that they may secure new capital for the purpose of adding to their facilities by increasing the number of their tracks, improving their condition and adding to their rolling stock, which are not sufficient for the business now being offered. To secure these betterments it is necessary that they secure new capital. Are they to secure it by continuing to advertise their own poverty through public speeches made by their officials and attorneys and through the newspapers, which give publicity to their sentiments, exaggerated in every possible way? The wonder is, considering all their own efforts to show their desperate condition, that any of them have escaped bankruptcy."

Mr. Prentis objected to the saying that the railroads have 49 masters, because no railroad runs through 48 states, and said that criticism of the present plan of regulation is but an attack upon our form of government as provided by the constitution. He proposed "that we continue the policy of the past, which has produced results, which, while not perfectly satisfactory, has certainly accomplished many reforms," and by amendments of the act to regulate commerce and by co-operation between state and interstate commissions, to remedy the defects.

Chairman Meyer pointed out that the long period covered by the growth of railroad regulation in the United States has resulted in the framing of a large number of laws which are inclined to obscure certain matters, and that experience has shown that the federal commission must have power to regulate more than rates. He also urged the state commissions to co-operate with the Newlands committee in its work. He said that the difficulty in such cases as the Shreveport case, involving conflicting jurisdictions, could be settled if the commissions would have a single eye to establishing reasonable rates and not become bewildered by issues involving state sovereignty and constitutionality. He hoped for legislation providing for the close co-operation of the Interstate Commerce Commission and the state commissions in working out such disputed points. "Under such a plan as I have in mind," he said, "when an overlapping rate case arises the resulting investigation would be conducted jointly by the state commissions and the Interstate Commerce Commission. Every state commission directly involved would be given an opportunity in accordance with law to participate in the deliberations and to assist in formulating the final conclusions upon a record jointly made."

Change in Fiscal Year Recommended

The Committee on Statistics and Accounts of Railways, B. H. Meyer, of the Interstate Commerce Commission, chairman, submitted a report, which was adopted, recommending that the Interstate Commerce Commission and those state commissions possessing the requisite authority change the reporting year for steam railway companies from the present period ending on June 30 to the calendar year, and that others make such change as soon as authority could be obtained. The committee pointed out that the proposed change is under consideration by the Interstate Commerce Commission at the request of the American Railway Accounting Association and that the commission has canvassed state commissions to ascertain their views with respect to the proposed change. Substantially unqualified approval of the change was expressed by 29 commissions. Although several states indicated that it would be necessary to secure changes in their statutes, they propose to request such change as soon as they learn that the Interstate Commerce Commission has adopted the calendar year. Seven commissions appeared to be somewhat indifferent in regard to the matter and indicated that they would make the change if the Interstate Commerce Commission does. Some of these also will have to secure the consent of their legislatures. Six other commissions are opposed to the change, apparently solely because their statutes require the year closing June 30. Six commissions are opposed to the change regardless of statutory provisions.

Should the proposed change be adopted, it is the view of the committee that the transition from the present basis to the new one can best be made by requiring a report for the calendar year 1916. This would give for comparative purposes figures for a 12-month period, which would be comparable with much less necessity for adjustment and allowance than would be the case if a report were required which would cover only the six months July 1 to December 31, 1916. In dealing with the report for the entire calendar year, 1916, the committee said, it is not apparent that there will be any need for adjustment in comparison with preceding annual reports further than to bear in mind that the time interval between the report for the 12-month period ended June 30, 1916, and that for the 12-month period ending December 31, 1916, is only half as great as that between any two consecutive preceding annual reports. This can easily be taken into consideration in any comparative study of annual statistics and apparently this is the only feature involved in the change for which any allowance need be made. The record for any 12 consecutive months includes a complete cycle of seasonal changes. The committee recommends that the association approve the proposed change to the calendar year as the basis for annual reports of carriers by steam railway to the state and national commissions receiving such reports.

Proposed Legislation to Prevent Grade Crossing Accidents

A uniform system of signals and other precautionary measures to be adopted at all railroad grade crossings with highways with a view to preventing the huge annual loss of life and property, was the principal topic considered in the report of the Committee on Grade Crossings and Trespassing on Railroads, Thomas Duncan of the Indiana commission, chairman. Following the report a resolution was adopted by the association approving seven recommendations for the protection of grade crossings made in the report and recommending to the several state commissions the submission to their respective legislatures for passage of a bill or bills "for such enactments as may be necessary to put the committee's recommendations into effect, to the end that, pending the separation of grades which we regard as the final objective, uniform and effective protection may be provided at grade crossings in the several states."

The committee report points out that the movement for such a uniform plan has gained considerable impetus in that the committee making this report met last June at Chicago with a special committee on the Prevention of Accidents at Grade Crossings of the American Railway Association, and formulated a report containing numerous recommendations which has been sent to the various state railroad and utility commissioners, who have been urged to press its general adoption. The recommendations of the joint meeting, presented in the report of the committee, contain the following:

(1) That every grade crossing should be protected by an approach warning sign to be placed in the highway at a distance not less than 300 ft. on each side of the railroad tracks, the sign to be a circular disk not less than 24 in. in diameter, painted white with a black border and black cross lines with the letters "R. R." in the upper quarters of the circle. Where it is deemed necessary this approach warning sign should be properly lighted at night.

(2) That the railroad companies maintain within the limits of their rights of way proper cautionary signs such as are now in use or authorized by law, and where deemed necessary such signs to be equipped with a red light at night.

(3) That all lights displayed at night towards the highway at grade crossings shall be red.

(4) That all crossing flagmen use during the day a uniform disk 16 in. in diameter, painted white with a black border, and the word "Stop" painted thereon in black letters about 5 in. high, instead of the varicolored flags, which are now in use.

(5) The uniform painting of all crossing gates with alternate diagonal stripes of black and white.

(6) That the railroad companies wherever practicable be required to maintain their property at grade crossings free of obstruction to vision, also that the highway approaches to crossings shall be so graded that the free passage of vehicles shall not be impeded.

(7) That the National Association of Railway Commissioners, the American Railway Association and the American Automobile Association consider the advisability of agreeing upon whatever legislation may be necessary in the several states to make thoroughly effective the precaution of grade crossings; and that it is advisable that a uniform law requiring vehicles approaching such a crossing to reduce speed to a safe limit at the warning approach sign.

It is stated that about 2,000 persons a year meet death at grade crossings. The appearance in recent years on public highways of high-powered automobiles, the report states, has intensified an already almost intolerable condition.

"The welfare of the state demands the best effort of all in authority to avert these disasters," the report adds. Referring again to the proposed uniform system of preventive measures, the report says: "The presence and uniformity of the warning sign is imperatively demanded if accidents are to decrease. The sign should signify the same thing everywhere. It ought to be so installed as to be in plain view of the driver of the vehicle and so that it could be plainly read at night by automobile headlights.

"The sign on the right of way should be as prominently displayed. Wherever the warning sign can be lighted at night it will increase its usefulness. The drivers of vehicles drawn by horses will receive no practical help from the warning sign in the night time unless it is lighted. The law should require the driver to slow down at the first sign to such a speed as will enable him to have his vehicle under complete control when he reaches the second sign. The uniform painting of all crossing gates with alternate stripes of black and white strikes the traveler like a flaming bush. No prudent man will misconstrue its significance. The uniform red light and the striped gates will soon familiarize all people with their significance. The circular disk recommended by the joint committee looks both to effective warning and uniformity. No one needs to misunderstand its significance."

Referring to the great cost which grade crossing elimination entails, the report suggests that the number of grade crossings may be decreased by the giving of additional powers to state commissions to establish new highways and to abandon and consolidate existing highways. The report also takes up the question of trespassing on railroad tracks and states that responsibility for casualties rests entirely upon the trespasser. The creation of sound public opinion against trespassing upon the rights of way of railroads is described as the best solution of this problem.

A joint meeting of the American Railway Association special committee, the committee of the National Association of Railway Commissioners and a committee representing the American Automobile Association was held at Washington on Monday, in advance of the convention, to consider recommendations formulated by the railway committee for legislation to prevent automobile accidents at grade crossings. The three committees agreed upon the draft of a proposed bill to be submitted by the committee of the Association of Railway Commissioners to the association later in the week. Following a joint meeting of the committees representing the railway commissioners and the American Railway Association in Chicago on June 28 a sub-committee conferred with the executive chairman of the American Automobile Association and the American Railway Association committee was requested to meet with counsel and prepare the drafts of legislation which could be recommended by the railroads. As a result, the committee submitted three drafts of a bill requiring cities, towns and counties to maintain warning signs at every highway approaching a crossing at grade with the tracks of a railroad, to be placed in conspicuous locations beside the highway at a distance of not less than 300 ft. from the nearest rail. The proposed bill would provide a penalty of $1 for each day of neglect upon the part of the community to maintain such a sign unless released from the requirement by order of the state public service commission or body having like jurisdiction. Draft No. 2 provided for a reduction of the speed of automobiles to 10 miles an hour within a distance of 100 ft. from a crossing. Draft No. 3, which the committee most strongly recommended, would require automobile drivers to come to a full stop at a point not less than 10 ft. from the crossing, under penalties for violation.

Committee on Safety of Railroad Operation

The report of the Committee on Safety of Railroad Operation, C. C. McChord, of the Interstate Commerce Commission, chairman, urged that safety to the traveling public demands legislation requiring block signals and rules governing their operation on all railroads. It is pointed out that the association has previously recommended that the use of the block system be made compulsory. The question of signals and the safety in train operation which may be derived from them is treated at great length in the report, which also deals with the subjects of steel cars, wheels, axles, track maintenance and steel rails.

"While it is unfortunately true that accidents do occur on block-signaled roads, nevertheless the block system is the safest method of train operation in general use, and its superiority, as compared with all other methods of railroad operation, is fully recognized," says the report. The report holds that it is doubtful if any improvement which it is possible to make in rules and discipline of employees may overcome the chance of human error and entirely prevent accidents even on well signaled roads. It seems evident that something else may be required to prevent disasters. If it is impossible to entirely eliminate the chance for human error, the only other alternative, the report states, would appear to be some system of automatic control of trains. This is admitted to be a serious problem taxing the brains of the greatest signal engineers. It is deemed wise and recommended that the railroads undertake the further development of a practicable system of automatic train control and place installations under actual working conditions.

The report holds that relatively a too small proportion of the railroad mileage of the United States is operated under block signals. The system should be extended and that already installed should be worked under absolute rules to be obeyed without variation by engineers. Comparisons are made to show that American railroads are still far behind England and the Continent in the use of railroad signal appliances. At the close of the year 1915, for instance, it is stated, the Great Western Railway of England had 45,389 interlocking levers in service. Reports of the Interstate Commerce Commission show that on January 1, 1916, the Pennsylvania Railroad and the New York Central Railroad, including all affiliated lines, with a mileage of about 20,000, as against the Great Western's mileage of 6,600, had less than 44,000 such appliances.

The advantages of steel over wooden cars are stated to be perfectly apparent, and it is said to be only a question of time when all wooden cars will have been retired from service. Attention is declared to be now centered on the manner of use of steel cars, and the committee states that it is highly undesirable that wooden cars be placed either in front of or between steel cars, as the wooden cars in case of derailment or collision would be at serious disadvantage.

At Wednesday's session the Committee on Capitalization and Intercorporate Relations (E. O. Edgerton of the Railroad Commission of California, chairman) recommended that the Interstate Commerce Commission be given power to regulate the stocks and bonds of interstate carriers and that the interstate commission or some other federal agency be empowered to regulate rates and practices and the stocks and bonds of interstate public utilities. The committee also recommended the passage of a national incorporation act; that the Interstate Commerce Commission be given jurisdiction over mergers and receiverships and that legislation be

enacted for federal and state intervention in emergencies to adjust wage conditions, that legislation be enacted for the enhancement of railroad credit and that a committee be appointed by the association to consider the possibilities of co-operation between the government and the railroads.

Max Thelen, president of the California Railroad Commission, was elected president of the association. Reports of additional committees including those on federal and state legislation, etc., will be presented at later sessions.

THE HEARINGS ON THE CAR SHORTAGE SITUATION

The threatened coal famine in the Middle West, Northwest and South, resulting from the shortage of coal cars and the injury to business in general in that part of the country, resulting from a shortage of cars of all kinds, have resulted in extraordinary measures for relief of the situation, notably the Louisville hearing before the Interstate Commerce Commission and legal action of western coal mining companies before the United States District court in Chicago.

The Court Action

As was pointed out in the *Railway Age Gazette* a week ago, 26 coal companies located on the Chicago & Eastern Illinois and the Chicago, Terre Haute & Southeastern filed an application in the United States District court at Chicago for an injunction to force 142 railroads named in the bill to return coal cars to these two roads for the use of mines along these roads. Judge Kenesaw M. Landis of this court, in a decision handed down on November 11, held that his court had no jurisdiction over the case, and that if the companies desired relief they should appear before the Interstate Commerce Commission now sitting at Louisville, Ky., to hear such complaints.

The Louisville Hearing

The Commission's first step in this matter at Louisville, Ky., was taken on November 11, when Commissioner Charles C. McChord, who is conducting the hearing, telegraphed all the important railroads requesting them to start towards home all foreign coal cars and to make daily reports to the Commission as to the results obtained, beginning November 13. The order followed the hearing of testimony by representatives of railroads, shippers and consignees at Louisville.

The outstanding facts brought out by the examination of witnesses were particularly the acute shortage of coal in the Middle West, Northwest and South, the shortage of coal cars where they are most needed, the holding of coal cars by brokers for reconsignment at record-breaking prices, the accumulation of cars in the Atlantic seaboard states with a car shortage in the rest of the country, and the general violation of car service rules by the railroads.

Representatives of public utility companies and manufacturers in the Middle West and South testified that they were unable to secure contract coal from coal operators because of an alleged shortage of cars, and that they had either very small stocks left or had actually been forced to close down. Although operators of eastern Kentucky and Ohio maintained that they were receiving only enough cars to operate their mines half time or less, several witnesses stated that they had no trouble obtaining "free" coal provided they were willing to pay extortionate prices. E. C. Nettles, traffic manager of the Postum Cereal Company, Battle Creek, Mich., stated that his company bought 250 cars of coal from Detroit brokers at $5 and $5.75 a ton, the coal being the same grade which, under their contracts, was worth from 80 cents to $1.25. He added that the brokers had sent him the numbers of coal cars, as proof that they were in their possession, and had promised prompt delivery.

F. B. Dow, attorney examiner of the Interstate Commerce Commission, presented evidence confirming that of Mr. Nettles. He read confidential quotations on Illinois and Indiana coal evidently intended for Michigan consumers. Coal was offered at prices ranging from $5 to $5.50; and below the quotations, in red ink, the reader's attention was called to the car shortage, the embargo placed by many Chicago roads on the shipment of their coal cars east, the impending coal famine and the rapidly rising prices of fuel. The circular offered to ship coal on short notice from junction points on the Pere Marquette, the Michigan Central and other lines.

Testimony of this sort led Mr. McChord to send investigators into Central Freight Association territory to determine to what extent coal brokers were holding cars to take advantage of advancing prices. He also asked the representatives of the carriers present to telegraph their officers at once to determine how many coal cars were being held at junction points and terminals and how long they had been held.

J. A. Paisley of the Valley Camp Coal Company, Cleveland, Ohio, lake shipper of coal, stated that the Northwest was short about 3,500,000 tons of coal and that unless the railroads showed a decided preference to coal shipments to the lake ports during the time remaining until the close of navigation on November 25, there would be great suffering in the territory which gets its coal supply from the head of the Great Lakes.

Other witnesses, representing shippers of grain, lumber, brick and clay testified to their inability to get enough cars to take care of their business. J. S. Brown, transportation manager of the Chicago Board of Trade stated that Chicago grain elevators were as full as insurance restrictions would permit and that, although approximately 80 per cent of the grain was sold for export, it could not be moved east because of the lack of cars. He added that several hundred inbound grain cars were standing on the tracks waiting to be unloaded and that at least 20 per cent of all inbound cars unloaded were marked "bad order" and were thus not available for outbound movement. On October 30, 1915, there were 7,500,000 bu. of grain in store at Chicago, whereas a year later 27,380,000 bu., or nearly four times as much, was held there.

The Railroads' Testimony

The testimony of the railroads showed, first, that there is a very unequal division of cars in the country; second, that carriers are generally violating car service rules; third, that business is abnormal, estimated at 25 to 30 per cent above last year; fourth, that the general trend of business is toward the Atlantic seaboard, drawing cars there at the expense of the rest of the country; fifth, that many shippers and receivers of freight are holding cars for long periods in spite of the cost of demurrage; sixth, cars with export lading are not moved unless vessel room has been arranged for, thus largely eliminating congestion at the ports.

W. C. Kendall, superintendent of car service, Boston & Maine, explained that even in normal times his road had 20 per cent more cars on its line than it owned, because of the trend of the traffic eastward, the Boston & Maine receiving much more freight than it originated. In amplifying this point he stated that the ratio of the raw materials which were received by New England manufacturing plants to the manufactured products shipped west is about three cars to one. At the present time the Boston & Maine has on its line cars equivalent to 150 per cent of its ownership, owing to the fact that industrial activity is from 25 to 30 per cent above normal. He said that the Boston & Maine had tried to reduce its surplus of cars by establishing what he termed "fast days" which are set aside during the week-end once or twice a month. On these days no empty foreign cars are given to local shippers, but are moved direct to western connections. Mr. Kendall also cited numerous instances of shippers and

consignees on his line holding cars for indefinite periods, regardless of demurrage costs.

G. H. Alexander, superintendent of car service of the New York Central, testified that his road decreased its surplus of freight cars in October by 10.2 per cent, but still controlled cars equal to 108.62 per cent of its ownership, the surplus of 8.62 per cent being equivalent, he thought, to the empty cars homeward bound. He said that the New York Central, like the Boston & Maine, observed "fast" days once every two weeks for a period of from 24 to 48 hours, and that west of Buffalo the New York Central lines observed an almost continual fast, generally refusing to bill cars for use except in the direction of the home lines.

R. G. Phillips of Rochester, N. Y., secretary of the International Apple Shippers' Association, said that the apple growing districts of Colorado, Washington and Oregon were suffering a severe shortage of refrigerator cars in spite of the fact that the principal fruit and vegetable crops this year are short from 15 to 50 per cent of the normal production. William L. Wagner of William H. Wagner & Sons, Chicago, apple dealers doing their principal business with apple growers in Washington, confirmed Mr. Phillips' testimony. This information led F. D. Dow, attorney examiner assisting Mr. McCord, to prepare six additional questions relative to the refrigerator car situation to be answered by the railroads.

Edward H. De Groot, Jr., superintendent of transportation of the Chicago & Eastern Illinois, not only confirmed the opinion of other witnesses that during the present emergency coal cars should not be used to carry other commodities, such as sand, gravel, clay and sugar beets, but urged that the Interstate Commerce Commission order the return of coal cars to the owning roads, the order to remain effective as long as the demand for cars in coal traffic continued strong. (This suggestion has since been followed by Mr. McChord.)

Mr. De Groot also favored the creation of a committee, similar to the eastern freight accumulation conference of last spring, to redistribute box cars among roads having less than 100 per cent of equipment, irrespective of the initials on the cars. He said that the box cars of the country were hopelessly pooled and that to attempt to return them to the owning roads at the present time would result in much needless crosswise movement, resulting in great confusion and economic loss. He believed that the Interstate Commerce Commission should be represented on the proposed committee, to give it proper authority.

George Hodges, chairman of the committee on relations between railroads of the American Railway Association, pointed out that the maximum use of cars each year occurred in October and November with a subordinate peak demand for cars in March. He emphasized the fact that net car shortages are relatively infrequent, giving the dates of those occurring since the severe shortage of 1906-07, at the same time pointing to the large net surpluses of intervening years. The present shortage and that of last spring, he said, were due principally to our greatly increased export business which took cars into new channels. The closing of the Panama canal, the diversion of lake and coastwise bottoms to ocean trade, the transformation of the territory east of Chicago and north of the Ohio river into one vast workshop,—all contributed in adding to the burden on the rails of the carriers. Cars have accumulated in the East because the trend of traffic is in that direction and because shippers and receivers of freight have not provided themselves with sufficient facilities rapidly to unload cars, with the result that cars accumulate on the station tracks, materially clogging the circulation of equipment. At present there is an excess of 100,000 box cars in the East above the number owned by the roads. (By the "East" he means the states in Official Classification territory as well as Virginia and North and South Carolina.) On the other hand, these roads are short of their ownership 25,000 coal cars.

Mr. Hodges said that the railroad executives in a meeting at New York on November 14, would probably oppose a car pool and favor an increased per diem charge to be fixed according to conditions prevailing on a line at a particular time. The per diem charge will be determined by a new body which can act more quickly than the American Railway Association. An increase in per diem rates must be accompanied by a more careful study of traffic by individual lines to forestall the acceptance of shipments which cannot be readily disposed of. He stated further that the demurrage rules would be revised but he did not go into the details of the proposed changes.

The car pool, Mr. Hodges said, is not a panacea. The alleged advantage of the pooling arrangement is that cars can move in any direction, which is exactly what has happened under the present rules. An investigation of 107 railroads during one month of this year disclosed the fact that every line violated the car service rules of the American Railway Association and that the violations during that period aggregated 40,000. The Committee on Relations prepared the revised car service rules, which are designed to be automatically enforceable, and this plan, was to be considered by the railroad presidents at New York this week. He believed the rules, if adopted, could be put into force in their entirety before January 1.

E. E. Betts, superintendent of transportation of the Chicago & North Western favored the revision of car service rules so that, in contrast with the present rules, they would be few, simple and enforceable by virtue of heavy penalties. He would provide that cars should move always in a homeward direction and that owners should take cars at any junction point offered, except coal cars in joint traffic where two or more lines unite to form a through route. He spoke of the importance of changing tariffs so as to set higher minimum weights for the loads of cars, thus increasing the total available car supply; and advocated an increase in demurrage rates and a modification of the placing rule so that cars may be placed at noon as well as at 7 a. m., free time to end in 48 hours from the hour placed. He also favored restricting reconsigning privileges.

R. K. Smith, vice-president and general manager of the Mississippi Central, stated that from the point of view of his road, it was a poor investment to purchase cars. In fact, he asserted that under some conditions, the ownership of cars proves a liability. Two years ago the Mississippi Central owned 1,100 cars, since which time 100 have been destroyed by other lines. The per diem, he stated, by no means covers the cost and interest on new equipment. On November 1, 1916, his road had cars equivalent to 23 per cent of its ownership on its lines, with its own cars scattered over 117 railroads of the country, with no hope of getting them back. Participating roads should furnish cars to originating roads. This view was later opposed by E. E. Betts (C. & N. W.), who said that any arrangement by which participating roads would furnish cars for shipments coming from an originating line would lead to endless confusion and perplexing accounting difficulties; the simplest way out of the difficulty was for the originating roads to furnish sufficient equipment for traffic originating on their lines and the per diem rate be made high enough to cover the cost and interest on the equipment.

J. T. Bougher, chief clerk in the car department of the Philadelphia & Reading, suggested that the government establish a car trust to protect weaker lines, like the Mississippi Central, such measures being in line with the assistance the government is giving to the forestry, fisheries and farming industries. Mr. Bougher also suggested the issuance of maps by the Interstate Commerce Commission showing in what territories car shortages exist. He believed that

if the men who control the movement of cars on railroads were furnished with maps at intervals indicating where cars are needed, the problem of relieving shortages would be simplified.

The Chicago, Rock Island & Pacific, in conformance with the Commission's request of November 11, has sent orders to its division superintendents to return all foreign coal cars empty to the owning roads.

The railroads appearing before the commissioner at Louisville are answering not only the first series of 17 questions already published in the *Railway Age Gazette*, but a second series which has been prepared by the Commission relating to car mileage and car detention, the substance of which was published in the *Railway Age Gazette* of a week ago. The Commission has also required the railroads to file a statement of the location of their cars, as of November 1, November 8, and each day thereafter. Those roads which compile location reports at given times every month classifying the kinds of cars, are expected to submit such reports in addition to the others.

SPECIAL COMMITTEE ON LEGISLATION

The Special Committee on Relations of Railway Operation to Legislation made the following report to the roads supporting it at a meeting in New York Wednesday:

Two hundred and thirty-five railway companies (224,610 miles) are supporting the work of the committee.

Two bills of extreme importance will be pending when Congress convenes on December 4, those relating to Hours of Service and to Clearances.

H. R. 14530, which has been favorably reported in the House of Representatives, provides, in effect, that despatchers and operators are to be limited to an eight-hour continuous trick in each twenty-four hours, instead of being permitted to work nine or thirteen hours, as under the existing law.

The provisions of the Act are also made applicable to any employee who operates signals, switches, or any mechanical devices affecting the movement of trains, and provides, in addition, that, except in cases of accidents any trainman or engineman using the telephone under any circumstances comes under the operation of the eight hour rule.

As a result of hearings held on April 27, 1916, the then existing clearance bills were dropped, but new bills were immediately introduced into both houses (S. 6550 and H. R. 16681). The latter was favorably reported in the House, without opportunity having been given for a hearing. We are assured of an opportunity to present the matter in the Senate, and it is in the hands of the sub-committee of engineering officers, who are prepared to deal with the question, should the necessity arise. The bills now pending on this subject are far less drastic than those which preceded them and it is not beyond the bounds of possibility that a satisfactory solution of this question can be worked out.

On July 1, 1917, the period within which freight cars must be brought into conformity with the United States Safety Appliance Standards, expires. It will be recalled that, after a hearing, the Commission extended this time for one year from July 1, 1916. Bulletin No. 87, issued November 1, 1916, shows, in a general way, the progress made by the larger lines in the equipment of freight cars by six months' periods, from July 1, 1911, to July 1, 1916, together with the number remaining unequipped. From this it is apparent that a large number of cars will necessarily be found lacking when the law goes into effect fully. That a larger number of cars have not been equipped within the last year has been due to two facts: 1. The extreme difficulty in obtaining material, and 2. The increasing difficulty of obtaining unequipped cars for the purpose of providing them with the necessary appliances, owing to the heavy traffic, which has dispersed the cars all over the country and keeps them out of the possession of their owners. For these two reasons a number of roads have asked that representations be made to the Interstate Commerce Commission with a view to obtaining, if possible, an additional extension of time.

On June 6, 1916, the Interstate Commerce Commission issued its order prescribing headlights on all road locomotives which would enable persons with normal vision, under normal weather conditions, to see a dark object the size of a man for a distance of one thousand feet or more ahead of a locomotive and that all switch engines must have headlights which will enable a man under similar conditions to see a similar object for a distance of three hundred feet or more.

This requirement was to take effect October 1, 1916, but was, on September 1, 1916, extended to January 1, 1917. Since that time the Commission has called for a further hearing on this subject. This was held on October 30. No further order has been issued up to the present time.

Officers of multiple track roads fully equipped with signals have been insistent upon the dangers which would be incurred by operating locomotives on such roads with headlights which would obscure signals and flags and would dazzle engineers on opposing trains.

It is to be hoped that some modification of the commission's order may be secured.

State Legislation.—During 1916 the legislatures of eleven states were in session. In these, 198 bills affecting railway operation were introduced, and but 23 enacted, most of the latter being of small importance. During the coming year legislatures will meet in 42 states. In a number of these the state committees which have been previously organized will be prepared to resume their duties.

J. F. Maguire has tendered his resignation as a member of this committee. Your committee has recommended to the members of the executive committee of the American Railway Association that the chairman of the General Managers' Association of New York be nominated to the roads to fill this vacancy, and that whoever may be hereafter elected chairman of that association shall automatically become a member of the committee.

Japan's Railway Problem.—When the first railways were planned for Japan in 1871 there was no standard gage track. There were a number of gauges. A British engineer explained them all to the mikado and his advisers, and they decided to adopt the narrow gage because it was the cheapest and because it fitted best the country's narrow highways and stiff grades. Now, the 6,000 miles of Japanese railways are all of the narrow gage, 3 ft. 6 in. The railway service of the Nippon empire is frightful. The trains are slow, the fastest expresses making less than thirty miles an hour, the coaches are low and narrow and the sleeping cars cramped and inconvenient. Since 1892 there have been several attempts to broaden the gage on the main island, but the proposed legislation has failed of adoption. The estimated cost is nearly $450,000,000. The transformation to the standard gage, would require several years and cause much inconvenience. The track would have to be rebuilt, the rolling stock scrapped and stations and tunnels rebuilt and widened. Dr. Soyeda, director of the imperial railways, favors the change. He estimates the main Tokaido line could be converted to broad gage in 12 years and the other lines on the main island within 25 years.. There would be but little interruption to traffic, according to his present plans. There is an organized opposition to the conversion from business men all over Japan. They think the money could be spent better in some other way. They fail to see the advantages of increased capacity, military expediency, increased speed and the benefit of all the railway inventions of the other nations.—*Commerce and Finance.*

Comparative Statistics of the World's Railways

Our Railways Charge Lowest Rates Except India Yet Pay Highest Wages Except Western Australia

THE Bureau of Railway Economics has issued its second annual compilation of comparative railway statistics of the United States and foreign countries, giving in tabular form the principal information which is furnished for the United States in the statistical reports of the Interstate Commerce Commission, for 38 countries or states, whose combined railway mileage in 1913 was 591,000 miles, or approximately seven-eighths of the total railway mileage of the world. Part I of the bulletin gives consecutively the principal information for the 38 countries and states for the latest year for which they are available, while Part II brings together comparatively in a series of tables the most significant averages and ratios pertaining to railway operation in the different countries for the year 1913, the latest year for which most nearly complete sets of official statistics are available.

In a review of the bureau's bulletin issued last year giving comparative figures for 1912, published in the *Railway Age Gazette* of October 29, 1915, page 805, it was pointed out that in only one country in the world do the railways haul freight so cheaply as the railways of the United States, and that wages of railway employees in the United States are higher than in any other country except one. The country that has lower freight rates than the United States is India, where the cost of labor is so little as to be almost negligible, and the only country in which railway wages are higher than in the United States is Western Australia, where the average freight rate per ton is almost twice as great as in the United States. These facts are not changed by the statistics for 1913, nor is the fact that, in the factor of capital per mile, the United States is exceeded by every one of the principal countries of the world.

The data for the present bulletin have been seriously curtailed as the result of the European war, which has apparently put a stop to statistical compilation in many of the more important countries and has narrowed its extent in others. The comparative tables, therefore, are not entirely complete in some instances.

Undoubtedly the most striking feature of these comparisons is the low rates for which freight is carried in the United States in spite of the high wages paid, since wages constitute the principal item in railway operating expenses. The average receipts per ton mile on the railroads of the United States, .729 cents, are only about 60 per cent of the average rate for hauling a ton one mile received by the principal European countries. India is the only country in the world that has a lower rate, .7 cents. Brazil has the highest rate, 7.03 cents per mile. Canada has only a slightly higher rate than the United States, .758 cents, while in most countries the average freight rates are two, three or four times as much as those received by the railways of the United States. The comparative figures for the different countries are as follows:

AVERAGE RECEIPTS PER TON-MILE

	Cents.		Cents.
United States	0.729	Germany	1.244
		Holland	1.242
Algeria and Tunis (1911)	1.691	Hungary (1912)	1.215
Australia:		India	0.700
New South Wales	1.593	Japan	0.774
South Australia	1.756	Mexico (National Railways)	1.443
Austria	1.509	Norway	1.487
Brazil (1912)	7.038	Roumania (1912)	1.297
Canada	0.758	Russia (1910)	0.933
China (Peking-Mukden Line, 1912)	0.815	Siam	1.435
		Spain (1909)	2.226
Cuba (1911)	2.944	Sweden (1912)	1.373
Denmark	2.113	Switzerland	2.632
France (1912)	1.183	Union of South Africa	1.597

The average receipts per passenger mile in the United States, on the other hand, are higher than in any other country except Brazil and Cuba. The average rate in the United States is 2.008 cents, while in Austria the average rate is 1.079, in France 1.068, Spain 1.522, Hungary, .967, Germany .908 and Russia .699 cents. In India the average rate is only .414 cents. In Brazil the average passenger rate per mile is 2.64 and in Cuba 2.86 cents. The reason for the low passenger rates in other countries is, of course, to be found in the difference in the character of the service and is explained in the tables published in the bulletin, showing that the average density of passenger traffic is greater in 17 other countries than it is in the United States, and also the tables showing the distribution of passengers into classes in other countries. In the United States practically all passenger traffic is first class, while in other countries the great bulk of the travel is second or third class and the average rate per passenger mile is greatly reduced on account of this preponderance of low class traffic. In India, for example, which has the lowest passenger rates, 89.8 per cent of the traffic is third class and the density of passenger traffic is 479,399 passenger miles per mile of line as compared with 143,067 in the United States. In Germany, which has a density of 693,317 passenger miles per mile of line, 42 per cent of the travel is third class, 49 per cent is fourth class and only 0.1 per cent is first class. Belgium has a passenger density of 1,046,614.

An indication of the difference in the accommodations furnished in the different countries is afforded by the statement of the average number of passengers per train, which in the United States is 55. Denmark, with an average of 52, is the only country which has a smaller number of passengers in proportion to the train service than the United States. In India the average number of passengers per train is 183, in New South Wales it is 112, in Japan 108, Belgium 99, Germany 84 and France 70.

The extravagance with which our passenger service in the United States is conducted to meet the demands of the traveling public is indicated by the fact that the passenger revenue per mile of line received by the railways of the United States, $2,871, is exceeded in 16 other countries. In the United Kingdom the average passenger revenue per mile of line is $9,684, in Belgium $7,347, in Switzerland $6,899, in Holland $6,373 and in Germany $6,292.

The principal economies in operation in this country which have made possible practically the lowest freight rates in the world have been effected in the conduct of the freight service and mainly by increasing the size of the units in which freight is transported. The railways of the United States handle more freight per car, per train and per mile than the railways of any other country in the world. The average carrying capacity per freight car in the United States in 1913 was 38 tons, as compared with 14.3 tons in Austria, 14.1 in France, 15.9 in Germany and 13.4 in Hungary. The only countries in which the average capacity of the freight cars approaches that of the United States are Mexico with 35.4 tons and Canada with 32.1. No other country in the world approaches the United States in the number of tons of freight per train. The average in 1913 was 445.4. In Canada, which comes next in order, the average was 342 tons, while in Austria the average was 195.9, in France it was 147, in Germany 239 and in Hungary 147 tons.

The comparison of traffic density per mile of line and of the number of passengers and tons of freight per train suggests that in many countries passengers are handled very much like freight.

That the level of freight rates in this country is even lower

than would be accounted for by the traffic density, is shown by the fact that although the railways of the United States handle the greatest volume of traffic per mile of line their freight revenue is exceeded in four other countries. Railways in the United States in 1913 handled an average of 1,245,158 ton miles per mile of line as compared with 1,119,983 in Germany, and 1,033,254 in Russia, the next two countries on the list in point of traffic density. The freight revenue per mile of line in the United States, however, was only $9,048, as compared with $13,950 in Germany. In Austria the railways averaged $11,262 per mile of line freight revenue with an average density of 747,060. In Belgium the average freight revenue per mile of line was $14,440 and in the United Kingdom it was $13,689.

The average yearly compensation per employee is shown in the following table:

AVERAGE YEARLY COMPENSATION PER EMPLOYEE

Based on average number of employees during year:		Based on number of employees at end of year:	
Australia:			
New South Wales	*$618.62	United States	*$756.83
Western Australia	*800.50		
Germany	*408.97	Australia:	
Holland	*341.52	Victoria	*623.24
Italy	376.81	Austria	*335.90
Japan	112.56	Canada	*647.91
New Zealand (1912)	*632.16	Hungary (1912)	*300.41
Sweden (1912)	409.00	Roumania (1912)	*249.40
Switzerland	*365.08	Russia (1910)	*211.40

*Computed by Bureau of Railway Economics.

In the principal European countries the average wage is hardly more than half that paid in the United States. The lowest average is in Japan, $112.56.

In earnings per mile of line the railways of the United States are exceeded by those of 10 other countries, Austria, Belgium, Egypt, France, Germany, Holland, Italy, Russia, Switzerland and the United Kingdom. The average operating revenues per mile of line in the United States in 1913 were $12,859. In Belgium, Germany and the United Kingdom the earnings per mile were approximately twice as great. The highest average is that for the United Kingdom with $28,645.

In net operating revenue per mile of line the railways of the United States are exceeded by the railways of 12 other countries. The average for the United States was $3,930, while that for the United Kingdom, whose railways had the largest net earnings, was $10,708.

The bulletin points out that statements of railway capital in different countries are not strictly comparable in many cases because where railways are privately owned the term capital means outstanding stocks and bonds, while the statistics of railways under government ownership ordinarily refer to the amounts expended for construction and equipment. The average capital per mile of line as shown by the bureau's compilation in 1913 was as follows:

CAPITAL PER MILE OF LINE

1913

United States	$65,861	France (1912)	$150,439
Algeria and Tunis (1911)	55,108	Germany	120,049
Australia	47,040	Hungary (1912)	71,226
New South Wales	71,392	India	46,343
Queensland	35,360	Japan	88,633
South Australia	44,971	Mexico (National Railways)	68,360
Victoria	63,474	New Zealand	55,035
Western Australia	26,080	Norway	43,718
Austria	122,053	Roumania (1912)	90,093
Belgium (1912)	216,143	Russia (1910)	86,968
Bulgaria (1911)	47,133	Siam	40,097
Canada	56,605	Spain (1909)	89,348
Chili	48,265	Sweden (1912)	33,940
China (Peking-Mukden Line, 1912)	32,902	Switzerland	129,597
Denmark	61,397	Union of South Africa	48,527
		United Kingdom	274,027

The list is headed by the United Kingdom with a capital of $274,027, Belgium comes next with $216,143, while France had $150,439 and Germany $120,049.

While the railway mileage of the United States far exceeded that of any other country in the world, there are 11 countries that in 1913 had more miles of line per 100 square miles of area. These were Belgium, which heads the list with 48.16 miles of line per 100 square miles, Austria, Denmark, Egypt, France, Germany, Holland, Hungary, Italy, Switzerland and the United Kingdom. The average for the United States was 8.52. The mileage of line per 10,000 of population in the United States was 26.09, which is exceeded in Argentina, Australia and Canada. The greatest mileage of line in proportion to population was in Western Australia, with 121.84 miles per 10,000 of population.

WASHINGTON CORRESPONDENCE

WITNESSES TO APPEAR BEFORE NEWLANDS COMMITTEE.

Active preparations are being made for the beginning of the general investigation into the problems of railroad regulation to be undertaken by the congressional Joint Committee on Interstate Commerce. The first hearing is to be held at Washington, beginning November 20. Representatives of every interest affected by the railroad question, including shippers, bankers, railroad executives, state commissioners and officers of labor organizations, as well as a number of leading economists, have signified their intention of appearing before the committee.

Senator Newlands, chairman of the committee, has already received letters indicating that the following men will appear before the committee:—John H. Gray, University of Minnesota, Minneapolis; Nicholas Murray Butler, president, Columbia University, New York; Prof. John R. Commons, University of Wisconsin, Madison; Dr. F. H. Dixon, Dartmouth College, Hanover, N. H.; F. A. Delano, Federal Reserve Board, former president Wabash and Chicago, Indianapolis & Louisville; E. R. Dewsnup, University of Illinois; Samuel O. Dunn, editor *Railway Age Gazette;* O. P. Gothlin, former member Ohio Railway Commission; Dr. Arthur T. Hadley, president, Yale University; F. C. Howe, commissioner of immigration, New York; Louis H. Haney, Federal Trade Commission; Emory R. Johnson, University of Pennsylvania; Ray Morris, of White, Weld & Co., New York; Samuel Rea, president, Pennsylvania Railroad, Philadelphia; Prof. W. Z. Ripley, Harvard University; Prof. E. R. A. Seligman, Columbia University; Jacob Schiff, Kuhn, Loeb & Co., New York; Frederick D. Underwood, president, Erie Railroad; T. F. Woodlock, of S. N. Warren & Co., New York; Dr. Charles Zueblin, Boston; Victor Morawetz, New York; Joseph N. Teal, Portland, Oregon; Paul H. King, Detroit, receiver, Pere Marquette; Luther M. Walter, Chicago; J. M. Dickinson, Chicago, receiver, Chicago, Rock Island & Pacific; A. P. Thom, general counsel, Southern Railway.

In addition to these individuals the chairman of the committee has been informed by letter that representatives will appear for the four railroad brotherhoods, for each of the express companies, the Western Union and Postal Telegraph Companies, the American Telephone & Telegraph Company, New York Paper and Pulp Traffic Association, National Association of Manufacturers of Medicinal Products, Detroit; National Association of Railway Commissioners, Chamber of Commerce of the United States, Farmers' Cooperative Association and other organizations.

Several of the state railway commissions, including those of Texas and New York, will be represented individually as well as by the national association.

It is highly probable that the railroads will first be given an opportunity to state their case, informing the committee of the character and scope of legislation which they regard as fair and necessary to the carriers. The shippers' organizations will probably follow with a statement of their case and after these interests have been heard the state railway commissions, representing the public, will be given a hearing. Individuals who wish to deal with specific phases of the railroad problem will be heard later. This program un-

doubtedly will be broken or interrupted at times, but it is authoritatively indicated that this is the general order in which the committee will hear testimony.

Commercial Bodies Urge Improvement in Railroad Regulation

The interest of the country at large in the Newlands investigation is reflected in resolutions coming into Washington from trade bodies in all parts of the country requesting further action by the Chamber of Commerce of the United States in connection with the railroad situation, which is to be one of the principal topics for discussion at a special meeting of the National Council of the chamber to be held here the latter part of this week. The chamber's committee on the railroad situation, which was appointed last February with particular reference to the wage controversy between the railroads and the brotherhoods of train service employees, is to be continued and is preparing for a study of the railroad problem in the various phases to be considered by the joint congressional committee.

Many of the resolutions from trade organizations are in response to an invitation from the Railway Business Association and the New York Merchants' Association to other commercial bodies to join in a request for action by the national chamber. The Railway Business Association, for the purpose of correcting defects in our present system of railway regulation, advocates especially that the national government should take over the regulation of the instrumentalities of interstate commerce on behalf of the states, except as to purely local matters. The Merchants' Association of New York has sent to other commercial organizations throughout the country copies of a pamphlet containing resolutions adopted by the association, in support of the plan for preventing the interruption, by strikes, of the operation of public utilities, together with an outline by Henry R. Towne of New York, telling how the plan might be carried into effect.

Briefly, it provides for the enforcement of a contractual relation between employers and employees on public utilities. It is suggested not so much as a final solution of this important question, although the Merchants' Association hopes it may prove to be such a solution, but as a means of bringing the matter forward for discussion. The association has asked the Chamber of Commerce of the United States to submit the question to its constituent members in the form of a referendum in order that the sentiment of the business men of the country may be ascertained. It has also asked other organizations to join in requesting such a referendum.

The Merchants' Association has also declared in favor of giving the federal government, through the Interstate Commerce Commission, control over railroad rates and regulation within state limits, for the purpose of doing away with a large number of vexatious matters arising from the conflict between federal and state authorities over lines of transportation. The Merchants' Association is also in favor of the federal incorporation of railroads; federal supervision of the issue of securities by interstate carriers; the enlargement of the Interstate Commerce Commission so as to enable it promptly and adequately to perform its functions; and strongly opposes government ownership of public utilities.

Early indications are that the National Council meeting in Washington will be largely attended.

Illinois Passenger Fares

The supplemental decision of the Interstate Commerce Commission in the case involving Illinois passenger fares, which was briefly noted in last week's issue, seems to be broad enough and specific enough to permit, and practically to require, the railways of Illinois to advance their passenger fares throughout the state to 2.4 cents a mile in spite of the act of the state legislature limiting the fares to 2 cents a mile. This is the case in which the Business Men's League of St. Louis filed a complaint with the commission because of the discrimination against St. Louis created by the lower passenger fares in the state of Illinois after the Interstate Commerce Commission had allowed the railroads to advance their interstate fares to approximately 2½ cents a mile. This made the fare from Chicago to St. Louis $7.50 while the fare between Chicago and East St. Louis was only $5.62. The commission in its decision of July 12 held that 2.4 cents was a reasonable rate for interstate fares in this territory and required the railroads to remove the discrimination against St. Louis, Mo., and Keokuk, Iowa. The decision was limited, however, to the points involved in the complaint. The supplemental report covers all points in Illinois.

"In our original report in this proceeding," Commissioner Daniels says, "it was shown how the lower state fares within Illinois furnished a means whereby passengers could and did defeat the lawfully established interstate fares between St. Louis and Illinois points. This was done by using interstate tickets purchased at interstate fares from St. Louis to an east side point in Illinois and thence continuing the journey to any Illinois destination on a ticket purchased at the lower state fare.

"We deem it advisable to point out that the interstate fares between St. Louis and Keokuk on the one hand and interior Illinois points on the other, made on a per mile basis of 2.4 cents, would likewise be subject to defeat if the state fares to and from interior Illinois points intermediate to the passenger's ultimate destination be made upon a basis lower than the fares applying between St. Louis or Keokuk and such Illinois destination. It would be necessary merely for the passenger who desired to defeat the interstate fare to shift the intermediate point at which to purchase his state ticket. The burden and discrimination which a lower basis of fares within the state casts upon the interstate commerce would not be removed merely by an increase in the intrastate fares to and from the east bank points.

"And not only this burden, but the direct undue prejudice to St. Louis and Keokuk will also continue if the east side cities while on the face of the published tariff paying fares to and from Illinois points upon the same basis as do St. Louis and Keokuk can in practice defeat such fares by paying lower state fares in the aggregate to and from Illinois destination, by virtue of such an adjustment of fares."

The commission therefore held that any contemporaneous adjustment of fares between St. Louis or Keokuk and Illinois points and generally within Illinois which would permit the defeat of the interstate fares by methods such as described will continue the undue prejudice to St. Louis and Keokuk and continue the illegal burden on interstate commerce, and the roads are required to put the new rates in effect on or before January 15, 1917.

There are now 38 states in which passenger fares are permitted on a basis of more than 2 cents a mile, leaving only 10 states which have 2-cent fares, including Illinois. The commission pointed out in this decision that Illinois is on the western confines of official classification territory, in which the commission has permitted interstate fares on a basis of approximately 2½ cents a mile, and is partly included in territory where the commission itself fixed the basis of passenger fares, in the western passenger fare case, at 2.4 cents a mile. The railroads, therefore, under the state rates receive less for the transportation of passengers in Illinois than they do for hauling passengers in either direction into or out of the state. The extent to which the average passenger revenue of the Illinois roads is reduced by the Illinois 2-cent fare law is shown in an exhibit filed in this case showing that 11 roads whose mileage in Illinois was 7,003 as against 33,916 for their entire lines, in 1914 received an average revenue per passenger per mile in Illinois of 1.804 cents, while the average for the entire lines was 1.965 cents, and for the entire lines, excluding Illinois, 2.021 cents.

American Railway Association—Fall Meeting

Radical Action; Freight Car Per Diem Rate Increased; the Powers of the Car Service Commission Enlarged

THE fall session of the American Railway Association was held at the Biltmore Hotel, New York City, on Wednesday, November 15. There were present 252 members represented by 175 delegates. The Executive Committee reported that the membership now comprises 405 members operating 284,019 miles and 229 associate members operating 14,756 miles. The following were elected members of the Committee on Nominations: W. J. Harahan, president, Seaboard Air Line, and Hale Holden, president, Chicago, Burlington & Quincy. The following roads were elected members of the Committee on the Safe Transportation of Explosives and Other Dangerous Articles: Canadian Pacific, Chicago, Rock Island & Pacific and Philadelphia & Reading. The following roads were elected members of the Committee on Electrical Working: Baltimore & Ohio, and Chicago, Milwaukee & St. Paul.

It was decided to hold the next session of the association in New York May 16, 1917.

Report of the Executive Committee

The following is a summary of the report of the Executive Committee, which was adopted:

A. W. Thompson, vice-president of the Baltimore & Ohio, having been elected first vice-president, A. H. Smith, president of the New York Central Lines, has been elected second vice-president, to fill the unexpired term of Mr. Thompson, and Fairfax Harrison, president of the Southern, has been elected a member to fill the vacancy in the committee.

At the session of the association on November 17, 1915, a resolution was adopted directing the executive committee to consider the most suitable manner of perpetuating the memory of W. F. Allen. The committee has considered this subject at several meetings. In its opinion it is not within the association's power to use its funds for any object other than as provided in the by-laws. It is the feeling of the committee, therefore, that the proper channel in which to handle this matter will be through the American Railway Guild.

At its meeting on November 20, 1912, the association adopted a resolution authorizing the president on receipt of any complaint to appoint a committee of three members of the executive committee to act as a commission under the provisions of Per Diem Rule 19 for the purpose of supervising the observance of Per Diem Rule 3, governing the handling of freight cars. Three commssioners were appointed accordingly at different times to consider complaints.

In November, 1913, the executive committtee reported that the members of the several commissions had recommended that the three commissions be consolidated. In accordance therewith, a resolution was adopted by the association providing for that action and the resolution is now in effect.

The foregoing action apparently requires that members of the Commission on Car Service must be also members of the executive committee. The executive committee is of the opinion that the resolution should be so amended as to provide that the selection of the members of the Commission on Car Service need not be limited to the members of the executive committee.

A sub-committee consisting of L. F. Loree, chairman; J. Kruttschnitt and D. Willard, has been appointed by the executive committee to report upon the co-ordination of the various voluntary railway organizations with the American Railway Association and generally upon the administration and work of the association itself. The sub-committee has held several meetings and at the present time is prepared to recommend the creation of a committee on traffic relations to consider questions intimately connected with the transportation practice and involving wide stretches of territory. In order to make effective the recommendations of the sub-committee, several amendments to the by-laws are proposed for consideration at the next regular session of the association (May, 1917).

As there are a number of subjects now pending, such as charges for the use of cranes, minimum carload weights, rates to apply to freight cars of private ownership, etc., which should be considered by a committee on traffic relations, the services of such a committee should be available without delay. The following resolution creating a special committee on traffic relations is recommended, therefore, for the consideration and approval of the association:

Resolved, That a Special Committee on Traffic Relations, consisting of ten members, be appointed by the President; five to be traffic officials and five to be transportation officials; four to represent the Official Classification territory, two the Southern Classification territory and four the Western Classification territory. This committee to consider questions intimately connected with the transportation practice and involving wide stretches of territory.

The report from the special committee on accident statistics (given below) indicates that the committee has made substantial progress. The efforts of the railroads should be continued in an endeavor to prevail upon the railroad or public service commissions, in the states which have not already done so, to accept accident reports on blanks identical with those of the Interstate Commerce Commission.

Freight Car Situation.—One of the most important subjects which the association has before it is in connection with the present freight car situation. It is evident that the railroads must promptly and earnestly seek remedies which will insure the proper handling of freight equipment. The association, through its committee on relations between railroads, has taken the first step, which cannot fail to produce results, in recommending that railroads file tariffs containing certain amendments to the demurrage rules which provide for increasing the demurrage rates, reducing the number of credits under Rule 9 of the average agreement, and the abolition of the weather rule. In response to its recommendation, in view of the urgency of the situation, a large number of railroads have filed tariffs containing the amended demurrage rules.

It is now essential that necessary rules be adopted by the association which will prevent the misuse of freight equipment by any railroad. The commission on car service has given the most serious consideration to this phase of the subject. As a result, the commission recommends the establishment of certain principles in the handling of freight equipment to overcome the present difficulties. Its conclusions and recommendations have received the unanimous approval of the executive committee and it is hoped that they will be adopted by all the members of the association. The changes in the codes of car service and per diem rules which are necessary to make effective the recommendations of the commission on car service should be submitted to the members of the association for a vote by letter ballot and a resolution to provide for such action will be offered by the committee.

In view of the importance of concerted and prompt action being taken by the railroads to put in effect the rules to insure the proper handling of freight equipment, the executive committee held a conference with the presidents of members of

the association on Tuesday, when the report of the commission on car service and the suggested amendments to the rules were carefully considered. A vote by roll call was taken on the following resolution: *"Resolved,* That the report of the commission on car service be approved and further that the commission on car service be and is hereby empowered, with the approval of the executive committee, to add to or modify any of the rules recommended by it."
This was adopted unanimously.

In view of the exigency of the present car situation, it was the feeling that the amendments as proposed should be adopted and put into effect at the earliest date possible. It is recommended, therefore, that the amended rules become effective on December 1, 1916.

Law Regulating Purchases.—On the recommendation of the committee, the association at its session last May approved the appointment of a sub-committee consisting of J. Kruttschnitt, chairman; W. W. Atterbury and W. G. Besler, with Alfred P. Thom as counsel, to represent the association at the hearing on June 19, before the Interstate Commerce Commission with respect to its tentative rules for the administration of Section 10 of the Clayton anti-trust act. The meeting was postponed to June 20 and on June 19, the question was discussed with representatives of the various carriers. The position of the carriers was then fully represented by the sub-committee at the hearing of June 20 before the Interstate Commerce Commission, and copies of the proceedings of the hearing have been distributed to the members of the association.

The Interstate Commerce Commission subsequently appointed a special committee, consisting of W. J. Meyers, F. W. Sweney and E. W. Hines, to confer further with the sub-committee concerning the details of the proposed regulations. The sub-committee met this special committee of the commission on July 13, and after expressing its views as to the changes that were desirable in the proposed regulations, presented a revision of the tentative rules that it was hoped might receive the endorsement of the special committee and of the commission.

In the meantime a resolution which had been introduced in Congress postponing the effective date of Section 10 of the Clayton act was passed and approved by the President, August 31, 1916. Therefore, the effective date of Section 10 is now April 15, 1917, instead of October 15, 1916. Additional time will thus be allowed for further investigation by Congress of the objectionable features of the law and for careful consideration by the Interstate Commerce Commission of the rules to be formulated for the enforcement of the act in its final form.

Standard Freight Car.—A report of progress has been submitted to the executive committee by the committee on standard freight car equipment. That committee advises that the final revision of the specifications for a standard box car will be completed by December 1, 1916, and that three sample cars to be constructed in accordance with those specifications will be ready for the inspection of the committee by February 15, 1917. If the expectations of the committee are realized it hopes to make a final report to the association at the May, 1917, session.

Highway Crossings.—It will be noted from the report of the special committee on the prevention of accidents at grade crossings that substantial progress has been made with the important subjects which that committee has in hand. Its recommendations relative to standard practice to prevent accidents at grade crossings and which were approved by the association at its last session should be put into effect at once by every railroad. A number of railroads have already adopted the specified standards.

Continuous Home Route Card.—At the May, 1915, session of the association, on the recommendation of the Committee on Relations Between Railroads, an amendment to Rule 5 of the car service rules covering the compulsory use of owners' continuous home route card or substitute, as prescribed in car service rule 19, was ordered presented to the members of the association for a vote by letter ballot. The letter ballot was taken with the following result: Yes, 251 memberships, representing 1,831,248 cars; no, 110 memberships, representing 609,709 cars; not voting, 42 memberships, representing 84,915 cars. Announcement was, therefore, made on June 28, 1915, that the amended rule would take effect as of January 1, 1916. At the November, 1915, session of the association, the committee on relations between railroads requested the association to postpone the effective date of amended car service rule 5 until July 1, 1916. Again at the May, 1916, session of the association, the committee asked for a further postponement of the obligatory use of the continuous home route card until January 1, 1917, which was granted.

Attention is called, therefore, to the fact that the amended form of car service rule 5, which provides for the obligatory use of the continuous home route cards, will become effective on January 1, 1917. As car service rule 5 forms a part of per diem rule 9 its provisions should be observed by all subscribers to the per diem rules agreement.

A sub-committee of the executive committee, consisting of H. E. Byram, chairman; H. U. Mudge and W. J. Jackson, has been appointed for the purpose of investigating the reasons existing which have prevented certain western lines from adopting the continuous home route card and to determine whether the plan can be adapted to the situation of the railroads which now object to its use. It is hoped as a result of this investigation that all of the subscribers of the per diem rules agreement will be prepared to adopt the continuous home route card on January 1, 1917.

Place of Meeting.—A number of members have expressed the opinion that the spring session of the association should be held each year in New York City and the fall session in Chicago. In order to cover this suggestion, in which the committee concurs, an amendment to the by-laws to provide accordingly is proposed and will be presented for action at the May, 1917, session.

Special Committees.—In accordance with the resolution adopted by the association on May 19, 1915, the committee recommends that the following special committees, whose functions would otherwise cease with this session, be continued:

Committee on Standard Freight Car Equipment;
Special Committee on Co-operation with the Military Authorities;
Special Committee on Accident Statistics;
Special Committee on Section Ten of the Clayton Anti-Trust Act;
Special Committee on Statistics of Employees;
Joint Committee on Automatic Train Stops;
Committee on Packing, Marking and Handling of Freight;
Committee on Weighing;
Committee on Legal and Traffic Relations;
Committee on Standard Time;
Special Committee on the Prevention of Accidents at Grade Crossings.

Commission on Car Service

The following is a summary of the report of the commission on Car Service which was adopted:

At the May, 1916, meeting the association amended Per Diem Rule 19 to give this commission powers of police, to examine the records of members of the Per Diem Rules Agreement, and to institute of its own motion proceedings against member lines for violation of Car Service Rules 1, 2, 3 and 4.

On June 21, the commission employed 20 inspectors to make investigation, by examination of the records of individual railways and by scouting duty in the field. The inspection was confined to records covering car movements during June, 1916, and embraced 107 railroads.

The result of this inquiry is that on the first comprehensive study of the current practice of a limited number of principal and typical railroads in all parts of the United States

there were readily found more than 40,000 violations of the rules in a single month. It seemed to the commission that the result of this investigation may be taken as convincing proof of what has been common knowledge—that for years the rules as written have been generally disregarded whenever the situation of individual roads rendered that course apparently desirable.

Under the rule constituting the commission, it has the authority to impose fines for violations of the rules after trial and judgment. After considering the reports of its inspectors, the commission concluded, however, that its powers were not adequate effectively to deal with the actual situation.

The one primary requirement of equity in any system can and should be established—that of adequate compensation.

The adoption of the following resolution is, therefore, recommended:

(*a*) That the principle of variable per diem be adopted, the minimum to be the present rate of 45 cents, as approximating the cost of ownership of equipment, the maximum to be $1.25, representing approximately the cost of ownership plus the net earnings of the car.

It is clear that "adequate compensation" must be different in times of car shortage and in times of great surpluses. It is also clear that to avoid hardships changes in rates should be accomplished promptly. To bring this about the adoption of the following resolution is also recommended:

(*b*) That a body be created by The American Railway Association with authority to vary the per diem upon notice, this variation to be based upon car and traffic conditions.

The knowledge that such authority exists would no doubt cause many roads to reconsider their car situation in the periods of the year just preceding those when shortages may be normally expected.

It is doubtful whether the rate should always be the same for all classes of equipment. Shortages in box cars do not always coincide with shortages in open cars. To provide for this contingency the adoption of the following resolution is also recommended:

(*c*) That, inasmuch as a difference of principle obtains as between open and closed cars, and as in the future it may be desirable that the per diem rate on open cars differs from that on closed cars, settlement of balances under the Per Diem Rules Agreement be made in two settlements instead of in one, as at present, one settlement to include the balances on closed cars, and the other to include those on open cars.

This commission feels that it is essential that the difference between open and closed cars be emphasized for reasons already given. It, therefore, recommends that in addition to the changes in Per Diem Rules 1 and 19, suggested by the Committee on Relations between Railroads, that committee be now requested to bring in a rule that will permit the separation of settlements for any class of cars for which the per diem rate may be set at a figure other than that applying to cars as a whole.

Finally, it would seem that the rules must now be given teeth which will work automatically. It is, therefore, recommended that the Committee on Relations between Railroads be requested to bring in a rule which will define a diversion and provide an automatic penalty of $5 per car for every diversion if reported by the offending road, but of $10 if found by the inspectors. This will involve a continuance of the authority heretofore given for the creation and maintenance of a force of inspectors.

Military Preparations

The Special Committee appointed to co-operate with the military authorities of the United States, Fairfax Harrison (Southern Railway), chairman, reported that since June 29 there have been sent from mobilization camps to the Mexican border approximately 136,000 troops, and 33,000 have been returned; all without accident.

The routing of troops was specified by the Quartermaster-General's department, apparently to give as many railways as possible an opportunity to participate in the traffic, but there were cases where troops were handled over circuitous routes with resulting dissatisfaction.

As a result of its experience the Special Committee recommends—

1. That an effort be made to obtain from the War Department a statement of possible concentration points on the Eastern coast, the Gulf coast, the Mexican border, and the Pacific coast, and that the Committee on Transportation work out a series of possible and preferred routings from the several mobilization camps to such concentration points.

2. That steps be taken to see whether it is not possible to so pool the expenses and revenues of such movement as to take advantage of the preferable route in each case.

3. Some delay and inconvenience was caused in the loading of troops and of their supplies. There was no congestion at the border, but it is conceivable that with larger bodies there might be difficulty in the prompt unloading of troops and supplies. It is recommended, therefore, that a memorandum of the troops forwarded from each mobilization camp, together with the supplies and other property transported with them, be furnished to the Committee on Maintenance (A. R. A.), and that that committee investigate and make recommendations for the facilities to handle an equal or greater number of men in accordance with such schedules as may be available from the War Department.

4. That, provided a schedule of possible concentration points can be obtained from the War Department, the Committee on Maintenance ascertain what would be necessary to provide for the prompt unloading of the troops, and the length of time within which such facilities as may be found additionally necessary could be provided.

5. Difficulty was experienced at times in ascertaining the actual equipment required. Tourist cars were always desired, and it was not possible to ascertain how many would be available. Coaches, therefore, were held in excess of real requirements. Correct advices could not always be obtained from the camp quartermasters. Reports showing the movement of troop trains were sent by the roads direct to the Quartermaster-General. They were sometimes incomplete and in many cases delayed. There was also difficulty in obtaining information as to the return of empty equipment. It does not appear that any great hardship resulted from this, but it is conceivable that in a larger movement this would be a most important feature. It is recommended that at least semi-annually the railways file with the general secretary a statement of their passenger equipment, subdivided into classes, particularly with relation to the character of the coaches available and their seating capacity.

6. That the Committee on Relations Between Railroads prepare a system of passing reports for movement of troop trains, which can be put into service upon short notice, ciphered, if possible, in order to save telegraphing.

7. That the Committee on Relations Between Railroads be directed to prepare a passing report for empty passenger equipment, ciphered, if possible.

8. That under similar conditions in the future the Pullman Company and the A. R. A. combine their offices, so that all information as to car and troop movements will be available to both.

9. A series of ciphers was prepared for sending information from mobilization camps and concentration points, but additional information at times would, however, have been desirable. It is therefore recommended that the ciphers which were utilized for reports of representatives and inspectors be examined by the Committee on Relations Between Railroads and a better system be devised.

10. In order to prevent delays in creating an organization, it is desirable that there be maintained lists of persons available to act as representatives of the railways at mobilization and concentration points without the necessity for their designation after the emergency arises. It is recommended that the railroads having access to each mobilization camp desig-

nate a representative at each camp, whose name will be filed with the general secretary. . . .

11. That similar action be taken at the concentration points if a list of them can be obtained.

12. It is desirable that the railways be informed not only what are their duties in connection with the transportation of troops, but also what is required of officers of the Quartermaster-General's department in their relation to the railways; and it is recommended that such portion of the "Hand Book of Transportation by Rail and Commercial Vessels" as are applicable to transportation of troops and supplies be printed by the American Railway Association, and issued to the members for their information.

13. That the Special Committee on Co-operation With the Military Authorities be continued as a channel through which the War Department can convey information. . . .

In conclusion, the report says:

"The work of the Special Committee has developed mutual confidence and an understanding with the military authorities, which has made the work one without friction with the responsible representatives of the Government.

"The Special Committee gratefully acknowledges the cordial, unselfish and unstinted support which it has had from all the railways, without which its efforts would have been futile. The unanimous expression of willingness to exchange passenger equipment, something entirely new in railroad experience in any national sense, has been evidence of a sincere patriotism.

"The work of the representatives of department headquarters and at the mobilization camps is also to be highly commended. Thrown into a novel experience, without other instructions at the start than to represent all the railways and to do what seemed necessary, they have given new evidence of the versatility and efficiency of the American railroad officer. The official government appreciation of what has been done was expressed in a letter from President Woodrow Wilson [heretofore published]."

The report gives a history of the doings of the committee since May, 1914, when the War Department first called on the A. R. A. to co-operate in permanent arrangements for military transportation. The report was approved.

"Daylight Saving"

The Committee on Standard Time reporting on the "daylight saving" movement says that the correct stand for the railways to maintain is:

1. That the present zone system of dividing time is scientifically correct.

2. That any change in the sub-divisions of time would result in endless confusion, and would be disastrous to the railroads.

3. That in the event of a nationwide movement to change the hands of the clock in order to readjust the hours of daylight to the hours of labor, the railroads should not antagonize the movement. The railroads will not suffer any very serious inconvenience by the change as proposed, although such a change from a scientific standpoint is not warranted nor is the committee in sympathy with the movement. The railroads should not agree to the "daylight saving" project until it has been previously adopted by the principal business and municipal centers and the state and local authorities. Unless a change of the character proposed can be made on the same date throughout the country it will lead to great confusion and difficulty. The report was approved.

Transportation of Explosives

The committee on the safe transportation of explosives and other dangerous articles, N. D. Maher (N. & W.), chairman, presented a brief report. It refers to the recent disastrous fire and explosion at Black Tom Island, N. J., and says that the chief inspector of the bureau of explosives will submit a special report on it at an early date. The facts as brought out by the investigation indicate the necessity for continued activity in the enforcement of all of the regulations prescribed by the Interstate Commerce Commission.

The rule requiring missing placards or certificates on cars containing explosives and other dangerous articles to be replaced, and that placards and certificates on empty cars must be removed, is not well obeyed; and the Executive Committee of the Master Car Builders' Association, having considered the matter, says that the application of this amendment must of necessity be a transportation matter; the car inspector has no knowledge of the lading in the car and is not in position to decide whether or not the placard is required. Attention is called also to the fact that placards for only one character of lading should be on a car.

Refusal on the part of a receiving road to accept in interchange cars which are not fully placarded, or cars bearing placards which do not require them, would cause needless delay and confusion. The committee believes, therefore, that if a penalty charge were inflicted against the delivering road the remedy would be obtained without undue hardship, and the result would be a material improvement over present conditions. The car inspector should be, and the interchange agent is, in possession of information as to the lading of cars and should know which cars require placards. It can be determined, also, without difficulty, whether or not the placards should be removed from an empty car.

The committee recommends, therefore, that the matter be brought again to the attention of the Master Car Builders' Association with the request that its rules be amended to conform to the standing resolution of The American Railway Association.

In response to request from this committee the Interstate Commerce Commission has issued an amendment to Rule 1553*a*, and the revised rule is appended to the report.

Accident Statistics

The special committee on accident statistics, J. Kruttschnitt (S. P.), chairman, reported that the revised rules were made effective July 1, 1915. Very satisfactory progress has been made with respect to securing better statistics of accidents. The Interstate Commerce Commission has invited the committee to assist in a further revision of its rules governing monthly accident reports, to be made effective January 1, 1917, and this work is now in progress. Since the committee's last report the state railroad or public service commissions of Georgia, Illinois and Maine have accepted the Interstate Commerce Commission's form of accident report, so that, at the present time, of the 39 states which require detailed reports 20 have consented to receive them on blanks identical with those of the Interstate Commerce Commission.

Legal and Traffic Relations

The Committee on Legal and Traffic Relations reported that in the rehearing of the case entitled "In the Matter of Private Cars," argument for the association was made before the Interstate Commerce Commission by Messrs. Berry & Minor, who were retained for this purpose. No opinion has, as yet, been handed down by the commission. Applications have been made by the packing interests for an increase in the mileage rates on refrigerator cars in Official Classification territory. These applications are still pending.

Accidents at Grade Crossings

The Special Committee on the Prevention of Accidents at Grade Crossings, J. A. McCrea (Long Island), chairman, presented a report recounting what the committee has done since last May. The principal thing reported is the conferences with the committee of the National Association of Railroad Commissioners, and with representatives of the American Automobile Association, already made known to the

readers of the *Railway Age Gazette*. The committee of railroad lawyers appointed to draft laws to be presented to different legislatures, consists of Wm. S. Jenney, (D., L. & W.); D. K. Brent, (B. & O.); B. A. Richmond, (W.M.); A. C. Rearick, (C. & O.); A. S. Lyman, (N. Y. C.); T. W. Reath, (N. & W.); G. S. Patterson, (Pennsylvania). The committee presents three tentative drafts of bills. The first is substantially like that of the law now in force in New Hampshire. It requires cities and towns to maintain a cautionary signal at highway crossings, three hundred feet or more from the tracks, with a penalty of $1 a day for neglect. The committee recommends that the colors of such a sign be white face with black letters; this is thought to be better, considering all hours of the day and night, than the white letters and blue background in use in New Hampshire. The second draft is similar to the first but includes a section requiring the person controlling the movement of any self-propelled vehicle, on passing the caution sign, to reduce speed to ten miles an hour, with a penalty of $10 for violation. The third draft goes farther and requires such vehicles to be brought to a full stop before crossing the tracks.

The committee expects to report further progress after the convention of the National Association of Railway Commissioners which is held in Washington this week. Several railroads have already carried out the recommendations published by the committees last summer, and the railroad commission of California has made the caution approach sign, which was then recommended, the standard for the state of California. The committee urges all railroads to adopt at once the use of disks in place of flags at crossings, the painting of gates black and white, and the use of red lights at night.

Electrical Working

The committee on Electrical Working, George Gibbs (Long Island), chairman, presented a report recommending for adoption an amended diagram of third rail working conductor clearances; and a simplified diagram of these clearances for the use of car inspectors. In the standard now recommended the "designing line" is fixed 18¼ in. from the track gage line and 6½ in. above the top of rail.

As a result of a study of clearances for overhead working conductors, it is recommended that the committee on standard freight car equipment consider the question of limiting the height of the brake staff on box cars to 15 ft. 3 in. In connection with this subject the committee reprints the five diagrams for overhead clearances adopted by the association in 1914.

Committee on Maintenance

The Committee on Maintenance, C. S. Churchill (N. & W.), chairman, reported that it was continuing the review of the code of rules governing the determination of physical and educational qualifications of employees and also the subject of rail sections. Criticisms presented by the Rail Manufacturers' Committee are now under discussion. In connection with the proposal to increase the thickness of the flange of car wheels ⅛ in. and the discussion of the question with the American Railway Engineering Association and the Master Car Builders' Association, the committee reports that the M. C. B. Association has decided not to recommend any changes from the standards adopted in 1909.

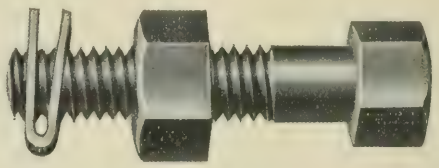
Safety Appliances on Cars. From reports made by 389 roads as of July 1, 1916, the number of freight cars in service is 2,447,178, of which 1,972,607 are fully equipped with safety appliances as required by the United States standards of March 13, 1911; passenger cars in service, 56,352, number fully equipped, 55,227; locomotives in service, 64,152, fully equipped 62,955. Of freight cars in service prior to July 1, 1911, the number equipped with United States standard appliances during the 12 months ending June 1, 1916, was 344,422. All cars in service, both freight and passenger, are fully equipped with grab irons as required by the law prior to 1911. Data for the years preceding 1916 are given in the following table:

Cars and Locomotives Equipped as Required by the U. S. Safety Appliance Standards

	July 1, 1913	July 1, 1914	July 1, 1915	July 1, 1916
Number of members reporting...	351	396	399	389
1. (*a*) Freight cars in service.	2,430,758	2,524,400	2,603,490	2,447,178
(*b*) Passenger cars in service	55,664	57,392	60,571	56,352
(*c*) Locomotives in service...	64,927	67,294	69,023	64,152
2. Fully equipped as required by order of March 13, 1911:				
(*a*) Freight cars in service July 1, 1911	398,676	656,046	1,058,265	1,388,795
(*aa*) Freight cars put in service since July 1, 1911.....	351,871	554,929	605,220	583,812
(*b*) Passenger cars	32,954	52,832	58,125	55,227
(*c*) Locomotives	60,052	64,085	65,920	62,955

SPRING NUT LOCK

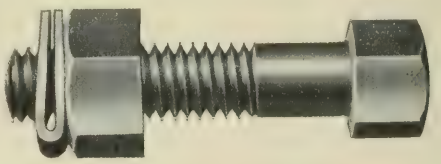
A simple spring nut lock, which is designed to replace the ordinary type of jam nut, has recently been developed by the Industrial Development Corporation, Chicago. The device consists of two octagonal plates of thin steel, which are stamped from the sheet in one piece, a connection being provided between adjoining sides of the octagons. The plates are first stamped from the sheet, after which a circular hole is punched in each octagon of a size to fit the bolt for which it is intended. The plate is then bent until the two holes



The Loose Nut Lock Applied to the Bolt

are almost in line, one being slightly offset from the other. The connection between the two plates acts as a hinge and, after being tempered, provides a powerful spring action.

When the nut lock is slipped on the bolt and both legs engage the thread of the screw, the holes in the two parts are forced into perfect alinement against the action of the spring connection, which exerts a powerful pulling force



Tightened Against the Nut, the Nut Lock Follows the Nut as It Is Set Up Against the Material

on one of the legs and a similar pushing force on the other. The leg on which the pulling force is exerted thus engages the valley of the thread on the side of the bolt opposite the spring, while the leg on which the pushing force is exerted engages the valley of the thread on the side of the bolt adjacent to the spring. Tightened into place against the nut, the gripping on the threads thus produced is said to resist the action of vibration which tends to slack off the nut.

Tunnel Under the Bosporus.— A project for the construction of a tunnel under the Bosporus is being discussed at Constantinople. Engineers have worked out detailed plans showing that the project is feasible and financially profitable, while its strategic importance is obvious. Earlier projects for direct communication between the European and Asiatic shores of Turkey, inspired by the construction of the Anatolian and Bagdad Railway, were devoted to the subject of bridging the narrows at Rumili Hissar.

General News Department

At Lockport, La., November 1, a car float was launched for the Gulf, Colorado & Santa Fe, 244 ft. long by 42 ft. wide. This float is to be used between Port Bolivar, Tex., and Galveston, five miles.

According to a Cleveland (Ohio) paper, a company of militia from that city, Company B of the Cleveland engineers, now at El Paso, Texas, is practicing in the railroad yards of that city with a view to getting experience, as soldiers, in the handling of railroad trains.

At a meeting of the Independent Order of Railroad Employees —an organization said to be composed of men employed by the Philadelphia & Reading—at Reading, Pa., this week, a vote was passed to ask for an increase of pay. The majority of the members of this organization appear to be station men, clerks and telegraphers.

The Cleveland, Cincinnati, Chicago & St. Louis has found it necessary to confiscate coal for the use of its locomotives; and a manufacturing concern in Cleveland is making a loud complaint, alleging that in place of coal costing less than $3 a ton, confiscated by the railroad company, it will be necessary to buy coal at $6 a ton.

Train 108 of the Missouri Pacific was boarded by a robber near Leavenworth, Kan., on Tuesday evening last and the Pullman conductor and four passengers, in the rear sleeping car, intimidated by means of a pistol, were robbed of $96. The robber rode on the train as far as Kansas City, Kan., about twenty miles, and then jumped off and escaped.

Preparations are being made for holding a convention in New York City on January 30 and 31, to discuss the "daylight saving" proposition, and it is expected that organizations in all parts of the country will be represented. The executive committee in New York is headed by Otto T. Bannard; and another member of it is Waldo H. Marshall.

The New York, Westchester & Boston, an electric passenger railroad, reports that during the six months ending with October, 999 out of every thousand of its trains arrived at the end of the trip on time, except in cases where delays were incurred while the trains were on the tracks of the New York, New Haven & Hartford, delays mainly due to an open draw bridge at the Bronx river. Counting these and all delays, the number of trains arriving on time was 993 in a thousand. This company, operating twenty-two miles of road, some of it four track, runs something over one hundred trains daily into its New York terminus and a similar number out, and the total number of trains run during the six months under consideration was 38,790.

At Baltimore, Md., this week, there was a conference, under the auspices of the Merchants' and Manufacturers' Association of Baltimore, to see about the formulation of a plan for economizing time and avoiding a waste of words in presenting facts before the Newlands Congressional Committee, which is to investigate the general subject of transportation. Charles E. Falconer, president of the Merchants' and Manufacturers' Association, invited to the conference about two hundred leading business men, members of the National Industrial Traffic League, and proposed to them a policy outlined as follows: Testimony should be presented before the congressional committee, so far as feasible, by those who are especially competent to discuss (a) the commercial and financial, (b) the legal and (c) the traffic phases of the matter. He suggested that questions affecting traffic, rates and service and the organization of the rate regulatory machinery be presented by the National Industrial Traffic League; that commercial and financial questions be presented through a temporary committee of industrial, mercantile and banking executives formed for that purpose; and that to deal with the legal questions the proposed temporary committee of business executives and the National Industrial Traffic League should jointly retain counsel.

M. C. B. Tank Car Specifications

The executive committee of the Master Car Builders' Association has issued Circular No. 14, stating that on account of labor and material delays the date at which the tank car specifications for Class III and IV tank cars were to become effective, has been extended 60 days, to March 1, 1917.

Cost Data on the St. Paul Electrification

In the annual report of the Chicago, Milwaukee & St. Paul for the fiscal year ended June 30, 1916, some figures are given on cost and maintenance of the equipment in electrified territory. The first cost of 20 electric locomotives was $2,286,963; other additions and betterments included the expenditure of $3,870,411 for power stations, transmission systems, etc. Work is progressing at a rate which indicates the completion of the fourth electrified division by the end of the present calendar year. Expenditures for maintenance during the past year include $2,612 on power plant buildings, $425 on sub-station buildings, $144 on power transmission systems, $18,764 on power distribution systems and $1,147 on line poles and fixtures. The purchase of 23 more electric locomotives has been authorized.

Heavy Fines at Chicago

In disposing of an accumulation of old cases on November 11, Judge Kenesaw M. Landis of the United States District Court at Chicago, assessed fines totaling $173,000 against six railroads and one packing company for sundry violations of law. The Elgin, Joliet & Eastern was fined $20,000 and costs for false billing, having shipped cardboard boxes at the rate on strawboard, which is lower. The Pennsylvania was fined $20,000 and costs, and the Pittsburgh, Cincinnati, Chicago & St. Louis $20,000 and costs in one case, and $50,000 and costs in another, for granting rebates in connection with switching charges. Swift & Co., Chicago, was fined $60,000 and costs in connection with carload rates on less than carload lots. The Indiana Harbor Belt, the Chicago & North Western and the Chicago, Milwaukee & St. Paul were assessed fines from $100 to $1,000 in a number of cases, some of which involved violation of the hours of service law, and others violation of the 28-hour cattle law.

The Freight-Car Famine

The hearings held by the Interstate Commerce Commission, at Louisville, Ky., in its general investigation of the freight car supply, are reported in another column. On the 14th, Commissioner McCord issued a proclamation calling on all railroads to send refrigerator cars to their home roads.

The Public Utilities Commission of Illinois began investigating the holding of coal cars by dealers for higher prices. The commission will hold hearings on the car shortage at Springfield, November 22, for the railroads, the coal operators and the grain dealers; and at Chicago, on the twentieth, on the proposed increased demurrage rates.

The Nebraska State Railway Commission is to hold a hearing on the increased demurrage rates on the 24th.

The United States District Attorney, at Chicago, is investigating the holding of coal and food stuffs in cars by dealers for higher prices.

Today (Friday) Commissioner McCord is to confer at Louisville with a committee of railroad officers representing the executive committee of the American Railway Association. These officers are: C. H. Markham, president of the Illinois Central; H. E. Byram, vice-president of the Burlington; G. L. Peck, vice-president of the Pennsylvania Lines West, and W. G. Besler, president of the Central of New Jersey. These representatives will be accompanied by five members of the committee on relations between railroads, namely: C. M. Sheaffer (Pennsyl-

vania); E. J. Pearson (N. Y., N. H. & H.); E. H. Coapman (Southern); W. A. Worthington (S. P.), and W. L. Park (I. C.).

Electric Operation on the New Haven

Information regarding proposed new equipment on the electrified zone of the New York, New Haven & Hartford was given out at an investigation of the passenger train service of that road, held by the Massachusetts Public Service Commission at Boston, October 17. Howard Elliott, president of the company, stated that specifications are now being drawn up for 60 additional electric locomotives for passenger, freight and switching service between New York and New Haven. He said that until the road was in better financial condition, nothing would be done in the direction of electrification at Boston; also that the company is not considering the extension of electric service beyond New Haven. A. R. Whaley, vice-president, said that the New Haven would require 70 additional electric locomotives to handle the entire traffic, passenger and freight, electrically, throughout the electrified zone between New York and New Haven. At present only partial electrical service is carried on between Stamford, Conn., and New Haven. The company has now about 100 electric locomotives. According to Mr. Elliott, electric locomotives cost at least $50,000 each. The cost of steam locomotives has risen from $28,000 to $42,000 in the past three years. The company can not yet say when it will have 100 per cent electrical operation in the New York-New Haven zone.

Car Shortage Statistics for November 1

The American Railway Association's statement of freight car surpluses and shortages for November 1 shows a net shortage of 108,010 cars. The net shortage on September 30 was 60,697; on September 1, 19,873. On August 1 there was a net surplus of 9,762. For nearly eight years preceding the middle of August this year, there had been a continuous net surplus except for about one month in 1909, three months in 1912, one month in 1913 and the month of March this year.

In connection with the discussion of this subject at the semi-annual convention, held in New York City this week the committee presented a tabular statement, summarizing all of the freight-car statements since January 1, 1907, with the net surplus on each date shown in red. The column headed "net shortage," with nearly all its dates blank, shows, in a striking way, how the excessive demand for cars is concentrated within a few months of each year; and how, in 1908, 1910, 1911, 1914 and 1915 there was a surplus of idle cars throughout the year.

Hearing on Proposed Change of Fiscal Year

Chairman Meyer and Commissioner Clark of the Interstate Commerce Commission held a hearing at Washington on November 13 on the proposed change of the fiscal year from the year ending June 30 to the calendar year. R. A. White, general auditor of the New York Central, and Frank Nay, comptroller of the Chicago, Rock Island & Pacific, appeared as a committee from the Association of American Railway Accounting officers to urge the Commission to change its requirements as to annual reports filed by the railroads so that such reports may be made for the calendar year instead of for a period arbitrarily fixed. B. P. Kerfoot, general attorney of Wells, Fargo & Co., opposed the change on the ground that the heaviest business of the express companies is experienced at the end of the year. A. H. Plant, comptroller of the Southern, objected to any change in the requirements of the Interstate Commerce Commission unless a similar change was made at the same time by the states so that it would not be necessary to make two sets of annual reports. H. C. Prince, comptroller of the Atlantic Coast Line, made a similar objection.

Mr. White and Mr. Nay pointed out that the American Railway Engineering Association had gone on record as favoring the change because the closing of the accounts for the year on June 30 delayed the beginning of the season's maintenance work; that the change in the fiscal year would not disturb comparisons to any serious extent if the commission were to require one report covering the 12 months ending June 30 and one report covering the 12 months ending December 31; that a majority of the roads are in favor of the change, and that the reports to the stockholders, many of which are now made for the calendar year, could be made for the same period as the commission's reports. They also pointed out that the period at the end of the year and the three months following, which the roads would be allowed for making up their reports, would be a much better time for the work to be done because great difficulty is now experienced in compiling the reports during the season when many of the officers and employees in departments from whom the information is obtained are taking their vacations. For this reason they said, the reports could be filed with the commission more promptly. It was also urged that the logical business year coincides more consistently with the calendar year than with a year ending on June 30, and that tax reports are required for the calendar year. G. R. Martin, vice-president of the Great Northern, also pointed out that many statistics now have to be kept separately because they are only useful as reports for the season to which they pertain and not for an arbitrary period ending on June 30.

The Switchmen's Arbitation

Charles H. Howry and Jeremiah W. Jenks have been appointed the neutral members of the arbitration board selected to settle the controversy between the Switchmen's Union of North America and fourteen railroads operating in the middle west. The neutal arbitrators were appointed by W. L. Chambers, commissioner of the United States Board of Mediation and Conciliation, upon the request of the arbitrators representing the men and the railroads following their failure to agree. Judge Howry was for some years assistant attorney-general of the United States and for a number of years, previous to his recent retirement, was associate judge of the United States Court of Claims. Professor Jenks is a director of the division of public affairs of the School of Commerce, Accounts and Finance, New York University. The dispute in question began last March, when 9,000 switchmen demanded an eight-hour day and time and one-half for overtime. The board convened for the first time at Hotel Manhattan, New York, on November 13.

On November 14 it continued its hearings at the New York Chamber of Commerce. Four witnesses were called for the switchmen. F. D. Reid, a switchman employed by the Baltimore & Ohio at Chicago, spoke concerning working conditions in his district, paying attention to the severe conditions often met with in winter. He said that the men wanted three eight-hour shifts and added that at present by working 12 hours a day for 30 days a month, he could make $140 a month. Peter J. Finnegan, employed by the New Haven & Harlem River yards, where the eight-hour schedule has been in operation for 34 years, said that in the last year he had not worked more than twenty minutes overtime. He preferred working on shorter hours, although he could make but $80 a month and could not save anything after providing for his wife and five children.

Finnegan said that if the demands of the switchmen are granted he would receive $4 a day, or $120 a month, an increase of 50 per cent on his present wages. Living expenses are so high, he said, that not a man in his yard owns his own home, and he knew of none who was able to save any money form his wages.

John O'Brien, a yard conductor employed in transfer service in the Chicago & Eastern Illinois at Chicago, said he averaged 12 to 14 hours a day, but would prefer shorter hours, even at less money.

T. J. Hanrahan, yard conductor for the Nickel Plate at Cleveland, described a 60-day trial of the eight-hour system in his yard in 1913.

Hanrahan said that it took seven additional crews to put the eight-hour plan in force, but road figures which showed that more cars were moved at less cost than in corresponding months in previous years.

The arbitrators for the railroad in the controversy are E. F. Potter, assistant to the general manager Minneapolis, St. Paul & Sault Ste. Marie Railway, and T. W. Evans, assistant general manager New York Central Railroad, and for the switchmen—J. B. Connors, assistant president, and W. A. Titus, vice-president of the Switchmen's Union of North America. The case is being handled for the railroads by Horace Baker, general manager of the Queen & Crescent, and for the men by S. E. Heberlin, international president of the switchmen's union. The demands are for an eight-hour day with pay at 47 cents an hour for helpers and 50 cents an hour for foremen and with time and a half for overtime.

Conference on Adamson Law

The action of prominent roads in seeking injunctions against the enforcement of the "eight-hour day law" and the expressions of the views of the brotherhoods concerning the matter, are reported in another column. There was a conference in New York on Monday of this week, between railroad officers, representing the conference committee of managers and Messrs. Stone and others representing the train service brotherhoods; but it produced no visible result. It is understood that there will be no further conferences prior to the meeting of the Newlands congressional investigating committee which comes on Monday next, at Washington. The brotherhood leaders went from New York to Washington. Before they left they repeated their ultimatum of an eight-hour day on January 1—regardless of court decisions —or a general strike.

Mr. Stone is quoted as saying:

"The situation is closed as far as the brotherhoods are concerned. We know what the President intended we should have. We feel confident that if the present law does not give us an eight-hour basic day the President will give us a law that will. I believe the managers are either whistling to keep up their courage or trying to scare the public into sympathizing with them.

"We asked for a conference to reach a working agreement on the operation of the new law. They told us they did not interpret it as meaning that the old schedules (mileage and hourly basis of pay) should be maintained. They claimed that all the old schedules should be thrown out. We hold that all the schedules are to be retained, the only difference being the substitution of 'eight hours' for 'ten hours.' We refused to discuss our interpretation of this feature of the law.

"Then they proposed that we join with them in an appeal to the Attorney General for a thirty-day extension of time before the law became effective, in which to try to reach a tentative agreement. We refused.

"As we understand it, it is their plan to have each of the 175 railroad systems file suit in each federal district through which their lines run. In that case they will be forced to file 5,000 suits, for each road covers from five to eight states."

Suits asking for injunctions against the enforcement of the Adamson law were begun, on Wednesday, by the New York Central, the Pennsylvania, the Erie, the Northern Pacific, the Great Northern and the Chicago & Alton, and the New York, New Haven & Hartford took action in the same direction.

On Wednesday of this week, W. S. Carter, leader of the firemen's brotherhood, said that no threat had been made to renew the strike movement after January 1. Attention was called to the statement made by Mr. Garretson in September that the authority granted to the leaders (to call a strike) had expired.

Valuation of the Atlanta, Birmingham & Atlantic

Because of some confusion which has arisen from the report of the valuation of the Atlanta, Birmingham & Atlantic prepared by the Division of Valuation of the Interstate Commerce Commission (See *Railway Age Gazette,* October 27, page 757) Thomas W. Hulme, general secretary of the Presidents' Conference Committee on the Federal Valuation of the Railroads has issued the following statement showing correctly the information appearing in this report.

Cost of reproduction of property *owned* and *used* (not including land)	$24,155,000
Lands *owned* and *used*	2,291,413
Lands *owned not used*	1,165,000
Materials and supplies	433,000
Mulga Branch, leased to another operating company	788,000
Total	$28,832,413
Add to this cash on hand, but not reported by the Government	200,000
Grand total	$29,032,413

The Government's total of $29,000,000 may be contrasted with the $37,000,000 in cash which was obtained as the proceeds of the sale of securities issued and expended for the construction of new lines and acquisition and rehabilitation of other lines, now part of its main line and branches. The officers of the Atlanta, Birmingham & Atlantic Railroad contend that the property could not be reproduced, at this time, for less than this amount.

The Division of Valuation, as a matter of administration, has prepared its estimates on the lowest basis, leaving, as required, to the Interstate Commerce Commission the determination of all matters in dispute. The commission has announced that it has not passed upon the many questions involved in the determination of correct principles and methods, but that it will do so as illustrated by the inventories that are first presented to it for consideration with the carriers' objections, and that its decisions in these cases will serve as a guidance for its future work. It is, therefore, to be expected that the Government's findings of $29,000,000 for the Atlanta, Birmingham & Atlantic will be materially increased upon its ultimate determination of correct principles and methods.

Committees for the Master Mechanics' Association

The committees for the Master Mechanics' Association, which are to report at the 1917 convention, have been appointed. The following four special committees, which reported last year, have been discontinued: Equalization of Long Locomotives, Dimensions of Flange and Screw Couplings for Injectors, Best Design and Material for Pistons, Valves, Rings and Bushings and Modernizing of Existing Locomotives. A new special committee has been appointed to report on Springs—Shop Manufacture and Repair, Including Design, Appliances and Repairs. The committees on Powdered Fuel and Specifications and Tests for Materials, which reported as special committees last year, have been made standing committees.

The personnel of the committees remains practically the same, there being two new members added to the standing committee on Powdered Fuel, one to the special committee on Locomotive Headlights, two to the special committee on Design, Maintenance and Operation of Electric Rolling Stock, and one to the committee on Train Resistance and Tonnage Rating. The special committee on Co-operation with Other Railway Mechanical Organizations has been practically revised, only two of the members serving last year remaining on the committee this year. The following is a list of the committees and their personnel:

STANDING COMMITTEES

1. *Standards and Recommended Practice:*

W. E. Dunham (Chairman), Supr. M. P. & M., C. & N. W.; M. H. Haig, M. E., A. T. & S. F.; A. G. Trumbull, Asst. to G. M. S., Erie; C. D. Young, Engr. Tests, Penna.; G. S. Goodwin, M. E., C. R. I. & P.; R. L. Ettenger, C. M. E., Southern; B. B. Milner, Engr. M. P., N. Y. C.

2. *Mechanical Stokers:*

A. Kearney (Chairman), A. S. M. P., N. & W.; M. A. Kinney, S. M. P., Hocking Valley; J. R. Gould, S. M. P., C. & O.; J. T. Carroll, A. G. S. M. P., Balto. & Ohio; J. W. Cyr, S. M. P., C. B. & Q.; A. J. Fries, A. S. M. P., N. Y. Central Lines; L. B. Jones, A. E. M. P., Penna.

3. *Fuel Economy and Smoke Prevention:*

Wm. Schlafge (Chairman), G. M. S., Erie; W. H. Flynn, S. M. P., Mich. Central; D. M. Perine, S. M. P., Penna.; Robert Quayle, G. S. M. P. & C., C. & N. W.; D. J. Redding, A. S. M. P., P. & L. E.; W. J. Tollerton, G. M. S., C. R. I. & P.; F. H. Clark, G. S. M. P., B. & O.

4. *Powdered Fuel:*

C. H. Hogan (Chairman), A. S. M. P., N. Y. C.; E. W. Pratt, A. S. M. P., C. & N. W.; Thos. Roope, S. M. P., C. B. & Q.; J. H. Manning, S. M. P., D. & H.; Charles James, M. S., Erie; G. L. Fowler, 83 Fulton street, New York City; W. L. Kellogg, S. M. P., M. K. & T.; O. S. Beyer, University of Illinois, Urbana, Ill.

5. *Specifications and Tests for Materials:*

C. D. Young (Chairman), Engr. Tests, Penna.; J. R. Onderdonk, Engr. Tests, B. & O.; A. H. Fetters, M. E., Union Pac.; Frank Zeleny, Engr. Tests, C. B. & Q.; H. E. Smith, Engr. Tests, N. Y. C.; H. B. MacFarland, Engr. Tests, A. T. & S. F.; Prof. L. S. Randolph, Virginia Polytechnic Institute, Blacksburg, Va.

SPECIAL COMMITTEES

6. *Design and Maintenance of Locomotive Boilers:*

C. E. Fuller (Chairman), S. M. P., Union Pacific; A. W. Gibbs, C. M. E., Penna.; D. R. MacBain, S. M. P., New York Central; M. K. Barnum, S. M. P., Balto. & Ohio; R. E. Smith, G. S. M. P., Atlantic Coast Line; C. B. Young, M. E., Chgo. Bur. & Quincy; J. Snowden Bell, New York City.

7. *Locomotive Headlights:*

D. F. Crawford (Chairman), G. S. M. P., Penna. Lines; C. H. Rae, G. M. M., L. & N.; F. A. Torrey, G. S. M. P., C. B. & Q.; H. T. Bentley, S. M. P. & M., C. & N. W.; M. K. Barnum, S. M. P., Balto. & Ohio; Henry Bartlett, G. M. S., B. & M.; W. H. Flynn, S. M. P., Mich. Central; W. O Moody, M. E., Illinois Central; A. R. Ayers, S. M. P., N. Y. C. & St. L.

8 *Superheater Locomotives:*

W. J. Tollerton (Chairman), G. M. S., C. R. I. & P.; H. W. Coddington, Engr. Tests, N. & W.; C. H. Hogan, A. S. M. P., N. Y. C. & H. R.; R. W. Bell, G. S. M. P., Ill. Cent.; T. Roope, S. M. P., C. B. & Q.; W. C. A. Henry, S. M. P., Penna. Lines; E. W. Pratt, A. S. M. P., C. & N. W.; G. M. Basford, 30 Church street, New York City.

9. *Design, Maintenance and Operation of Electric Rolling Stock:*

C. H. Quereau (Chairman), New York Central; G. C. Bishop, S. M. P., Long Island; G. W. Wildin, M. S., N. Y. N. H. & H.; J. H. Davis, E. E., B. & O.; R. D. Hawkins, S. M. P., Great Northern; A. E. Manchester, S. M. P., C. M. & St. P.; T. W. Heintzelman, G. S. M. P., Southern Pacific; J. T. Wallis, G. S. M. P., Penna.; J. E. Pilcher, M. E., N. & W.

10. *Co-operation with Other Railway Mechanical Organizations:*

D. R. MacBain (Chairman), S. M. P., New York Central; E. W. Pratt, A. S. M. P., C. & N. W.; C. A. Shaffer, G. T. I., Illinois Central; F. J. Barry, M. M., N. Y. O. & W.; E. S. Fitzsimmons, M. S., Erie; F. C. Pickard, M. M., D. L. & W.

11. *Train Resistance and Tonnage Rating:*

O. C. Wright (Chairman), A. E. M. P., Penna. Lines; H. C. Manchester, S. M. P., D. L. & W.; C. E. Chambers, S. M. P., C. R. R. of N. J.; J. H. Manning, S. M. P., D. & H.; Frank Zeleny, Engr. Tests, C. B. & Q.; Prof. E. C. Schmidt, University of Illinois, Urbana, Ill.; Jos. Chidley, A. S. M. P., N. Y. C.; J. T. Carroll, A. G. S. M. P., B. & O.

12. *Springs—Shop Manufacture and Repair, Including Design, Appliances and Repair:*

M. F. Cox (Chairman), A. S. M., L. & N.; Eliot Sumner, S. M. P., Penna.; A. G. Trumbull, Asst. to G. M. S., Erie; E. W. Pratt, A. S. M. P., C. & N. W.; T. A. Foque, G. M. S., M. St. P. & S. S. M.; C. A. Gill, G. M. M., B. & O.; G. W. Rink, M. E., C. R. R. of N. J.

13. *Subjects:*

M. K. Barnum (Chairman), S. M. P., B. & O.; D. R. MacBain, S. M. P., New York Central; C. E. Fuller, S. M. P., Union Pacific.

14. *Arrangements:*

Wm. Schlafge, G. M. S., Erie; C. E. Chambers, S. M. P., C. R. R. of N. J.; E. H. Walker, Standard Coupler Co.

Individual Papers:

Feed Water Heaters, by J. Snowden Bell; Welding Locomotive Tubes, Fire Box and Boiler Sheets, by D. R. MacBain.

The June Mechanical Conventions

Atlantic City has been chosen by the executive committees of the Master Car Builders and the Master Mechanics' associations as the place for holding the 1917 conventions. The Master Mechanics' Association convention will be held first this year starting on Wednesday, June 13. The Master Car Builders will follow commencing Monday, June 18. The vote as to whether the convention should go to Chicago or Atlantic City was especially close this year, and the question was only decided after an extended discussion by the two executive committees sitting in executive session. The Chicago Chamber of Commerce presented an able argument, offering the associations the exclusive use of the Municipal Pier for both the exhibits and the convention.

President Edmund H. Walker, of the Railway Supply Manufacturers' Association, has appointed the following committees:

Exhibit committee, J. G. Platt (chairman), Hunt-Spiller Manufacturing Corporation; George R. Carr, Dearborn Chemical Company, and C. W. Beaver, Yale & Towne Manufacturing Company.

Finance committee, J. F. Schurch (chairman), Damascus Brake Beam Company; George H. Porter, Western Electric Company, and William McConway, Jr., McConway & Torley Company.

Hotel committee, George H. Porter (chairman), Western Electric Company; C. P. Cass, Westinghouse Air Brake Company, and H. G. Thompson, Edison Storage Battery Company.

Badge committee, C. D. Eaton (chairman), American Car & Foundry Company; C. W. Beaver, Yale & Towne Manufacturing Company, and George A. Cooper, Frost Railway Supply Company.

By-laws and resolutions committee, P. J. Mitchell (chairman), Philip J. Justice & Co.; Frank Beal, Magnus Metal Company, and C. P. Cass, Westinghouse Air Brake Company.

Entertainment committee, E. H. Bankard, Jr. (chairman), Midvale Steel Company.

Enrollment committee, Charles H. Gayetty (chairman), Quaker City Rubber Company.

Transportation committee, L. S. Wright (chairman), National Malleable Castings Company.

Railway Development Association

The semi-annual meeting of the Railway Development Association was held in Chicago, November 9 and 10, L. J. Bricker, general colonization agent, Northern Pacific, presiding. Various agricultural, industrial and colonization subjects pertaining to the railways were discussed. Under the heading of agricultural questions the demonstration farm, the demonstration trains, the co-operation of the business men of small towns with the railways which serve those towns, the relation of the railways to the county agricultural agents and the co-ordination of the railway agricultural work with the local agricultural colleges and the United States Bureau of Agriculture, were discussed in an informal manner. Under the heading of industrial problems questions relating to the community industrial surveys, co-operation with chambers of commerce and business men in the location of industries and sidetrack agreements were discussed.

R. H. Aishton, president of the Chicago & North Western, addressed the meeting during the first day. Mr. Aishton referred to these men as the missionaries of the railroads. In speaking of the work of the members of this association he said: "For instance, in four states which the Chicago & North Western traverses there is a population of slightly over 12,000,000 people living on, and working and developing something like 600,000 acres. In Germany there are five times as many people in a slightly less area. Thus it can be seen that there is great room for improvement and development of our territory. You men of the Railway Development Association are doing this." The annual convention of this association will be held in Louisville, Ky., May 9, 10, 11, 1917.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Demurrage Officers.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., New York. Next convention, December 5-8, 1916, Engineering Societies' Bldg., New York.

American Wood Preservers' Association.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

Association of Transportation and Car Accounting Officers.—G. P. Conard, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

New England Railroad Club.—W. E Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 30 Church St., New York. Next annual meeting, January 16, 1917, Waldorf-Astoria Hotel, New York.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF AUGUST, 1916

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Peoria & Pekin Union	19	$11,723	$4,476	$88,628	$6,770	$13,741	$153	$43,588	.....	$2,692	$66,944	$21,684	$7,000	$14,684	$9,852
Philadelphia & Reading	1,127	4,087,555	657,992	5,039,753	372,295	713,555	51,222	1,623,095	$10,896	67,700	2,837,080	2,202,673	116,594	2,085,251	787,555
Pittsburgh & Lake Erie	225	1,867,119	203,204	2,203,467	203,175	323,779	12,855	481,842	4,607	30,595	1,056,853	1,146,614	67,900	1,078,714	59,743
Pittsburgh, Shawmut & Northern	300	192,185	11,253	206,066	33,594	54,749	1,481	64,508	.....	5,241	159,573	46,493	2,161	44,332	12,204
St. Louis, Iron Mountain & Southern	3,555	2,251,794	699,273	3,164,207	680,318	510,128	67,605	789,501	10,867	64,094	2,108,621	1,055,586	131,600	923,138	239,800
St. Louis, San Francisco & Texas	235	74,095	26,673	104,414	23,856	23,353	2,423	40,781	.....	5,556	95,970	8,444	1,565	6,378	7,738
St. Louis Southwestern of Texas	810	248,243	95,165	375,691	49,853	98,065	13,586	151,163	1,754	21,315	335,391	40,300	16,797	23,469	47,202
* San Pedro, Los Angeles & Salt Lake	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Southern	6,983	4,259,708	1,721,440	6,496,711	1,031,507	944,727	163,655	1,979,609	36,470	173,496	4,299,021	2,197,689	251,100	1,945,203	513,697
Southern in Mississippi	281	53,219	29,427	90,106	22,086	8,893	1,618	33,786	.....	3,515	69,898	20,208	8,350	11,856	12,508
Spokane, Portland & Seattle	555	295,168	163,537	508,234	58,025	42,717	8,644	105,529	5,357	15,294	235,070	273,165	57,445	215,536	—2,442
Staten Island Rapid Transit Co.	11	47,082	39,619	89,957	11,620	6,896	753	36,583	.....	1,802	57,654	32,304	5,000	27,304	—27,006
Toledo & Ohio Central	436	509,316	67,561	617,993	79,668	111,390	8,176	196,057	1,696	11,633	408,619	209,374	23,502	185,872	86,409
Union Pacific	3,622	4,953,927	1,098,639	6,601,526	1,038,097	675,341	106,043	1,371,095	99,846	140,327	3,391,932	3,209,594	532,400	2,676,781	706,844
Wabash-Pittsburgh Terminal	63	111,254	8,978	127,998	18,480	16,084	1,801	30,820	1,807	4,321	73,302	54,696	7,500	47,196	34,742
Western Maryland	689	869,436	129,494	1,072,565	111,511	150,196	25,184	315,137	11,157	21,473	634,152	438,413	33,500	404,913	112,622
Western Pacific	941	632,967	124,098	806,657	126,912	72,736	21,493	216,860	10,995	18,792	467,788	338,869	32,716	306,138	50,377
Western Ry. of Alabama	133	56,591	34,491	102,455	15,168	21,787	6,379	28,938	1,723	4,302	78,286	24,169	6,331	17,824	9,393
Wichita Valley	257	48,563	22,614	74,883	13,434	7,343	135	19,479	.....	1,330	41,722	33,161	3,925	29,236	—1,832
TWO MONTHS OF FISCAL YEAR 1917															
Alabama Great Southern	309	$613,786	$242,914	$942,757	$94,504	$195,080	$27,706	$265,281	$6,386	$24,276	$613,232	$329,525	$34,128	$295,310	$73,902
Ann Arbor	294	330,101	119,370	479,023	47,100	71,298	10,577	188,115	1,465	16,833	333,388	145,635	26,800	118,552	32,196
Atlanta & West Point	93	106,740	84,607	220,447	26,095	39,300	13,021	62,926	3,746	9,666	154,753	65,694	13,270	52,380	23,949
Atlanta, Birmingham & Atlantic	640	381,394	107,196	529,863	85,825	96,847	28,196	189,358	45	18,450	418,720	111,142	26,200	84,926	.....
Atlantic & St. Lawrence	167	268,625	67,923	359,184	61,243	64,355	8,530	168,593	.....	9,371	312,092	47,092	19,790	27,298	36,305
Atlantic City	170	181,903	667,567	874,286	47,136	63,250	11,632	321,315	267	6,093	449,669	424,618	20,000	404,598	82,223
Atlantic Coast Line	4,746	3,499,365	1,314,814	5,213,103	758,999	1,020,483	115,073	1,859,365	15,790	152,988	3,917,330	1,295,773	320,000	972,467	649,637
Baltimore & Ohio	4,539	15,763,656	3,271,908	20,704,142	2,570,345	3,987,981	386,407	6,809,927	172,818	421,914	14,348,938	6,355,204	694,169	5,655,192	—247,055
Bangor & Aroostook	632	315,256	117,225	468,448	90,277	99,868	7,965	143,284	6,802	25,890	373,567	94,881	26,160	68,721	—2,590
Bingham & Garfield	36	560,425	5,811	570,480	46,235	51,609	1,944	66,749	116	6,239	172,893	397,587	19,667	377,920	158,479
Boston & Maine	2,298	5,526,667	3,331,610	9,890,161	1,137,041	1,167,743	80,579	3,765,864	54,670	216,660	6,422,558	3,467,603	341,102	3,126,501	775,138
Canadian Pacific Lines in Maine	234	106,224	39,612	163,736	54,615	29,305	11,345	65,235	.....	7,571	168,069	—4,333	18,200	—22,533	12,905
Carolina, Clinchfield & Ohio	283	270,842	42,180	331,670	29,938	58,061	29,081	79,895	.....	22,693	218,983	112,687	28,500	84,187	—110,525
Carolina, Clinchfield & Ohio of S. C.	18	10,204	2,213	13,176	759	172	3,930	4,564	.....	1,434	10,854	2,322	1,500	780	—6,771
Central of New Jersey	684	3,964,326	1,496,825	5,905,467	468,504	950,941	67,626	2,031,885	32,252	159,383	3,708,373	2,197,094	280,001	1,917,085	275,614
Central Vermont	411	479,121	210,076	763,170	122,526	119,363	18,044	320,183	3,899	17,914	601,928	161,242	31,130	130,053	9,549
Chicago & Eastern Illinois	1,136	1,983,282	578,998	2,778,677	470,704	629,439	47,612	949,472	15,651	80,527	2,187,302	591,376	124,800	466,474	134,450
Chicago & Erie	270	1,189,534	140,347	1,429,904	148,759	133,833	36,687	508,000	3,824	31,535	855,309	574,595	44,460	530,136	198,016
Chicago, Burlington & Quincy	9,369	12,455,669	4,424,330	18,494,705	2,309,227	2,911,438	289,274	5,039,468	163,782	381,691	11,094,879	7,399,826	762,062	6,637,764	2,001,753
Chicago, Detroit & Can. Gd. Trunk Jctn.	60	113,592	41,246	189,588	32,946	21,750	3,109	84,933	.....	3,038	145,777	43,811	6,974	36,836	—14,122
Chicago Great Western	1,496	1,819,685	691,654	2,749,071	427,943	436,618	94,272	862,896	19,632	71,120	1,910,724	838,347	91,488	745,208	266,584
Chicago, Indianapolis & Louisville	622	997,623	343,240	1,445,622	145,378	236,071	40,994	446,084	1,028	33,178	899,620	546,002	58,902	487,054	147,098
Chicago, Peoria & St. Louis	255	229,873	58,968	305,648	42,344	71,933	11,356	120,015	.....	11,672	257,319	48,329	12,000	36,329	14,494
Chicago, Rock Island & Pacific	7,653	8,701,360	3,916,342	13,612,092	1,928,835	2,231,517	273,109	4,386,071	96,132	306,724	9,195,740	4,416,352	584,106	3,829,519	1,975,552
Cincinnati, Hamilton & Dayton	622	1,508,297	242,414	1,978,422	291,502	248,510	30,254	659,205	7,009	35,557	1,267,202	711,220	59,043	652,086	175,392
Cincinnati, Indianapolis & Western	322	283,393	100,208	422,022	62,276	56,307	14,735	152,643	891	12,872	299,364	122,659	18,882	103,777	.....
Cincinnati, New Orleans & Texas Pacific	337	1,398,767	367,012	1,881,798	154,547	447,218	50,936	500,721	13,727	36,926	1,204,074	677,724	65,000	612,606	228,083
Coal & Coke	197	150,186	37,878	195,288	40,891	50,411	2,013	55,517	.....	5,841	154,673	40,615	10,000	30,615	—1,089
Colorado & Southern	1,102	1,024,428	375,531	1,508,767	199,248	281,585	25,489	411,363	9,583	43,588	970,856	537,911	77,000	460,566	197,551
Cripple Creek & Colorado Springs	87	184,509	54,583	243,722	22,214	27,913	5,477	60,739	.....	6,623	122,966	120,755	15,205	105,550	—6,460
Cumberland Valley	164	420,091	126,611	579,055	64,012	64,348	9,517	168,204	1,456	16,313	321,630	257,425	11,919	245,417	43,915
Delaware & Hudson Co.—R. R. Dept.	886	3,604,019	743,941	4,641,473	383,113	948,246	67,454	1,562,627	46,751	154,318	3,162,508	1,478,965	117,300	1,361,665	—241,215
Delaware, Lackawanna & Western	955	6,291,432	1,677,026	8,857,135	1,066,073	1,278,933	151,924	2,719,260	77,422	170,031	5,453,284	3,403,851	435,000	2,968,530	850,804
Denver & Rio Grande	2,577	3,230,601	898,723	4,457,220	596,796	702,642	83,178	1,061,894	70,758	126,826	2,642,093	1,815,127	184,000	1,630,674	357,225
Detroit & Mackinac	383	140,082	69,575	226,478	26,822	35,695	4,173	71,879	906	5,263	144,738	81,741	16,135	65,605	23,252
Detroit & Toledo Shore Line	81	246,427	.....	247,592	18,007	14,785	3,158	67,915	.....	5,964	109,829	137,763	13,600	124,163	47,820
Detroit, Grand Haven & Milwaukee	191	351,000	134,000	579,151	71,208	70,518	10,915	265,051	2,253	9,659	429,604	149,547	7,926	141,282	—42,477
Detroit, Toledo & Ironton	441	333,094	36,250	398,684	44,006	61,084	8,541	164,776	.....	11,792	290,200	108,484	12,000	96,425	36,044
Duluth, South Shore & Atlantic	601	417,649	219,448	707,212	125,189	77,430	15,064	216,873	8,961	17,450	460,967	246,245	38,000	208,237	34,916
Duluth, Winnipeg & Pacific	191	224,179	41,186	273,592	31,929	34,149	3,851	90,663	1,199	10,054	171,844	101,748	13,606	88,142	7,271
Elgin, Joliet & Eastern	799	2,145,218	65	2,282,477	203,319	559,243	12,765	633,414	.....	42,210	1,450,294	832,183	76,121	756,062	—42,572
Erie	1,988	8,480,014	1,955,547	11,574,037	1,069,241	2,286,280	185,895	4,072,835	84,111	269,307	7,952,454	3,621,583	388,294	3,232,608	—662,808
Fort Worth & Denver City	454	647,153	292,982	990,854	122,344	175,754	16,906	256,893	5,822	31,872	609,592	381,262	32,400	348,862	128,314
Georgia	307	369,019	149,065	558,876	47,994	83,188	27,408	193,191	249	17,590	369,619	189,258	9,730	179,490	106,727
Grand Trunk Western	347	1,247,000	331,000	1,670,432	140,327	278,416	33,675	503,282	16,268	28,067	1,000,036	670,396	73,274	596,611	209,431
Great Northern	8,051	11,136,680	3,038,139	15,633,279	1,982,547	1,784,362	202,266	3,922,268	179,402	232,783	8,180,775	7,452,504	960,948	6,490,843	1,501,703
Gulf & Ship Island	308	252,400	64,677	335,090	33,385	58,190	7,579	100,272	615	15,549	215,589	119,501	14,480	105,000	5,032
Gulf, Colorado & Santa Fe	1,938	1,926,166	615,257	2,676,735	526,528	391,604	55,380	922,564	.....	89,848	1,983,961	692,774	118,878	572,654	296,925
Hocking Valley	350	1,280,089	189,992	1,596,257	155,452	361,849	16,133	418,789	.....	35,832	988,054	608,203	82,700	525,496	62,118
International & Great Northern	1,160	1,111,212	474,544	1,714,069	246,618	326,558	43,756	610,011	10,197	58,141	1,259,925	454,144	60,000	393,915	394,310

* Succeeded by Los Angeles & Salt Lake as of August 1, 1916.

REVENUES AND EXPENSES OF RAILWAYS

TWO MONTHS OF FISCAL YEAR 1917—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Lehigh & Hudson River	97	$346,347	$19,451	$410,465	$51,787	$70,228	$2,959	$134,866	.....	$8,780	$268,622	$141,843	$10,000	$131,798	$23,980
Los Angeles & Salt Lake	1,154	1,249,181	594,259	2,017,044	174,039	279,587	61,966	519,892	$40,511	38,923	1,106,207	910,837	100,346	810,414	—7,533
Louisiana & Arkansas	279	216,321	37,863	263,014	51,588	35,571	7,138	70,527	.....	8,279	173,103	89,911	16,115	73,761	11,237
Michigan Central	1,803	4,691,031	2,333,562	7,930,664	1,030,299	1,132,631	131,941	2,554,395	111,292	139,153	5,099,710	2,830,954	280,000	2,548,200	643,019
Mineral Range	120	175,649	7,450	188,350	33,639	31,784	792	73,055	.....	2,906	142,176	46,174	6,600	39,574	—10,665
Minneapolis, St. Paul & S. S. Marie	4,227	4,466,379	1,380,775	6,330,717	596,235	710,224	100,526	1,621,070	37,258	129,766	3,187,758	3,142,959	286,291	2,856,667	1,164,604
Missouri, Oklahoma & Gulf of Texas	134	43,834	1,108	45,362	6,184	5,442	3,277	19,566	.....	3,139	37,610	7,752	375	7,377	8,227
Missouri Pacific	3,931	4,385,227	1,031,723	5,876,373	1,038,970	1,222,309	158,692	1,927,228	18,915	130,839	4,497,134	1,398,939	218,000	1,176,785	328,296
Mobile & Ohio	1,160	1,565,359	254,844	1,931,890	258,656	435,660	69,400	668,715	5,015	62,094	1,499,540	432,350	74,103	358,012	33,553
Nevada Northern	165	339,747	25,599	375,240	43,758	27,291	1,536	59,430	167	9,630	141,812	233,428	12,493	220,934	70,431
New Orleans, Texas & Mexico	191	142,078	34,619	183,501	34,979	34,098	10,756	51,133	.....	13,157	144,122	39,379	2,728	36,651	—22,351
New York Central Railroad	6,093	23,041,895	10,426,838	38,919,657	3,939,154	6,450,007	637,345	11,667,231	525,716	794,385	24,013,838	14,905,818	1,467,623	13,435,103	3,339,141
New York, Chicago & St. Louis	570	2,115,851	358,157	2,586,498	243,443	475,456	95,159	953,515	11,173	53,292	1,831,588	754,910	84,000	670,849	206,968
New York, Ontario & Western	568	924,277	741,842	1,957,554	224,066	249,665	16,601	600,352	.....	35,725	1,124,813	832,740	50,000	782,706	53,073
New York, Susquehanna & Western	140	364,643	100,344	527,968	45,959	64,392	4,200	235,759	.....	16,619	366,890	161,078	28,200	132,876	—33,665
Norfolk Southern	998	497,105	251,927	808,022	123,166	128,637	17,332	263,702	279	37,165	570,280	237,742	25,029	212,338	33,008
Northwestern Pacific	507	459,200	468,060	1,033,868	112,084	87,045	11,081	283,103	1,960	18,038	511,901	521,967	36,311	485,359	77,426
Oregon Short Line	2,247	3,302,061	965,329	4,604,453	589,842	428,914	67,717	951,520	69,458	116,621	2,218,772	2,385,681	349,200	2,036,256	454,636
Oregon-Washington R. R. & Nav. Co.	2,053	2,239,555	890,446	3,425,593	607,408	331,988	92,233	1,006,548	48,345	139,991	2,218,340	1,207,253	189,600	1,017,312	—42,530
Panhandle & Santa Fe	670	760,898	192,080	993,853	148,427	150,777	8,194	232,324	.....	22,716	561,892	431,961	24,287	407,674	241,367
Peoria & Pekin Union	19	22,296	8,760	172,234	13,203	26,506	287	85,463	.....	5,484	130,943	41,291	13,500	27,791	19,093
Philadelphia & Reading	1,127	7,849,304	1,309,293	9,745,494	687,790	1,434,666	103,843	3,205,001	24,339	156,708	5,608,662	4,136,832	233,768	3,901,846	1,240,926
Pittsburgh & Lake Erie	225	3,600,795	402,772	4,268,423	368,694	632,269	26,291	931,984	8,694	62,943	2,030,876	2,237,547	135,800	2,101,746	241,582
Pittsburgh, Shawmut & Northern	300	364,620	21,163	390,992	68,316	116,329	3,063	125,890	.....	9,180	322,778	68,214	4,294	63,920	—14,631
St. Louis, Iron Mountain & Southern	3,555	4,291,717	1,317,767	6,018,729	1,271,260	1,035,588	144,140	1,591,882	17,760	126,853	4,157,153	1,861,577	263,200	1,596,722	353,205
St. Louis, San Francisco & Texas	235	141,992	60,728	211,081	37,525	40,941	4,858	85,256	.....	10,258	178,838	32,243	3,131	29,112	3,442
St. Louis Southwestern of Texas	810	518,395	204,638	783,159	107,421	190,299	31,926	300,375	3,343	39,660	671,891	111,268	33,563	77,573	34,299
* San Pedro, Los Angeles & Salt Lake	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Southern	6,983	7,758,692	3,166,052	11,978,186	1,730,698	1,910,020	324,048	3,925,773	78,736	350,694	8,244,172	3,734,013	504,589	3,227,030	430,669
Southern in Mississippi	281	102,271	53,815	170,976	44,761	17,460	4,119	68,659	.....	6,988	141,987	28,989	16,700	12,221	26,999
Spokane, Portland & Seattle	555	553,955	341,179	988,824	117,458	83,315	17,360	201,429	10,434	30,320	459,057	529,767	114,890	414,562	28,042
Staten Island Rapid Transit Co.	11	94,001	81,135	181,675	20,225	12,884	1,448	71,555	.....	3,527	109,639	72,036	10,000	62,036	—50,304
Toledo & Ohio Central	436	995,001	131,350	1,210,749	151,273	248,882	15,422	380,965	3,612	22,073	822,227	388,523	47,003	341,384	147,943
Union Pacific	3,622	8,766,611	2,144,184	11,991,760	1,923,295	1,315,002	210,374	2,625,726	196,320	271,380	6,480,592	5,511,168	736,800	4,773,668	1,166,754
Wabash-Pittsburgh Terminal	63	217,280	18,435	251,627	38,001	31,721	3,770	61,892	3,390	8,906	147,668	103,959	15,000	88,959	74,340
Western Maryland	689	1,653,991	241,691	2,041,774	227,814	288,929	48,625	594,866	23,266	42,561	1,224,840	816,934	65,000	751,934	204,443
Western Pacific	941	1,240,290	246,788	1,579,759	242,831	139,683	40,805	417,278	21,833	36,652	899,082	680,677	65,477	615,166	109,600
Western Ry. of Alabama	133	107,534	68,743	199,081	29,814	43,880	12,871	55,884	3,398	8,556	154,392	44,688	11,672	32,973	16,906
Wichita Valley	257	99,886	43,979	151,113	27,018	14,568	196	39,253	.....	2,686	83,720	67,393	7,675	59,718	9,242
MONTH OF SEPTEMBER, 1916															
Alabama & Vicksburg	143	$88,627	$37,091	$138,750	$17,745	$30,876	$3,516	$49,831	$2,637	$5,717	$110,322	$28,429	$8,600	$19,829	—$8
Baltimore & Ohio Chicago Terminal	79	.....	522	155,871	16,139	25,898	757	71,721	1,852	7,708	121,495	34,376	22,689	10,251	—20,399
Buffalo & Susquehanna Railroad Corp.	253	133,270	6,173	142,013	22,976	36,621	1,790	38,348	.....	6,471	106,206	35,807	2,600	33,207	—7,092
Central of Georgia	1,924	834,676	287,906	1,241,711	167,661	199,165	36,331	356,491	873	39,832	799,206	442,505	61,251	380,929	40,993
Chicago Great Western	1,496	981,204	333,553	1,440,982	223,895	219,439	53,294	439,535	11,327	36,719	981,584	459,398	53,430	404,719	70,488
Chicago, Peoria & St. Louis	255	122,797	26,755	158,927	21,018	32,683	5,641	59,388	.....	5,483	124,213	34,714	6,000	28,714	—9,764
Chicago, St. Paul, Minn. & Omaha	1,753	1,364,495	535,772	2,043,232	298,637	226,549	29,475	659,471	16,773	43,278	1,272,483	770,749	91,662	678,227	231,738
Cincinnati, Hamilton & Dayton	622	715,958	120,724	947,393	115,581	136,036	15,601	334,744	3,489	20,169	623,188	324,205	31,684	291,347	16,419
Colorado Midland	338	144,957	21,876	178,300	31,300	34,009	6,642	69,993	1,449	5,300	148,693	29,607	9,000	20,607	22
Delaware, Lackawanna & Western	955	3,175,046	804,467	4,412,131	454,888	677,547	72,654	1,373,831	37,528	88,756	2,699,241	1,712,890	232,500	1,480,164	—121,222
Detroit & Mackinac	383	72,254	29,751	111,093	12,200	18,592	1,866	36,269	241	3,274	72,442	38,650	8,030	30,621	15,963
Duluth & Iron Range	277	864,765	19,383	898,074	79,337	92,753	1,433	188,048	2,177	11,658	370,801	527,272	70,100	457,173	—30,582
Duluth, Missabe & Northern	411	2,051,932	29,972	2,159,607	139,428	129,184	2,796	305,271	1,642	15,586	593,907	1,565,700	185,432	1,380,269	355,946
El Paso & Southwestern Co.	1,028	893,693	225,825	1,177,525	106,349	118,232	18,547	261,033	6,555	25,269	535,986	641,539	39,529	601,948	335,120
Elgin, Joliet & Eastern	800	1,130,657	46	1,203,242	99,166	281,610	6,366	329,667	.....	17,813	734,184	469,058	43,210	425,848	—57,549
Galveston, Harrisburg & San Antonio	1,361	1,170,915	344,702	1,589,598	127,780	165,295	29,712	448,921	10,584	34,936	814,121	775,477	48,502	726,751	352,549
Galveston Wharf	14	.....	.....	110,266	843	1,673	372	26,628	19,499	373	49,388	60,878	10,300	50,578	56,102
Gulf & Ship Island	308	131,063	31,315	171,725	14,437	28,210	2,568	53,207	305	8,354	107,081	64,644	8,011	56,602	—1,749
Houston, East & West Texas	191	94,603	28,036	131,730	18,572	14,586	2,064	39,721	756	2,897	78,491	53,239	7,670	45,499	19,828
Houston & Texas Central	895	592,428	138,003	771,648	61,988	73,278	16,607	188,582	4,669	16,620	361,382	410,266	37,123	372,987	175,772
Illinois Central	4,767	4,695,505	1,287,057	6,461,004	1,022,949	1,365,662	105,974	1,854,337	35,993	152,591	4,525,541	1,935,463	320,000	1,614,455	287,122
Indiana Harbor Belt	109	.....	.....	394,231	47,157	34,782	2,753	152,943	.....	8,100	245,734	148,497	8,668	139,772	24,613
Kanawha & Michigan	177	247,852	35,830	291,972	41,125	79,548	2,545	71,330	—1	7,369	201,917	90,056	14,100	75,956	—25,624
Kansas City Southern	837	735,917	138,210	974,791	109,729	126,704	30,406	294,030	.....	35,727	596,225	378,565	48,447	329,583	11,551
Lehigh Valley	1,444	3,568,056	440,165	4,308,962	493,258	865,906	82,737	1,525,372	17,978	83,967	3,066,017	1,242,945	158,000	1,084,891	—65,463
Louisiana Railway & Navigation Co.	350	150,118	26,161	186,545	28,199	26,936	6,450	57,090	.....	6,948	125,623	60,922	11,000	49,904	—15,291
Louisiana Western	208	150,523	66,871	229,926	20,546	26,023	7,076	44,281	1,794	6,780	106,488	123,438	11,950	111,398	57,487
Maine Central	1,221	689,712	405,092	1,187,049	144,365	141,368	14,796	413,827	8,660	27,507	750,450	436,599	49,578	386,983	112,602
Minneapolis, St. Paul & S. S. Marie	4,227	2,178,660	633,615	3,046,448	307,734	359,164	43,835	847,906	16,634	56,328	1,628,855	1,417,593	136,890	1,280,703	—41,713

* Succeeded by Los Angeles & Salt Lake as of August 1, 1916.

Traffic News

Among numerous embargoes reported during the past week is one at Baltimore, imposed by the Pennsylvania, on all shipments to the principal western points, except foodstuffs. Congestion in and near Chicago and other cities is understood to be the reason for this embargo.

Beginning November 26, the Pennsylvania will run a solid steel train through between New York and Cleveland, Ohio, nightly, with sleeping car connections to and from Washington, D. C. and Akron, Ohio. The westbound train will leave New York at 6:40 p. m. and run through in about fourteen hours; eastbound, leave Cleveland at 5:15 p. m.

The City of Bayonne, N. J., six miles from the business center of New York City, through its Board of Commissioners is working up interest in a project to establish a great municipal freight terminal and industrial center, to occupy two hundred acres of land along the waterfront, and to provide dockage for thirty modern freight ships. Plans for the proposed establishment, with an estimate of something over seven million dollars as its cost, have been made under the direction of B. F. Cresson, Jr., chief engineer of the New Jersey State Board of Commerce and Navigation, and have been issued in pamphlet form. The city has consulted Irving T. Bush, and the idea is to establish on the west side of the New York bay a freight center similar to the Bush Terminal on the east side of the bay. The Bayonne location is about five miles southwest from the lower end of Manhattan Island, and is a short distance south of the freight terminal of the Pennsylvania Railroad at Greenville. The proposed site, now unoccupied, is conveniently located near the tracks of the National Docks Railroad, which has freight connections with all of the trunk lines.

New Adjustment of Transcontinental Rates

The Interstate Commerce Commission has granted authority to the transcontinental lines to cancel all of the protested eastbound and westbound rates between points on the Pacific coast and inter-mountain territory on the one hand and points in eastern defined territories on the other hand, contained in transcontinental tariffs which were suspended by the commission in its orders in Investigation and Suspension Docket No. 909. In consequence the hearings on the suspended rates set for Chicago, November 20; Salt Lake City, November 28; San Francisco, December 4; Portland, Oregon, December 11, and Spokane, Washington, December 14, 1916, before Attorney-Examiner Thurtell, have been cancelled.

Hearings on Fourth Section Applications Nos. 205, etc., respecting rates on commodities from eastern defined territory to Pacific coast points and intermediate points, and Fourth Section Applications No. 9813, etc., respecting rates on barley, beans, canned goods, asphaltum, dried fruit, wine and other commodities from Pacific coast ports to eastern destinations, set for the same places and dates will be held as scheduled.

It is understood that the transcontinental lines propose to file tariffs effective upon statutory notice on December 30, applicable upon the so-called "Schedule C" commodities named in the tariffs suspended in I. & S. Docket No. 909, which will increase the present rates to the Pacific coast ports a maximum of 10 cents per 100 pounds on carload and 25 cents per 100 pounds on less-than-carload traffic, but no changes to intermountain points from eastern groups A to E inclusive are contemplated; hence the discriminations under the fourth section now existing between Pacific coast ports and intermountain cities will be diminished to the extent of the increases to the Pacific coast ports. Rates from Missouri River and groups west thereof to intermountain cities taking maximum rates will be increased to the level of the rates to the Pacific coast ports, the maximum increases being 10 cents per 100 pounds on carloads and 25 cents per 100 pounds on less than carloads. It is also understood that the eastbound carload rates on asphaltum, barley, beans, canned goods, dried fruit and wine, from Pacific coast ports will be increased 10 cents per 100 pounds.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended until March 10, 1917, proposed increases in commodity rates on glass bottles, jars and flasks, in carloads, from points in Pennsylvania, West Virginia, Oklahoma and other states to Pacific coast terminals and intermediate points.

The commission has suspended from November 15 until March 15, 1917, proposed increases of the class rates in the tariff filed by the Pennsylvania Railroad from Oil City and certain other points in western Pennsylvania to Minneapolis, Minn., and points taking the same rates via rail, lake and rail routes.

The Commission has further suspended from November 12 until May 12, a tariff providing for the cancellation of carload commodity rates on clay, gypsum, earth paint, plaster board and other commodities from certain points in New England by rail and lake to Duluth, Minn., and other destinations.

The commission has suspended from November 17 until May 17, 1917, the operation of items in a tariff filed by E. B. Boyd, providing for the cancellation of commodity rates on dressed poultry, any quantity, when shipped with full carloads of fresh meat or packing house products from Texas points to New Orleans, Galveston and other Gulf ports for export to Cuba.

The commission has suspended from November 10 to March 10, 1917, revised rates on grain and grain products from Kansas City, Mo., Omaha, Neb., and points taking the same rates to destinations in Mississippi valley territory. The proposed rates are in many instances from 1 to 4 cents per hundred pounds higher than those now in effect. The tariff also provides for a number of reductions.

Oral arguments will be heard by the commission on December 2 on the question of reopening the case of the railroad-owned boat lines on the Chesapeake Bay and tributaries, which have filed applications with the commission under the Panama Canal Act. The petitions for a reopening of the case were filed by the Board of Trade and the Merchants', Shippers' and Receivers' Association of Baltimore.

A hearing on proposed advances in freight rates in Western Trunk Line territory has been set by the commission to be held before Examiner Bell at Kansas City beginning on December 2. In order to facilitate and expedite the hearing the commission has arranged the following schedule of commodities to be considered: December 2, proposed increases in rates on cooperage, stoves and stove linings; December 4, paper, asphalt, asphaltum, candy and grapes; December 5, stone, agricultural implements, soda products, burlap, building blocks; December 6, butter, eggs and dressed poultry.

In accordance with an experiment recently begun by the Interstate Commerce Commission of having examiners submit tentative reports of rate cases to the attorneys on both sides for criticism, Examiner-Attorney Watkins has submitted a tentative report of the commission's investigation of the tariffs suspended in I. & S. No. 870 involving increases in the rates on cotton piece goods from southern mills to Central Freight Association points. The conclusion reached by the examiner is that the Central Freight Association lines have not justified the advance which they proposed in the proportion of the rates north of the Ohio river.

The hearing, begun in New York City on Monday of this week, on the complaint of Jersey City and other New Jersey interests relative to the alleged unreasonable difference between the rates on freight from the West to New York City and those to Jersey City, was at once adjourned, because of the large amount of other matters requiring the attention of the commission during the next few weeks; and it was understood that nothing more would be done until January 4, or later. A large array of counsel was present to controvert the claims of the New Jersey people; among the objectors being the State and city of

New York, the New York Real Estate Board, the Merchants' Association of New York, the Chamber of Commerce of the State of New York, and many railroads.

The California Wholesale Potato Dealers' Association has filed a complaint with the commission asking damages of $50,000 from the Pacific Fruit Express to compensate for the loss alleged to have been sustained because of the failure to furnish the necessary equipment for the movement of potatoes and onions to market from points in Oregon, Nevada and California. The complaint says that the defendant's equipment has been sent loaded out of these states and is being used for the handling of non-perishable commodities in other parts of the country. The commission is asked to have an immediate accounting made of all P. F. E. equipment and "that it be immediately returned to California, Oregon and Nevada for the loading of complainant's onions and potatoes." If this is not done, it is stated, the complainant's losses will probably amount to $500,000.

STATE COMMISSIONS

The Railroad Commission of Wisconsin made a material reduction in intrastate distance tariffs on agricultural implements, vehicles, and articles of this character in carloads, in a decision handed down in the case of Lindsay Brothers, Milwaukee, against the Chicago & North Western, the Minneapolis, St. Paul & Saulte Ste. Marie, the Chicago, St. Paul, Minneapolis & Omaha, and the Chicago, Milwaukee & St. Paul.

A Safe (?) Grade Crossing

Seymour Van Santvoord, chairman of the New York State Public Service Commission, Second district, in an opinion settling an application for the elimination of the Floyd road grade crossing of the New York Central near Marcy, lays down the seemingly paradoxical dictum that to abolish the crossing would increase the danger! He gives facts, however, tending to support his view. At the same time, he calls on the legislature to give the commission more power over the regulation of obstructions to view at existing grade crossings; it has the power to order the elimination of crossings but no power to order conditions surrounding the crossings to be improved. In this case the railroad asked for the elimination of the crossing because of dangerous conditions due to a wooded patch which cuts off the view of the tracks from the highway. The company wanted to build a new road to connect with the Robbins road 1,000 feet away, where the Robbins road crosses the tracks by an underpass. But Mr. Van Santvoord finds that the danger of joining the Floyd road with the Robbins road, which latter is an improved state highway with heavy automobile traffic, would be greater than the maintenance of the grade crossing of the Floyd road with the railroad. The new connecting road would join the Robbins road just north of the underpass at an acute angle and in such a way that vehicles approaching the intersection upon either road would have no good view of vehicles on the other. The Floyd road could be made perfectly safe for its very moderate traffic, were the trees and underbrush at the grade crossing removed, says the chairman.

PERSONNEL OF COMMISSIONS

Charles W. Hurdleston, manager of the Texas State Railroad, has been appointed a member of the Texas Railroad Commission by Gov. James D. Ferguson, succeeding the late Judge William D. Williams. He was born September 21, 1874, at Asheville, N. C., and received his early education in the public schools of Fort Worth, Tex., later completing a business course at the Pruitt Business College in the same city. In 1892 he entered the service of the Texas & Pacific as call boy and telegraph operator. He took employment with the Missouri, Kansas & Texas in December, 1892, as a brakeman, and was promoted in 1893 to freight conductor, later becoming superintendent of construction on the Hillsboro terminal and the Houston extension of this same road, and remaining in this latter connection until 1907. During 1907 and 1908 he was engaged in construction work on the Illinois Central and the Panama Railroad. From 1908 to 1912, he was a division superintendent on the Missouri, Kansas & Texas, with office at Trinity, Tex. On account of an injury suffered in a collision early in 1913 he was compelled to retire from active railway work during 1913 and 1914, but in October, 1914, he accepted the position of general manager of the Texas State Railroad, with which line he was connected at the time his present appointment became effective.

COURT NEWS

Contributory Negligence of Brakeman

Freight cars were equipped with automatic couplers, so as to couple by impact, as required by the Maine statute. A brakeman, after failing to recouple cars by the automatic coupler, went between moving cars to couple with his hands. There was no necessity or circumstances that made it his duty to try such an unsafe method. His foot was caught in a guard rail, and he was run over and injured. The Maine Supreme Court holds that he was guilty of contributory negligence, barring his recovery for his injuries.—Swasey v. Maine Central (Me.), 98 Atl., 706.

Proof of Shrinkage in Weight of Cattle

To recover damages for shrinkage in the weight of cattle, alleged to have been caused by delay in transportation, the fact that there was a shrinkage must be proved by competent evidence. In such a case the plaintiff testified that the cattle were not weighed when shipped, but that he thought they would weigh more than 1,400 pounds. The selling weight was an average of a little over 1,400 pounds. Several stock shippers testified that the extra shrinkage of cattle when held over one day is from 30 to 50 pounds per head. The Nebraska Supreme Court held the proof did not establish a claim for shrinkage.—Underwood v. C. & N. W., 159 N. W., 408.

Traffic Contracts

A traffic contract between two railroad companies, the Wabash and Wheeling & Lake Erie, for the interchange of business, by its terms was to continue for a stated number of years, and bound one company to pay to the other a percentage of its receipts from the traffic interchanged, if necessary to meet the interest on an issue of bonds to be made by the latter. The United States Circuit Court of Appeals, Sixth Circuit, holds that the contract, conceding its validity, created no lien on the property or income of the promisor as against subsequent creditors or purchasers, but might be repudiated by its receiver, if deemed unprofitable, leaving to the other company or its bondholders only a general claim for damages for its breach.—Baker v. Central Trust Co., 235 Fed., 17.

Man Injured in Yard

In an action for personal injuries sustained while attempting to cross one of five tracks used in a well-defined switching yard, by the backing of a train, on which no lookout was kept and no warning was given by bell, whistle or otherwise, the Georgia Court of Appeals holds that a railroad company is entitled to the exclusive use of the tracks in its yard, and there can be no implied license to the public to use such tracks, inconsistent with this exclusive right. Judgment for the defendant was affirmed.—Wright v. Atlantic Coast Line (Ga.), 89 S. E., 595.

Accident to Trespasser in Yard

An avenue in Spokane running parallel with a freight yard had been impassable for some time, and people had crossed the railroad premises to get to their houses. A man was killed by an engine while walking on one of the tracks. In an action for his death the Washington Supreme Court held that he was a naked licensee using the yard by sufferance of the railroad. There was a safer way beside the track, and the man was under a duty to exercise the highest degree of care in making use of the yard, to choose the safer of two paths, and make constant use of his sight and hearing. The operators of the engine had a right to rely on a bare licensee or trespasser to perform the primary duty upon him to keep out or get out of danger. The proximate cause of the man's death being his contributory negligence, the fact that the railroad's servants might have been negligent in failing to give a warning signal or keep a lookout was immaterial.—Scharf v. Spokane & Inland Empire (Wash.), 159 Pac., 797.

Railway Officers

Executive, Financial, Legal and Accounting

Thomas F. Brennan, who has been appointed vice-president of the Buffalo, Rochester & Pittsburgh, with headquarters at Rochester, N. Y., as has already been announced in these columns, was born at Rochester and was educated in the public schools. He began railway work in 1878, with the New York Central and for several years served in the transportation department of that road. In September, 1887, he entered the service of the Buffalo, Rochester & Pittsburgh as general car agent, remaining in that position until January, 1905, when he was appointed superintendent of transportation. From March, 1909, to February, 1911, he was general superintendent and then became general manager, which position he held at the time of his recent appointment as vice-president of the same road, as above noted.

Henry J. Hart, who has been appointed general counsel of the Bangor & Aroostook with headquarters at Bangor, Maine, as has already been announced in these columns, was born on January 25, 1880, at Lynn, Mass., and was educated at Brown University. After being admitted to the Massachussetts bar in July, 1905, he was connected for four years with the law firm of Choate, Hall & Stewart, Boston, Mass., engaged in general practice of law, but principally giving attention to the trial of cases for the New York, New Haven & Hartford, the Boston & Albany and the Boston Electric Railway Company. On October 15, 1909, Mr. Hart was appointed assistant attorney of the New York, New Haven & Hartford, and on November 1, 1914, became solicitor. For the past six years he has devoted his time to state and federal laws affecting railroads, railroad taxation and railroad financing.

Edward E. Cleary, the announcement of whose appointment as general claim agent of the Nashville, Chattanooga & St. Louis, with office at Nashville, Tenn., succeeding S. D. Cowden, resigned to enter other business, was made in a recent issue, was born October 17, 1873, at Nashville, Tenn. After a preliminary education in the common schools of that city, he entered high school. In 1887 he took employment with the Nashville, Chattanooga & St. Louis in the office of the general freight agent at Nashville, Tenn. He was connected with this department in various capacities up to 1898, when the claim department was organized, being then transferred to this new office and made chief clerk. He held this latter position until the time of his present appointment as claim agent became effective, on October 15, 1916.



E. E. Cleary

Operating

Michael Sheehan has been appointed trainmaster and supervisor of the Rantoul district of the Illinois Central, with office at Rantoul, Ill., succeeding Daniel S. Bailey, retired on a pension.

W. A. Whitney, superintendent of transportation on the Union Pacific, with office at Omaha, Neb., has been temporarily assigned also to the duties of superintendent of the Wyoming division, with headquarters at Cheyenne, Wyo., succeeding S. R. Toucey, transferred. A photograph and biographical sketch of Mr. Whitney's railway career appeared in the *Railway Age Gazette* of August 25, 1916.

J. H. Lockett has been appointed superintendent of transportation on the Ogden, Logan & Utah, with office at Ogden, Utah, succeeding J. M. Read, appointed traveling freight and passenger agent.

Charles G. Lunday, who was recently promoted from superintendent to general superintendent of the Louisiana & Arkansas, succeeding F. W. Green resigned, was born January 5, 1872, in Macon county, Mo. He entered railway service on April 1, 1886, with the Hannibal & St. Joseph, as an operator. From January to September, 1904, he was with the St. Louis Southwestern in the same capacity, and then went to the St. Louis, Iron Mountain & Southern as a despatcher. In February, 1910, he was appointed trainmaster on the Louisiana & Arkansas, and in August, 1911, was promoted to superintendent of this same road. His present appointment as general superintendent became effective November 1, 1916.

G. B. Minshull, superintendent of car service of the Lehigh Valley, at South Bethlehem, Pa., has been promoted to assistant to the general superintendent. W. J. McGarry has been appointed superintendent of car service with headquarters at South Bethlehem, Pa. F. B. Parry, assistant superintendent of the Wyoming division at Wilkes-Barre, has been appointed assistant superintendent at Perth Amboy, N. J.; T. W. Brewer, trainmaster at Easton, has been transferred as trainmaster to Packerton, Pa., succeeding E. E. Jordan, assigned to other duties. C. O. Smith, chief train despatcher at Easton, succeeds Mr. Brewer as trainmaster at Easton, and H. C. Miles, night chief despatcher, becomes chief despatcher. G. R. Lewis trainmaster at Auburn, N. Y., has been transferred as trainmaster to Cortland, succeeding P. T. Carmody, assigned to other duties. A. C. Kerrick, chief despatcher of the Auburn division, has been appointed trainmaster at Auburn.

Edgar F. Robinson, who has been appointed general manager of the Buffalo, Rochester & Pittsburgh, with headquarters at Rochester, N. Y., as has already been announced in these columns, graduated from Rose Polytechnic Institute, of Terre Haute, Ind., in 1894, with the degree of civil engineer. He began railway work in December, 1895, and served consecutively as assistant engineer on the Cleveland, Cincinnati, Chicago & St. Louis, at Mattoon, Ill., and as assistant engineer on the Indiana & Illinois Southern, now a part of the Illinois Central. From October, 1898, to September, 1899, he was assistant roadmaster on the New York Central, at Lyons, N. Y. He was then appointed roadmaster on the Chicago, St. Paul, Minneapolis & Omaha, leaving that position in October, 1901, to become superintendent of maintenance of way and structures on the Butte, Anaconda & Pacific. In November, 1902, he entered the service of the Buffalo, Rochester & Pittsburgh as engineer of track at Rochester, N. Y., and on November 1, 1907, was promoted to chief engineer, which position he held at the time of his recent appointment as general manager of the same road.

Traffic

Thomas E. Poole, traveling freight agent of the Western Maryland at Cumberland, Md., has been appointed division freight agent with headquarters at Cumberland, succeeding J. Howard Magee, resigned.

W. F. Mundee, commercial agent of the Macon, Dublin & Savannah at Jacksonville, Fla., has been promoted to Florida agent, and W. M. Coble, traveling freight agent at Jacksonville, has been promoted to commercial agent.

J. H. Manderfield, assistant general freight and passenger agent on the Los Angeles & Salt Lake, with office at Salt Lake City, Utah, has resigned to assume a position as manager of the Salt Lake Stockyards Company, at Salt Lake City, Utah.

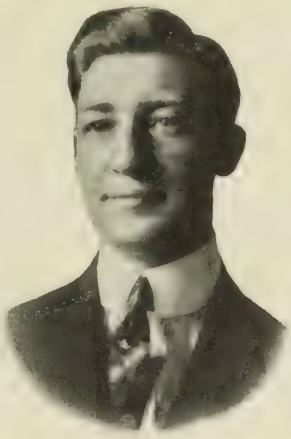
John L. Fox, traveling freight and passenger agent of the El Paso & Southwestern, with office at St. Louis, Mo., has been appointed general agent, with office at Kansas City, Mo., succeeding Joseph F. Hogan, appointed general agent at Los Angeles, Cal., in place of Charles H. Phillips, resigned.

John C. Emig, industrial agent of the Cleveland, Cincinnati, Chicago & St. Louis, with office at Cincinnati, Ohio, was appointed assistant general freight agent of this company, with jurisdiction over the Cincinnati Northern and the Peoria & Eastern, effective November 1. He was born at St. Louis, Mo., September 3, 1878, and began railway work with the Cleveland, Cincinnati, Chicago & St. Louis as a messenger and clerk in March, 1892. From January, 1895, to February, 1901, he was successively tracing clerk, claim clerk, rate clerk and chief clerk on this same line. From February, 1901, to December, 1903, he was contracting agent and then traveling freight agent. In January, 1904, he was appointed commercial agent with jurisdiction over this line's Central State's Despatch Fast Freight service, with headquarters at St. Louis, Mo., which position he held until January, 1910. From February, 1910, to October, 1916, he was industrial agent for this same company with jurisdiction over the Cincinnati Northern and the Peoria & Eastern, with office at Cincinnati, Ohio.



J. C. Emig

R. H. Carmichael, division freight agent of the Southern Pacific, Texas lines, with office at Houston, Tex., the announcement of whose appointment, effective October 16, as assistant general freight agent with same headquarters as at present, was recently made in these columns, was born October 25, 1879, at Wellsburg, W. Va. In January, 1905, he entered the service of the Southern Pacific Steamship Company, Morgan Line, as a clerk in the dock office at Galveston, Tex., working here in various capacities until May, 1905, when he was appointed clerk to the general agent of the Southern Pacific, Texas Lines, with the same headquarters, being later promoted to chief clerk in this office. In 1909 he was made general agent of the Southern Pacific and Morgan Line at Monterey, Mexico, and in 1910 was transferred to Galveston, Tex., with the same title. In 1912 he was appointed general agent at Houston, Tex., for this same company and in 1914, promoted to division freight agent, which latter connection he held until his present appointment became effective.



R. H. Carmichael

Engineering and Rolling Stock

David Peters, extra gang foreman on the Illinois Central, has been appointed supervisor, with office at Freeport, Ill., succeeding C. G. Bryan.

A. B. Ford has been appointed master mechanic of the Butte division of the Great Northern, with headquarters at Great Falls, Mont., vice F. M. Fryburg, on leave of absence.

John D. Rogers, formerly roundhouse foreman of the Oregon Short Line at Pocatello, Idaho, has been appointed shop superintendent of the Virginian Railway with headquarters at Princeton, W. Va.

C. E. Denney has been appointed special engineer for the New York, Chicago & St. Louis, effective November 16, with headquarters in Cleveland, Ohio. He will perform special duties working from the office of the president and general manager. Mr. Denney served nearly seven and one-half years as signal engineer of the Lake Shore & Michigan Southern, one year as special engineer in the office of the vice-president of the Lake Shore, and during the last two years has been consecutively assistant general sales manager, assistant general manager, and assistant to the president of the Union Switch & Signal Company.

William H. Vance, engineer maintenance of way on the Louisiana & Arkansas, the announcement of whose appointment as chief engineer has been made in these columns, was born November 6, 1876, at Effingham, Ill. After receiving a preliminary education he entered the University of Illinois, from which institution he graduated in 1899. On March 1, 1902, he took employment with the Peoria & Eastern in the engineering corps as assistant engineer, in which capacity he served until March, 1905, when he was appointed assistant division engineer of the Missouri division of the St. Louis, Iron Mountain & Southern. From June 1, 1906, to October 20, 1909, he was division engineer on the Louisiana & Arkansas, being then appointed engineer maintenance of way. His present promotion to chief engineer became effective November 1, 1916.

George W. Corrigan, roadmaster of the Southern Pacific at Hornbrook, Cal., whose appointment effective September 15, as division engineer of the Stockton division, with office at Stockton, Cal., was announced in these columns, was born in September, 1876, at Harrisonville, Mo. He graduated from the engineering department of the Missouri University at Columbia, Mo., in 1900, and immediately entered railway service with the Union Pacific as a rodman and instrumentman on location and construction. From January, 1901, to November, 1907, he was employed by the Missouri Pacific, as assistant engineer, and later as division engineer, engaged chiefly on location and construction From May 1908, to March, 1911, he was assistant engineer maintenance of way on the Southern Pacific, and from March, 1911, to September 15, 1916, roadmaster with this same company. He succeeded L. Beauman, resigned.

Melville Fisk Clements, assistant engineer for the last two years, in charge of the Spokane grade separation on the Northern Pacific, has been appointed bridge engineer, effective November 6, with office at St. Paul, Minn., succeeding H. E. Stevens, promoted, as was announced in these columns last week. He was born in March, 1875, at What Cheer, Ia., and graduated from the state university at Iowa City, Ia., in 1899. The same year he entered railway service with the Burlington, Cedar Rapids & Northern in the engineering department. From June, 1902, to May, 1906, he held various engineering positions with the Chicago, Rock Island & Pacific, and from May, 1906, to August, 1907, he was engineer for the Clinton Bridge & Iron Works, at Clinton, Ia. In August, 1907, he was appointed assistant engineer on the Northern Pacific, since which time he has been engaged chiefly on new construction and grade separation.



M. F. Clements

OBITUARY

Emerson Hadley, assistant general counsel of the Northern Pacific with office at St. Paul, Minn., died at his home in that city on November 11, of heart trouble.

Equipment and Supplies

LOCOMOTIVES

The Wabash has again revived its inquiry for 25 Santa Fe type locomotives.

The Pickands Mather Company, Duluth, Minn. is inquiring for one six-wheel switching locomotive.

The Paris, Lyons & Mediterranean (France) has ordered 40 superheater Mikado locomotives from the Baldwin Locomotive Works.

The Chicago, St. Paul, Minneapolis & Omaha has ordered 2 superheater Sante Fe type locomotives from the Baldwin Locomotive Works.

The Atlantic Coast Line has ordered 5 six-wheel switching and 20 superheater Pacific type locomotives from the Baldwin Locomotive Works.

The Cia de Minerales y Metales, San Luis Potosi, Mexico, has ordered one 10-wheel locomotive from the Birmingham Rail & Locomotive Company.

The New York, Chicago & St. Louis has ordered 25 Mikado locomotives from the American Locomotive Company and 20 six-wheel switching locomotives from the Lima Locomotive Works.

The Union Pacific, reported in last week's issue as having issued a new inquiry for 15 Santa Fe type locomotives, has ordered 16 superheater Santa Fe type locomotives from the Baldwin Locomotive Works.

The Nevada Northern, reported in the *Railway Age Gazette* of October 27 as about to buy a Consolidation locomotive, has ordered one superheater Consolidation locomotive from the Baldwin Locomotive Works.

The Russian Government has ordered 40 Decapod locomotives from the American Locomotive Company, 40 from the Baldwin Locomotive Works and 20 from the Canadian Locomotive Company, a total of 100 engines. The original inquiry was for 600 locomotives and it is possible that additional orders are to be placed later.

FREIGHT CARS

The Atlantic Coast Line has issued inquiries for 100 stock cars.

The Pressed Steel Car Company will build 100 gondola cars for its own uses.

The Wabash Pittsburgh Terminal is reported to have placed an order for 1,000 cars.

The Chicago, Indianapolis & Louisville has withdrawn its tentative inquiry for 500 box cars.

The New York Central is reported in the market for 11,000 car and tender axles for replacements.

The Northern Pacific has ordered 350 ore cars from the Western Steel Car & Foundry Company.

The Chicago, Burlington & Quincy has ordered 2,000 box cars from the Haskell & Barker Car Company.

The Detroit, Toledo & Ironton has ordered 400 automobile cars from the American Car & Foundry Company.

The Brier Hill Steel Company, Youngstown, Ohio, has ordered 20 coke cars from the Pressed Steel Car Company.

The Chicago, Rock Island & Pacific has been authorized by the Federal Court to purchase 2,000 gondola cars. It is expected that inquiries for these cars will be issued in a few days.

The Illinois Central has ordered 1,000 composite gondola cars from the Pullman Company and 1,000 from the Haskell & Barker Car Company. It is also inquiring for 500 furniture cars.

The New York, Chicago & St. Louis has ordered 150 center constructions and 500 automobile cars from the Pressed Steel Car Company. The latter are in addition to 500 cars reported in the *Railway Age Gazette* of September 29. It is understood that other orders for cars will also be placed.

The Great Northern, reported in the *Railway Age Gazette* of October 27 as contemplating the purchase of 1,000 refrigerator and 2,000 box cars, is now inquiring for 1,000 box and 500 refrigerator cars.

The Atchison, Topeka & Santa Fe, reported in last week's issue as having ordered 500 tank cars, ordered these cars from the Pressed Steel Car Company. It has also ordered 1,000 stock cars from the Haskell & Barker Car Company.

Russian Government.—The Wall Street Journal printed the following in its evening edition of November 14: "Equipment interests are still hopeful that the Russian $50,000,000 order will be successfully arranged, as this would probably mean the placing of further large orders for cars and locomotives. . . . Orders for the 7,000 cars, for the buying of which the British $17,000,000 credit will also be used, have not yet been placed. There is some question as to whether this credit is intended to be used solely for the purchase of equipment here, or is designed to cover transportation and other charges. In some quarters the understanding is that Britain is ready to finance these additional charges separately, and if this is correct it means that Russia will have a fund here, independent of any credit arranged with American banks, sufficient to duplicate the orders placed and placing, as the 100 engines and 7,000 cars will cost only about $8,000,000, at tidewater. The order which was placed by Russia with the Bettendorf Axle Company for 4,000 cars at $1,750 each, some time ago, probably will not be filled. Deliveries were to be made as follows: 1,500 cars on October 31, 1,500 on November 30 and 1,000 on December 31. The first 1,500 were not delivered on time, and this lot was canceled. It is though that the others will be as well. . . ."

PASSENGER CARS

The Boston & Maine is in the market for 6 postal cars.

The New York Municipal is asking prices on 100 subway cars.

The New York Central is reported in the market for 30 multiple unit cars.

The Illinois Central has ordered 3 private cars from the Pullman Company.

The Chicago & Eastern Illinois has ordered 6 baggage cars from the Pullman Company.

The El Paso & Southwestern has ordered 2 coaches, 4 baggage cars and one mail car from the Pullman Company.

IRON AND STEEL

The St. Louis Southwestern is inquiring for 5,000 tons of 85 lb. rails for 1917 delivery.

The Northern Pacific has ordered 1,200 tons of steel from the American Bridge Company for an extension to ore dock at Duluth, Minn.

The Great Northern has ordered 1,438 tons of bridge steel from the American Bridge Company and 1,100 tons from the Wisconsin Bridge & Iron Company.

MISCELLANEOUS

The Pennsylvania Equipment Company, Philadelphia, Pa., is in the market for a second-hand 30-ton capacity locomotive crane.

Solder Scarce in Germany.—Because of the stoppage of tin imports, Germany is reported to have prohibited the use of solder containing more than 30 per cent of tin and the tin so used must have been recovered from dress or scrap. The making of soldered joints has to be restricted to cases where lapping, riveting and electric or autogenous welding are impracticable. It is stated that a usable solder can be prepared from 10 parts of tin, 80 of lead and 10 of cadmium. Although the cadmium is three times as expensive as tin, the extra cost is considered of no consequence because of the necessity of using sufficient tin as raw material.—*Iron Age.*

Supply Trade News

Frank L. Severance has been appointed general manager of the Irving-Pitt Manufacturing Company, Kansas City, and H. R. McCleary has been appointed general sales manager.

The United States Steel Corporation and other steel companies have announced an increase of $5 in the price of rails. This makes the price of open hearth rails $40 a ton and Bessemer rails $38.

The Selby Safety Flag Company, St. Louis, Mo., is in receipt of orders from the Atlanta, Birmingham & Atlantic for improved flagmen's signal outfits for all crews. This is the ninth system to adopt this appliance as standard.

Sydney Dillon has been appointed chief mechanical engineer of the Carnegie Steel Company, succeeding John Hulst, who was recently appointed assistant to the vice-president and chief engineer of the United States Steel Corporation. Mr. Dillon has been with the Carnegie Steel Company since 1889.

Charles Lounsbury has recently been made president and general manager of the American Railway Supply Company, 134 Charles street, New York. Mr. Lounsbury was born in New York City in 1863 and is a graduate of the College of the City of New York. He began his business career in 1887 with the American Railway Supply Company as junior clerk and has been with that company in various capacities ever since.

Edward Thomas Hendee, secretary of Joseph T. Ryerson & son, Chicago, died suddenly at Minneapolis, Minn., on November 12. He was born at Claremont, N. H., on February 22, 1880, and graduated from New York University in 1900. From 1901 to 1902 he was assistant professor of mechanical engineering at New York University. On the latter date he became associated with Joseph T. Ryerson & Son, Chicago, as advertising manager and also built up and became manager of the machinery department. He was made assistant to the president in January, 1911, and in 1913 he assumed charge of the railway supply department. In the same year he was elected secretary of Joseph T. Ryerson & Son. He was particularly successful in developing the domestic and foreign machinery business and the railway supply business of his company. Mr. Hendee was also vice-president and director of the Lennox Machine Company and director of the American-Glyco Metal Company.



E. T. Hendee

The Chicago Car Heating Company, Chicago, has issued the following: "The long continued steam hose coupler patent litigation between Chicago Car Heating Company and Gold Car Heating & Lighting Company has been ended by a decision rendered on October 3, 1916, by the United States Circuit Court of Appeals at Chicago in favor of Chicago Car Heating Company. As there is no appeal, this decision ends this controversy in favor of Chicago Car Heating Company."

R. H. Wood, for a number of years connected with the Buffalo office of the Warner & Swasey Company, Cleveland, Ohio, has been appointed manager of the Chicago district office of the Modern Tool Company, Erie, Pa. Leo C. Steinle has been appointed direct representative in France of the Modern Tool Company, with offices at Paris and Lyons. Mr. Steinle is actively connected with the Steinle Turret Machine Company, Madison, Wis., whose interests he is also looking after abroad.

Hugh E. Creer, formerly sales agent for the Union Railway Equipment Company, Chicago, Ill., has been appointed general sales representative of the Camel Company, manufacturers of railway specialties, with headquarters in Chicago. He was born in Hardin, Ray county, Mo., in August, 1874. In 1898, he took employment with the Missouri Pacific at Osawatomie, Kan., and in the following year entered the car department of the St. Louis, Iron Mountain & Southern, where he remained until 1904, consecutively as car repairer, inspector, chief clerk, assistant foreman and foreman of freight car repairs. In August, 1904, he left railway work, but returned in September, 1905, as car foreman of the Pere Marquette at Muskegon, Mich. In January, 1907, he was promoted to general foreman of the car department, and in August, 1910, entered the service of the Missouri Pacific as division foreman in the car department at Atchison, Kan. In March, 1911, he took a position with McCord & Co., of Chicago, as mechanical expert, and in March, 1916, joined the sales forces of the Union Railway Equipment Company.

Hess-Bright Not Controlled by Outsiders

To correct misleading rumors and statements, the Hess-Bright Manufacturing Company makes the following announcement:

A group of bankers including Frank A. Vanderlip, Philip W. Henry, Thatcher M. Brown, and Franklin B. Kirkbride, of New York, and Marcus Wallenberg, of Stockholm, have recently acquired from the American group of stockholders a controlling interest in the shares of the Hess-Bright Manufacturing Company. This group of bankers owns also a substantial interest in the S. K. F. Ball Bearing Company, of Hartford, Conn.

The two companies will be operated quite independently of each other. The former policy of the Hess-Bright Manufacturing Company will be continued, except that its manufacturing facilities will be increased somewhat more rapidly to meet the constantly growing demand for its product. B. D. Gray, who retains his former stockholdings, will continue to manage the business as president. F. E. Bright retires from active participation in the company's affairs, but remains identified with the company as chairman of the board. Aside from these two changes, the organization remains as before.

The directors are: F. E. Bright, chairman; B. D. Gray, president of the Hess-Bright Manufacturing Company; Willard Parker Butler, of New York City; Arthur V. Morton, vice-president of the Pennsylvania Company for Insurance on Lives and Granting Annuities, of Philadelphia, and Paul von Gontard, managing director of the Deutsche Waffen-und Munitions Fabriken, Berlin, Germany.

Westinghouse Air Brake Company

At the recent annual meeting of the stockholders of the Westinghouse Air Brake Company, the position of chairman of the board was created and filled by the election of H. H. Westinghouse. John F. Miller, formerly first vice-president, was elected to the office of president.

Mr. Miller is a native of Pittsburgh, and received his early education in the public schools of that vicinity. Upon his graduation from Wooster Academy, he became connected with the Westinghouse interests, and did his first Westinghouse work for the Philadelphia Company of Pittsburgh. He later took charge of the real estate development of East Pittsburgh and Wilmerding as conducted by the Westinghouse Companies, and subsequently, was identified with important banking and public utility interests. In 1899 he was made assistant secretary of the Westinghouse Air Brake Company. His fitness for large responsibility resulted in his being made vice-president in 1905, including, among his other duties, special attention to the organization and development of the company's interests abroad. Mr. Miller's broad experience, sound judgment and conservative temperament as a banker, financier and accountant qualify him particularly for his new position.

A. L. Humphrey, formerly second vice-president and general manager, was made first vice-president and general manager of the company. Mr. Humphrey's career and achievements as a railroad officer and general manager of the Westinghouse Air Brake Company are so well known to railway officers and manufacturers as to need no detailed mention.

Charles A. Rowan, heretofore auditor, was promoted to the position of controller, and John H. Eicher, formerly assistant auditor, was made auditor of the company.

TRADE PUBLICATIONS

PNEUMATIC TOOLS.—Bulletin No. 130, recently issued by the Chicago Pneumatic Tool Company, takes up the subject of lubrication of pneumatic tools.

A TEST FOR CREOSOTE OILS.—The Republic Creosoting Company, Indianapolis, Ind., has issued a folder describing the Davis spot test for the determination of the presence of tar, free carbon or dirt in creosote oil, with colored illustrations of the results of these tests. This test was described in the *Railway Age Gazette* of September 1, page 362.

A VITRIFIED CLAY CONDUIT.—The National Fire Proofing Company, Pittsburgh, Pa., has issued a 46-page booklet on the McRoy-Camp vitrified clay conduit. The book is practically a hand-book of conduit construction showing the dimensions of all standard conduits, details of man-holes and duct line construction, the cost of duct lines and man-holes with a suggested specification for clay conduits. The book is fully illustrated in color attractively presenting the facts which it contains.

BOILER TUBE CLEANERS.—The Lagonda Manufacturing Company, Springfield, Ohio, in catalog L-9 deals with its line of Lagonda boiler tube cleaners. The booklet illustrates and describes a number of water driven and compressed air or steam driven cleaners and also the Lagonda automatic lubricator; the Lagonda vibrator cleaner for return tubular boilers; the Lagonda locomotive arch tube cleaner; special cleaners for economizer tubes, evaporators, and condenser tubes and other Lagonda products.

GRINDING WHEELS.—The Star Corundum Wheel Company, Detroit, Mich., has issued a catalogue showing its line of Star grinding wheels. The book contains 100 pages and in them it illustrates its various types of grinding wheels, noting for what uses they are intended and giving dimensions, price lists and code words. Much useful information is also given as to speeds, mounting, grains and grades, etc. With the catalogue the company is also sending out a 16-page booklet entitled: Safety Code for the Use and Care of Abrasive Wheels.

REINFORCED CONCRETE DESIGN.—The Portland Cement Association, Chicago, is issuing in pamphlet form a lecture by Ernest McCullough, chief engineer of the Fire Proof Construction Bureau of that association, for a short course at Lewis Institute, Chicago. This gives a clear and concise exposition of the primary principles of reinforced concrete, explaining the principles of mechanics involved, by the use of numerous diagrams. The derivation of the usual formulæ for column and beam design are given. The subject is reduced to the simplest form possible.

PNEUMATIC COLLECTING AND CONVEYING SYSTEMS.—Catalogue No. 235 recently isued by the B. F. Sturtevant Company, Hyde Park, Mass., is devoted to the line of Sturtevant fan systems for collecting dust and conveying materials. The book is 8 by 11 in. in size and contains 76 well illustrated pages. It shows the necessity for dust collecting systems and takes up the advantages of Sturtevant apparatus for this work and for conveying pulverized coal and other materials. The fans themselves are described in detail with illustrations of the various types of fans and auxilliary equipment. Information is given which will enable the prospective purchaser to ascertain what type and size of apparatus is best suited for his purpose. There are also given tables of velocity, volume pressure, horsepower, etc. A large number of illustrations show actual installations in plants of various kinds.

ELECTRIC RAILWAY APPARATUS.—Recent bulletins from the Westinghouse Electric & Manufacturing Company include the following Circular No. 1516-A covers electric locomotives for freight haulage. It gives reasons for the adoption of electric locomotives takes up the handling of freight traffic by electric railways and contains a detailed description of the equipment used in such work as well as the Interstate Commerce Commission requirements for this service. Leaflet 3764-A describes the No. 323-V split frame type railway motor having a rating of 30 kw. at 600 volts. The No. 101-K railway motor with a rating of 30 kw. at 600 volts is described and illustrated in considerable detail in leaflet 3510. This motor is especially adapted to operating conditions requiring the handling of heavy loads at slow speed without undue draft of current on the generating equipments. Circular 1577 takes up standard railway equipments and 1571 drum type controllers. The bulletins are well illustrated.

Railway Construction

ALASKAN RAILROADS.—William C. Edes, chairman of the Alaskan Engineering Commission, reports that much progress has been made on the construction of the United States Railroad. Forty-nine miles of track has been laid from Anchorage, which, with the 71 miles of the old Alaskan Northern now in operation as far as Kern Creek, will make 130 miles of the 470 needed to connect Seward with Fairbanks. The tracks so far laid from Anchorage comprise about 6 miles southward toward Seward, 38 miles of main line northward to Fairbanks and 15 miles on the Matanuska branch and into the coal fields nearby. Rail will be laid in the near future as far as Potter Creek, 15 miles from Anchorage, from which point the rock work will be undertaken during the coming winter.

CHICAGO, BURLINGTON & QUINCY.—The report of this company for the year ended June 30, 1916, shows that the connection between Wendover, Wyo., and Guernsey has been completed. Work on the Chalco-Yutan cut-off is progressing and much of the grading has been completed and track laying is under way. This cut-off shortens the line between Omaha and Sioux City and it is expected that the new line will be ready for operation early in 1917. On the Beardstown and La Crosse divisions, 34 miles of double track was completed and an additional 51 miles is under construction. Action was taken by the city of Aurora, Ill., which compelled the company to elevate the tracks through that city. This necessitated the purchase of a large amount of property and the relocation of part of the line. The work has been started and the estimated cost is $3,250,000.

GREAT NORTHERN.—The report of this company for the year ended June 30, 1916, shows that construction of an extension to the Stanley-Wildrose branch was commenced in June, 1916. This line will extend from Wildrose, N. D., in a westerly direction to Grenora, about 36 miles, and is expected to be finished in 1916. The work which was suspended on the lines of the Montana Eastern has been resumed; about 30 per cent of the grading for the line from Lambert, Mont., to Richey, about 25 miles, has been finished and it is expected that the line will be completed during 1916. Work will also be resumed on the line from Lewistown, Mont., to Grassrange, and it is expected will be finished early in 1917. In May, 1916, work was started on the Great Falls & Teuton County Railway, constructing a line from Bynum, Mont. (the present terminus of the Great Northern branch from Power, Mont.), northerly to Pendroy, 8.7 miles, and the line is expected to be ready for operation in 1916. Work was recommenced upon the line of the Vancouver, Victoria & Eastern Railway Navigation Company between Sumas Landing and Kilgard, B. C., 9.37 miles, and is expected to be finished during 1916.

MORGANTOWN INTERURBAN.—This company plans to build a line from Morgantown, W. Va., it is said, north to Pt. Marion, Pa., about 10 miles. J. McDermott, Morgantown, may be addressed.

NEW YORK SUBWAYS.—Bids are wanted by the New York Public Service Commission, First district, until November 29, for building a connecting link about 600 ft. long between the New Utrecht avenue (West End) Line and the Culver Line in the borough of Brooklyn. The work to be done is in part open cut and in part embankment between retaining walls.

NORTHERN PACIFIC.—The report of this company for the year ended June 30, 1916, shows that in Minnesota the Cuyuna Northern is building a spur track about 4,100 ft. long and two sidings will be completed this fall to provide facilities for handling ore from the Hillcrest Mine. A contract has been let for grading the Flathead branch between Dixon, Mont., and Polson, about 32.76 miles, and it is expected that this line will be completed in 1917, also another line from Billings north and west into the Lake basin country. In the state of Washington, an extension of the Sunnyside branch from Grandview to Gibbon, about 12.1 miles, has been authorized and the work is now under way; it is expected that the work will be com-

pleted in 1916. An extension of the Fort Simcoe branch from Harrah to White Swan, about 10.23 miles, has been authorized and work is under way; this is also expected to be finished in 1916. An extension of the Cowiche Branch, 1.5 miles, has been authorized and contract was let for the grading, but owing to right-of-way complications the work has been deferred for the season. To serve a large saw mill being constructed by the Snoqualmie Falls Lumber Company, a bridge and track about 2,500 ft. long is being built at Snoqualmie Falls, and it is expected will be finished in 1916. Grade separation work at Spokane has been in progress during the entire year and will all be completed before 1917 except the ballasting. Four bridges under construction east of Spokane under the yard, which are supplementary to the grade crossing proper, will not be finished until 1917.

Pennsylvania Railroad.—This company has authorized work at West Morrisville (Pa.) yards, on the New York division, consisting of the construction of an eastbound receiving and a westbound departure yard, also an eastbound and westbound main running track. The work involves from 350,000 to 400,000 cu. yd. of grading, the construction of 3,000 cu. yd. of concrete masonry and about 2,500 sq. yd. of macadam paving.

Rome & Northern.—This company intends soon to extend its line from Gore, Ga., to a point about 9 miles south to Subligna, Ga. The main line runs from Rome, Ga., to Gore, Ga., a distance of about 19 miles. No contracts have as yet been awarded for this proposed extension, nor have any definite plans been formulated.

Santa Creek Western.—Incorporation articles have been filed for this company, which proposes to construct a new line to connect with the Elk River branch of the Chicago, Milwaukee & St. Paul at Marsh, Idaho, a distance of 15 miles. It has not yet been decided when contracts for building the line will be let.

RAILWAY STRUCTURES

Newark, N. J.—A contract has been given by the Central of New Jersey to F. D. Hyde, New York, to build the new passenger station at Broad street, Newark. The building is to be 45 ft. high, 60 ft. wide in front, and 266 ft. in the rear. The length will vary from 86 ft. to 400 ft. The building proper will cost $500,000, and the track changes $50,000 additional. The structure will have concrete foundations, steel frame, brick and terra-cotta walls, wood and concrete roof with built-up roofing. (April 28, page 975.)

New York.—The New York Public Service Commission, First district, will receive bids until December 4, for the construction of station finish for nine stations on the Seventh avenue section of the Seventh Avenue-Lexington Avenue line in the borough of Manhattan. These nine stations are those between Fourteenth street and the Battery, including the Fourteenth street station.

San Antonio, Tex.—The Missouri, Kansas & Texas will erect a new passenger station in this city. The building will be one story high, 245 ft. long and 77 ft wide. The structure will be fireproof throughout with stucco on brick, built mission style and have mission towers. The platform along the passenger tracks will be 850 ft. in length and covered with umbrella sheds. The approximate cost is $125,000.

Toronto, Ont.—Regarding the report that a bridge will be built by the Canadian Pacific over the ravine, east of the New Toronto station, an officer writes that the railroad has agreed to build a joint structure and the matter is now before the city for consideration.

West Burlington, Iowa.—The report of the Chicago, Burlington & Quincy for the year ended June 30, 1916, shows that a locomotive repair and machine shop with necessary power house is being built at West Burlington, at a cost of $1,500,000. It is expected that the work will be finished and ready for use by June, 1917. For the Paducah & Illinois Railroad bridge over the Ohio river at Metropolis, Ill., the piers are all in place and the superstructure is being erected; this work should be completed during 1917. The work of replacing the Burlington bridge over the Missouri river at Kansas City is nearing completion, and it is expected that the rebuilt structure will be put in use early in 1917.

Railway Financial News

Boston & Maine.—Counsel for the minority stockholders who have asked to have the temporary Boston & Maine receivership set aside will be heard by Judge Morton in the United States district court on December 5. The hearing will be in the form of a trial, counsel for both sides having agreed to this form of hearing.

Chicago, Rock Island & Pacific.—See editorial comments on the proposed reorganization plan.

New Orleans & Northeastern.—This company has heretofore been controlled by British capitalists, but it is understood that arrangements have been made by which J. P. Morgan & Co., New York, have taken over the securities heretofore held by these capitalists as a part of the general plan of arranging for British credits based on the return to this country of American railroad securities or their hypothecation.

New York Central.—The New York Central has filed an application with the Second district Public Service Commission in regard to the New York Central Railroad Equipment Trust of 1917. It proposes to purchase 4,000 steel box freight cars; 3,000 all-steel coal cars; 100 steel passenger coaches; 100 steel baggage cars; 30 multiple unit cars, and 10 electric locomotives, the estimated cost of which is $15,000,000. To pay for them the company proposes an equipment trust agreement for 1917, and to issue certificates to the amount of not exceeding $12,000,000, and the sale thereof at not less than 97 per cent of par net.

Rome & Northern.—D. B. Carson has been appointed by the United States district court a receiver of the Rome & Northern, succeeding John H. Reynolds, resigned.

Texas & Pacific.—A member of one of the reorganization committees is quoted as saying that whatever the form of reorganization that is finally fixed upon it will not involve any change in the charter of the company. The Texas & Pacific now operates under a federal charter. The same director is quoted as saying that the reorganization would not involve any assessment to stockholders.

Toledo, St. Louis & Western.—See editorial comments on the form of the company's annual report.

An English Poultry Demonstration Train.—The Great Eastern Railway has sent an egg and poultry demonstration train on a tour through Norfolk and Suffolk. The train is accompanied by an experienced staff of demonstrators, who give lectures, and who will be prepared to afford general information as to the best methods of poultry keeping and increasing the production of eggs and poultry.

The Bureau of Standards Criticized.—The Bureau of Standards of the United States Department of Commerce recently issued a bulletin on "Some Foreign Specifications for Railway Materials," in which it was said that British railways carried 3,000,000,000 passengers a year, and 520,000,000 tons of freight. The number of passengers we carry is about one-third of that given above—in 1913, by including the estimated number of journeys by season ticket holders, it was 1,591,000,000. The freight carried that year totaled 372,000,000 tons.—*The Engineer, London.*

English Railwaymen with the Colors.—Recent figures issued by some of the English railways show that from the eight principal railways 94,441 men joined the colors up to June last. These were furnished as follows: London & North-Western, 19,042, or 20.5 per cent of its staff; Great Western, 17,409, or 22.2 per cent; Midland, 14,127, or 19 per cent; North-Eastern, 11,930, or 25.9 per cent; Lancashire & Yorkshire, 6,977, or 18.4 per cent; Great Central, 6,372, or 18.5 per cent; Great Eastern, 6,037, or 17.9 per cent; Great Northern, 5,489, or 15.9 per cent; London & South-Western, 3,675, or 15.1 per cent, and London, Brighton & South Coast, 3,383, or 20.7 per cent.

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A Low Batting Average

Clifford Thorne, chairman of the Iowa Railroad Commission, gave an excellent explanation of one of the great defects in our dual system of railroad rate regulation during the discussion last week at the meeting of the National Association of Railway Commissioners. Mr. Thorne said he had found eleven rate cases involving conflicts between state and interstate rates and that in not one of these cases had the state rates been adopted, whether the interstate rates had been made by the Interstate Commerce Commission or by the railroads. "In other words," he said, "our batting average is very low." A great many people will believe that Mr. Thorne for once has hit the nail squarely on the head. We do not understand that Mr. Thorne meant to speak deprecatingly of the batting ability of the state legislatures or state commissions. We do understand that he was questioning the decisions of the umpire, which is not an unprecedented thing for a batter who has struck out to do. To illustrate his remarks Mr. Thorne referred to the Illinois passenger fare case, in which, he said, the Illinois state legislature had come to the conclusion that 2 cents a mile was a reasonable passenger fare and the Interstate Commerce Commission had found 2.4 cents a reasonable rate and ordered the lower rates advanced. If 2.4 cents is a reasonable passenger fare in Illinois it requires no great stretch of the imagination to predict that the time will come when the Interstate Commerce Commission will make a similar decision as to Iowa. Instead of roasting the umpire possibly some of the state's legislatures and commissions would improve their batting average by practising a higher swing at the ball.

Repairs to Foreign Cars

The relation of freight car revenue and the cost of repairs to foreign cars is quite clearly analyzed in the paper on Freight Car Utilization and M. C. B. Rules, read by N. D. Ballantine at the November meeting of the Car Foremen's Association of Chicago, and published elsewhere in this issue. In this paper it is shown quite forcefully how in times of heavy business and under the present M. C. B. rules, it may be more expensive to await authority and material from an owning road to make repairs to its cars than to make the repairs, whether "right" or "wrong," and get the cars back into service. Of course, the repairing road will not be able to collect for these repairs, and, further, they will be charged for making wrong repairs when the owner sees fit to correct them. But what difference does this make, so long as the cars are safe to run and if the expense caused by the delay would be greater than the total cost of the "wrong" repairs? Why penalize for making wrong repairs if the material and its application are satisfactory, although not standard? It is an economic question and involves such a considerable amount of money and amount of service to the public that it surely is worthy of the most careful consideration, especially at this time of extreme shortage in equipment. Mr. Ballantine also shows that for 148,000 foreign cars the transportation cost (per diem, switching charges, and loss of revenue) of defective foreign equipment was 82.5 per cent of the mechanical department charges, and for which the road received nothing. He raises the question as to whether or not the prices should not be raised to include these costs and make an incentive for the car owners to place their cars in first class shape before offering them in interchange. He further asks that the roads study these problems and keep sufficient data to enable them better to analyze the conditions. Without doubt this would be a profitable thing to do, and the information thus obtained would do much toward the determination of the most economical type of construction for the various kinds of cars.

State Commissioners as Standpatters

It has been popular in some quarters to refer to the railways as being "reactionary" or as "standpatters" and to criticise them for opposing so-called progressive legislation. In fact it is probable that the railways too often have appeared in opposition to needed reforms; not always because they were opposed to reform but because many of the schemes put forth for that purpose have been impractical or even worse. In connection with the inquiry begun by the Newlands committee this week the shoe is on the other foot. It is the state railway commissioners, or some of them, who are taking the position that they have nothing to propose, that they can see nothing wrong with our present plan of regulation that de-

mands remedies. Therefore they insisted that the railway officers, who do see some very vital defects in present methods, and who, moreover, have some very definite remedies to suggest, should present the first testimony before the committee. J. E. Love, chairman of the Oklahoma Corporation Commission, was not the official spokesman for the state commissioners, but he represented the views of many of them in a few words when he said he desired to be heard "upon the subject of the states holding the control they now have." That some of the commissioners do not share the views of the majority was indicated at last week's meeting of the National Association of Railway Commissioners when several of them urged that power to regulate security issues be taken from the states and placed under the control of the federal government. Only one of them, however, applied the same reasoning to the question of rate regulation. It appeared at the hearing on Monday that the railroads are not alone in seeing disadvantages in the plan of trying to maintain 49 different varieties of regulation. Many of the commercial organizations that entered appearances seemed to have some rather definite ideas about it and also have some remedies to propose. As some of the state commissioners themselves constitute one of the difficulties of the present situation, it is perhaps not to be wondered at that they are now appearing as standpatters.

"ANYBODY CAN KICK A RAILROAD"

UNDER the caption, "But Anybody Can Kick a Railroad," the Chicago Tribune in an editorial in its issue of November 16, summarized the railway situation in the United States with a felicity and a completeness which left little to be desired. It said:

"Political wiseacres are declaring that the law enlarging the Interstate Commerce Commission will meet great opposition even from the present congress. Progressive Democrats, according to newspaper articles, are afraid the president will appoint men 'favorable to the railroad.'

"It would be a frightful thing (or would it?) to have men on the commission who could see things from the side of the railroads. The railroads might be able to rehabilitate themselves; they might dare to invest in more freight cars; they might even extend their lines or put in double tracks if such a thing should come to pass.

"This fear and distrust of the railroads is a curious thing. America used to be proud of its railroads. It had more of them than any other country. It ran its trains faster and more conveniently than any other country. There was less inconvenience and red tape in traveling in this country than in any other. Perhaps that pride still exists in some Americans. But most of us apparently prefer to see these lines of communication as monsters, dangerous to public welfare—unless, of course, they are kept well starved.

"We have been starving them. They have not been able to build enough freight cars. They have not ventured in many cases to tap new territory with their lines. Few people even dare to purchase railroad securities. At one time the railroads were able to tell the public to be damned. Now any one can kick a railroad in its financial slats and find a meek and conciliatory victim.

"But if America keeps on doing so we will not only have no improvement in our transportation service; we will not have any railroad service at all. The railroads need some friends on the Interstate Commerce Commission."

The Tribune, for at least a quarter century, has been one of the most consistent, persistent and powerful advocates of effective government regulation of railways in this country. It is just as strong an advocate of government regulation now as it ever was. But it can see when railway regulation is unjust and overdone, as well as when railway management is unfair, dishonest or otherwise at fault.

Fortunately, there has been a large increase within recent years in the number of newspapers of which the same thing may be said. The wise solution of every great question of public policy depends, in a democratic country, chiefly on the intelligence and courage with which it is discussed in the press; and the main reason which we have for hoping that the railway problem of this country will be wisely solved is the manner in which it is beginning to be treated in those magazines and newspapers whose news carry the most weight with the public.

If the discussion of the railway situation continues to be carried on in the press as it is being carried on now it may not always be true that "Anybody Can Kick a Railroad."

THE EQUIPMENT MARKET BAND WAGON

WHILE November is always one of the best months of the year from the standpoint of equipment purchases, the month of November this year has thus far considerably exceeded expectations. This is particularly true of freight cars, the issues of the *Railway Age Gazette* for November 3, 10 and 17, having reported respectively, 16,543 cars, 11,175 cars and 7,270 cars, a total for only three issues of 34,908. Although only three weeks are represented the purchases exceed those reported in any month for the last three years. The second best month in the three years was October, 1915, when orders were placed for 28,449 cars, including, however, 8,500 cars for export. The best previous month in 1916, itself, was October, when domestic orders totaled 21,034, or more even than the domestic orders alone in October, 1915. The domestic orders reported in the *Railway Age Gazette* thus far this year now total 123,386 as compared with 84,298 up to this time last year.

The orders for locomotives during the same first three weeks of November have also been hitting the high spots. Domestic orders reported have totaled 256, but there have been foreign orders placed for no less than 633 locomotives, a total of 889. The domestic orders reported thus far this year total 2,386, as compared with 1,023 at this time last year, or with a total of 1,612 ordered in the entire 12 months of 1915. Foreign orders for locomotives thus far in 1916 total, 1,838, or, in other words, the locomotive builders and the railroad shops of this country and Canada have received orders this year for 4,224 locomotives.

Passenger cars orders are also heavy, having totaled 416 in the past three weeks.

It is rather interesting to see how these orders figure up in actual money value. In three weeks, a total of 34,908 cars conservatively worth $1,500 apiece, $52,362,000; 256 domestic locomotives averaging about $30,000 each, $7,680,000; 633 foreign locomotives worth conservatively $8,640,000, and 416 passenger train cars at $17,000 each (considering the large number of baggage cars), $7,072,000, a total of $75,754,000, which for three weeks is "going some."

Now, there is a moral to this, and it is made all the more cogent when it is realized that the railroads are buying big at a time when prices are 40 to 50 per cent above normal and when deliveries are exceedingly slow. The large locomotive and car plants are completely filled up with orders for six months ahead, and it is a fortunate purchaser who can order at this time and secure his cars or locomotives before next May, June, or July. For a while the railroads held off from purchasing, primarily because they hoped for a decline in prices. They were not eager to place orders at top notch prices with delayed deliveries while there was still some chance that their war time rush of business and attendant revenues might fall off before the cars or locomotives were ready for use. It has now become evident that no decline in prices is to be looked for in some time. The railroads have at last been forced to the conclusion that they can wait no longer for equipment (the present car shortage has

brought that home too sharply). They now see that they must buy while they have the funds and before deliveries become even worse than they are. Those railroads which have not already placed orders for their requirements for many months ahead will be further reminded that there is a great foreign demand for equipment. Nor will they be put at ease when they learn that the New York Central's orders for 230 locomotives reported in September are for delivery in November 1917, 14 months ahead. They can apparently gain but little and seemingly have much to lose by delaying their purchases even a little while longer.

HIGHWAY CROSSING SIGNALS

A PROMINENT signal engineer has told his general manager that highway crossing signals ought to be visual, and not audible; a visual signal can be made to comply more nearly with the principle that every signal, if it fails, should fail on the side of safety. A bell, arranged to ring when a train is approaching, belongs in the class of "open circuit" devices; if its control circuit is broken or its power fails, it remains silent and by its silence it signals to the wayfarer "all clear" when it ought to say "look out." A disk or arm, on the other hand, may be so arranged that it will indicate "all clear" only when its power and the control of that power are both active; and will indicate stop or caution when either is inactive.

This is an intricate subject, and whether or not the railroads of the country are likely soon to agree on anything in the way of uniformity is hard to say; but it will be well to set forth the facts of the situation as simply as possible. Crossing signals should never fail; for failure not only introduces danger, as does a failure of an automatic block signal, it goes farther; it affords unscrupulous lawyers a very acceptable aid in manufacturing claims for damages. Every failure of a bell to give warning of an approaching train is liable to be magnified into a hundred failures when some careless driver is trying to convince a jury that he was not warned. There seems never to be any difficulty in getting this kind of testimony.

But the first objection that will be raised against abandoning bells and substituting disks is that the bell system already gives a very high percentage of safety, and is susceptible of further improvement. One large road, in its records of crossing-signal operations for a year—several hundred signals and millions of operations—shows an average of about one failure per signal each two years. It may be expected that municipal officers, state commissioners, and others, firm in the belief that a bell is better than any noiseless warning, will insist that this is a satisfactory record, and that bells be retained and their introduction extended. The railroad officer, however, must take care not to listen to any partial showing of results. To him,—we will assume that he has 100 bells—this record means one failure every week. And even if some of the failures cause stop indications (instead of false-clear) the fact affords him little comfort; for false stop indications discredit the bell; and when such failures are at all common—on his road or on other roads—he finds that many people will hold in contempt all bells everywhere.

And the fact that bells are comparatively so efficient deters the railroad manager, forced to count all his pennies, from making a radical change that may cost him perhaps twenty or thirty thousand dollars per hundred crossings.

In favor of a change from the common bell to a visual signal, less likely to give deceptive indications, is the increasing use of automobiles. Most motor cars make, at times, a good deal of noise, and in cold weather the drivers shut themselves in their glass houses and are liable not to hear a bell until they come pretty near to it. In Louisiana the railroad commissioners recently ordered the establishment of gates at a crossing for the reason, among others, that the automatic bell, then in use, "could not be heard by wagons or buggies with iron tires," on account of the gravel in the street (which formerly had been a "dirt" road). While not everybody will agree that buggies can fairly be expected to have ears to hear, there is no question that, in many situations, bells have serious limitations.

The most weighty reason, however, for using a visual signal is that, with the increasing use of high speed vehicles on the highways, it has become imperative to educate drivers —and compel them, if necessary and if practicable—to exercise caution, *always*, in approaching a railroad crossing. (With a percentage of drivers, incurably dull or reckless, such compulsion is unquestionably needed; education has no show). The committees representing the state commissions and the American Railway Association have unequivocally endorsed the highway caution signal—the signal set several hundred feet back from the railway in such a position that a driver who has his eyes open and is attending to his duty, will surely see it. This is a definite recognition of the fundamental principle that the highway traveler has a duty to know, by affirmative evidence, whether or not he is approaching a crossing; that to keep going, assuming that he has a clear road, until something tells him to stop, is fundamentally wrong and unsafe. This cautionary signal throws upon the driver the responsibility for finding the crossing; he cannot expect the crossing to rise up from the ground and shout at him. Then, with a signal close to the crossing, always indicating something positively, either all-clear or stop—and never neutral or meaningless—the driver is again responsible; responsible for knowing which of the two indications is presented to him. And, for a signal giving indications all of the time, one addressing itself to the eyes is the only kind that is practicable; an audible signal, if loud enough to be of service, would be an intolerable nuisance to all persons within hearing distance.

As observed in our opening paragraph, the crossing-warning problem is by no means an easy one. With any kind of apparatus it is imperative that the care and maintenance shall be of the very best, for every instance of wrong functioning weakens the confidence of highway travelers—if they know of it—whether it does or does not cause danger. At best, the confidence of travelers is blind, and often ignorant and wrong headed; and there is a great task ahead; the task of educating this traveling public.

REMEDIES FOR THE CAR SHORTAGE

THE "car shortage" now breaks all records, and there is apparently no decline in the movement of traffic. A similar condition existed exactly ten years ago at this time. Then, as now, the managements of the railways were receiving severe criticism for it. But the criticisms they are receiving now are mild and few compared with those they were receiving then. The change in the amount and tone of the criticism is a good illustration of the change in public sentiment toward the railways which has occurred. Shippers and consignees are suffering great inconvenience and loss, but, while many of them are disposed to put the entire blame on the carriers, a majority, and especially the larger business concerns, are fair and even charitable. They know the troubles due to regulation and to financial conditions which the railways have had during the last ten years. They know also that the congestion of traffic of which the so-called "car shortage" is merely the principal symptom, is due not only to some shortcomings on the part of the railways, but also to the suddenness and magnitude of the increase in traffic, and to defects in the business methods and facilities of shippers and consignees themselves.

There are two general classes of remedies or preventives of car shortages. One consists of means which may be adopted

to move the largest amount of traffic possible with the facilities available. The other consists of the means which may be adopted to increase the available facilities. The former class of measures has the greater timely interest just now. The facilities available can be increased only slowly, especially at a time such as this when it is impossible for the railways to secure prompt delivery of supplies and equipment.

The two things most essential to the most efficient utilization of the available facilities are, first, to secure the maximum movement per car per day, and second, to secure the maximum loading per car per mile. Neither of these results can be secured without co-operation, either voluntary or compulsory, between the railway managements and the shippers and consignees. The great bulk of the freight traffic moved in this country is carload business. Every time a carload of freight is moved the car is placed in the hands of the shipper for loading. It is then returned to the railway for movement, and finally delivered to the consignee for unloading. The freight cars of every railway move over all the railways. The roads always have had rules intended to expedite the return of cars to their owners. It is notorious, however, that these rules have been violated, especially in periods of traffic congestion, in the most flagrant manner. The American Railway Association has now created a commission on car service, and it is proposed to authorize an increase in the per diem rate from 45 cents to $1.25, and to empower the car service commission to enforce it. Few people appreciate how drastic this plan is. If it should be carried out, and some roads which usually have on their lines more than their own share of cars should continue to handle cars as they have in the past, they would be bankrupted by the increase in their payments for car hire. The enforcement of the new rule would not, however, necessarily increase the total supply of cars. It would merely cause cars to be transferred from roads which now have more than their share to roads which have less; and this might merely relieve the situation in some territories, and aggravate it in others.

There is no good reason why the average load per freight car can not be increased. The increase in the capacities of cars within recent years has greatly exceeded the increases in the minimum carload weights and in the average load per car. The most effective way available to enhance car efficiency is to increase the loads. It is questionable, however, if many shippers can be prevailed on to do this without advances in the minimum carload weights. These weights, therefore, ought to be advanced, because neither the railways nor the shippers who are willing to load cars to their maximum capacity should be penalized for the failure of other shippers to properly utilize the cars furnished to them.

It also seems probable that the average movement per car per day can be further increased. In fact, great improvements have been made along this line already. Many roads within recent years have increased the average movement per car per day from around 25 miles to upward of 35 miles, and some roads have actually averaged over 45 miles in some months. Since every complete movement of a car carrying carload freight involves putting it in the hands of the shipper for loading, and delivering it to the consignee for unloading, it is evident that the efficiency of freight cars will be determined largely by the way they are used by shippers and consignees. Forty-eight hours of "free time" is given for loading and unloading. The evidence shows conclusively that a large part of the "car shortage" is due to the course of shippers in holding cars after the expiration of the "free time." In the fiscal year 1915 over $9,000,000 was collected in demurrage. To reduce the delays to cars resulting from their detention by shippers and consignees, the railways proposed an increase in demurrage rates, effective December 1. The Interstate Commerce Commission has suspended this. Doubtless the commission believes it should not permit such an important change until after more full hearing; but its action probably means that the car shortage will be over before there can be any advance in demurrage rates. One of the most flagrant causes of car shortage which the investigation by the Interstate Commerce Commission at Louisville has developed is the abuse of cars by shippers under the cover of the privilege of reconsigning shipments. Brokers in coal have been the greatest sinners in this respect; and their conduct, harmful alike to the railways, other shippers and the public, has demonstrated conclusively the need for increasing the restrictions and penalties with which reconsignment is surrounded.

After all, however, one fact is clearly disclosed by the present situation. This is that the railway facilities of this country are not adequate to handle the available traffic. There is but one remedy for this condition, and that is, to increase the facilities. There is but one infallible way to get them increased, and that is to make investment in railways more attractive. The only way actually to cure a disease is to remove its cause. Any remedy which does not tend to make investment in railways more attractive will be a mere temporary palliative.

CHICAGO, BURLINGTON & QUINCY AND GREAT NORTHERN

TOTAL operating revenue of the Chicago, Burlington & Quincy was 12 per cent more in the fiscal year ended June 30, 1916, than in the previous year, and the Great Northern's total operating revenue was 21 per cent more than in the previous year. The Burlington's operating income, however, was 36 per cent more in 1916 than in 1915, and the Great Northern's 25 per cent more. While it is impossible to make either a comparison or a contrast between two such roads as the Burlington and Great Northern which will not leave many points of difference to be explained, it is not unfair nor uninteresting to compare certain figures for these two roads, leaving each reader in many instances to make his own analysis of the differences which may exist.

Both the Burlington and the Great Northern are Hill roads. Both have for a number of years been particularly well operated and both have had ample revenue to permit the management to follow that policy of betterment which appeared to be in the best interests of the property. The Burlington operates 9,016 miles of line, of which a little over half is branch line mileage. The Great Northern operates 8,051 miles of road, with a very much smaller percentage of branch line mileage than has the Burlington. The Great Northern has a large volume of ore business from the Missabe range to Duluth, while the Burlington has no business that corresponds with this. Of the total operating revenues in 1916, 70 per cent of the Burlington's was from freight and 21 per cent from passengers, and of the Great Northern's, 74 per cent was from freight and 17 per cent from passengers.

Total operating revenues of the Chicago, Burlington & Quincy amounted to $102,359,000 in 1916, an increase of $11,234,000, or 12 per cent. Total operating revenues of the Great Northern amounted to $81,262,000 in 1916, an increase of $14,100,000, or 21 per cent. Total operating expenses of the Burlington amounted to $61,713,000, an increase of only $1,272,000, or 2 per cent, over the previous year, and total operating expenses of the Great Northern amounted to $43,914,000 in 1916, an increase of $7,086,000, or a little over 19 per cent. The Burlington spent for maintenance of way $12,014,000 in 1916, and for maintenance of equipment $15,592,000. This was an increase over the previous year of $654,000 for way, or 6 per cent, and $177,000, or 1 per cent for equipment. On the other hand, the Great Northern spent $9,727,000 for maintenance of way, an increase of $1,457,000, or 18 per cent, and for maintenance of equipment, $8,740,000, an increase of

$1,588,000, or 22 per cent. In part the Great Northern's increased maintenance expenditures were necessitated by a very unusually severe winter, followed by spring floods and bad washouts. There had been heavy reductions in maintenance expenditures in 1915, so that the heavier expenditures in 1916 were not quite as large, compared with the average for a number of years, as would appear from the comparison with 1915 alone. The increases in the Burlington's maintenance of way expenditures are principally accounted for by larger outlays for roadway maintenance (track labor), bridges, trestles and culverts, and track laying and surfacing. The amount spent for materials—ties, rails and ballast—was less in 1916 than in 1915. Higher prices for track labor unquestionably had their effect. In the maintenance of equipment account a large increase—$804,000—in the amount spent for repairs of locomotives—the total in 1916 being $4,825,000—was in part offset by smaller charges for depreciation of all classes of equipment. The Burlington's equipment stands on its books as costing $78,627,000, and against this there has already been accrued up to the end of 1916, $34,046,000 depreciation. The Burlington was one of the roads that chose to be well on the safe side in the rate which it charged for depreciation of equipment, and experience is apparently demonstrating that a lower rate is more nearly in accord with the necessities of the situation.

Maintenance of way expenditures are often affected by the amount of betterment work being done. The Chicago, Burlington & Quincy spent a total of $4,038,000 for additions and betterments to way and structures, and the Great Northern spent $2,541,000. This compares with $4,798,000 spent by the Burlington in 1915 and $3,145,000 spent by he Great Northern. The difference, therefore, in the amount of betterment work that was done in 1915 and 1916 does not account for the much larger increases in maintenance of way expenses on the Great Northern than on the Burlington. Maintenance of way expenditures are, in part, a reflection of the policy adopted each year by the management, and while to some extent the difference shown between the Burlington's comparison of maintenance expenditures in 1916 and 1915 and the Great Northern's may be affected by the Burlington's inability to get labor and materials, a very considerable part of it must apparently have been due to a difference in needs of the property.

Transportation expenses are not a question of policy but a question of necessity. The ton mileage of revenue freight handled by the Burlington in 1916 was 10,087,484,000, an increase of 18 per cent over 1915. The passenger miles amounted to 1,117,676,000, an increase of 4 per cent. Total transportation expenses of the Burlington amounted to $29,957,000, an increase of only 3 per cent over 1915. The ton mileage of revenue freight handled by the Great Northern totaled 7,809,817,000 in 1916, an increase of 35 per cent. The passenger mileage totaled 601,257,000, an increase of 5 per cent. Transportation expenses amounted to $22,310,000, an increase of 22 per cent. It must be borne in mind that in the comparisons, both for the Burlington and the Great Northern, the standard of efficiency of operation of 1915 and of previous years was very high, so that any gains made in 1916, as compared with 1915, are gains above an already high mark. The Burlington's showing, therefore, is truly remarkable. To have handled 18 per cent more freight business and 4 per cent more passenger business, with an increase of only 3 per cent in the transportation cost of doing this business, on a road where room for improvement is relatively so small, is truly noteworthy.



The Chicago, Burlington & Quincy and the Great Northern

Heavier trainloading was one explanation of the Burlington's achievement. With the increase of 18 per cent in ton mileage there was an increase of only 5 per cent in freight train mileage. The trainload of revenue freight in 1916 was 558 tons, or 66 tons more than in 1915, a gain of 14 per cent. The revenue trainload of the Great Northern was 663 tons in 1916, an increase of 13 tons, or 2 per cent over the previous year.

It is interesting to note that on the Burlington the largest proportionate increases in transportation expenses were in wages of yard enginemen and wages of yard conductors and brakemen. It is also interesting and probably significant that the wages of train enginemen increased by $251,000, the total in 1916 being $3,658,000, while the cost of fuel

for train locomotives increased only by the same amount—$251,000, the total in 1916 being $5,711,000.

In revenue per unit of business handled the Great Northern gets somewhat the best of it as compared with the Burlington. The Burlington's revenue per ton per mile in 1916 was 7.10 mills, and in 1915, 7.33 mills; the Great Northern's was 7.71 mills in 1916 and 8.17 mills in 1915. The revenue per passenger per mile on the Burlington was 1.89 cents in 1916 and 1.87 cents in 1915; the Great Northern's was 2.27 cents in 1916 and 2.29 cents in 1915.

At the end of 1916 the Burlington had on hand $15,201,000 cash and $11,772,000 time deposits and $4,271,000 loans and bills receivable, with no loans and bills payable. The Great Northern had $16,050,000 cash and $10,249,000 bills receivable, with no loans and bills payable except $225,000 which technically came under this head.

The following table shows the principal figures for operation for the Chicago, Burlington & Quincy and the Great Northern in 1916, as compared with 1915:

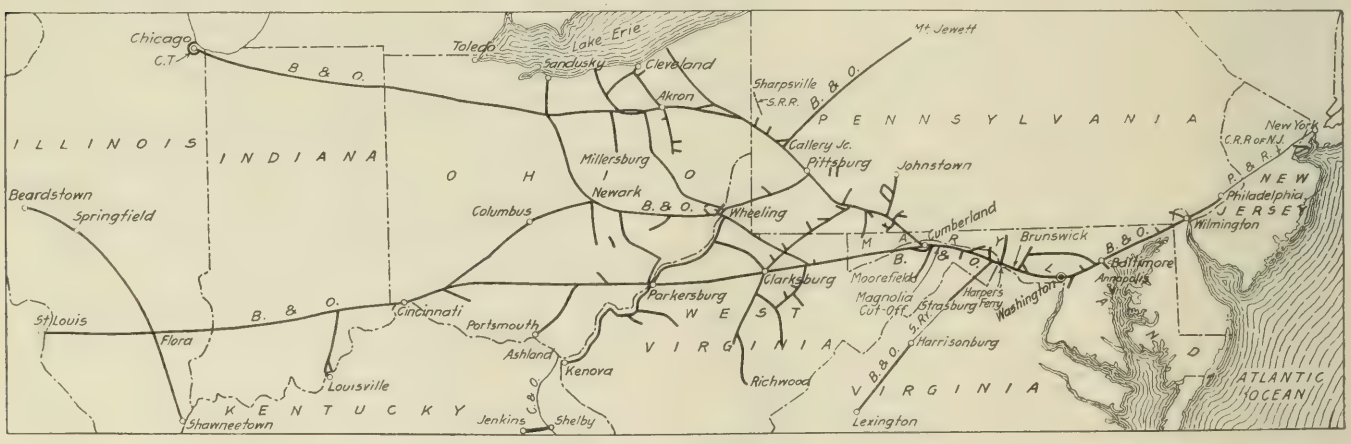
	C. B. & Q.		Great Northern.	
	1916.	1915.	1916.	1915.
Average mileage operated..	9,368	9,339	8,053	8,061
Freight revenue.....	$71,592,578	$62,509,484	$60,177,249	$47,147,314
Passenger revenue.....	21,168,052	20,185,564	13,661,645	13,164,857
Total operating revenue....	102,358,893	91,125,061	81,282,478	67,162,858
Maintenance of way and structures	12,014,208	11,360,210	9,727,328	8,270,354
Maintenance of equipment	15,592,110	15,415,123	8,739,909	7,152,302
Traffic expenses.....	1,610,627	1,629,676	1,168,733	1,167,536
Transportation expenses..	29,956,781	29,117,164	22,310,055	18,261,030
General expenses.....	2,017,687	2,087,041	1,355,420	1,258,755
Total operating expenses...	61,713,161	60,441,367	43,914,076	36,828,275
Taxes	4,449,291	4,081,508	5,132,208	4,629,668
Operating income.....	36,186,894	26,578,028	32,216,194	25,704,915
Gross income.....	38,581,045	27,802,098	35,061,822	28,015,114
Net income.....	29,846,270	19,041,919	27,600,614	20,618,270
Sinking funds.....	1,817,279	1,753,007	.....	.....
Dividends	8,867,128	8,867,128	17,456,930	16,796,857
Appropriations for additions and betterments.....	4,431,360	3,340,669	.....	.....
Fund from accrued taxes not yet due.....	2,400,000	.....	.....	.....
Miscellaneous appropriations of income.....	6,000,000	.....	7,857,197	1,724,651
Surplus	6,330,103	5,081,115	2,287,027	2,096,762

BALTIMORE & OHIO

DANIEL WILLARD has a certain direct way of stating facts which carries conviction, whether it be in his capacity as chief spokesman for the eastern railroads before the Interstate Commerce Commission in a rate inquiry or as president of the Baltimore & Ohio in his statements to stockholders. One of the first things he did on coming to the Baltimore & Ohio in 1910 was to write off $8,500,000 from the book value of the equipment accounts of the company. When he was bearing the brunt of the fight for increased rates from the Interstate Commerce Commission he was at the same time having to carry the load of responsibility of refunding $40,000,000 short-term notes falling due and of so reducing expenses on the Baltimore & Ohio as to show the 5 per cent dividend earned on the common. There was no concealment, either in statements made to the commission or to stockholders of the Baltimore & Ohio, that that company was, in the fiscal year ended June 30, 1915, cutting its coat to fit its cloth. When the great expansion of industrial business began to bring revenues to the Baltimore & Ohio larger than ever before in its history, no time was lost in facing the fact that deferred maintenance must be taken up in full and the property put in condition to meet the strain of a larger business than had ever before been offered it. In the fiscal year ended June 30, 1915, maintenance of way expenditures were nearly 55 per cent greater than in the previous year and maintenance of equipment expenses nearly 47 per cent greater.

A similar straightforward, frank method was adopted in meeting the difficulties brought about by the receivership of the Cincinnati, Hamilton & Dayton. Control of this property had been assumed by the Baltimore & Ohio before the present management came into office, and along with control the Baltimore & Ohio had assumed very considerable responsibilities and had made a very considerable investment. With luck this investment might have been proved all right, but floods, followed by hard times, were too much for the Cincinnati, Hamilton & Dayton and the Baltimore & Ohio was faced with the choice of taking a loss and possibly letting the property disintegrate, or taking a loss and taking over the Cincinnati, Hamilton & Dayton and making it a part of the Baltimore & Ohio system. The Baltimore & Ohio chose the latter course and arrangements were made with Kuhn, Loeb & Co. for a reorganization. The Baltimore & Ohio's net investment in the Cincinnati, Hamilton & Dayton is estimated at $35,892,000. The securities of the new company which the Baltimore & Ohio is to receive are valued by its management at $25,000,000 and the $10,892,000 difference has been debited to profit and loss. It may well be that this estimate of the loss will prove high and that through the enhancement in value of Cincinnati, Hamilton & Dayton securities a considerable part of this depletion of assets will be made up. It is far better, however, to err on the part of conservatism than to take into the assets account of the Baltimore & Ohio securities at a higher book value than their market value.

Notwithstanding the greatly increased appropriations for maintenance the Baltimore & Ohio had $11,262,000 available for common dividends after the payment of 4 per cent on the preferred and after the payment of 5 per cent on the common, and a surplus of $3,664,000. The readjustment of the book value of the Cincinnati, Hamilton & Dayton investment and certain other minor miscellaneous readjust-



The Baltimore & Ohio

ments, and the debit to profit and loss of the discount and expenses on the sale of $60,000,000 refunding and general mortgage 5 per cent bonds, and the retirement of the $40,000,000 notes, meant a net reduction in the profit and loss credit balance of approximately $12,000,000, the amount carried on the balance sheet at the end of the 1916 fiscal year being $20,607,000. In the history of American railroads there have been numerous instances where a large credit to profit and loss on the company's balance sheet meant little or nothing. The Baltimore & Ohio management is attempting to make the balance sheet statement of profit and loss have some meaning in fact.

With the much greater work done in repairs of equipment, and with the lack of boats to take export freight delivered at the seaboard by the Baltimore & Ohio, it would not have been surprising to have found evidences of bad congestion and much heavier transportation expenses. There was some congestion, of course, but the increased business was handled remarkably effectively and economically. Revenue ton mileage increased 21.76 per cent; revenue passenger mileage, 4.96 per cent, while transportation expenses amounted to $36,836,000, an increase of only $2,581,000, or 7.54 per cent. The average miles per freight car per day was 27.8 in 1916 as against 23.7 in 1915, an increase of 17 per cent. This certainly very strongly bears out the conclusion which President Willard draws from the results of operation in 1916—that the property has demonstrated a reserve carrying capacity over the unprecedented volume of business in 1916.

The principal increase in cost of transportation was in yard expenses. Yard conductors and brakemen were paid $2,764,000 in 1916, an increase of $604,000 over the previous year, and yard enginemen, $1,587,000, an increase of $412,000. Fuel for yard locomotives cost $963,000, an increase of $212,000. These increases, together with an increase of $630,000 in the wages of station employees—the total on this account being $4,768,000—account for almost the entire increase of $2,581,000 in transportation expenses. The very small proportionate increases in train expenses were offset by a remarkably large saving in payments for loss and damage to freight. The total on this account in 1916 was $710,000, or $467,000 less than in 1915. Freight train mileage in 1916 totaled 20,763,000, an increase of 2,029,000. Passenger train mileage totaled 17,059,000, an increase of 262,000. The wages of train enginemen totaled $4,924,000, an increase of only $194,000. This is strong evidence of the success which the Baltimore & Ohio has met with in its efforts to reduce overtime through a system of supervision based on daily reports of individual train performance. The measure of the success is more fully shown by a comparison of trainload figures. The average revenue trainload in 1916 was 761 tons, an increase of a little more than 68 tons over the average in the year before, or 9.87 per cent. Better car mileage, a lower cost for wages and fuel per train-mile, a lower cost of engine house expenses per hundred locomotive-miles, and a lower cost for water per hundred locomotive-miles, with a considerably larger revenue trainload, are operating results that speak for themselves.

At the beginning of the year the Baltimore & Ohio had on hand $16,718,000 cash, with no loans and bills payable. The sale of $60,000,000 5 per cent refunding and general mortgage, series A, bonds has been mentioned. The expenses and discount on this sale amounted to $1,923,000. Besides the retirement of $40,000,000 notes which fell due there were other bonds and equipment trusts paid off amounting to $7,134,000, so that the net increase in outstanding funded debt was $14,636,000. There was a net addition to investments of $10,352,000, accounted for by expenditures for additions and betterments to road, $3,754,000; new equipment, $4,574,000 (this is after the deduction of credits for equipment retired), and $2,024,000 increase in other investments. Cash on hand at the end of the year amounted to $17,476,000, and materials and supplies on hand showed a considerable increase. There was an increase in current liabilities due to the greater volume of business being done. There were no loans and bills payable.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Miles operated	4,538	4,535
Freight revenue	$88,476,032	$70,780,809
Passenger revenue	14,971,472	14,059,940
Total operating revenue	111,668,680	91,815,797
Maintenance of way and structures	13,917,815	8,985,627
Maintenance of equipment	23,513,811	16,002,589
Traffic expenses	1,937,389	1,905,496
Transportation expenses	36,835,921	34,254,572
General expenses	2,486,520	2,228,274
Total operating expenses	79,319,804	63,925,508
Taxes	3,674,248	3,289,611
Operating income	28,639,064	24,581,697
Gross income	34,483,439	29,842,545
Net income	13,692,447	10,780,881
Sinking funds	76,231	57,633
Dividends	9,951,752	9,951,752
Surplus	3,664,464	771,496

ST. LOUIS SOUTHWESTERN

THE St. Louis Southwestern has what two of its competitors lack, namely, a northbound drag traffic. Both the Kansas City Southern and the Missouri, Kansas & Texas are handicapped by the fact that the greater part of their tonnage of freight is southbound, whereas of the total tonnage carried by the St. Louis Southwestern in 1916, 2,075,000 tons was northbound and 1,670,000 tons southbound, the percentages being 55.42 northbound and 44.58 southbound. A considerable part of the drag freight northbound is lumber. Of the total 3,745,000 tons of all freight carried both north and south in 1916, 1,280,000 tons, or over 34 per cent, was lumber. Of the total tonnage carried in 1915, amounting to 3,181,000 tons, 1,067,000 tons, or 33.56 per cent, was lumber. The tonnage of lumber showed an increase of 19 per cent in 1916 as compared with 1915. This much more than offset the loss in the tonnage of cotton, due to a partial failure of the cotton crop in the Southwest. In 1916 the St. Louis Southwestern carried 112,000 tons of cotton, or 21,000 tons, 15.50 per cent, less than in 1915. There was twice as much corn carried in 1916 as in 1915, the total tonnage in 1916 being 71,000 tons. The activity in the lumber business, the very good corn crop, a good rice crop and an increase in the tonnage of manufactures carried gave the St. Louis Southwestern a far more favorable showing in gross in 1916 as compared with 1915 than either the Missouri, Kansas & Texas or the Kansas City Southern.

Total operating revenues amounted to $12,224,000, an increase of $1,597,000, or 15 per cent. Operating expenses were held down to within a few thousand dollars of as low a figure in 1916 as in 1915, so that net amounted to $3,818,000 in 1916, an increase over the previous year of $1,551,000. Fixed charges remaining practically the same, all of this increase was saved for net corporate income, so that there was a credit for the year to profit and loss of $1,267,000, comparing with a debit for the previous year of $281,000.

The following table shows the percentage of each class of operating expenses to total operating revenues in 1916 and 1915:

	1916.	1915.
Maintenance of way and structures	11.40	14.92
Maintenance of equipment	18.56	19.53
Traffic expenses	4.26	4.24
Transportation expenses	30.77	35.83
Miscellaneous	0.41	0.45
General	4.26	4.91
Transportation for investment—Cr.	0.89	1.21
Total	68.77	78.67

The decrease in maintenance of way expenses was the result principally of smaller expenditures for bridges, trestles and culverts, for track laying and surfacing, and for superintendence. The increase in maintenance of equipment expenditures was largely the result of increased amounts spent for repairs of freight cars and repairs of passenger cars. The repairs of locomotives cost slightly less in 1916 than in 1915.

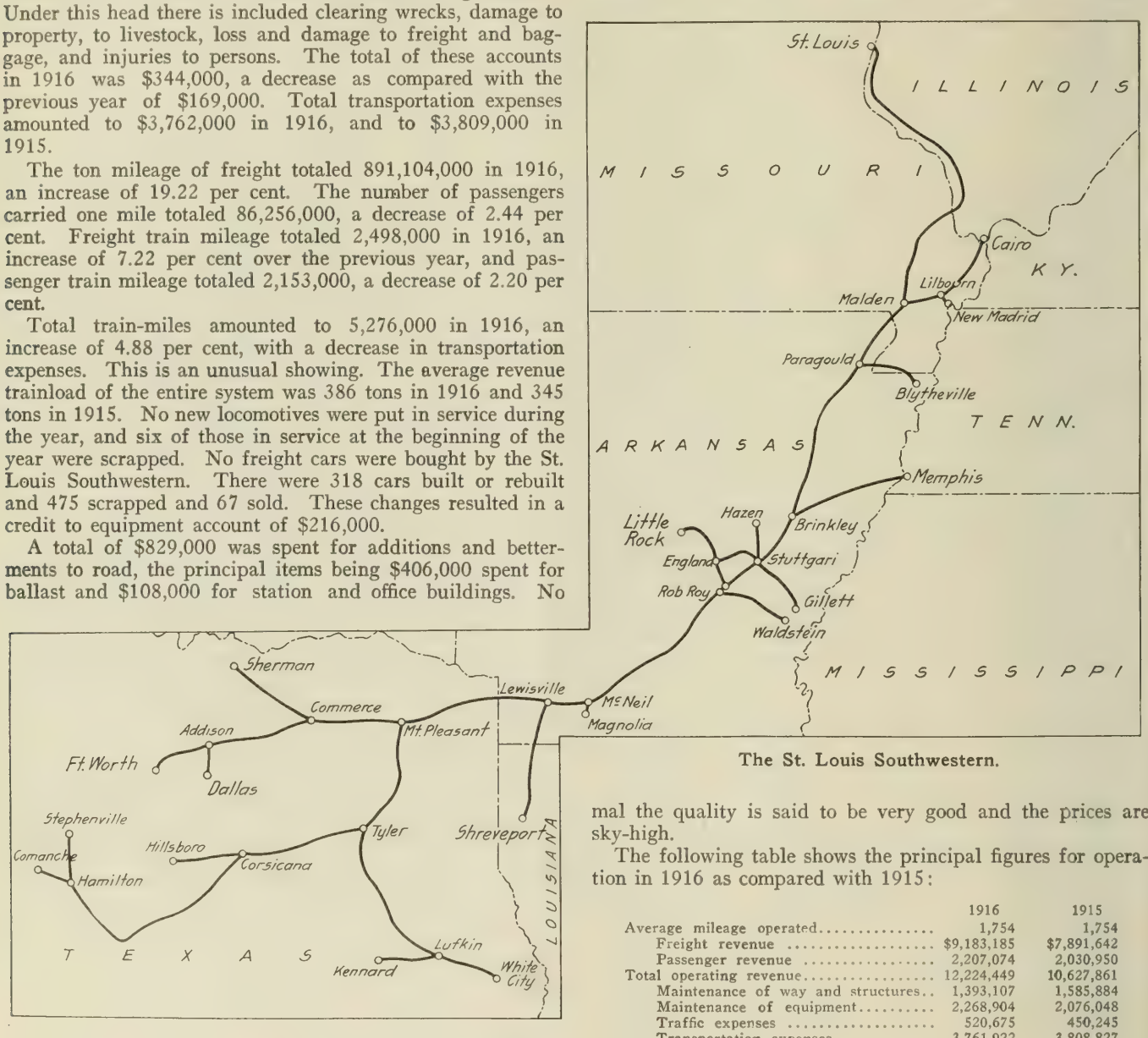
The St. Louis Southwestern groups the primary accounts prescribed by the Interstate Commerce Commission under station service, yard service, engine service, train service, casualties and other accounts. The cost of yard service increased, partly because of a smaller amount received from other roads for operating joint yards and terminals. The cost of engine service totaled $1,415,000, or $57,000 more than in the previous year, due to the increased cost of fuel for train locomotives. The cost of casualties showed a big decrease. Under this head there is included clearing wrecks, damage to property, to livestock, loss and damage to freight and baggage, and injuries to persons. The total of these accounts in 1916 was $344,000, a decrease as compared with the previous year of $169,000. Total transportation expenses amounted to $3,762,000 in 1916, and to $3,809,000 in 1915.

The ton mileage of freight totaled 891,104,000 in 1916, an increase of 19.22 per cent. The number of passengers carried one mile totaled 86,256,000, a decrease of 2.44 per cent. Freight train mileage totaled 2,498,000 in 1916, an increase of 7.22 per cent over the previous year, and passenger train mileage totaled 2,153,000, a decrease of 2.20 per cent.

Total train-miles amounted to 5,276,000 in 1916, an increase of 4.88 per cent, with a decrease in transportation expenses. This is an unusual showing. The average revenue trainload of the entire system was 386 tons in 1916 and 345 tons in 1915. No new locomotives were put in service during the year, and six of those in service at the beginning of the year were scrapped. No freight cars were bought by the St. Louis Southwestern. There were 318 cars built or rebuilt and 475 scrapped and 67 sold. These changes resulted in a credit to equipment account of $216,000.

A total of $829,000 was spent for additions and betterments to road, the principal items being $406,000 spent for ballast and $108,000 for station and office buildings. No bonds were sold by the company during the year, and $350,000 equipment trust certificates matured and were paid. At the beginning of the year the company had $1,585,000 loans and bills payable secured by the pledge of $3,270,000 face value of collateral. Out of current funds the company paid off $800,000 of these loans and bills payable during the year, leaving $785,000 loans and bills payable at the end of the year secured by $1,114,000 first terminal and unifying 5 per cent bonds of the St. Louis Southwestern and $556,000 first mortgage 4 per cent bonds of the Southern Illinois & Missouri Bridge Company. At the end of the year there was $620,000 cash on hand, with, in addition, special deposits of $443,000 to cover matured interest unpaid amounting to $441,000.

The prospects for the present year of the St. Louis Southwestern are very encouraging. Crops are in fine shape and prices are high. In 1916 the planter got about $61 a bale for his cotton, compared with $41 in the previous year, but he had an abnormally small crop. The prospects are that this year he will get from $70 to $75, or even better, a bale, with at least a normal crop. The quality of wheat this year in the Northwest is very much below normal, while in Texas although the quantity of wheat is somewhat below normal the quality is said to be very good and the prices are sky-high.



The St. Louis Southwestern.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	1,754	1,754
Freight revenue	$9,183,185	$7,891,642
Passenger revenue	2,207,074	2,030,950
Total operating revenue	12,224,449	10,627,861
Maintenance of way and structures	1,393,107	1,585,884
Maintenance of equipment	2,268,904	2,076,048
Traffic expenses	520,675	450,245
Transportation expenses	3,761,922	3,808,827
General expenses	520,674	521,878
Total operating expenses	8,406,786	8,361,154
Taxes	599,076	581,778
Operating income	3,215,254	1,682,741
Gross income	4,494,887	2,905,961
Net income	1,267,455	280,993*

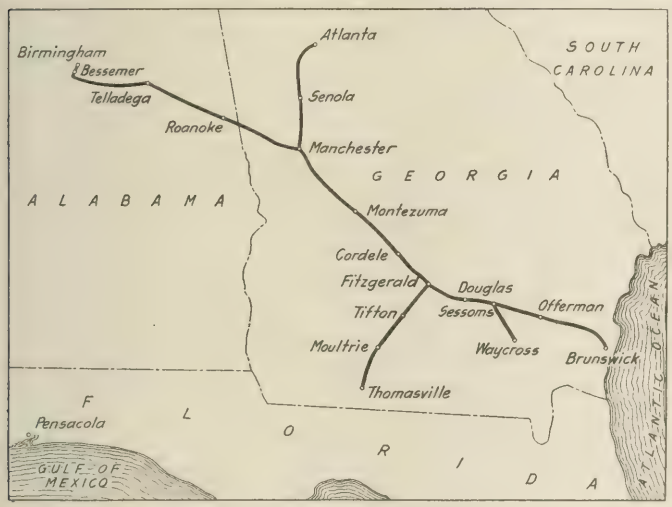
*Deficit.

ATLANTA, BIRMINGHAM & ATLANTIC

A ROAD built as expensively as the Atlanta, Birmingham & Atlantic cannot earn a fair return on its cost with total operating revenues of less than $5,000 per mile of line. Even in the fiscal year ended June 30, 1916, total operating revenues for the Atlanta, Birmingham & Atlantic amounted only to $4,781 per mile of line. The new company—the Atlanta, Birmingham & Atlantic Railway—which bought under foreclosure the property of the old Atlanta, Birmingham & Atlantic Railroad, the Georgia Terminal and the Alabama Terminal, began operation on January 1, 1916. During the six months the company showed a net income, after paying rentals and interest, of a few thousand dollars, but as the company was reorganized the fixed charges amount only to $321 per mile of line per year so that the interest on funded debt in the first six months of the new company's operation amounted to $192,000.

The first annual report issued by the new company shows the accounts of the old company recast so as to make possible a comparison of the operation of the entire fiscal year ended June 30, 1916, with that of the fiscal year ended June 30, 1915.

Total operating revenues in the year 1916 were $3,052,000, comparing with $2,656,000 in 1915. Total operating expenses amounted to $2,454,000, comparing with $2,374,000 in the year 1915. The following table shows the percentage of each class of operating expenses to total operating revenues:



The Atlanta, Birmingham & Atlantic

	1916	1915
Maintenance of way and structures	15.51	15.88
Maintenace of equipment	18.21	19.48
Traffic expenses	5.27	5.50
Transportation expenses	37.82	43.77
General expenses	3.60	4.73
Miscellaneous expenses	0.01	0.01
Total	80.42	89.37

An operating ratio of over 80 is, of course, still much too high, but, apparently, the operating ratio could be brought down if only the road could get more business. The average revenue per ton per mile in 1916 was 6.05 mills, and in 1915 6.40 mills. The average receipts per passenger per mile were 2.158 cents in 1916 and 2.219 cents in 1915. Total transportation expenses in 1916 amounted to $1,154,000, comparing with $1,162,000 in 1915. This decrease was in the face of an increase of $389,000 in freight revenue and $23,000 in passenger revenue. The total number of tons of revenue freight carried one mile in 1916 was 380,000,000, an increase over the previous year of 27.3 per cent., and the number of passengers carried one mile amounted to 24,372,000, an increase of 7.5 per cent. The average revenue trainload in 1916 was 398 tons, comparing with 316 tons in 1915. This is a good indication of increased operating efficiency and economy. To make it effective, however, in earning interest on the income bonds, of which the new company has $5,200,000 outstanding, the traffic will have to show a considerable increase.

The Atlanta, Birmingham & Atlantic was built largely with Boston capital. The economic function which the road was to perform besides the development of local towns was to give Birmingham and Atlanta an outlet at Brunswick, Ga. Of the total freight tonnage carried—1,749,000—by the road in 1916, 1,070,000 tons was received from connections and 679,000 tons originated on the road. Lumber and bituminous coal furnished the largest proportions of the tonnage. Bituminous coal furnished 451,000 tons, or 25.7 per cent of the total freight tonnage; lumber and other forest products furnished 332,000 tons, or 19 per cent of the total tonnage. Almost the entire tonnage of bituminous coal was received from connections, but considerably over two-thirds of the tonnage of lumber and forest products originated on the road. It was in the tonnage of coal, lumber and manufactures that the gains were made in 1916. The total tonnage of products of agriculture was 241,000 in 1916, as against 249,000 in 1915.

The new company has a fair working capital to start with. At the end of 1916 there were no loans and bills payable and the company had $827,000 cash, $450,000 time deposits and $223,000 special deposits.

The following table shows the principal figures for operation in 1916, as compared with 1915:

	1916	1915
Average mileage operated	638	642
Freight revenue	$2,298,853	$1,909,988
Passenger revenue	526,006	502,610
Total operating revenue	3,051,877	2,656,483
Maintenance of way and structures	473,442	421,847
Maintenance of equipment	555,689	517,585
Traffic expenses	160,843	146,149
Transportation expenses	1,154,308	1,162,483
General expenses	109,735	125,796
Total operating expenses	2,454,349	2,374,111
Taxes	158,254	146,682
Operating income	439,274	135,690
Gross income	505,690	191,519
Net income	159,706	145,783*

*Deficit.

NEW BOOKS

Canadian Trade Index, 1916-1918. Compiled and published by the Canadian Manufacturers' Association, Inc., 1404 Traders Bank buildings, Toronto, Can. Size 7 in. by 10½ in., 560 pages. Bound in cloth. Price $5.

This book will fill for Canada the place held in the railway supply field in the United States by MacRae's Blue Book. The aim of the publishers has been to provide all buyers of Canadian manufactured goods with a dependable list of the articles made in Canada and the names of the manufacturers. The book is primarily a directory of the manufactures and manufacturers of Canada classified according to the articles made. There are also given a list of the Canadian trade commissioners in foreign lands, a list of the important British consuls, an alphabetical list of 74 pages of manufacturers with addresses, branches, export representatives, etc., and an alphabetical index in French of the headings in the list of manufactures. The last two tables are in blue paper for ready reference. Although the book covers all Canadian industry, the names of railway products and the Canadian railway supply companies are as easily found as could be wished.

Letters to the Editor

ENDORSES EX-TRAINMASTER'S VIEWS

OTTUMWA, Iowa, September 20, 1916.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I read with considerable interest the letter from an ex-trainmaster in your issue of September 15, entitled "The High Cost of Expediency." This letter is certainly very interesting and if my railway experience of 15 years counts for anything the ex-trainmaster has given the exact status of affairs.

I do not claim any particular ability or foresight, but it was perfectly evident 15 years ago that the railroad labor proposition was developing rapidly into the present impossible situation. The ex-trainmaster has put the responsibility exactly where it belongs.

In my humble opinion there is no railroad president, or vice-president, or manager, whose time is too valuable for him to spend reading the ex-trainmaster's letter with profit. The past cannot be undone, but we may do something to greatly improve the future. L. R. CLAUSEN.

HOW CLERKS AND SUBORDINATES CAN KEEP CARS MOVING

BOSTON, Mass.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The car service department is doing much to educate employees and the shipping public to the economical use of the freight car as a means to increase efficiency and earnings in all departments. Manufacturers and merchants are gradually learning that they can greatly increase car efficiency by the education of their shipping departments to the possibilities of consolidating loadings, and of loading and unloading cars more promptly. The more progressive shippers have discarded the idea that they must endeavor to consume all the free time allowed for loading and unloading, being broad-minded enough to realize that time saved in this way makes a car available more quickly for use by another shipper.

Railroad agents who properly instruct their yard clerks and yard masters find that many shippers will release a car upon request, which under ordinary circumstances would remain under load until the next morning and be tied up for another day. Progressive agents can also frequently approach shippers and show them that they are discommoding themselves by inadequate loading conditions. Many plants have their unloading platforms unprotected from the weather. Although railroads allow additional free time when the unloading is delayed by the weather, the real solution is protection from the elements rather than waiving of the demurrage charges. Railroad men see these instances daily, but neglect to call them to the attention of any one. Men who check private tracks are welcomed by the shippers, and any suggestions made by them will usually receive consideration if directed towards the improvement of facilities.

A car repair workman frequently has valuable ideas regarding improved locations of repair tracks which will be of value to the operating department if brought to the attention of the proper officer. A clerk employed to check way bills in the auditing office will note evidences of light loading day after day from certain stations which can be remedied if he will call this matter to the attention of his superior officer.

In many large terminals the various departments do not hesitate to load a small amount of material in a good car and then request that it be switched to another part of the yard, tying up the car for several days when the same work could have been performed more expeditiously and cheaply by a horse and wagon or by an auto truck. The men interested know that these conditions exist, but in general the operating officers are so busy attending to the movement of traffic that they have little opportunity to consider the elimination of unnecessary movements.

Thousands of cars throughout the country await someone's prying eyes. When every one learns the value of the car and the possibilities of waste the car will come into its own. The railroad employee who forces his way ahead today is the one who attracts attention by demonstrating that he is increasing the efficiency and earnings of his employer. The freight car is an excellent goal for this class of men to focus their attention upon. Increased car miles per day is the aim of every operating officer. It is the idle car which holds back the desired increase. If every employee would think in terms of cars and car miles for a month, great benefit would result. FRANK E. CALDER,

Chief Clerk, Car Service Dept., Boston & Maine.

ASSIGNED ENGINES

HAILEYVILLE, Okla.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In a paper on "Fuel Economy and the Transportation Officer," presented by W. H. Averell at the International Railway Fuel Association convention last May, which was abstracted in the May 26 issue of the *Railway Age Gazette* on page 1121, an appeal was made to the chief despatchers to see that engines are assigned to regular crews for the purpose of fuel economy. While we agree that there are many benefits to be derived from assigned engines, especially on roads where there is sufficient power, those in charge of this work are unlikely to assign them if they think engine miles is preferable to the economy in fuel incident to the operation of assigned engines. In most every case the assigning of engines to regular crews will require more engines to do the business than when these engines are run in the "chain gang." Where an engine must lay ten hours at each terminal for the crew to rest it cannot be presumed that the engines will make as many miles as where they are placed in service as soon as they are turned at the round house. The division on which the writer is located is 197 miles long. It includes two sub-divisions, and 12 engines are used to handle the business. During the summer these engines averaged from 125 to 167 miles per day. To have handled the business with assigned engines at least three more engines would have been required and the mileage per engine would have dropped considerably under these figures. This record, however, is greater than any before established on this division. With this large engine mileage the engine failures were very few, in fact not worth mentioning. The freight hauled over this division is made up of heavy commodities, such as coal, lumber, rock and the like; therefore the speed of freight trains with tonnage trains is not very fast. It is the intention to run all engines through, over the entire 197 miles, it being planned to turn the engines through the roundhouse at the intermediate terminal, while the trains are being broken up and switched. This will save fuel in that fewer locomotives will be under steam at the terminal and the terminal fuel consumption will be decreased. J. L. COSS.

NICARAGUAN RAILWAY.—The Ferrocarril Pacifico de Nicaragua is a 3 ft. 6 in. gage line, 171 miles in length, with headquarters at Managua on the Pacific coast, owned by the State, but leased to a New York concern. Recently an agreement between the latter and the Nicaraguan Government was made whereby the firm contracts to build and operate a railway, 200 miles in length, which is to give communication with the Atlantic coast also.

Freight Car Utilization and M. C. B. Rules*

An Analysis of the Ultimate Cost of Repairs to Foreign Cars and Suggestions by Which It May Be Reduced

By N. D. Ballantine
Assistant to Vice President, Chicago, Rock Island & Pacific

M. C. B. Rule 1 reads:—"Each railway company must give to foreign cars, while on its line, the same care as to inspection, oiling, packing, adjusting, brakes and repairs that it gives to its own cars." The prime object is undoubtedly to repair and care for foreign cars the same as though they were your own.

M. C. B. Rule 120 provides that where the labor cost of repairs to cars that are in general worn out condition, exceeds 10 per cent of the base price of car body, upon joint evidence of defects and estimated total cost of repairs, owner must authorize destruction or repairs.

Per diem rule 8 operates in connection with M. C. B. Rule 120 and provides for cancellation of the actual per diem which would accrue on such cars during the process of rebuilding not to exceed 60 days; or if material is required from the owner, 60 days from date it is shipped.

The M. C. B. rate allowed car repairers is about 28 cents an hour. It is customary to work two men in a gang; if this amount of labor was the minimum applied in making the repairs, it would admit of an expenditure of $5.60 per day for labor, which should on the average apply, say, $4.40 for material, or the equivalent of $10 per day. The per diem for one day, being 45 cents, is equivalent to 8 per cent of the labor cost which should as a minimum be applied in making the repairs. Since per diem does not stop on Sundays and car repairs are not generally made on that day, a more correct determination of the relation between per diem and the labor costs would be 9.3 per cent of the labor charge.

An actual record of over 100 cars repaired under M. C. B. rule 120, by a certain western road, shows it took an average of 20 days from the date of notice to the owner until authority was received, and an average of 49 days from the date of authority to rebuild the cars until the repairs were completed, making a total of 69 days. This record also shows there was an average of $200 spent in repairing the cars. On the basis of 55 per cent of this expense representing a labor charge it means $110 for labor. At the rate of $5.60 per working day, it would have taken 20 working days and allowing for two Sundays, 22 per diem days. Instead of 22 days, 49 days were taken, which on a conservative basis means a net loss of 27 days on the average.

Should there not be some incentive to secure more prompt action in repairs to foreign cars? Why bother the car accountants with records of such transactions? Let per diem accrue regularly, regardless of any mechanical defect, taking care of this feature on repair bills, by adding, in the case of cars repaired under M. C. B. rule 120, say, 10 per cent of the labor charge as a per diem credit, together with the equivalent per diem expense incurred while awaiting authority to repair or for shipment of material, letting the accounting department debit and credit such amounts to the Hire of Equipment account, thus saving a lot of unnecessary correspondence and minimizing the accounting work.

If this plan prevailed, a road which did not spend at least $5.60 per day would be out of pocket some per diem and if $11.20 was spent for labor per day it would profit to the extent of 45 cents or about 4 per cent of its total labor charge.

Clearly there is need for expediting the handling of such matters.

We all know when cars are in demand and if we are unable to secure parts which are "standard" to one of our own cars, we substitute and get the car in service. Rule 1 says: "Each railway must give to foreign cars, while on its line, the same———repairs that it gives its own cars." Why then should there not be more latitude permitted in this direction without penalizing the holding road by depriving it of a right to collect for having put the car in safe and serviceable condition, earning per diem for the owner and revenue for the holder?

As a suggestion to aid in this direction why not require car foremen in ordering material from the owner, in every case whether under rule 120 or otherwise, to state what, if any, portion of the material ordered he could substitute standard material for, though not necessarily standard to the particular car. Also the approximate expense for welding or procuring special castings or other parts which would enable him to make repairs promptly, thus giving the owner an opportunity to authorize such work or exercise his right (?) to keep the car out of service until material could be shipped. During times such as the present when there is uncertainty in deliveries of steel products, the option to authorize immediate repairs would doubtless be taken advantage of by many and could be given by wire.

Have not the mechanical and transportation officers too often been content to rest easy and look with complacency upon delays to foreign cars while waiting for material from the owner, in the thought "there is no per diem accruing on the car," overlooking the fact that while this was true with respect to that particular car, he was losing an equivalent amount on one of his cars on another road;—that both were losers by the process; and overlooking, too, a still more important factor "The Value of a Car?"

Value of a Car.—The value of a car is a variable ranging from a liability to an asset. When there is a surplus of cars, is it not a liability? During which period, would not the following estimate be conservative, assuming the average car as representing an investment of $1,000?

Interest at 5 per cent on $1,000	$50
Depreciation at 5 per cent on $1,000	50
Insurance at 4 per cent on $1,000	4
Interest on 40 ft. track room at $80 at 5 per cent	4
Switching and watching	10
	$118

This is equivalent to 32.4 cents per day, or say, in round numbers, 30 cents per day as representing the expense of owning a car which is stored and not earning revenue. As a maximum value we have had cars giving a net revenue of $20 per day.

Using the figures given by the Bureau of Railway News and Statistics, it has been estimated that the average net value of a car for all railroads during the year 1915 was 60 cents per day; this included stored cars, bad order and all classes.

Clearly, then, 60 cents is too low a basis to consider as the value of a car per day when there is a heavy demand such as at the present.

Surely it would be safe to say that a good order car at the rate of 14 cents per loaded car mile would earn $5 per day, and if this is done, with an operating ratio of 75 per cent,

*Abstract of a paper presented at the November meeting of the Car Foremen's Association of Chicago.

it would mean a net revenue of $1.25 per day. This, plus the 45 cent per diem, amounts to $1.70, the amount lost by not using a foreign car.

Repairing Foreign Cars.—M. C. B. Rule 87 reads: "Any company making improper repairs is solely responsible to the owners, with the exception of the cases provided for in Rules 56, 57 and 70, and excepting that a company applying axles smaller than the limits given under Rule 86 shall not be held responsible for improper repairs if the car is not stenciled showing the capacity or maximum weight or Limit Weight II."

M. C. B. Rule 88 reads: "The company making such improper repairs must place upon the car, at the time and place the work is done, an M. C. B. defect card, which card must state the wrong material used."

In these rules we find a penalty to a holding road for putting a car in serviceable condition, if it does not apply parts designated by the owner as "standard" in making the repairs, although the work done or material substituted may be as good or better than that designated by the owner as "standard." Do they harmonize with M. C. B. rule 1? If not, is not the principle fundamentally wrong? Let us see how the rules work in practice.

Road *A* has a foreign car with a broken center plate and has no plates of the particular design in stock; in 24 hours time while on the repair track, it can apply another kind of center plate and make the car just as safe to run as with its own standard. If this is done the net labor and material expense amounting, to, say, $2.50, could not be charged against the owner; on the other hand, when the owner secured possession of the car he could bill road *A* for the labor and material necessary to replace the standard part, giving credit for material *A* applied, at scrap value, thus further penalizing road *A* to the extent say of $2, making a net loss to road *A*, when viewed from the standpoint of the mechanical department expense solely, of say $4.50. The mechanical department generally being the sole judge in disposing of cases of this kind, and properly having in mind the importance of reducing its cost of car repairs, would doubtless order the material from the car owner. Per diem rule 8 provides, that when a car is detained awaiting the receipt of repair material from the owner, per diem ceases from date of order until date owner ships material. Assume a car is in Kansas City, Mo., in bad order and the headquarters of road owning the car is in New York. It would be safe to say that there would be 5 days delay chargeable to the owner and 6 days delay chargeable to road *A*, including one day for making the repairs, before the car was placed in service.

We now see that instead of making repairs "as though it owned the car," and getting it into revenue service the same day, or within 24 hours of the date placed on repair track, there was an economic loss of $17, as follows:

The owner lost 5 days per diem	$2.25
The holding road lost 5 more days per diem than need be lost if repaired promptly	2.25
Total 10 days per diem	$4.50
Some road lost the opportunity to earn 10 days net revenue at $1.25 per day	12.50
Total economic loss	$17.00

What for? Surely not for the purpose of reducing the cost of repairs to freight cars as a whole; if safe and serviceable, why arbitrarily remove the parts applied in this manner, so long as the cars are not used for exhibition purposes, but for carrying freight?

A superintendent of rolling stock of a large Eastern line in writing on this subject states: "There is nothing so sacred about certain castings on a freight car that make it necessary to hold a car out of service for unreasonable periods for the sake of getting a standard casting for it and it has been our practice when foreign roads order a standard casting to wire them to make wrong repairs and let the car run——"

We recently received a letter from a superintendent motive power of another large Eastern line reading as follows:

"On September 21, we had Rock Island car 261998 in our yard loaded with rush freight. The car was rejected by the inspectors on account of truck side frame broken at *A* and *B* end.

"In order to save delay to this car, we ran it to our shop tracks and used our electric welder and succeeded in welding this truck frame without transferring the lading and with very little delay.

"Will you kindly authorize us to bill you for this material and labor."

It is needless to say we authorized the bill and thanked him for his interest, but our clerks handling these matters tell me if we did such work without first securing authority we would have little chance of collecting.

In June, 1916, there was an average of 16,000 foreign cars on the line each day; 22 per cent of all cars received were placed on repair tracks for repairs with an average expenditure for labor and material of $6.65 per car. We ordered material for making repairs to 78 cars during the month or a trifle over 0.1 per cent. The average time between date of order and date of shipment was 15 days. Note particularly that this is three times the loss in per diem to the owner that is used in the estimate made heretofore. The average time between the date of shipment and receipt of material was 14 days. Note this is practically three times the estimate used heretofore. In other words, the economic loss was actually:

29 days per diem	$13.05
29 days net revenue at $1.25	36.25
Total economic loss	$49.30

In the face of such figures, can we justify either the rule or practice?

Suggested Changes.—Appreciating that M. C. B. rules cannot be changed instantly, if desirable, and that we shall have to work under them a while at least, the following suggestions may be of some value:

First.—Consider the advisability of issuing a blanket authority, placing a limit upon the total amount which may be spent in repairing a foreign car under rules 87 and 88, figuring on the money so spent by the mechanical department not being recoverable, but being more than offset by the saving in per diem and net revenue from the more prompt use of the car.

Second.—Consider the plan of having the car foreman in each instance when ordering material from a car owner state whether he is in position to repair promptly, how, and approximate cost. Let an experienced man in the general office pass upon each case, and elect to authorize the car foreman without conferring with the owner; or communicate such information to the owner with the order, letting the owner elect to pay for such repairs regardless of rules 87 and 88 rather than lose the per diem and put the car in service, during the time the material would be in transit.

Third.—For roads ordering equipment; a "Call up" file system for tracing roads for date of shipment; for tracing car foreman for advice of the receipt of the material; tracing road to whom the material is delivered instead of through the mechanical department of the road making shipment, on shipments delayed enroute; tracing car foreman after the receipt of the material for the date car was repaired and returned to service.

Fourth.—For roads electing to ship material on orders; a definite understanding with the store department that they be immediately advised if the material ordered is not in stock, with the approximate date the shipment may reasonably be expected to be made; that a reconsideration may be made when it is learned that certain parts of the order are not in stock and deliveries uncertain.

Fifth.—Consider advisability of having standing instructions with your connections which handle a large number of your cars, that in case of roofs or other parts which are not generally carried in stock by such company, but who do carry roofs or other parts which material it is satisfactory to you to have applied, to apply without recourse to correspondence and special authority in each particular case. This practice already exists between the Rock Island and a few roads.

In repairing foreign cars have we not overlooked the relation that per diem, switching and value of the car has on the situation? With a view of impressing these facts on our local mechanical and transportation people, we have for some time past been having them show the following information on the back of the repair bill for each foreign car placed on the repair track, using a rubber stamp as follows:

Date bad order .....
Date placed on repair track .....
Date repairs completed .....
Date removed from repair track .....

This enables the local, as well as the general officer, to know the per diem involved on this account and the proportion chargeable to the transportation and mechanical departments. By this we have found that it requires about three times as long to switch a foreign car to and from the repair track as it takes the mechanical department to repair it when once it is placed there. Would this not be good information to include regularly on the M. C. B. repair bills so the owner would also be informed?

There must be some fundamental reason for these conditions existing. Is it not due to the fact that the prices allowed for repairing the foreign car are not remunerative? Why should they not be remunerative, thus making it an incentive for an owner to put his cars in first class shape before offering them in interchange, keeping his old rough freight cars for local service? If there was a 10 or 15 per cent profit in repairing foreign cars, would there not be more foreign cars repaired and heavier work done than at present? Surely under present prices for material M. C. B. prices do not nearly compensate a road for doing the work, much less net a profit. This situation, it seems to me, warrants a prompt and effective remedy.

Our records show that on 148,000 foreign cars it required an average of 1.5 days transportation delay and 0.5 day mechanical delay, or 2 days for each foreign car placed on repair tracks. This means a per diem equivalent of 90 cents plus the switching expense of say 30 cents per car and two days not producing revenue, or $2.50, totalling $3.70 as the approximate cost for "rip tracking" a foreign car; this is 82.5 per cent of the amount the mechanical department spent in repairing the car after it was placed there. Why shouldn't the owner pay a premium to have his car repaired away from home?

More money spent on each car when once on the repair track putting the car in first-class shape is cheaper than temporary or partial repairs with increased expense for per diem, switching and loss in net revenue. Incident to such work would follow substantial economies in decreased empty mileage, claims for damaged contents, switching to repair tracks, delays to trains between terminals, hazard of accident to car, hazard of accident to trainmen, violation of federal laws on safety appliances, and complaints from public.

More Data Needed.—Since there are such large sums being expended in the purchase of equipment, as well as enormous sums being expended in keeping it in repair, should we not have more definite information with respect to the actual bearing the various factors have on the whole proposition? With data prepared so as to show the information separated between classes of cars, and series of each class where there is a difference in construction, so that a thousand box cars of a given design and alike in every particular could be compared with another thousand box cars alike in every particular except draft gear, roof, sills, trucks or what not, so that at the end of a year or a series of years it would be possible to compare such items as the following:

Average number of days between repairs.
Average detention while bad ordered, separated as between mechanical and transportation departments and the total.
Average amount spent per car per year, per day, per mile and per time repaired.
Nature of repairs made, costs thereof, separated as between body, roof, sills, draft gear, trucks, specialties, etc., to as great a degree of refinement as good judgment of the requirements, combined with practical knowledge of how to secure it, indicates it should be carried.

With this information the car designer would have less trouble convincing his superior officer that ten dollars more spent for draft gear, fifteen dollars more for a roof, fifty dollars more for sills or trucks, on the next lot of cars built, or making some particular reinforcement or alteration in present equipment would be a splendid investment, and what is better still, he would be able later on to prove it.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., November 22, 1916.

Discussion of Railroad Regulation

Washington, both this week and last week, has been a storm center of discussions of various plans and theories of railroad regulation. As a sort of prologue to the Newlands inquiry, which began with a meeting on Monday, the National Association of Railway Commissioners devoted most of the time of its convention last week to the discussion of the question of state versus federal regulation, the National Council of the Chamber of Commerce of the United States devoted its special meeting on Friday and Saturday mainly to railroad questions, especially means for the prevention of railroad strikes, while the railroads and the brotherhoods were furnishing new material for investigation by renewing their wage controversy which had been temporarily postponed because of the election.

The state commissioners were able to agree almost unanimously that they did not want the Interstate Commerce Commission to regulate rates within the states, but they presented a much less solid front on the question of security regulation. Most of the state commissions now have no jurisdiction over security issues and, therefore, have nothing to lose, but members of the New York and California commissions, that do have that power, were entirely willing to give it up and were agreed that the position of the railroads would be intolerable if federal regulation of securities were superimposed upon that of the states. The chairman of the legislative committee, L. B. Finn of Kentucky, readily disposed of the argument that the states discriminated against each other in passing extra crew laws, for example, by quoting Governor Brumbaugh of Pennsylvania as saying that instead of requiring an army of additional employees, the law required but one additional employee (he did not say one employee per train), and by showing that in New York there were actually less train employees in 1914, after the passage of the extra crew law, than in 1913. No one asked any questions as to how many employees would have been required if the traffic had not fallen off enormously in 1914. Mr. Finn also disposed of the question of railroad credit by explaining, on the authority of the Pujo committee, that transactions involving credit merely consist of transferring money from one pocket of the "money trust" to another, which process, he said, the railroad men are trying to make the public believe is a very difficult thing.

The meeting of the National Chamber of Commerce was called to discuss means of preventing railroad strikes and of getting rid of the conflict of 49 different jurisdictions in railroad regulation. As remedies for strikes, President Van Hise of the University of Wisconsin advocated an amendment of the Newlands arbitration act to require a public investigation before a strike can be called and said the wage regulation was ultimately inevitable. Henry R. Towne, of the Merchants' Association of New York, urged the plan of

requiring railroad employees to contract not to strike and Charles Nagel insisted that the principle of arbitration should be preserved. Officers of the railroad brotherhoods declined the opportunity to give the meeting the benefit of their views on the subject. A. P. Thom, counsel for the Railway Executives' Advisory Committee, explained the plan urged by the railroads for exclusive federal regulation of interstate carriers.

W. C. Adamson, vice-chairman of the Newlands committee, made it clear where he stood on the proposal for centralization of regulation. He said no one had asked the railroad "magnates" to buy up and consolidate local railroads to create interstate systems and that the constitution would have to be amended before they could change our form of government to suit their own convenience and enable them to "send satraps from Washington to the outlying provinces" to regulate local railroad affairs.

It had been expected that the state commissions would be the first witnesses before the Newlands committee, but they insisted that the railroads should first present what plans they had to propose, and the committee finally decided that the first testimony to be received should be that on behalf of the railroads, as representing the most specific objections to the present system and proposals for improving it. None of the brotherhoods were represented at the first meeting.

The Eight-Hour Law Controversy

The department of justice has announced its intention of taking direct charge of defending the injunction suits filed by the railroads in various parts of the country to test the Adamson law. Assistant Attorney General Underwood and G. C. Todd, assistant to the attorney general, will have charge of the cases for the government and Frank Hagerman of Kansas City has been retained to assist in the preparation and trial of the cases. It has not yet been definitely stated whether all of the suits are to be tried or whether one will be selected for a test, but it is said to be the intention to hurry at least one of the cases to the Supreme Court as rapidly as possible. The government attorneys left Washington on Monday for Kansas City for the hearing to be held on Thursday on the suit filed by the Atchison, Topeka & Santa Fe. It had been announced that the brotherhoods would not take any part in testing the suits, but on Monday the heads of the four brotherhoods came to Washington and held a short conference with President Wilson, Attorney General Gregory and their legislative representatives, after which it was stated that they would aid the government in opposing the injunction suits.

In addition to the roads mentioned in last week's issue, suits have been filed attacking the validity of the Adamson law by the Missouri Pacific, Chicago, Burlington & Quincy, Chicago, Milwaukee & St. Paul, Illinois Central, Baltimore & Ohio, St. Louis Southwestern, St. Louis, Iron Mountain & Southern and Delaware, Lackawanna & Western. Hearings in several of the suits have been set for various dates during the next two or three weeks.

The threat by W. G. Lee of the Brotherhood of Railroad Trainmen that the brotherhoods will call a strike on January 1 on any railroad that fails to put the "eight-hour day" into effect, law or no law, has served to increase the interest in the labor feature of the Newlands investigation and also in President Wilson's promise to ask legislation from Congress to prevent the recurrence of the situation that arose during the summer. In his message to Congress on that occasion he recommended "an amendment of the existing federal statute which provides for the mediation, conciliation, and arbitration of such controversies as the present by adding to it a provision that in case the methods of accommodation now provided for should fail, a full public investigation of the merits of every such dispute shall be instituted and completed before a strike or lockout may lawfully be attempted."

The President is now engaged in preparing his message to be delivered at the opening of Congress in December and it is understood that he intends to insist on the completion of the legislative program outlined in his previous message. The opposition this proposal will encounter is foreshadowed by the fact that the American Federation of Labor at its convention at Baltimore on November 17 unanimously adopted a committee report taking an unequivocal position against legislation to make strikes illegal. Whether the fact that the election is over will change the position of Congress in the matter remains to be seen. Judge Adamson, in his speech before the chamber of commerce, indicated that it might, saying, "capital and labor cannot have a fight in the street that will halt interstate commerce" and that "when Congress enters the arena it will not do so as a partisan of either side but in a way that will control the entire situation." He also indicated that Congress would not wait for a report by the Newlands committee before taking action.

After his conference with the brotherhoods on Monday, President Wilson conferred with Judge Adamson regarding plans for railroad legislation, after which Judge Adamson announced that he had a bill prepared to introduce when Congress convenes. He did not state definitely what the bill contains. One of the recommendations made by President Wilson for the enlargement and administrative reorganization of the Interstate Commerce Commission is embodied in a bill passed by the House of Representatives and now awaiting action by the Senate. The other recommendations made by the President, in addition to that for an amendment to the Newlands law, provided for explicit approval by Congress of the consideration by the Interstate Commerce Commission of an increase of freight rates to meet such additional expenditures by the railroad as may be rendered necessary by the adoption of the eight-hour day, also a provision for giving the President power to take over railroads for military purposes. Judge Adamson has insisted that the eight-hour law is constitutional and that the Interstate Commerce Commission has power under existing laws to take wages into consideration in fixing freight rates.

Plans for a closer affiliation of the brotherhoods of railroad train service employees with the American Federation of Labor were discussed at the convention of the federation at Baltimore on Tuesday, when addresses were made by W. G. Lee and W. S. Carter, of the trainmen's and firemen's brotherhoods, voicing opposition to the plan of making strikes illegal pending an investigation.

The commission appointed in accordance with the Adamson law to observe its effect in operation is making preparations for beginning its work by arranging for offices in New York. Chairman Goethals has announced a preliminary meeting of the commission to be held in New York shortly. Dr. M. O. Lorenz, assistant statistician of the Interstate Commerce Commission, has been appointed secretary of the eight-hour law commission.

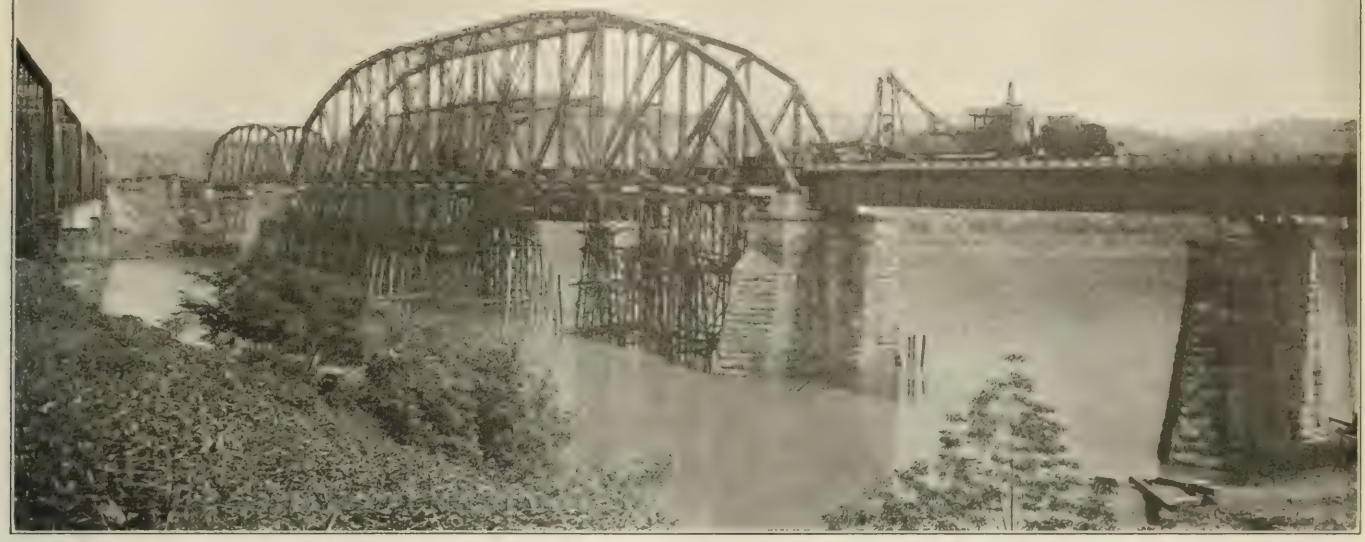
On Tuesday the government filed a motion in the United States District Court at Kansas City against Alexander New and Henry C. Ferriss, receivers for the Missouri, Oklahoma & Gulf embodying two distinct requests of the court, as follows:

1.—The government asks an immediate decision on the injunction petition filed by the receivers for the Missouri, Oklahoma & Gulf, in which the Adamson law was attacked as unconstitutional and an order required forbidding its enforcement. The government contends that the ininjunction petition filed by the receivers for the Missouri, constitutional, the referee leaving the railroad no basis in equity for its action.

2.—Should the law be held unconstitutional, the government asks that the court direct the receivers for the railroad to join the government in getting the case advanced immediately to the Supreme Court of the United States for final decision.

A New Bridge at Kiskiminetas Junction, Pa.

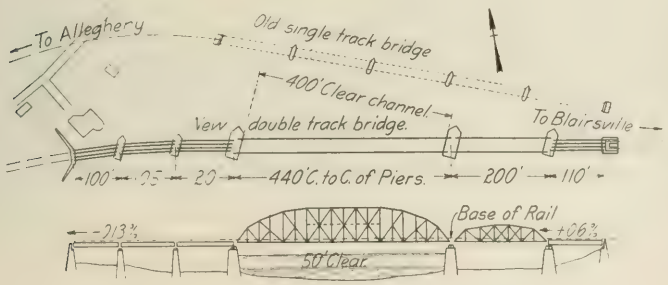
The Pennsylvania Has Completed a Large Structure Across the Allegheny River and Relocated Approaches



Erecting the New Bridge

DURING the past year the Pennsylvania Railroad has completed the erection of a new double-track bridge across the Allegheny river at Kiskiminetas Junction to replace the old structure which had become inadequate for the increased loading and traffic. The old structure formed a single-track section in a double-track line and while gauntlet tracks were provided, operating conditions were not satisfactory.

Kiskiminetas station is located on the Conemaugh division of the Pennsylvania near the entrance of the Kiskiminetas river into the Allegheny. Because of a projected dam across the Allegheny river approximately six miles down stream



Plan and Elevation of the New Bridge

from the bridge, which will raise the pool level of the river, it was necessary to place the new structure at an elevation eight feet above that of the old, elevate the station tracks and buildings and raise a three span gauntleted single-track through pin-connected truss bridge that spans the Kiskiminetas river at this point. This bridge was raised under traffic and the methods followed were described in the *Railway Age Gazette* of February 18, 1916.

Because of this increased elevation it was desirable to relocate the river crossing, abandon the old main line and build new approaches. The new line approaches the bridge from the east on a 1 deg. 52 min. curve, changing to tangent across the bridge as far as pier No. 4. From this point across the two remaining spans the track swings to the left on a 3 deg. 30 min. curve to the junction with the old line.

To reach the new level, the tracks ascend to the bridge from the east on 0.6 per cent grade which continues across the bridge to the main truss span which is level. This span is placed at an elevation of 50 ft. above the average pool level of the river to provide clearance for navigation. Beyond the main span the track descends on a 0.13 per cent grade to the elevation of the old line. This change in grade and relocation of the main line required a large amount of filling, which was obtained from the mills of the United States Steel Corporation at McKeesport and Homestead.

An interesting feature of this bridge renewal is the fact that photographs are available of all the structures which have spanned the river at this point. These photographs illustrate the progressive steps in bridge design to meet the additional requirements of the heavier equipment and increased traffic. The first bridge, as may be seen in one of the accompanying photographs, was a single-track, deck, wooden structure erected in 1866. It was replaced in 1888 by a single-track through steel truss bridge which in turn was replaced by the present double-track structure.

The New Bridge

The new bridge is built for double-track. Beginning at the east end it consists of one 110-ft. deck girder span, one 200-ft., and one 440-ft. through truss spans, one 120-ft., one 105-ft., and one 100-ft. deck girder spans, making a total length of 1,075 feet between parapets. The four east spans are on a tangent and the two west spans on a 3 deg. 30 min. curve. The piers are placed parallel to the direction of the flow of the stream and at an angle of 75 deg. with the center line of the bridge. Approximately, 3,400 tons of steel were required in the superstructure.

A concrete deck was applied to the deck girder spans which aggregate 445 ft. in length. The slab was poured in place for each track separately. The stone ballast was placed in the trough-shaped slabs and new ties and rails were laid.

The fully-ballasted track is shown in one of the accom-

panying photographs which also shows the reinforced concrete slab sidewalks which are provided on each side of the tracks across all the girder spans. The slabs are self-supporting and were cast outside at a central plant. They were then brought in and placed in the position shown in the photograph.

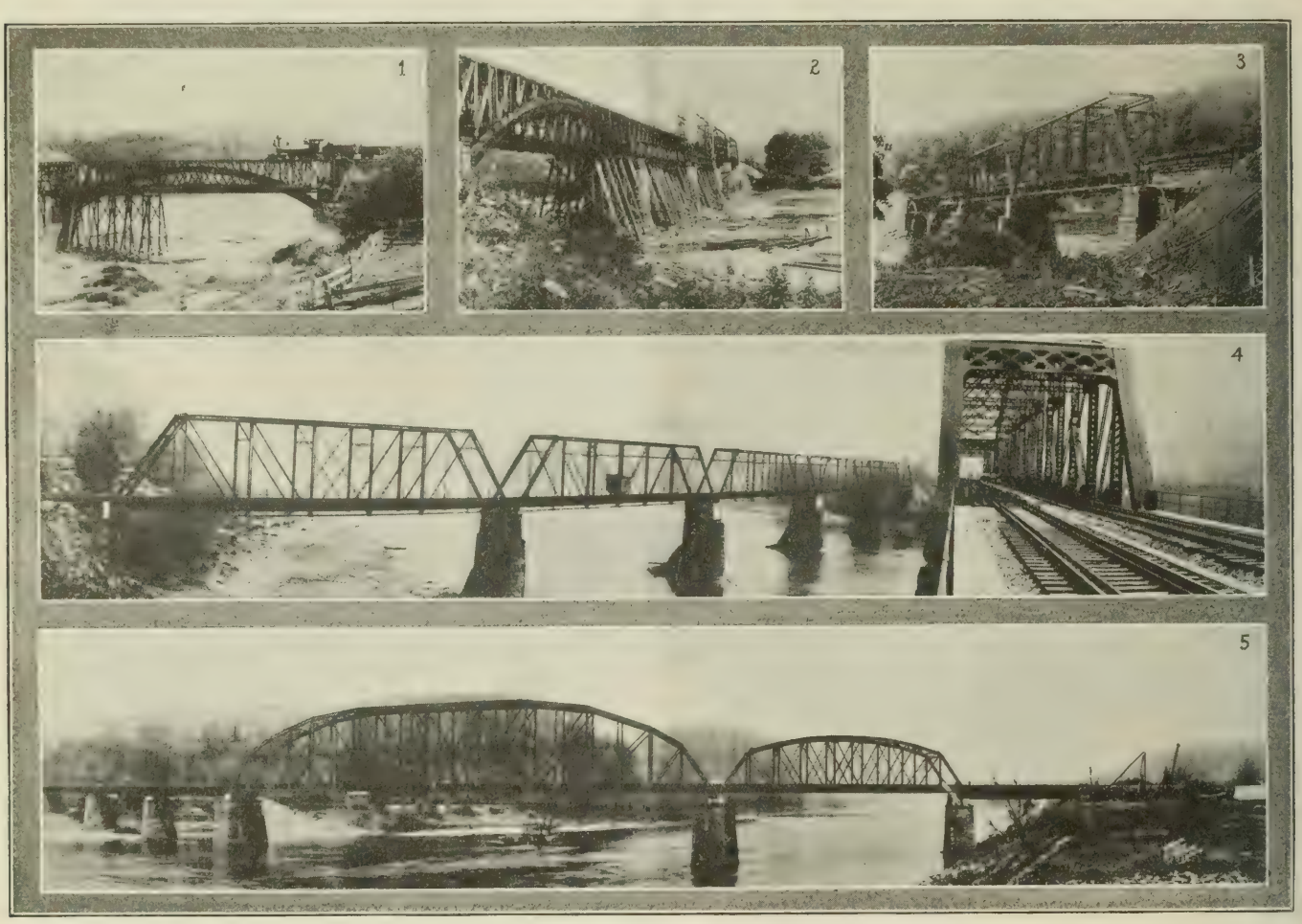
Construction was commenced in March, 1915, and was continued without interruption until completion on December 1, 1915. The building of the bridge in its new location made it possible to carry on the work free of all traffic and without interference with the old bridge. The materials for the sub-structure were concentrated at a shore plant on each side of the river. A trestle was run out from the east shore to pier No. 2, and from the west shore to pier No. 3. These trestles carried narrow gage tracks for handling light material and concrete. The stone and heavier materials were loaded into flat boats and floated to the proper position. Derricks were provided at the shore plants and at the pier sites for handling the materials.

The construction work was carried on from both shores and was completed without trouble from high water. Coffer dams of steel sheet piling were provided and the excavation for the piers was carried down to rock at an elevation of about 20 ft. below the bottom of the stream. The water in the coffer-dams was lowered by 6-in. centrifugal pumps and no serious leakage occurred. The masonry was carried to rock and approximately 23,000 cu. yds. were required in the abutments and piers which are of Pennsylvania sandstone with concrete backing.

Because of the necessity of maintaining an unobstructed channel for navigation the method of erecting the steel of the main truss span is of interest. Single falsework bents were erected at all panel points of the truss to the limits of the channel. Here the bents were doubled and 100-ft. deck girders were placed across the channel. These girders served as falsework and provided a channel approximately 90 ft. in width. To provide the proper vertical clearance under the girders, it was necessary to erect the new truss at an elevation of four feet above the final grade. When the erection was completed the falsework was removed and the truss span was jacked down to its proper level.

Other Features

In connection with this project, a new station is under construction to replace the present wooden structure that is old and improperly located. At this point the tracks of the western Pennsylvania and the Conemaugh divisions of the Pennsylvania cross at grade, at an angle of about 70 deg. The present station is located in the larger angle formed by the crossing and in such a position that the trains of one division, standing at the station, extend across the tracks of the other.



(1) The Original Wooden Bridge Erected in 1866, (2) Removing the Wooden Bridge in 1888, (3) The Five Span Single Track Steel Bridge, (4) and (5) The New Structure

To remedy this condition in the new layout the old station site was abandoned and the new building was placed on the opposite side of the tracks of the Conemaugh division to gain the advantages of the smaller angle. The building is placed symmetrically between the tracks of the two divisions and, without sacrificing accessibility from the station, it was possible to so locate the platforms that trains can be served on either line while standing clear of the crossing.

The new station is carried on spread concrete foundations and is a one-story brick structure with terra-cotta trim and

a tile roof. The waiting room occupies the central part of the building. The building also contains a women's room, a men's room, a ticket office and a baggage room. There are two main entrances to the waiting room, one from the tracks of each division. The station platform is 15 ft. wide and 1,200 ft. long, 600 ft. being provided along the tracks of each division. These platforms are connected with the station by walks laid out as a part of a park system. More than 4,000 ft. of concrete curb was required in building the walks and the park.

These improvements have been carried on under the general direction of A. C. Shand, chief engineer of the Pennsylvania. N. F. Brown, assistant engineer, is in charge of all



The Concrete Ballasted Deck on the Girder Spans

construction. The rebuilding of the roadway and tracks was done by company forces. The steel in the bridge was fabricated and erected by the Mc-Clintic-Marshall Company of Pittsburgh, who also removed the old bridge. McMenamin & Sims of Philadelphia were contractors for the substructure and removed the old masonry from the river. Henry Shenk Company of Pittsburgh has the contract for the station building.

SPECIAL RAIL INSPECTION

In 1912 a special inspection service for rails, supplementary to that previously employed, was inaugurated by Robert W. Hunt & Company, Chicago, since which time it has been applied to over 4,500,000 tons of rails. While the ordinary inspection made by this and other testing companies is confined primarily to the examination of the finished rails, this special inspection provides for the stationing of additional inspectors throughout the mill where they can observe the principal steps in the manufacture of rails. As this service has now been in effect for four years it is possible to give some idea of its merits and of the results it is accomplishing. The November Employees' Bulletin of Robert W. Hunt, & Company contains an analysis of the statistics prepared by the rail committee of the American Railway Engineering Association for the year ending October 31, 1915, showing the number of failures reported from rails rolled under the special inspection as compared with those not subjected to it. This study shows that there were 19.6 failures reported per 100 track miles of rails rolled under this special inspection as compared with 26.4 failures reported for those to which this inspection did not apply, or 40 per cent less failures with rails subjected to the special inspection.

NATIONAL CHAMBER OF COMMERCE DISCUSSES RAILROAD SITUATION

A special meeting of the National Council of the Chamber of Commerce of the United States was held at Washington, D. C., on November 17 and 18 for the purpose of discussing some legal way of preventing an interruption of railroad service and some way of avoiding the conflict of 49 jurisdictions in railroad regulation. President Rhett, who presided, pointed out that the association represents a membership of over 350,000 and that it was proposed to secure referendum votes to reflect the views of the business men of the country on these subjects.

Dr. Charles R. Van Hise, president of the University of Wisconsin, discussed the Adamson law, which he declared imposed an unwarranted burden upon the public without any investigation as to whether it was justified or not. He said that it was necessary to enact legislation to prevent disaster to the public by a strike causing the interruption of railroad service and advocated an amendment to the Newlands arbitration law providing for a public investigation and recommendations before a strike can legally be called.

"If Congress will act in accordance with this recommendation of President Wilson's," he said, "we shall probably get as far as we can at the present time; but, if necessary, regulation should go to its logical conclusion and provide that some public tribunal shall decide what is a fair wage. Such a tribunal might consist either of a division of the Interstate Commerce Commission or a separate wage commission, but in either event a set of experts and statisticians should be at work all the time studying the question. Representatives of the employees and the employers might sit with this commission in each case."

Dr. Van Hise pointed out that, while railroads have been brought under a policy of strict governmental regulation, the employees are still as free as they were when the managements were wholly free from regulation. They are so strongly organized as to conduct concerted wage movements but the public interest still is paramount. He gave an outline of the developments in the present wage controversy, saying that the action of Congress in passing the Adamson law was one-sided in that it did what the men asked, but did not do anything to prevent a recurrence of the situation. "We are now in the ignominious position," he said, "where the same thing may be imposed upon us again. These same men may come back two years from now, or at the next presidential election, and say 'if you don't give us time and a half for overtime in four days, we will strike.' If remedial legislation is not passed it is inevitable that the country shall go through the same ignominious procedure unless a courage is exhibited which was not exhibited in this case." He thought that the plan of requiring employees to sign a contract not to strike would not be feasible.

W. C. Adamson, vice-chairman of the congressional Joint Committee on Interstate Commerce, discussed both the Adamson law and the proposed investigation by the Newlands committee. He insisted that the law provides for a limitation of the hours of work in the same way that the 16-hour law did, but expressed the opinion that Congress would pass further legislation to prevent the interruption of transportation without waiting for a report of the Newlands commitee. He said that the committee wishes to hear from everybody who has any information on the subject of railroad regulation and that because the committee was delayed in beginning its work, it is probable that Congress will provide for an extension of time instead of requiring a report in January. He said there is no doubt about the plenary power of Congress to control all the operations of the railroads in interstate commerce, saying, "Congress has

the power to regulate wages in interstate commerce if it wants to, but it never has done so."

Mr. Adamson opposed the proposal of the railroads that the Interstate Commerce Commission take over the regulation of rates within the states, saying that the states were here before the Constitution and that in every commerce law ever passed it was necessary to recite that it did not apply to commerce within the states, in order to make it constitutional. "I do not know of anybody," he said, "who ever asked these capitalists to go and buy up all the railroads that the people in the different states had helped to build and consolidate them into great systems to speculate on. That is not any more popular than absentee landlordism is in Ireland, and if the railroads would study and operate to please the people they would not have to work so hard to secure resolutions from chambers of commerce." He said that the Republican convention in recommending centralization of authority over transportation, wisely pointed out that the only way to do it was by an amendment to the constitution. He said he did not know whether anyone would seriously argue for government ownership of railroads but that government ownership would be the complete subjugation of the government to the railroads. "In the first place," he said, "they will be capitalized for 25 billion dollars. There is not that much money in the world, but the federal government can issue 25 billion dollars worth of bonds and the present holders of railroad securities would get the bonds, the government would have the property and we should have to hire the railroad managers to run the railroads, and it would be the most powerful political oligarchy that ever was on the face of the earth. We have never reached that extremity and never shall until republican institutions bite the dust at the feet of despotism. It is not necessary. Under our system of government all the representatives have to do is to do their duty and they will control the railroads without owning them."

Alfred P. Thom, general counsel of the Railway Executives' Advisory Committee, outlined the proposals which the railroads will lay before the Newlands committee for changes in our present method of regulation. He said the present system had its genesis in the abuses of the past and that the public is now concerned with the question whether this industry can survive if the system of regulation is to be permanently based upon principles of correction, repression and punishment instead of on conservative principles. He said it is the judgment of railroad managers that the credit of the carriers is not as high and as stable as it ought to be. They have mortgaged their properties and borrowed because they are unable to finance through stock issues; and this until the equity in the property has been reduced to the danger point. No business can endure without capital that takes the risk of the business. The railroads' proposals must be measured by the standard of public interest in the necessity for allowing the instrumentalities of commerce to meet the necessities of American commerce. "The high cost of living," he said, "is due to a limited supply of the things that people live on. If the supply could be doubled, prices would not be so high. Production could be increased if transportation facilities could be extended to the vast undeveloped but productive areas of the American continent."

Mr. Thom said that the railroad business is managed according to political principles instead of on business principles and that it cannot be permanently useful unless it is treated as a business and regulated by one consistent and uniform governmental policy instead of by 49 governmental policies. He pointed out that about 85 per cent of the commerce of the country is interstate and that it is a right of each state to be protected against narrow and inadequate policies on the part of another state.

Charles Nagel, former Secretary of Commerce and Labor, said that when the railroad employees reflected upon the real meaning of the eight-hour law they would not accept it. He urged that the plan of arbitration be adhered to and he doubted the efficacy of a plan of wage regulation.

Dr. Victor S. Clark of Washington, of the Carnegie Institution, formerly United States government investigator of railroad, labor conditions in Canada, Australia, and New Zealand, told of the success of the Canadian disputes act. He stated that about 225 cases have been handled under the act and that in the 75 cases regarding railroad service all but nine have been settled without strikes and that the act seemed to have even more popularity among the workers than among the railroad managers.

Henry R. Towne of New York, President of the Yale & Towne Manufacturing Company, outlined a plan for avoiding strikes and lockouts which has been endorsed by the Merchants' Association of New York and presented by that body to the national chamber for referendum. The plan involves a system of contracts between the railroads and their employees with the establishment of funds by both parties from which penalties will be paid for breach of contract. The plan further involves contracts which are individual between the railroad and each employee and not with a railroad employees' union. (See *Railway Age Gazette,* September 29, page 545.

H. A. Wheeler, vice-president of the Union Trust Company, Chicago, led the general discussion of the railroad situation and pointed out that since August, 1914, the people of the United States have invested more than two billion dollars in foreign securities while there had been practically no market for new railway stock issues.

Invitations to be represented at the meeting had been sent to the executive officers of the four brotherhoods of train employees. Two of them had not replied at all. President Carter of the firemen's organization had replied that he would not be able to be present and a reply on behalf of President Garretson of the conductors' organization, said that it would not be represented.

At the concluding session the national council adopted resolutions recommending that a referendum or referenda be prepared and submitted, to ascertain the opinion of the business interests of the country, respecting legislation designed:

(a) To prevent interruption of transportation service, pending the settlement of disputes between employers and employees of transportation lines, and to avoid any recurrence of the situation created by the recently threatened railway strike, which situation the President of the United States declared in a statement made public on August 18, 1916, "must never be allowed to arise again."

(b) To make certain that the transportation facilities of the country may be stabilized, improved and extended to meet and keep pace with the needs of commerce and the entire public.

The referendum as it goes out will embody specific recommendations, and take into consideration suggestions made at the meeting regarding government ownership, federal regulation, federal incorporation, government supervision of the issuance of stock, and expansion of the Interstate Commerce Commission.

The chamber's committee on the railroad situation has issued in pamphlet form a report of its work in endeavoring to bring about a settlement of the railway wage controversy during the spring and summer, along the lines of its proposal for a reference of the entire controversy to the Interstate Commerce Commission. The report includes copies of all the correspondence of the committee on the subject, including that with the brotherhood officers, who had refused to give the committee any information; with the representatives of the railroads, with President Wilson and with the congressional committees. The report and the correspondence show the repeated but unsuccessful efforts made by the committee to secure a conference with the leaders of the brotherhoods.

and to secure information from them as to their side of the case, after which the brotherhoods' publicity bureau had issued a statement charging the chamber with arriving at a conclusion "without hearing or asking for information from any one representing the employees." It also describes the unsuccessful efforts of the committee to arouse interest in Washington in the seriousness of the situation throughout the progress of the controversy.

THE CONCLUSION OF THE LOUISVILLE HEARING

On November 17, C. H. Markham, president of the Illinois Central, H. E. Bryam, vice-president of the Chicago, Burlington & Quincy, G. L. Peck, vice-president of the Pennsylvania Lines West and W. G. Besler, president of the Central of New Jersey, representing the executive committee of the American Railway Association, met with C. C. McChord, of the Interstate Commerce Commission at Louisville, Ky., to discuss a plan of the American Railway Association to relieve the present car shortage. As a result of the conference a committee of railroad operating officials will open offices at Washington, D. C., this week, where they will sit with a member of the Interstate Commerce Commission and will have plenary power to adopt such emergency measures as necessary to facilitate the circulation and distribution of equipment in the country. The railroad members of the committee are as follows: George Hodges, chairman of the Committee on Relations Between Railroads of the American Railway Association, chairman, C. M. Sheaffer, general superintendent transportation of the Pennsylvania; E. J. Pearson, vice-president of the New York, New Haven & Hartford; E. H. Coapman, vice-president and general manager of the Southern; W. A. Worthington, vice-president and assistant to the chairman of the Southern Pacific; W. L. Park, vice-president of the Illinois Central. The name of the member representing the Interstate Commerce Commission has not been announced. The immediate program of this committee will be to inaugurate such temporary measures of relief as are necessary, following which, it will make permanent alterations of the car service rules along the lines outlined in the report of the committee on car service of the American Railway Association published in the *Railway Age Gazette* last week.

The Louisville hearing on the car shortage, conducted by Commissioner McChord, continued throughout last week and was scheduled to terminate on Tuesday of this week.

J. W. Roberts, superintendent of freight transportation of the Pennsylvania Lines West, was of the opinion that if the railroads had been compelled during the last few weeks to send home all empty cars, the traffic of the country would have been paralyzed, and that any radical or drastic action taken by the commission or the carriers in the present abormal circumstances would stop the wheels of business the country over.

An attorney representing the New York, New Haven & Hartford read a telegram from Howard Elliott, president of the road, asserting that the entire country would suffer if the various New England roads were compelled to send all cars in excess of their ownership back to their owners. He stated that one reason for the excess of cars in that section was that the entire United States is calling upon New England for her manufactured products. New England, he asserted, possessed one sixth of the bank deposits of the country, all of which was a basis for credit and expansion for the entire country. Any reduction in the number of cars in New England would curtail business there and react disastrously on the rest of the country.

A. R. Whaley, vice-president in charge of operation of the New Haven and its subsidiary, the Central New England, stated that the lack of common labor to handle freight was a considerable factor in aggravating the car situation in New England today. He stated that during the past summer his road sent agents into the south and brought back 2,200 negroes to handle freight and install improvements. Within 24 hours after their arrival representatives of munition plants and contractors offered them wages which the railroads could not meet. Two days before his departure for Louisville, only 400 of them were still in the employ of the company. Mr. Whaley also stated that an extension of the time fixed for putting the Safety Appliance Act into operation would release a large number of men for freight handling purposes. He asserted that several thousand New Haven cars had not yet been equipped with safety devices and that a large force of men was kept busy equipping them, so that they will be ready when the law goes into effect next July.

Frank H. Alfred, general manager of the Pere Marquette, stated that the Panama Canal Act was responsible in some measure for the car shortage in his section of the country. A provision of the act prohibiting railroads from operating water and rail lines between the same points, according to Mr. Alfred, resulted in Great Lakes vessels being transferred to sea service with the result that an immense quantity of grain and coal formerly shipped over the lakes was now being transported by rail. He stated that coal supplies should be laid in during the summer months and advocated higher freight rates for coal during the winter months, the rate to increase every 30 days, and also the charging of progressively increasing prices as incentives for the purchase of coal in summer.

O. C. Castle, car service agent of the Southern Pacific, Texas Lines, charged the Erie with holding 50 carloads of apples for periods averaging 15 days, and announced that a total of more than 800 loaded cars of apples were on this line at the present time, numbering 50 per cent in excess of those on the line at the same time a year ago. T. H. Burgess, assistant general solicitor of the Erie, explained this situation by stating that fruit growers of the west send their goods east before they are sold. He said that every one of the 50 cars mentioned by Mr. Castle was shipped with a sight draft attached to the bill of lading and that the consignees would not take them. Under the circumstances the Erie was powerless.

F. B. Dow, examiner attorney of the Interstate Commerce Commission, read several detailed statements prepared by inspectors of the commission working at Toledo, Chicago, Sandusky, Lorain, Ohio, and other terminals for coal shipments showing the loaded cars held for reconsignment, cars loaded with fuel coal for the carriers, empty coal cars, how long held, etc. It was shown that on November 17, a total of 6,539 coal cars were under load at Chicago, 1,437 being held for reconsignment.

C. B. Phelps, superintendent of transportation of the Louisville & Nashville, charged an eastern Kentucky coal company with refusing to use cars which he had placed at its disposal for shipping contract coal to a Hamilton (Ohio) public utility. A representative of the company in question admitted the charge, but stated that his company did so because it wished to prorate the cars among all its contract customers north of the embargo line of the L. & N. It was further charged by the Louisville & Nashville that since November 1, it had loaded and billed 105 cars for the Hamilton (Ohio) utility company to be sent via the Cincinnati, Hamilton & Dayton, but that only 23 of these cars had ever reached their destination.

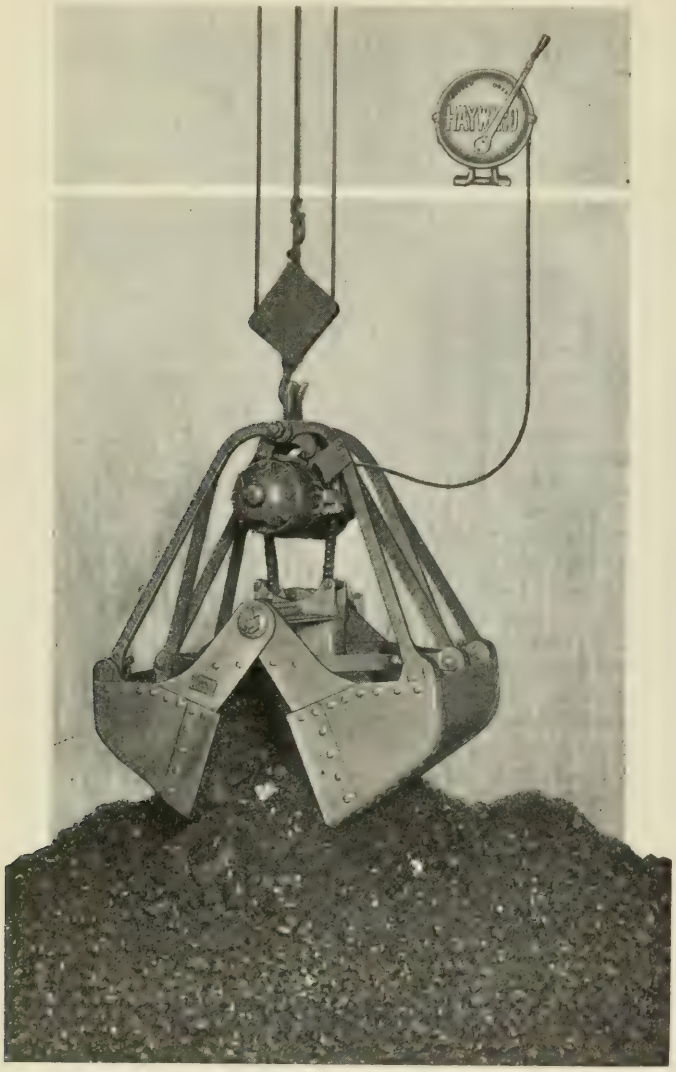
Various railroads reported substantial progress in returning empty coal and refrigerator cars to owning roads, in accordance with the requests of Mr. McChord.

Bolivian Railroad to Be Opened.—The La Paz-Yungel Railway will be opened for traffic December 1. The line is approximately 137 miles long.

A MOTOR-OPERATED CLAM SHELL BUCKET

An electrically operated clam shell bucket, which has been designed for use where the hoisting apparatus is equipped with a single hook of sufficient capacity to handle the weight of the bucket and its contents, has been developed by the Hayward Company, New York, and is now being used by a number of railways for excavating, loading and unloading operations, including the handling of coal and cinders. The bucket is operated electrically by means of a motor and transmission which are self-contained in the bucket. The motor, driving the winding drum through a train of gears enclosed in a dust and moisture proof case, closes the bucket by winding up on the drum a closing chain which is passed around a sheave in the lower center of the bucket. By reversing the motor, the chain is unwrapped from the drum, allowing the bucket to open.

The opening and closing motions are secured by the



The Bucket and the Controller

manipulation of a controller which is connected to the bucket motor by means of a flexible feeder cable containing the necessary number of electric conductors. In order to reduce the abrasion of these conductors, a cable reel is provided, which operates automatically, so that as the bucket is lifted or lowered the cable is wound up or paid out from the reel. The cable is also provided with a special center core for the purpose of taking the tensile strains from the conductors.

A special feature of the construction of the motor unit is the introduction into the transmission of a disk clutch which is adjustable for the load transmitted and which slips whenever the jaws of the bucket come together or meet with an obstruction. This permits the motor to continue running until the controller is moved to the "off" position, and makes it impossible to stall the motor across the line when closing the bucket.

As the opening and closing motions of the bucket are obtained through the operation of the motor, which is under the positive control of the man operating the controller, the bucket can be made to dig as little or as much as desired and its contents can be discharged rapidly or very slowly.

Buckets of this type have been in service on the Pennsylvania Railroad at East Altoona (two), Enola, West Philadelphia and Huntington, for periods of one year or more. The first four are used exclusively for cleaning ash pits, but the one at Huntington is also used at times for coaling locomotives. At some of these points it has been found possible, since the installation of the motor buckets, to dispense with the night forces at the ash pits, as they are of sufficient capacity to hold the night's accumulation. These buckets are rated at 1 cu. yd. capacity and have an extreme width of 3 ft. 4 in. so that ample clearance is assured between the bucket and the side walls of the pits. It has been found that the crane operators can place the buckets in the pits without the assistance of a man on the ground, thereby reducing the operating expense in removing the ashes.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS

Proposed changes in methods of state and federal regulation of railroads were the principal topics of discussion at the concluding sessions of the convention of the National Association of Railway Commissioners held in Washington last week. The proceedings of the first two days of the convention, November 14 and 15, were reported in last week's issue.

The association passed resolutions on the recommendation of its committee on state and federal legislation endorsing the Sheppard bill introduced in Congress at the last session, providing for an amendment to the act to regulate commerce to prevent the Interstate Commerce Commission from exercising jurisdiction over rates within a state until there has been a judgment of a court of competent jurisdiction holding the state rate unreasonable. The convention also adopted a resolution proposed by the same committee favoring the creation of regional commissions subordinate to the Interstate Commerce Commission, but after long discussion referred back to the committee for report next year a proposal to give the Interstate Commerce Commission jurisdiction over the issuance of securities and a proposal for the creation of a separate bureau for the purpose of prosecuting cases before the Interstate Commerce Commission as a representative of the public. It was decided to appoint a new committee of seven members to consider and report at the next annual meeting on the question of public ownership and operation of public utilities as contrasted with private ownership of public utilities. A committee on car service and demurrage was appointed to confer with the Interstate Commerce Commission to request that immediate steps be taken to relieve the car shortage situation and the committee on state and federal legislation was authorized and directed to appear before the Newlands committee at its hearing this week and to take such action as it deems wise and just in the premises.

The association also adopted a resolution recommending that the act to regulate commerce be amended to confer full power upon the Interstate Commerce Commission to issue rules and regulations in the matter of the exchange, interchange and return of empty freight cars to the owning roads.

It was also decided to petition the Interstate Commerce Commission to consider the advisability of amending its rules of practice so that the commission would render no decision in any case in which at least one member of the commission shall not have heard the entire evidence, except where a referee or examiner has been appointed to take testimony, in which case the referee or examiner shall submit his findings of fact to all interested parties for their criticism before submitting it to the commission. The Interstate Commerce Commission was also asked to insert in its annual report forms pages for the reporting of a classification of operating expenses between freight, passenger and joint expenses.

A resolution was adopted expressing the sense of the meeting that if the Interstate Commerce Commission orders a change in the fiscal year for which annual reports are filed, the state commissions shall call for reports for the calendar year 1916 and ask their state legislatures to authorize the change in the fiscal year at the earliest opportunity.

State and Federal Legislation

The report of the committee on state and federal legislation, L. B. Finn of the Kentucky commission, chairman, was the last to be presented and its discussion occupied nearly a day and a half. The committee on capitalization and intercorporate relations had submitted a report recommending federal regulation of security issues, but its discussion was postponed until after the report of the legislative committee had been presented and it was then ordered to be filed.

The legislative committee presented the results of a questionnaire on the question of exclusive federal regulation of railroads, which it had submitted to the various state commissions and to which 28 replies were received. All but two that replied opposed exclusive federal regulation. The Pennsylvania commission expressed the opinion that it would be a wiser policy to centralize a great deal of power exclusively in the federal government, but where or how the line could be drawn it does not know. The New York commission stated that certain of its members are united in the belief that certain elements of regulation should be centralized in the federal government. The committee submitted a series of resolutions, the first of which was that endorsing the Sheppard bill which was passed after considerable discussion with but one dissenting vote. W. T. Emmet of the New York Second District Commission, said that he was in favor of the enlargement of the powers of the federal commission and some diminution of the powers of the state commission and he cited the discrimination created by the fact that New York has a 2-cent passenger fare while the interstate fare is 2½ cents a mile in that territory. Clifford Thorne, chairman of the Iowa commission, said that a proposal to centralize regulation in the hands of the federal government was a proposal to overthrow our present form of government. He said that he would not claim that the state commissions were always right, but that he had found 11 rate cases involving a conflict between the jurisdiction of the states and the federal government and that in no case, whether the interstate rates were made by the commission or by the railroads themselves, had the findings of the state commission been sustained. "In other words," he said, "our batting average is very low." He also objected because important cases are decided without the evidence having been heard by any member of the Interstate Commerce Commission and on a "secret" report submitted by an examiner. He said he was not criticizing the Interstate Commerce Commission, but that he thought it was "a little more removed from the people" than the state commissions and that in cases of discrimination between them the decision should be left to the decision of the courts.

The second recommendation of the committee, that a state or an interested shipper should have the same right to a court review of negative orders of the Interstate Commerce Commission as is allowed as to affirmative orders of the commission, was adopted, but as to its third recommendation, that the Interstate Commerce Commission be given power "to compel proper publicity" as to issues of securities by interstate carriers, there were many differing opinions. Many of the commissioners were not satisfied with the publicity plan, insisting on the regulation of security issues, but when a substitute resolution was introduced by Mr. Thorne, giving the Interstate Commerce Commission the power to regulate securities while reserving the powers of the states, objection was made that such a plan would complicate the present situation. J. O. Carr of the New York second district commission and E. O. Edgerton of the California commission argued strongly in favor of exclusive federal regulation of securities to avoid the delay and confusion which they said now exists when a railroad is required to go to several states to have a bond issue approved. Mr. Edgerton described a case where the California commission had authorized a large issue of bonds by the Southern Pacific, part of the proceeds of which was to be spent for improvements in California, but its action had been nullified when the Arizona commission refused to approve the issue unless a certain part of the money was to be spent in Arizona. He said the position of the railroads is made intolerable when states engage in such a "scramble," and that he was not advocating less regulation but more efficient regulation. Mr. Carr said the present situation is ridiculous and merely adds to the expenses which are paid by the people. Thomas Duncan, chairman of the Indiana commission, said that dual control of securities would not work, that there is some justice in the claim of the railroads that there is too much regulation, and that the scheme of regulating securities will fail unless the states give up some of their rights. O. P. Thompson, of Illinois, objected to a surrender by the states of authority over stock and bond issues, saying that the next step would be to ask them to give up their control of rates and the power of incorporation for the same reasons. J. L. Bristow, of Kansas, said there might be some excuse for the action of the Arizona commission and said that a road in his state had had its ability to serve the people of the state impaired because it had mortgaged its property in the state to buy a railroad 1,000 miles away. C. E. Elmquist, of Minnesota, moved that the entire question be referred back to the committee for report next year and after some discussion it was so decided.

The resolution recommending regional commissions was adopted by a vote of 21 to 15 after eight different drafts had been discussed. In its final form it was as follows: "We believe the time of the Interstate Commerce Commission and the time consumed in the disposing of cases would be conserved by the creation of subordinate or regional commissions, the right being reserved for appeal or review in proper cases by the Interstate Commerce Commission."

No report was presented by the committee on car service and demurrage, but members of the Nebraska, Kansas, Illinois, Wisconsin, Iowa, Washington and Oregon commissions held a meeting and asked that the subject of the car shortage be made a special order of business. Commissioner Funk of Illinois was made chairman of a committee to confer with the Interstate Commerce Commission on the subject.

Commissioner Yates of Illinois read into the record an editorial from a Washington newspaper expressing the opinion that the state commissioners were actuated by fear of losing their jobs in opposing federal regulation. This he denounced as a "gratuitous insult" and had it referred to a committee.

Valuation Report

The valuation committee, Charles E. Elmquist of Minnesota, chairman, presented a report outlining in detail the

interest of the state commissions in the valuation of railroads being made by the Interstate Commerce Commission and outlining the attitude of the state commission toward many of the questions involved in the valuation. The report also described the work of the valuation committee appointed by the National Association of Railway Commissioners, which in May, 1916, established a bureau at Washington with the approval and encouragement of the Interstate Commerce Commission and of the division of valuation. C. B. Aitchison resigned as chairman of the Oregon commission to become the solicitor for the valuation committee and its Washington representative, devoting his entire time to the service of the state commissions in connection with federal valuation matters. Financial support for this work has been received from 16 states and others have assisted in various ways. Through this Washington bureau the committee has kept in close touch with the work of the division of valuation and has taken the lead in getting interested state commissions into conference for the purpose of analysis of various phases of the valuation situation. A number of properties have been inspected with the state commissions and their engineers, field notes prepared by the federal engineers have been checked and field parties have been visited to obtain first hand information as to the manner in which the work is being done. There have been daily discussions with officers or employees of the commission concerning the features of the work which affect the states. A number of special studies have been undertaken and a large amount of unit cost data has been assembled, supplied by the engineering departments of various commissions. Progress reports have been sent to the state commissions from time to time and special information has been supplied to the commissions interested in special valuations under way.

The committee holds that undue haste in the making of the federal appraisal is to be deprecated, and that the work should be done so thoroughly, that no question will remain open as to its accuracy and justness, or else the appraisal should not be made at all. It also holds that the question of whether a single value is to be deduced as the value of the property of any certain railroad is one of prime importance. The contention is made that such a construction may not be placed upon the federal valuation act. Upon this point, the report says: "The committee regards of primary importance the question of construction of the valuation act, as to whether the commission (Interstate Commerce Commission) is directed, after investigating the three costs and the history of each carrier, to deduce a single sum and to state the same as being the value of the property of the railroad without reference to the purposes for which the appraisal was made, and without qualification of the term 'value.' Such a construction of the act has seemed to the committee to be clearly negatived by its terms; and to be contrary to the intention of Congress as expressed in debates and antecedent history of the movement for a physical valuation; and, if adopted would lead to inconclusive, misleading, and confused results. Inasmuch as the decisions of the Supreme Court as to valuation are still largely unsettled, and the valuation act does not contemplate that some important elements, which must be taken into account in determining value in a rate case, should be investigated in the present proceedings; and because of the loose sense in which the elusive term 'value' is commonly applied to different and repugnant ideas, this committee has consistently opposed the construction of the act contended for by the carriers, which would culminate in a single ultimate finding of the value of the property of the carrier, based upon the principles which would be applied in a condemnation case. In the tentative valuations so far served by the commission are to be found no ultimate finding of value, in the sense contended for by the carriers, but there are findings of the various elements of value, stated separately and in detail as in the act required."

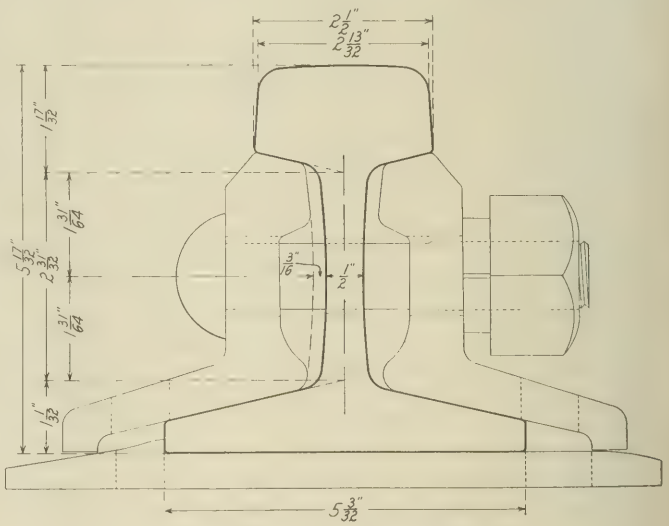
The committee on railway service, accommodations and claims, E. C. Niles of New Hampshire, chairman, pointed out that shippers' claims on account of overcharges under the interstate commerce act must be filed within two years of the date of their accrual, while the claims of a railroad against a shipper based on an undercharge is barred only by the statute of limitations. This distinction the committee believes unjust and it recommended that the committee on state and federal legislation be authorized on behalf of the association to take such steps as may be necessary to secure from Congress the same limitation upon claims by carriers for undercharges as is established by law upon claims by shippers for overcharges.

The committee on rates, W. S. Stutsman of the North Dakota commission, chairman, presented a review of the Shreveport rate case with a conclusion that the legislation covered by the resolution passed at the 1914 session of the association, recommending the amendment to the act which is provided for by the Sheppard bill, is vital to the continued existence of state railroad commissions and the exercise of the powers and duties with which they are charged by law.

Officers were elected as follows: President, Max Thelen, chairman of the California Railroad Commission; first vice president, E. C. Niles of the New Hampshire commission; second vice president, Charles E. Elmquist of the Minnesota commission; secretary, W. H. Connolly, secretary division of valuation of the Interstate Commerce Commission; assistant secretary, J. B. Walker of the New York First District Commission. It was decided to hold the next convention in Washington on October 16, 1917.

A NEW 90-LB. RAIL SECTION

The Chicago & North Western has designed a new 90-lb. rail section for use in its 1917 rolling, which embodies a number of features of interest. Before designing this section careful consideration was given to the probable necessity for increasing the weight of rail in the future and the conclusion was reached that the 90-lb. and 100-lb. sections will be sufficiently heavy for the traffic of the North Western for many years. A new 100-lb. section was designed two years



New C. & N. W. 90-lb. Rail

ago and has been used since that time with very satisfactory results. The new 90-lb. section has been designed for main line use with that section. While not the governing principle in the design of the new rail, advantage was taken of the opportunity to adapt it to the 100-lb. joint to enable the same angle bars to be used with both sections of rail. Also the same joint and intermediate tie plates may be used for

both the new 90 and 100-lb. sections, although the width of the base differs slightly. This uniformity of fastenings will not only prevent confusion, but will result in very material economies in the amount of material held in stock.

Comparison Between 90-Lb. Rail Sections

	Proposed C. & N. W. 90 lb.	A. S. C. E. 90 lb.	A. R. A. (A) 90 lb.	A. R. A. (B) 90 lb.
Weight (lb.)	90	90	90	89.5
Height (in.)	5 17/32	5 3/4	5 5/8	5 17/64
Width of base (in.)	5 5/64	5 3/8	5 1/8	4 49/64
Thickness of base (in.)	1 1/32	59/64	1	1 1/32
Width of head (in.)	2 1/2	2 3/8	2 9/16	2 9/16
Thickness of head (in.)	1 17/32	1 19/32	1 15/32	1 39/64
Thickness of web (in.)	1/2	9/16	9/16	9/16
Above neutral axis	3.056	2.83	3.085	2.825
Below neutral axis	2.475	2.54	2.54	2.445
Fishing depth (in.)	2 31/32	2 55/64	3 5/32	2 5/8
Area head (sq. in.)	3.35	3.68	3.20	3.56
Area head (per cent)	38.0	42.0	36.2	40.1
Area web (sq. in.)	1.75	1.85	2.12	1.70
Area web (per cent)	19.8	21.0	24.0	19.2
Area base (sq. in.)	3.72	3.30	3.5	3.61
Area base (per cent)	42.2	37.0	39.8	40.70
Area total (sq. in.)	8.82	8.83	8.82	8.87
Moment of inertia	36.72	34.4	38.70	32.3
Section modulus (head)	12.02	12.3	12.56	11.45
Section modulus (base)	14.82	13.2	15.23	13.21
Ratio of mom. inertia to area	4.16	3.90	4.39	3.64
Ratio of sec. modulus to area	1.36	1.39	1.42	1.29

In designing the new section an endeavor was made to secure a sufficient fishing depth to enable a joint of the requisite strength to be used and also to secure a thicker base than previously employed. As a result the new section is a compromise between the American Railway Association, A and B sections. The rail has the same thickness of flange as the B section (1 1-32 in.) but has a fishing depth of 2 31-32 in. as compared with 3 5-32 in. for the A.R.A. type A section and 2 5-8 in. for the B section. As a result the moment of inertia approaches that of the A section, being 36.72 as compared with 38.70 for the A section and 32.3 for the B section. To secure the desired distribution of metal the head and the web are 1-16 in. narrower than the American Railway Association section. Thirty-eight per cent. of the metal is in the head of this section as compared with 36.2 per cent in the A section and 40.1 per cent in the B section. Other comparisons are shown in the accompanying table. This rail has been designed under the direction of W. H. Finlay, chief engineer.

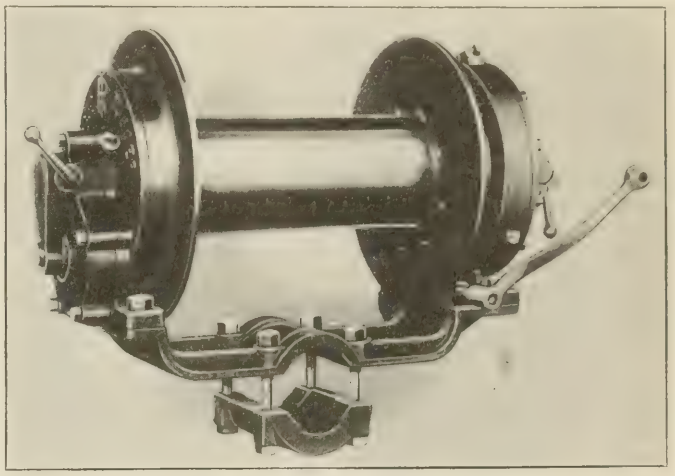
THE "PHILADELPHIA PLAN"

The Philadelphia Bourse, with nine other commercial organizations of that city, acting through the "Joint Committee on Reasonable Regulation of Railroads," Malcolm Lloyd, Jr., chairman, has issued a circular outlining views which it is proposed to present before the Newlands committee. By this program it is proposed to place regulation in the exclusive control of the federal government, enlarge and reorganize the Interstate Commerce Commission and give the government regulatory body jurisdiction over labor disputes and the legalization of agreements—such as pools—designed to eliminate wasteful and unnecessary duplication of railroad facilities and competition. The "Philadelphia Plan" is the result of a nine months' study of existing conditions and of expert advice from many quarters. It aims to place all phases of railroad regulation in the hands of the federal government, without impairment of the rights of the states to the fair proportionate taxation of railroad property within their borders, and without surrender by the railroads of rights granted them by state charters, provided such rights are not inconsistent with the federal charters. It calls for the division of the country into districts corresponding to the freight territorial districts each to be under a regional or district subcommission. The Interstate Commerce Commission, sitting in Washington, would consist of the chairman or heads of the regional subcommissions. The authority of the Interstate Commerce Commission would be extended to the settlement of railroad labor disputes. Through membership in one or more of the ten commercial bodies all the business interests of Philadelphia and vicinity will support this program of legislation. The Joint Committee will lay its program before the trade bodies of the country within the next few weeks with request for their action.

A NEW HOIST

The Ingersoll-Rand Co., New York, has recently introduced a portable hoist for the use of those who prefer manilla rope to wire rope for light hoisting and hauling. The hoist has a lifting capacity of 600 lb. and weighs less than 350 lb. completely equipped. It is 21½ in. long by 31¼ in. wide and 23 in. in height. The drum is 7 in. in diameter by 17 in. long with 5-in. flanges and accommodates 300 ft. of ⅞ in. manilla rope. The base is so arranged that it may be clamped to a circular column or pipe and by removing the clamps can be readily bolted to any convenient support.

The square piston, reversible driving engine, drum release clutch and worm-operated hand brake are essentially the same as in the portable hoist described in the *Railway Age Gazette* of September 25, 1914, the main differences being in the diameter and length of the drum, the width of the flanges and the main frame and over-all dimensions.



New Ingersoll-Rand Hoist

The hoist is built for operation either by compressed air or steam. Although designed primarily for underground work, it is adaptable for general hoisting, hauling and handling in mines, tunnels, quarries and industrial plants. These hoists have been in actual service since the latter part of 1914 and are used extensively by industrial plants in their yards for shifting cars and by railroads in coal mining service. They are particularly adaptable for service in railroad yards where compressed air is available.

CAR SHORTAGE STATISTICS

The American Railway Association, under date of November 13, published a bulletin as follows:

The American Railway Association makes public herewith its customary statement of freight car surpluses and shortages showing that November 1, 1916, on the railroads of the United States there was a net freight car shortage of 108,010 cars. The net shortage on September 30 was 60,697; on September 1, 19,873. On August 1 there was an actual net surplus of 9,762 idle cars.

The association also makes public a statement showing car shortages and surpluses since January 2, 1907, when the railroads began compiling these figures regularly. These figures show that for the whole period of nearly eight years preceding the middle of August this year, there had been a continuous net surplusage of cars not in use on American

railroads except for about one month in 1909, three months in 1912, one month in 1913 and the month of March this year. In 1908 there was at one time a surplusage of over 413,000 cars, and at no time during the year were there less than 100,000 idle cars.

In 1909 the maximum net surplusage was 332,513. In 1910 the maximum was nearly 143,000 for July 6, and there was throughout that year a net surplusage of at least 7,000 cars not requisitioned by shippers. For 1911, surplus cars numbered on March 15 over 207,000, and there was at no time during the year less than 20,000 cars standing idle. In January, 1912, there was a net surplusage of approximately 136,000. From November, 1913, until March, 1916, there was a continuous surplusage of cars, the number running in October, 1914, to over 200,000 when the figures became so large that the American Railway Association stopped compiling them. Compilation was resumed on February 1, 1915, when idle cars still numbered over 279,000.

The number of freight cars owned by the railroads of the country was increased during that same eight years from

Date	Total Surplus	Total Shortage	IDLE CARS	Net Shortage
1907.				
January 2*	29,855	115,348	.....	85,493
February 6	12,018	149,865	.....	137,847
April 10	15,037	96,154	.....	81,117
May 15	21,437	55,428	.....	33,991
" 29	24,915	42,970	.....	18,025
June 12	32,325	40,343	.....	8,018
" 26	32,859	34,458	.....	1,599
July 10	58,183	20,813	37,370	.....
" 24	50,954	18,753	32,201	.....
August 7	46,650	18,814	27,836	.....
" 21	40,477	22,628	17,849	.....
September 4	21,639	31,679	.....	10,040
" 18	17,251	64,920	.....	47,669
October 2*	6,193	64,469	.....	58,276
" 16	4,258	85,764	.....	81,506
" 30	3,946	90,757	.....	86,811
November 13	12,201	57,003	.....	44,802
" 27	40,348	17,964	22,384	.....
December 11	119,339	4,520	114,819	.....
" 24	209,310	724	208,586	.....

*Reports from January 2, 1907, to October 2, 1907 (inclusive), are adjusted figures, based on reports from only 60 per cent. of the roads in the Association.

Date	Total Surplus	Total Shortage	IDLE CARS	Net Shortage
1908.				
January 8	341,763	653	341,110	.....
" 22	342,580	738	341,842	.....
February 5	343,928	1,100	342,828	.....
" 19	322,513	1,249	321,264	.....
March 4	314,992	1,619	313,373	.....
" 18	297,042	1,007	296,035	.....
April 1	307,510	528	306,982	.....
" 15	375,770	146	375,624	.....
" 29	413,605	267	413,338	.....
May 13	404,534	159	404,375	.....
" 27	381,904	125	381,779	.....
June 10	349,994	427	349,567	.....
" 24	313,298	451	312,847	.....
July 8	303,560	518	303,042	.....
" 22	308,680	509	308,171	.....
August 5	281,621	635	280,986	.....
" 19	253,003	854	252,149	.....
September 2	222,632	1,418	221,214	.....
" 16	173,587	2,935	170,652	.....
" 30	133,792	8,114	125,678	.....
October 14	115,036	13,199	101,837	.....
" 28	110,912	10,839	100,073	.....
November 11	121,174	11,659	109,515	.....
" 25	132,829	9,210	123,619	.....
December 9	175,643	1,679	173,964	.....
" 23	222,077	1,019	221,058	.....

Date	Total Surplus	Total Shortage	IDLE CARS	Net Shortage
1909.				
January 6	333,019	506	332,513	.....
" 20	311,664	358	311,306	.....
February 3	301,571	288	301,283	.....
" 17	301,441	470	300,971	.....
March 3	299,925	685	299,240	.....
" 17	291,418	550	290,868	.....
" 31	296,600	399	296,201	.....
April 14	296,663	343	296,320	.....
" 28	282,328	497	281,831	.....
May 12	284,479	187	284,292	.....
" 26	273,890	1,240	272,650	.....
June 9	277,559	285	277,274	.....
" 23	262,944	827	262,117	.....
July 7	260,277	530	259,747	.....
July 21	243,324	339	242,985	.....
August 4	207,173	1,626	205,547	.....
" 18	159,424	2,009	157,415	.....
September 1	110,576	3,899	106,677	.....
" 15	78,798	7,425	71,373	.....
" 29	53,388	14,582	38,806	.....
October 13	35,977	23,431	12,546	.....
" 27	30,896	36,636	.....	5,740
November 10	36,616	39,902	.....	3,286
" 24	39,528	27,496	12,032	.....
December 10	57,470	18,593	38,877	.....
" 22	58,354	24,054	34,300	.....

Date	Total Surplus	Total Shortage	IDLE CARS	Net Shortage
1910.				
January 5	52,309	13,893	38,416	.....
" 19	51,836	24,992	26,844	.....
February 2	51,600	26,625	24,975	.....
" 16	45,513	31,204	14,309	.....
March 2	45,315	29,907	15,408	.....
" 16	44,529	27,187	17,342	.....
" 30	45,672	19,786	25,886	.....
April 13	84,887	7,530	77,357	.....
" 27	102,085	5,766	96,319	.....
May 11	127,148	4,555	122,593	.....
" 25	115,390	4,729	110,661	.....
June 8	129,508	2,729	126,779	.....
" 22	125,644	3,011	122,633	.....
July 6	143,824	959	142,865	.....
" 20	134,594	1,293	133,301	.....
August 3	105,564	2,783	102,781	.....
" 17	78,760	5,081	73,679	.....
" 31	60,022	9,293	50,729	.....
September 14	54,890	7,814	47,076	.....
" 28	42,469	17,941	24,528	.....
October 12	33,735	20,419	13,316	.....
" 26	29,131	21,896	7,235	.....
November 9	34,581	21,000	13,581	.....
" 23	43,066	14,673	28,393	.....
December 7	53,915	11,901	12,014	.....
" 21	62,118	10,705	51,413	.....

Date	Total Surplus	Total Shortage	IDLE CARS	Net Shortage
1911.				
January 4	110,432	3,508	106,924	.....
" 18	122,297	2,477	119,820	.....
February 1	156,355	1,287	155,068	.....
" 15	175,609	1,942	173,667	.....
March 1	192,673	2,831	189,842	.....
" 15	208,527	1,266	207,261	.....
" 29	196,217	1,330	194,887	.....
April 12	187,219	1,166	186,053	.....
" 26	189,524	2,518	187,006	.....
May 10	188,847	1,569	187,278	.....
" 24	168,233	835	167,398	.....
June 7	169,006	2,204	166,802	.....
" 21	165,934	2,764	163,170	.....
July 5	165,508	1,887	163,621	.....
" 19	150,433	1,361	149,072	.....
August 2	130,136	2,015	128,091	.....
" 16	108,000	3,830	104,170	.....
" 30	88,866	4,325	84,541	.....
September 13	70,722	6,439	64,283	.....
" 27	58,382	8,344	50,038	.....
October 11	48,854	12,957	35,897	.....
" 25	39,306	18,774	20,532	.....
November 8	45,290	18,776	26,514	.....
" 22	43,059	19,949	23,110	.....
December 6	53,840	17,697	36,143	.....
" 20	88,646	11,832	76,814	.....

Date	Total Surplus	Total Shortage	IDLE CARS	Net Shortage
1912.				
January 3	142,316	6,378	135,938	.....
" 17	102,479	12,194	90,285	.....
" 31	55,592	23,011	32,581	.....
February 14	50,886	36,928	13,958	.....
" 28	44,984	37,142	7,842	.....
March 13	46,028	42,985	3,043	.....
" 27	52,682	33,974	18,708	.....
April 11	94,943	15,554	79,389	.....
April 25	151,186	12,305	138,881	.....
May 9	136,776	6,678	130,098	.....
" 23	123,683	7,482	116,201	.....
June 6	89,208	2,822	86,386	.....
" 20	73,464	5,746	67,718	.....
July 4	70,731	6,707	64,024	.....
" 18	75,389	6,467	68,922	.....
August 1	65,904	9,394	56,510	.....
" 15	58,623	14,722	43,901	.....
" 29	36,047	26,297	9,750	.....
September 12	27,380	36,000	.....	8,620
" 26	26,754	44,547	.....	17,793
October 10	22,810	54,389	.....	31,579
" 24	17,289	67,270	.....	49,981
November 7	19,897	71,156	.....	51,259
" 21	22,363	73,475	.....	51,112
" 30	26,135	62,536	.....	36,401
December 14	26,614	61,006	.....	34,392
" 31	50,659	33,601	17,058	.....

Date	Total Surplus	Total Shortage	IDLE CARS	Net Shortage
1913.				
January 15	53,230	24,791	28,439	.....
February 1	62,045	24,785	37,260	.....
" 15	52,700	30,517	22,183	.....
March 1	58,529	27,148	31,381	.....
" 15	57,998	20,223	37,775	.....
April 1	68,792	10,804	57,988	.....
" 15	70,715	13,217	57,498	.....
May 1	53,977	14,178	39,799	.....
" 15	61,269	10,975	50,294	.....
" 31	60,291	9,383	50,908	.....
June 14	71,126	7,199	63,927	.....
" 30	70,740	7,036	63,704	.....
July 15	76,280	6,875	69,405	.....
August 1	69,716	11,261	58,455	.....
" 15	69,253	14,828	54,425	.....
September 1	73,576	15,270	58,306	.....
" 15	61,753	21,594	40,159	.....
October 1	41,994	31,620	10,374	.....
" 15	37,198	43,246	.....	6,048
November 1	38,276	40,118	.....	1,842
" 15	46,059	23,407	22,652	.....
December 1	67,466	10,212	57,254	.....
" 15	107,513	5,968	101,545	.....

Date	Total Surplus	Total Shortage	IDLE CARS	Net Shortage
1914.				
January 1	190,521	1,671	188,850	.....
" 15	217,274	2,385	214,889	.....
February 1	211,960	2,282	209,678	.....
" 14	199,385	2,333	197,052	.....
March 1	159,480	5,573	153,907	.....
" 15	132,010	7,145	124,865	.....
April 1	141,525	2,013	139,512	.....
" 15	213,324	455	212,869	.....
May 1	230,533	1,654	228,879	.....
" 15	239,406	764	238,642	.....
June 1	242,572	770	241,802	.....
" 15	232,994	660	232,334	.....
July 1	220,875	1,333	219,542	.....
" 15	228,384	1,843	226,541	.....
August 1	198,998	2,333	196,665	.....
" 15	174,260	2,115	172,145	.....
September 1	165,244	1,918	163,326	.....
" 15	138,108	2,059	136,049	.....
October 1	133,382	2,355	131,027	.....
" 15	154,342	2,360	151,982	.....

Note.—During the period from October 15, 1914 to February 1, 1915, the net car surplusage was so large and the railroad depression so acute, that The American Railway Association, as a measure of economy, temporarily discontinued the compilation

Date	Total Surplus	Total Shortage	IDLE CARS	Net Shortage
1915.				
February 1	280,573	1,162	279,411	.....
March 1	322,290	543	321,747	.....
April 1	327,441	357	327,084	.....
May 1	292,269	966	291,303	.....
June 1	300,146	218	299,928	.....
July 1	276,421	785	275,636	.....
August 1	266,312	948	265,364	.....
September 1	191,309	6,300	185,009	.....
October 1	88,351	10,010	78,341	.....
November 1	55,793	27,525	28,268	.....
December 1	60,793	23,391	37,402	.....

Date	Total Surplus	Total Shortage	IDLE CARS	Net Shortage
1916.				
January 1	70,391	23,310	47,081	.....
February 1	53,611	33,312	20,299	.....
March 1	43,025	62,562	.....	19,537
April 1	52,274	47,636	4,638	.....
May 1	63,344	29,983	33,361	.....
June 1	70,310	12,617	57,693	.....
July 1	68,035	15,801	52,234	.....
August 1	49,753	39,991	9,762	.....
September 1	45,044	64,917	.....	19,873
September 30	34,157	94,854	.....	60,697
November 1	24,064	132,074	.....	108,010

Car Surpluses and Shortages from 1907 to 1916

1,991,557 on July 1, 1907, to 2,447,178 on July 1, 1916.

The special conference committee held a meeting at Washington on Wednesday with the Car Service Commission of the American Railway Association to organize its work, and planned to seek an early conference with the Interstate Commerce Commission.

TRAIN ACCIDENTS IN SEPTEMBER[1]

The following is a list of the most notable train accidents that occurred on the railways of the United States in the month of September, 1916.

Collisions

Date	Road	Place	Kind of Accident	Kind of train	Kil'd	Inj'd
6.	Illinois Central	Effingham.	bc	F. & F.	1	3
8.	Int. & G. North'n	Lillian.	xc	F. & F.	3	0
8.	Penn.	Phillipsburg.	xc	F. & F.	0	6
16.	Penn.	New York	xc	P. & F.	0	14
*18.	Missouri Pacific	Stuart, Colo.	bc	F. & F.	3	3
19.	Carolina & N. W.	Cliff, N. C.	bc	F. & F.	1	2

Derailments

Date	Road	Place	Cause of Derailm't	Kind of train	Kil'd	Inj'd
2.	Grand R. & Ind.	Mancelona.	b. rail	P.	0	75
6.	Central Vermont	S. Amherst	b. beam	P.	0	0
7.	N. Y., Chi. & St. L.	Newton Falls	d. truck	F.	1	1
8.	Balt. & Ohio	Van Buren.	neg.	P.	0	1
8.	Ches. & Ohio	Medford.	d. track	P.	0	4
17.	Missouri Pacific	Moundville.	d. track	P.	0	4
20.	Atchison, T. & S. F.	Kingman.	unx	P.	4	5
20.	Virginian	Alberta.	unx	F.	3	1
26.	Del. & Hudson	Ray Brook.	b. rail	P.	..	10
30.	Penn.	King's Mills, O.	unx	P.	2	7

The trains in collision near Effingham, Ill., on the night of the 6th were through freights. Both locomotives and 15 cars were damaged. One fireman was killed and three other trainmen slightly injured. The collision was caused by the men in charge of Train 356 overlooking a meeting order.

The trains in collision near Lillian, Tex., on the 8th were a through freight train and a work train. Three employees of the work train were killed. The work train, which was occupying the main track on the time of the freight without right, had come to a stop; but was run into at the rear by the freight at about twelve miles an hour; and its caboose was wrecked.

The trains in collision at Phillipsburg, N. J., on the 8th, were a westbound passenger extra, No. 1427, consisting of express cars and carrying no passengers, and an eastbound locomotive without a train. Six employees were injured. By mistake of a signalman, the empty engine had been admitted to the block section occupied by the other train; and the engineman of the extra is also held at fault for not running under control within yard limits.

The trains in collision on the Pennsylvania Railroad, in New York City, on the 16th were westbound passenger No. 115, and a locomotive and some empty cars being switched in the yard. The switching locomotive ran past a signal set against it, and into the side of the passenger train, damaging the dining car and one coach. Five passengers and nine employees were injured. The motorman of the electric switching locomotive was arrested on a charge of criminal negligence, but in the court, before Judge Deuel, he was set free, the magistrate holding that there was no evidence of criminality. It appears that this motorman was in the leading end of his motor, but that the machine was being operated by his helper, who was in the east or trailing end, and was being guided by hand signals from his mate. The helper, in changing his position from the west end to the east, had neglected to cut in the brake apparatus in the east cab; and this, causing delay in applying the brakes, was the cause of the collision.

[1]Abbreviations and marks used in Accident List:

rc, Rear collision——bc, Butting collision——xc, Other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc. ——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

The trains in collision near Stuart, Colo., on the 18th were extra freights. Both engines and several cars were wrecked, and the wreck took fire. Two cars of gasoline exploded. One engineman and two firemen were killed, and three other trainmen were injured. The cause of the collision was the failure of an operator to deliver a train order.

The trains in collision near Cliff, N. C., on the 19th, were extra freight trains. Both engines were badly damaged. Three trainmen were injured, one of them fatally. The cause of the collision was a lap order.

The train derailed near Mancelona, Mich., on the night of the second, was a southbound passenger, and nine cars fell down a bank. About 70 passengers and 5 trainmen were injured, none of the injuries being serious. The cause of the derailment was a broken rail, the failure being due to a bad "pipe."

The train derailed near South Amherst, Mass., on the 6th, was southbound passenger No. 2. Two cars were overturned. No person was seriously injured. The cause of the derailment was the failure of a brake beam, which fell to the track.

The train derailed near Van Buren, N. Y., on the 7th, was a westbound special carrying soldiers. The fireman was injured. The train ran off the track at a point where repairers had removed a rail and in consequence of improper flagging, the flagman having failed to go far enough.

The train derailed at Newton Falls, Ohio, on the 8th, was an eastbound freight. Five cars fell into a river. A trespasser was killed and a brakeman was injured. The cause of the derailment was the breaking of a bolt in the rear truck of the tender.

The train derailed on the Chesapeake & Ohio, near Medford, Ind., on the night of the 8th of September, was eastbound passenger No. 4. The train was running about 40 miles an hour, and the engine was overturned. Four trainmen were injured. The cause of the derailment was a low spot in the track.

The train derailed at Moundville, Mo., on the 17th, was an eastbound special carrying soldiers. The locomotive was overturned and three cars were badly damaged. The engineman and fireman were injured, and two of the passengers were injured by jumping off. The cause of the derailment was a soft spot in the track, following a heavy rain.

The train derailed near Kingman, Ariz., on the 20th, was a westbound express. The engine was overturned and four cars left the rails. The engineman, fireman and two cooks were killed, and one passenger and four employees injured. The cause of the derailment was not determined.

The train derailed near Alberta, Va., on the 20th, consisted of a locomotive, without a train, running backward, and working on one side, a main pin having been broken. The engine was overturned, while running on a straight line where the track was in good condition; and of the four men in the cab, three were scalded to death, and the fourth sustained a fractured skull. These four were the only witnesses of the accident, and its cause has not been determined; but it is thought that the speed had been excessive.

The train derailed on the Delaware & Hudson at Ray Brook, N. Y., on the 26th, was a westbound passenger of the New York Central. Ten passengers and one trainman were injured, none seriously. The cause of the derailment was a broken rail.

The train derailed on the Pennsylvania lines, at King's Mills, Ohio, on the 30th, was westbound passenger No. 1231, and one of the two locomotives fell down a bank. Its engineman and fireman were killed and the men on the other engine were injured. Five passengers were slightly injured. All of the cars were steel. The cause of the derailment was not determined. The track was new and first class.

Congressional Inquiry on Railroad Regulation

Railway's Advisory Committee to Present First Testimony Before Joint Committee on Interstate Commerce

THE first public meeting of the Congressional Joint Committee on Interstate Commerce, which is to conduct a general inquiry into the subject of railroad regulation and control, and collateral questions, was held in the rooms of the Senate Committee on Interstate Commerce at Washington, D. C., on November 20. The first session was devoted principally to a discussion of the scope of the inquiry and plans of procedure, no testimony being heard.

There was a manifest disinclination on the part of most of those present to present the first testimony. Representatives of the state commissions insisted that as they had no plans to propose and as the railroads had undertaken an active campaign on behalf of proposed changes in methods of regulation, the railroads should be required to present the first testimony. As no definite program for the hearings had been prepared, an executive session of the committee was held, at which it was decided to hold the first hearing for the presentation of testimony on Thursday, November 23, and that the railroads should present their case. Alfred P. Thom, counsel for the Railway Executives' Advisory Committee, was to open for the roads on Thursday.

Senator Francis G. Newlands, of Nevada, chairman of the committee, opened the meeting on Monday with a statement outlining the scope of the inquiry, in part as follows:

Statement by Senator Newlands

"The inquiry will be a very wide one. It will relate to every phase of the transportation question, the rail carriers, the river carriers and the ocean carriers, and the perfection of a harmonious system of transportation embracing rail, river and ocean carriers that will meet the demands of interstate as well as foreign commerce, and it will also relate to telegraph and telephone lines, express companies, and other public utilities.

"It will embrace not only the subject of government control and regulation of these utilities, but also the wisdom and the feasibility of government ownership and the comparative worth and efficiency of government regulation and control as compared with government ownership and operation.

"In this connection the question will be considered as to whether the Interstate Commerce Commission is now overloaded and if so whether this difficulty should be met by relieving it of many of the supervising and administrative duties which it now exercises or by enlarging and subdividing it so as to enable it to meet the strain of its various duties.

"It is also suggested that the commission ought to be brought nearer to the various localities than it is now, that instead of sitting centrally in Washington it should be divided into departments corresponding to our different traffic areas, so that each department can sit within a given traffic area, in contact with its activities and its thought and more quickly solve the problems relating to it.

"Another question of importance that will come up will be the question of the control of railway and other public utility securities. As it is, most of the state public utility commissions are regulating the issue of securities upon the railroads within the boundaries of the state over which each has jurisdiction. Thus we may have 48 different sovereignties acting upon the securities of great railway systems not confined in their operation to any particular state, but whose operations are as broad as interstate commerce itself.

"It is complained that this complexity of control which affects not only the securities, but the rates, restrains the activities of the corporations themselves, makes their methods of obtaining money for needed improvements and developments very complicated, and frequently defeats their purpose of securing favorable markets, the approval of the securities sometimes being given when the favorable opportunity has passed by.

"It is suggested that the United States government by reason of its power over interstate commerce should create a tribunal for that purpose or give such control to the Interstate Commerce Commission. The question then arises whether the regulating commission shall be simply a co-ordinating body acting in addition to the 48 public utility commissions created by the various states, or whether its action shall be that of an over-lord, dominating and controlling, where contradictory, the action of lesser sovereignties. So the question of state rights will be involved in this most interesting subject.

"There will also come up the question as to whether the nation or the states should create the great organizations that serve the purpose of interstate commerce. Thus far we have been content to allow the states to create these corporations, these railroad companies. That served the purpose as long as the railroad system was a feeble system confined to the building of an individual railroad of a limited mileage in this or that state. But as interstate commerce increased and these systems were brought together in a co-ordinated service over the entire country in interstate commerce, it has been claimed that we have not met the economic requirements of the time by creating national organizations under which great railway systems could be incorporated as broad in their operation as the national power of interstate commerce.

"There again the question of state rights will come up. It will be contended on the part of many of the states that the creation of these gigantic national corporations under national control will tend to diminish the powers of the states, with reference to local requirements as to rates, and may diminish the power of the states as to taxation, and may also diminish to some degree the police powers of the states.

"Among others will be the question of taxation, as to whether the states will insist each upon its sovereign right to tax the corporation and its property doing business within the boundaries of that state or whether the national government, as in the case of national bank corporations, shall, by virtue of its sovereignty over interstate commerce, declare a uniform rule as in the case of the banks, under which taxes shall be levied.

"As it is, we find the greatest diversity in the tax laws of various states, some states imposing heavy burdens upon these corporations, and others imposing very light burdens; some taxing only the visible property, others taxing the intangible thing termed a franchise; some of them adopting the market price of the stocks and bonds as the standard and measure of valuation, others contenting themselves simply with the physical valuation of the actual property within the boundaries of the state.

"Then in connection with that will come the question of hours and wages of employees. The burdens which constitute the operating expenses of these corporations are in time transferred to the shippers. They cannot long rest upon the investors, for if they rest upon them too heavily there will be a decline in the securities, and a consequent difficulty in securing the money for improvements and extensions, and thus the public demands themselves will not be met.

"Railway corporations have to raise their entire revenue

from the public in the shape of rates for freight and passengers. That revenue goes to the operating expenses, wages of some 1,800,000 employees, the supplies to the railways, the taxes and the interest upon the stocks and bonds issued. So that the public itself, the ultimate bearer of this entire burden, is most profoundly interested in perfecting a system which will establish the credit of the carriers themselves in such a way as to enable them to obtain money at the lowest rates and yet maintain the value of their securities.

"As to wages and the hours of labor, it is very evident that under present conditions the only ultimate method of settling a difficulty between a railroad and its employees is a resort to force. And the question is whether a nation pretending to some degree of civilization, which has eliminated the doctrine of force from application to controversies between man and man, and which furnishes judicial tribunals for the settlement of those controversies, and which is now and has been for years endeavoring internationally to secure a system under which the nations of the earth will create similar tribunals for the adjustment of international disputes without resort to force—whether such a civilized nation can be content to perpetuate the existing condition of things. This is a subject for profound thought. It will require the best and the most humane consideration of communities and state and of the nation itself.

"It would seem to be our highest duty to meet this condition and by eliciting the best thought not only of the corporations affected, not only of the thinkers and economists of the country, but of the men themselves employed by those corporations to create some system under which a resort to force, the most barbaric and brutal of processes, can be avoided for the settlement of disputes between great employers and vast bodies of employees.

"In addition to this question of regulation and control of these great public utilities, there is entrusted to this committee the study of the question of government ownership. It is a question that must be faced. Other nations far advanced in civilization have adopted the system. Recently, under the stress of war, almost all European governments have taken over the railways. Whether that will be a permanent taking over or only a temporary one, it demonstrates that in conditions of great crises when autocratic powers must be given to the government, all intelligent governments drift toward absolute and complete operation of the roads as the only solution of the question.

"If we pursue the exercise and the study of government regulation wisely, persistently and energetically, we may create such a system of regulation as will meet every requirement, both in time of peace and of war, and in exigency of crisis. But it seems to be a wise thing for the government of the United States to ascertain now the history of the countries that have adopted government ownership and operation of railways, and to watch the experiences of the European countries in this great war in this regard.

"In this connection will come the question of the method of taking over the railroads. Shall it be accomplished by an actual valuation of the railways and a condemnation of them, or shall they be taken over by the easier method of taking over the stock and the bonds at their market value, thus at one step having the national government take the position of stockholder and security holder in these great corporations?

"These are a few of the questions which we have before us. It will not be possible for us to come to a speedy conclusion regarding all, but that conclusion will be more quickly arrived at if we have the sympathetic aid of practical men who for years have been conversant with the practical side of the transportation question, of the economists and publicists, and national state regulating commissions of railway executives and workers, commercial bodies, farmers and manufacturers, and shippers generally. We want the best thought of the country in the consideration of these important questions."

Organizations Represented

When the chairman inquired what organizations or individuals desired a hearing before the committee and upon what subjects, Joseph L. Bristow, chairman of the Kansas City Public Utilities Commission, announced that the National Association of Railway Commissioners would be represented by a committee appointed for that purpose consisting of himself, E. C. Niles, New Hampshire; C. E. Elmquist, Minnesota; O. P. Thompson, California; C. M. Candler, Georgia; L. B. Finn, Kentucky; C. D. Jackson, Wisconsin, and Max Thelen, California, ex-officio as president of the association. Mr. Bristow said that since the railways have a definite plan by which they state they desire to curtail the authority exercised by the state commissions, the latter would very much prefer that the railroads present that plan. Senator Underwood protested against any effort to give the inquiry the appearance of a fight between two contending parties, saying that the committee desires information and is not to be governed by the desire of the railroads, or shippers, or state commissions. Vice-Chairman Adamson said it would be intolerable if either the committee or the public should tolerate a fight between anybody on the subject, but that the principles should be recognized that any defects in the present system should first be pointed out and the remedies considered later.

The chairman then called for appearances of various organizations and boards of trade. Amos L. Hatheway, representing the Boston Chamber of Commerce, said that that organization favored the incorporation of railroads under a federal law, that the present system of dual regulation shall be supplanted by a system of federal regulation extending to the subject of railway securities, and that matters of detail which should be left to the state commissions should be adjusted by Congress and the Interstate Commerce Commission. F. B. De Berard said the Merchants' Association of New York desired to oppose government ownership and operation of public utilities and to favor the exclusive control by the federal government of the operation of all railroads. George E. Bartol, representing the Philadelphia Bourse, said that organization had formulated a comprehensive plan for the regulation of the railroads which it desired to present. George E. Rix appeared for the Lawrence, Mass., Chamber of Commerce, the associated boards of trade of Essex county and the American Woolen Company. William F. Garcelon appeared for the Arkwright Club, representing about 100 cotton mills in New England. George McK. McClellan, representing the Seattle Chamber of Commerce, said it desired to be heard later on the question of the railroad wage controversy. F. E. House entered the appearance of the Commercial Club of Kansas City. Philip Godley, chairman of the committee on inland transportation, Philadelphia Board of Trade, said he was authorized to present the question of government ownership. Benjamin C. Marsh appeared on behalf of the Committee on Real Preparedness, saying that Amos Pinchot, the chairman, will appear to urge government ownership and operation of railroads. George A. Post, president of the Railway Business Association, registered an application to be accorded a hearing on a general regulatory scheme to be presented with the results of collaboration with other trade bodies throughout the country.

S. H. Cowan, of Fort Worth, Texas, entered his appearance and that of G. S. Maxwell of Dallas, Texas, and a committee representing the Texas Industrial Traffic League, which will desire to meet "any contention with respect to abolishing the state railroad commissions or federal control of rate making." He said the committee is opposed to gov-

ernment ownership of railroads unless some further absolute necessity shall arise and "until somebody knows more about it than we think anybody knows now."

Mr. Cowan also entered an appearance for the National Live Stock Shippers' Protective League, the American Live Stock Association, the National Wool Growers' Association, the Texas Live Stock Shippers' Protective League, the Cattle Raisers' Association of Texas, Kansas City Live Stock Association, Corn Belt Meat Producers' Association and Southern Cattlemen's Organization. He also said the following would desire to appear, C. B. Bee, traffic expert, Missouri Public Service Commission; J. H. Henderson, commerce counsel of the state of Iowa and vice-president of the National Live Stock Shippers' Protective League, and A. E. Helm, attorney for the Kansas Public Utilities Commission and a member of the executive committee of the league. Mr. Cowan said that under the constitution the states have the exclusive right to regulate intrastate rates, that the question whether a state has violated the commerce laws is for judicial determination, and that while a state may be prohibited from doing so, the Interstate Commerce Commission cannot therefore be given power over the state rates. He said it was perfectly clear that the railroads are behind the movement to abolish state commissions and that they should first present their position. He said if the state commissions are abolished he did not know who will regulate the rates of the country because of the great burden it would place upon the Interstate Commerce Commission. He said he was also prepared to advocate a change in the practice of the commission by which it could employ the best talent available, to hear cases and submit reports to each side for their objections before they are submitted to the commission. He said that many of the witnesses which he represented would be in Washington early in December at the time of the Shreveport case hearing before the Interstate Commerce Commission and would like to be heard by the committee at about that time. He also said that the railroad commission of Texas will have a member in Washington at about that time and that he and the attorney general of Texas will want to be heard.

N. S. Myrick, Boston, representing the Amster committee of Rock Island stockholders and other investors in railroad securities, desired to be heard particularly on the question of government control of the issuance of securities. In addition to the committee representing the association of railway commissioners, appearances were entered by Max Thelen, president of the California commission, J. E. Love, chairman of Oklahoma corporation, who said he would like to be heard "upon the subject of the states holding the control that they have now," and Scott Z. Henderson, of the Public Service Commission of Washington. Mr. Bristow said that some of the state commissions desire to be heard upon matters that have not been placed directly in charge of the committee. The association's committee on car service will also want to appear some time after December 15. Prof. John R. Commons, of the University of Wisconsin, was the only economist who appeared, saying he wished to discuss principally the labor question.

F. W. Lehmann appeared on behalf of the American Telephone & Telegraph Company, saying it was preparing material regarding the relations between the public and public utilities and hopes to present facts gathered from the experience of the companies in this country and in other countries and would like to bring men from Europe who can speak from personal observation of the systems there. F. B. MacKinnon, representing the United States Independent Telephone Association, said the association desired to make some suggestions as to the relative merits of government ownership and common regulation. Albert T. Benedict appeared on behalf of the Western Union Telegraph Company. T. B. Harrison, representing the Adams and American Express Companies, entered the appearance of a committee representing the principal express companies, saying they had nothing to propose and nothing to object to. Other appearances were entered by R. S. Kellogg, representing the National Lumber Manufacturers Association, C. B. Heinemann, representing the National Live Stock Exchange, J. H. Townsend, Southern Hardware Traffic Association, R. C. Butler, Chicago Association of Commerce, and W. E. Lamb, California Fruit Growers Exchange. When Chairman Newlands asked if the Interstate Commerce Commission or the brotherhoods were represented, there was no response. C. B. Johns appeared for his local lodge of the Brotherhood of Locomotive Engineers, but said he had assumed that the brotherhoods would be represented by their officers.

Alfred P. Thom, counsel for the Railway Executives' Advisory Committee, said the railroad executives are represented by his committee, that it will be prepared to present its views during the course of the investigation, but that although it has formulated views in respect to many subjects to be considered, there are others which have come recently into the matter with respect to which no views have been formulated.

"We have understood this is an investigation proposed by the President and ordered by Congress," he said, "to consider the question of transportation from the standpoint of the public. We feel it incumbent upon us to keep our minds open as to what we shall ultimately propose for any reasons that may be advanced by the thought of the country in respect to the general subject. Even though we may have our own convictions at the moment as to what we shall propose, we should like to consider the suggestions which may be made by economists and financiers relating to the credit of the carriers and to other matters involving the philosophy of regulation so that we may be able to review any preconception we may have in respect to this matter."

He said the railroad executives would be ready to appear at the convenience of the committee, but would like to have the opportunity of presenting their views in the light of what may be developed by those who appear in the public interest. "We seek to avoid," he said, "so far as it is proper to avoid, the attitude of reducing this investigation to a plaintiff on the one side and defendants on the other. We do not desire to be placed in the position of plaintiffs in this investigation. We desire simply to come in as a part of the public."

Asked what he meant by the philosophy of regulation, Mr. Thom said one question to be considered is "whether or not there should be free trade between the states or whether there should be barriers placed between the states."

Mr. Adamson insisted that the railroad companies know more about the matter than anybody else, that "it is generally known throughout the country that the President delivered his message to Congress because it was represented to him that the railroads were suffering and needed some remedial legislation" and he insisted that the railroads, therefore, ought first to present whatever plans they had formulated.

The committee then went into executive session and it was decided to call upon the railroads to present the first testimony at a hearing on Thursday morning. The committee did not undertake to determine who shall be heard after the railroad executives have appeared. It was decided to hold one session each day, lasting from 10 o'clock in the morning until 1.30 in the afternoon.

In a statement explaining the position of the railways, Frank Trumbull, chairman of the Railway Executives' Advisory Committee, said:

STATEMENT BY MR. TRUMBULL

"The railways naturally desire to co-operate in this inquiry in whatever way the joint Congressional committee

considers most helpful. We regard the inquiry as one in which all those whose study or experience may throw light on the problems involved should participate, to the end that a plan may finally be adopted which will, in the President's phrase, make the railroads 'more useful servants of the public as a whole.'

"The representatives of the railroads have no completed plan or program to submit at this time and do not wish to appear as the advocates or opponents of any special plan. It is natural, however, that men who have been in daily contact with state and federal regulation in the operation of the roads should have formed more conclusions as to particulars in which existing methods of regulation are unduly burdensome to the commerce of the country. In doing this the railroads do not oppose public regulation. That is not now a question for debate. But if, as we feel, some features of the existing system are defective, wasteful and uneconomic, it is a matter of public duty to call attention to this fact.

"Many of the existing laws relating to railway regulation, especially state laws, are primarily punitive and restrictive. They were enacted to punish the railroads for actual or alleged past wrong doing. The difference in spirit and purpose between our railway laws and, for example, those governing our banking system, which are designed to serve the public by encouraging and facilitating banking operations, is obvious. The railways hold that it is to the public interest as well as to their interest that the system of regulation be framed with the purpose of encouraging railway development and efficient service along legitimate lines.

"By far the greater part of the railway business of the country consists of the transportation of interstate commerce and the regulation of this is properly a federal and not a state function."

THE ADAMSON LAW HELD UNCONSTITUTIONAL IN TEST CASE

Judge William C. Hook, in the United States district court at Kansas City, on Nov. 22 in a decision intended primarily to expedite an appeal to the Supreme Court of the United States and mentioned in the Washington Correspondence printed elsewhere in this issue, held the Adamson law unconstitutional. This was in an injunction proceeding brought to restrain the Missouri, Oklahoma & Gulf from putting into effect the provisions of the Adamson law.

Railroad attorneys now have under consideration the question as to whether the Missouri, Oklahoma & Gulf case is sufficiently broad in its scope to form the basis of a comprehensive decision by the United States Supreme Court. Suits similar to the Missouri, Oklahoma & Gulf have been brought by the Atchison, Topeka & Santa Fe, the Union Pacific and other large railroads, and it may be decided that one of these suits could be continued until a decision is reached in the district court on which an appeal could be made to the Supreme Court, the case being broad enough to cover all suits now pending under the Adamson law.

The following is the full text of Judge Hook's decision:

"This is an independent suit to enjoin the enforcement of a recent act of Congress, commonly called the Adamson law, upon the ground that it is contrary to the Constitution. In the character of the averments the plaintiff's bill of complaint is stated to be typical of numbers of suits recently filed by railroad companies in various district courts of the United States. A motion to dismiss has been presented on behalf of the defendant United States Attorney. The sole question raised by it is the constitutionality of the law. The court is informed that the other cases stand on applications for temporary injunctions.

"An appeal from an order granting or refusing a temporary injunction goes to the Circuit Court of Appeals and not further, by ordinary procedure, while an appeal from a final order or decree in such a case would go direct to the Supreme Court of the United States. In the former a decision would be inconclusive; in the latter a decision would definitely settle the question for the whole country. The motion to dismiss the case here, however, it is decided, will promptly result in a final decree from which an appeal will be taken to the Supreme Court.

"The assistance of this court has been invoked to facilitate a final and authoritative determination of the constitutional question. The case was presented but yesterday, and a decision is expected today. It is far from being an agreeable duty for a judge to record a judicial conclusion without the care and deliberation essential to a conviction that he would stand to in every circumstance.

"Upon the merits of a case the government neither asks nor receives from a court greater consideration than is required by the settled rules and presumptions of law, but a request by the Department of Justice to aid the progress of a case consistently with the rights of every one cannot be declined, certainly not for personal considerations.

"Upon a consideration of the Adamson law, and of what is said of its practical effect and what was intended to be accomplished by it, the judgment is that as the court construes the terms of the law, it cannot be sustained. Since both parties have said they would not plead further whatever the decision might be, a decree will be entered for the plaintiff, reciting that the defendant prays and is allowed an appeal in an open court.

"The case in which the plaintiffs were appointed receivers is in charge of the judge who is acting here. An order will be entered in that case directing plaintiffs and their counsel to co-operate with the Department of Justice in lodging the appeal in the Supreme Court by December 4 next and in then moving for the advancement thereof for such early hearing as that court may find it consistent to grant; also to invite counsel for all railroad companies and others similarly interested in the question involved to participate in the presentation of the motion to advance and in the arguments on the merits as fully as though their clients were parties to this litigation.

"Though the decree of the court in the case here will be final in form, yet, because of the exceptional circumstances, the plaintiffs will be directed to keep their accounts and be prepared promptly to pay their employees on the basis of the Adamson law, should the decree be not sustained."

RAILWAY-WOMEN IN FRANCE.—Members of Parliament in France, like those in England are not always quite sure of their facts when speaking on railway matters, so it is not surprising that the member of the Chamber of Deputies who recently suggested that France should imitate Prussia's example by making greater use of women in the railway service, should have been corrected by the press. In Prussia some 35,000 women have replaced men since the beginning of the war. It is a striking figure, but only represents 6.25 per cent. of the total staff as it stood before the war. In France, without counting the Nord and Est or the light and secondary railways, *i. e.*, taking only the so-called "interior systems," 32,000 women were in the railway service on July 1, and the number has increased since then. On the State railways, women numbered at the beginning of July, 10.8 per cent of the pre-war staff; on the Paris, Lyons & Mediterranean, 12.3 per cent; on the Orleans, 14 per cent; and on the Midi the figure was as high as 16.7 per cent. We agree with our French contemporaries that the railways of the Republic have nothing to learn from Germany in regard to the employment of railway-women, and if the full figures for both countries were available, it would probably be found that both the number and the percentage of women employed in the French railway service were much higher than those in Germany.—*Railway Gazette, London.*

General News Department

On the Texas & Pacific, a road which has just been put into the hands of receivers, a rule has been promulgated prohibiting the smoking of cigarettes by employees on duty. The rule is posted in the shops and yards at Fort Worth.

The car repair shops of the Atchison, Topeka & Santa Fe at San Bernardino, Cal., were almost entirely destroyed by a fire of unknown origin on November 11. The loss is estimated at over $125,000. The passenger station also was destroyed, together with six coaches.

A fire in the Clinton & Oklahoma Western shops at Clinton, Okla., originating from defective electric wiring, practically wiped out the entire plant on November 13; loss about $150,000. A locomotive in process of construction was destroyed. Plans are under way already for a complete new and larger plant.

The Interstate Commerce Commission has issued the text of its 28th annual report of the statistics of railways in the United States for the fiscal year ending June 30, 1915. The principal figures shown in this report were published in the *Railway Age Gazette* of June 30, 1916, page 1589, from a preliminary abstract issued by the commission.

Jerry Fountain, crossing watchman on the Alabama Great Southern at Twentieth street, Bessemer, Ala., has been awarded a Carnegie medal for heroism in rescuing an aged pedestrian from being killed by a freight train at his crossing, on the afternoon of May 1 last. Watchman Fountain, who has but one arm, succeeded in pulling the old man from the track but not before the engine had struck them both. Watchman Fountain was badly bruised, but the wayfarer, 94 years old, was not injured.

Fire badly damaged property at the Michigan Central freight yards at Kensington (Chicago), Ill., on November 15. The flames entirely consumed a large ice house, 30 ft. high, 150 ft. wide and 600 ft. long, a transfer house, 20 ft. high and 200 ft. square, together with a large freight house and office building, 20 ft. high, 700 ft. long and 200 ft. wide. A large number of loaded freight cars were lost. All the records of the freight office were lost. The damage is estimated at between $350,000 and $400,000.

Representatives of the Great Northern, the Northern Pacific, the Burlington, the Northwestern and the St. Paul met in Chicago last week to consider the formation of a telegraph company to be owned by the railroads of the Northwest. If such a company is formed the railroad-owned poles and lines now used by the Western Union and the Postal will be taken over, and other lines will be built. The projected company would control at least 48,000 miles of telegraph line.

Asa Farrar, claim adjuster of the Seaboard Air Line, has secured a patent on a locking arrangement for switch stands to be used for the benefit of car repairers. Repairers, to insure their own safety when working under cars on the repair tracks lock the switch, leading to that track, with a padlock. The repair man has in his possession the only key to the lock; and Mr. Farrar's device is to provide for the employment of this safeguard by any number of repair men at the same time. The switch having been locked, by each of the men, with their individual locks, it cannot be again moved until all of the locks which have been put on it have been released.

The semi-annual meeting of traffic and operating representatives of the Chicago & Alton was held in St. Louis on November 12 and 13, the meeting being presided over by S. G. Lutz, general traffic manager, and X. H. Cornell, general superintendent. In addition to the traffic representatives located on the line there were more than 50 freight and passenger representatives from Alton agencies throughout the United States. In addition to these general meetings, the Alton management has also arranged for monthly meetings between the various departments at the large terminals on the system, with a view to discussing matters of local interest and obtaining the closest possible co-operation in all departments.

Chicago to Hornell Without a Stop

Miss Ruth B. Law, flying in a Curtiss aeroplane, arrived in New York City on Monday morning, November 20, at 9:37, having traversed the 897 miles from Chicago in eight hours, fifty-six minutes, deducting stops; or at the average rate of over 100 miles an hour; and from Chicago to Hornell, N. Y., 590 miles, she flew without alighting, thus beating by 138 miles the non-stop record made November 2 by Victor Carlstrom, as reported in the *Railway Age Gazette,* November 10, page 863. Miss Law left Chicago at 8:25 a. m., eastern time, on Sunday, November 19; arrived at Hornell at 2:10 p. m.; left Hornell at 3:24 p. m.; arrived at Binghamton at 4:20 p. m. There she stopped over night, and completed the journey on Monday morning. Miss Law feels confident that with a machine in which she can carry 100 gallons of gasoline she can fly from Chicago to New York without a stop. The weather was rather cold when she started from Chicago, and she wore four heavy suits of clothes made of wool and leather.

Safety-First With an If

At Harrisburg, Pennsylvania, November 21, there was a conference under the auspices of the governor of the state on industrial welfare and efficiency; and one of the first subjects considered was that of trespassing on railroads. L. F. Loree, president of the Delaware & Hudson, presented matter showing the extent of this evil and proposed that the conference recommend to the legislature the passage of a stringent law forbiding trespassing. This was promptly obected to by representatives of labor unions, the objection being based on the claim that the railroads desired this law so as to enable them, in case of strikes, to "arrest railroad men at sight" on railroad premises. Except as applied to employees, ex-employees or strikers the rule forbidding unnecessary walking on tracks was not objected to. The conference concluded finally that the matter should be referred to the Public Service Commission; this view being adopted by a vote of 57 to 54.

Marcus A. Dow, general safety agent of the New York Central, delivered an address on trespassing, a report of which will be found under another head.

Railway Revenues and Expenses for August, 1916

The net operating income of the railways of the United States for August, 1916, exceeded that for August, 1915, by $101 per mile, or 27.1 per cent, according to the compilation just issued by the Bureau of Railway Economics.

Total operating revenues, $326,845,374, exceeded those for August, 1915, by $53,788,916. Operating expenses, $203,251,895, were greater by $27,939,208. Net operating revenue, $123,593,479, made a gain of $25,849,708. Taxes, $13,602,367, increased by $1,913,655. Net operating income was $109,822,341, an increase of $23,855,101.

If spread over the mileage represented, operating revenues averaged $1,418 per mile, an increase of 19.1 per cent; operating expenses per mile, $882, were greater by 15.4 per cent, net operating revenue per mile, $536; increased 25.8 per cent, and net operating income per mile, $476, showed an increase of 27.1 per cent. Taxes per mile rose 15.9 per cent.

This summary covers 230,521 miles of operated line, or about 90 per cent of the steam railway mileage of the United States.

For the eastern railways, operating revenues per mile exceeded those for August, 1915, by 18.1 per cent; operating expenses rose 19.2 per cent; net operating revenue increased 16.2 per cent, and taxes, 10.5 per cent. Operating income per mile increased 16.6 per cent.

REVENUES AND EXPENSES OF STEAM ROADS—AUGUST, 1916.

Compiled from monthly returns of the railways to the Interstate Commerce Commission and covering roads of Class I, *i. e.*, roads with annual operating revenues above $1,000,000.

Account.	United States				Eastern District				Southern District				Western District			
	Amount, August, 1916	Per mile of line		Increase over 1915	Amount, August, 1916	Per mile of line		Increase over 1915	Amount, August, 1916	Per mile of line		Increase over 1915	Amount, August, 1916	Per mile of line		Increase over 1915
		1916	1915	Per cent		1916	1915	Per cent		1916	1915	Per cent		1916	1915	Per cent
Total operating revenues	$326,845,374	$1,418	$1,190	19.1	$148,290,567	$2,504	$2,120	18.1	$43,817,906	$1,028	$874	17.6	$134,736,901	$1,047	$866	20.9
Freight	227,197,629	986	789	24.9	100,875,487	1,703	1,416	20.3	31,761,896	745	626	19.0	94,560,246	735	554	32.7
Passenger	70,093,162	304	292	4.2	32,256,083	545	499	9.1	8,901,079	209	186	12.1	28,936,000	225	231	d 2.5
Mail	5,120,375	22	22	3.1	1,849,042	31	31	0.6	• 773,279	18	15	18.0	2,498,054	19	19	1.2
Express	7,600,697	33	26	25.8	3,700,969	62	45	38.5	945,456	22	19	19.3	2,954,272	23	20	14.8
All other	16,833,511	73	61	18.2	9,608,986	163	129	25.8	1,436,196	34	28	21.7	5,788,329	45	42	6.9
Total operating expenses	203,251,895	882	764	15.4	95,156,798	1,607	1,348	19.2	28,769,845	675	609	10.8	79,325,252	617	546	12.8
Maintenance of way and structures	40,414,501	175	153	14.2	16,712,199	282	246	**14.7**	6,067,759	143	123	15.5	17,634,543	137	121	13.3
Maintenance of equipment	51,254,529	222	191	16.4	24,668,620	417	346	20.3	8,053,544	189	168	12.3	18,532,365	144	126	13.5
Traffic	5,318,122	23	22	4.9	2,088,900	35	32	9.5	953,634	22	20	9.1	2,275,588	18	18	d 0.5
Transportation	97,466,565	423	364	16.3	47,490,044	802	664	20.8	12,502,293	293	272	8.0	37,474,228	291	256	14.0
General	7,019,937	30	27	14.2	3,113,395	53	45	18.2	1,080,510	25	23	10.9	2,826,032	22	20	11.5
All other	1,778,241	9	7	2.6	1,083,640	18	15	19.5	112,105	3	3	d 5.7	582,496	5	5	d 17.5
Net operating revenue	123,593,479	536	426	25.8	53,133,769	897	772	16.2	15,048,061	353	265	33.3	55,411,649	430	320	34.7
Taxes	13,602,367	59	51	15.9	5,233,372	88	80	10.5	1,869,724	44	38	16.0	6,499,271	50	42	20.5
Uncollectible revenues	168,771	1	*	....	120,270	2	1	....	7,352	*	*	....	41,149	*	*	....
Operating income	109,822,341	476	375	27.1	47,780,127	807	691	16.6	13,170,985	309	227	36.4	48,871,229	380	278	36.8
Operating ratio—per cent—																
1916		62.2				64.2				65.7				58.9		
1915		64.2				63.6				69.7				63.1		
Average mileage represented—																
1916		230,521				59,223				42,627				128,671		
1915		229,364				59,047				42,120				128,197		

*Less than one dollar. d Decrease.

For the Southern railways, operating revenues per mile exceeded those for August, 1915, by 17.6 per cent; operating expenses rose 10.8 per cent; net operating revenue increased 33.3 per cent, and taxes 16.0 per cent. Operating income per mile increased 36.4 per cent.

For the Western railways, operating revenues per mile exceeded those for August, 1915, by 20.9 per cent; operating expenses rose 12.8 per cent; net operating revenue increased 34.7 per cent, and taxes 16.0 per cent. Operating income per mile increased 36.8 per cent.

The two months of the current fiscal year, compared with the corresponding period of the preceding year, show changes per mile of line as follows: Operating revenues increased 17.8 per cent, operating expenses increased 14.2 per cent, net operating revenue increased 24.4 per cent, taxes increased 12.8 per cent and operating income increased 26.0 per cent.

Operating income per mile increased 18.7 per cent in the East, increased 27.8 per cent in the South and increased 34.2 per cent in the West.

August operating income per mile was 27.1 per cent greater in 1916 than in 1915, 41.6 per cent greater than in 1914, 40.8 per cent greater than in 1913, and 21.1 per cent greater than in 1912.

Operating Results for July.

The bureau has also just issued its bulletin for July, showing that the net operating income of railways exceeded that for July, 1915, by $82 per mile, or 24.7 per cent.

Total operating revenues, $302,917,817, exceeded those for July, 1915, by $43,700,659. Operating expenses, $195,359,812, were greater by $23,408,076. Net operating revenue, $107,558,005, made a gain of $20,292,583. Taxes, $12,854,900, increased by $1,192,953. Net operating income was $94,660,285, an increase of $19,104,596.

If spread over the mileage represented, operating revenues averaged $1,315 per mile, an increase of 16.3 per cent; operating expenses per mile, $848, were greater by 13.1 per cent; net operating revenue per mile, $467, increased 22.7 per cent; and net operating income per mile, $411, showed an increase of 24.7 per cent. Taxes per mile rose 9.7 per cent.

This summary covers 230,407 miles of operated line.

For the Eastern railways, operating revenues per mile exceeded those for July, 1915, by 18.3 per cent; operating expenses rose 17.6 per cent; net operating revenue increased 19.7 per cent, and taxes 9.9 per cent. Operating income per mile increased 21.0 per cent.

For the Southern railways, operating revenues per mile exceeded those for July, 1915, by 10.6 per cent; operating expenses rose 8.0 per cent; net operating revenue increased 17.3 per cent; and taxes, 11.9 per cent. Operating income per mile increased 18.3 per cent.

For the Western railways, operating revenues per mile exceeded those for July, 1915, by 16.1 per cent; operating expenses rose 10.0 per cent; net operating revenue increased 27.8 per cent, and taxes 9.0 per cent. Operating income per mile increased 31.1 per cent.

July net operating income per mile was 24.7 per cent greater in 1916 than in 1915, 41.2 per cent greater than in 1914, 37.7 per cent greater than in 1913 and 33.7 per cent greater than in 1912.

Canadian Railways Reduce Forest Fire Damage

Clyde Leavitt, Chief Fire Inspector of the Canadian Railway Board, reports that notwithstanding the exceptionally dry season, no forest fires of any serious consequence have occurred which could be attributed to railway agencies. (This refers to the chartered railways, not the government-owned lines.) Acting under instructions of the Railway Board, the roads have kept fire protective appliances of engines in good order, and have cleared the rights of way. Special patrols have been maintained in forest sections. The railways, moreover, have done much in keeping down fire losses at a distance from the track. They have gone far beyond mere mechanical obedience to the Railway Board's orders, and have incorporated forest protection as an important branch of their business policy. Particularly on the Canadian Pacific and the western lines of the Canadian Northern has the forest guarding work been vigorous and thorough. The adoption of oil-burning locomotives in British Columbia has no doubt saved much timber. The Railway Board was created by the Dominion authorities to make private roads toe the mark, but there has been no disposition to have the Government lines

set the example. The Transcontinental and the Temiskaming & Northern Ontario show a greater amount of fire damage in forest land than is credited to the private lines. In Quebec, the fires attributable to the National Transcontinental were of very substantial extent. The track repairers on that line have instructions on fire prevention and fire fighting, but the supervision is weak. The management of the Government Railways, however, are beginning to bestir themselves. The loss of 500,000 acres of medium forest growth along the Government-controlled Hudson Bay Railway in 1915, due to construction engines and camps, and the wide swaths cut into the forests of northern Quebec by the National Transcontinental in the building stage, and even in the present year, have aroused public opinion and made action necessary.

Public Must Punish Trespassers

This was the theme of an address by Marcus A. Dow, general safety agent of the New York Central Lines, delivered in the capitol at Harrisburg, Pa., November 21, before the "Fourth Annual State Industrial, Welfare and Efficiency Conference." His invitation was to speak on "The Evil of Railroad Trespassing," and he began by giving facts showing that the problem of saving the 5,000 lives needlessly sacrificed on American railroad tracks, each year, was still unsolved. The problem is not a local one; it is a manifestation of the neglect of the whole nation. In the state of Pennsylvania in the year 1914, the number of trespassers killed on the railroads was 632; and 714 were injured. In the United States during the past 20 years, 90,000 trespassers have been killed. If these dead bodies had been laid in a trench, side by side, as is done on the battlefields of Europe, that trench would be 36 miles long, and it is being lengthened at the rate of two miles a year.

The railroads have consistently aimed to promote safety first; but the public has done nothing. In five years, the average number of railroad employees killed has been reduced 28 per cent, in spite of an increase in the number of persons employed; but the death roll of trespassers continues with little or no abatement because persons otherwise classed as sane, are every day thoughtlessly or recklessly using the railroad tracks as a public thoroughfare.

Every state in the Union has adopted laws dealing with almost every imaginable cause of accident, often imposing great financial burdens on the railroads to execute them, but laws proposed in the legislatures to prevent trespassing, and which would not cost the state a penny, have been persistently pigeonholed. Legislators seem to fear to take away from the public the inalienable right to do as it pleases. The railroads have tried to educate the public; but to get satisfactory results, state or federal officers must be empowered to take a hand. Educational matter bearing the stamp of authority should be widely and repeatedly circulated. The people must be warned that to trespass on railroad tracks means not only the possibility of death or injury, but is sure to mean arrest and punishment, even if they are fortunate enough to escape accident. In New York State, where there is a law making railroad trespassing a punishable offense, a special campaign of publicity along the New York Central, followed up by a campaign of arrests and prosecutions, resulted in a few months in a decrease of 19 per cent in trespass death and injury cases on that road. It is a peculiar thing that to many persons the fear of arrest is greater than the fear of injury, and the gates of a penitentiary seem to be more awe-inspiring than the doors of a hospital or morgue.

"As this problem is nation-wide, the restraining hand of Congress at Washington should be raised and a federal law passed prohibiting trespassing on all interstate roads, but a great step toward procuring the desired end would be made if a strict railroad anti-trespass law were passed in the state of Pennsylvania and every other state in the Union. Such a law, rigidly enforced, and augmented by a systematic campaign of education, conducted, not by the railroads alone, but by some authorized public officer, to teach all persons that the law was framed for their own protection and to save human life, and not for the mere purpose of guarding the railroad tracks against unlawful intrusion, would in time solve the problem.

"Can we permit this evil to continue, to grow and go on forever and not intervene? Let us continue being progressive and humane, but let us move in a straight line and not circle around our great railroad trespass problem, which is, after all, not such a difficult problem, but needs only our state and national attention. The cause of this life sacrifice, which amounts almost to a national calamity, is carelessness. The remedy is education and prohibitive legislation."

Association of Transportation and Car Accounting Officers

The winter meeting of the Association of Transportation and Car Accounting Officers will be held at Atlanta, Ga., on December 12 and 13. Reports will be presented by the committees on car service, continuous home route cards, office methods and accounting, railroad business, mail and conducting transportation.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Demurrage Officers.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., New York. Next convention, December 5-8, 1916, Engineering Societies' Bldg., New York.

American Wood Preservers' Association.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

Association of Transportation and Car Accounting Officers.—G. P. Conard, 75 Church St., New York. Next meeting, December 12-13, 1916, Ansley Hotel, Atlanta, Ga.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 30 Church St., New York. Next annual meeting, January 16, 1917, Waldorf-Astoria Hotel, New York.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

REVENUES AND EXPENSES OF RAILWAYS

Month of August, 1916

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Denver & Salt Lake	255	$127,561	$57,799	$194,889	$32,024	$33,527	$2,940	$55,543	.....	$5,065	$129,099	$65,790	$11,021	$54,768	—$18,384
Grand Canyon	64	678	17,355	24,145	18,690	412	53	12,010	.....	166	31,332	—7,187	1,670	—8,857	—150,173
Kansas City, Mexico & Orient	272	91,395	16,587	114,151	22,482	26,412	5,262	40,531	.....	5,603	100,292	13,859	6,000	7,858	11,541
Minneapolis & St. Louis R. R. Co.	1,647	735,142	191,861	978,542	136,046	153,330	19,062	311,789	76	21,161	641,464	337,078	40,735	296,170	84,314
Missouri, Oklahoma & Gulf	334	101,454	27,730	136,815	25,385	24,719	4,140	53,696	498	7,555	115,993	20,822	8,291	12,524	25,577
Oahu Railway & Land Co.	114	127,956	20,724	156,421	13,096	7,967	1,029	30,054	.....	4,794	56,926	99,495	9,500	89,995	—34,075
Port Reading	21	123,514	.....	151,094	9,305	16,591	38	54,586	.....	192	80,713	70,382	10,000	60,382	7,761
Ulster & Delaware	129	41,753	64,762	126,924	12,554	11,990	1,834	48,986	320	3,258	78,942	47,982	4,000	44,018	—4,708

Two Months of Fiscal Year 1917

Denver & Salt Lake	255	$245,701	$109,174	$373,111	$65,078	$65,803	$5,948	$106,553	.....	$10,224	$253,606	$119,506	$20,042	$99,462	—$22,583
Grand Canyon	64	2,124	44,743	58,930	28,145	1,387	106	22,654	.....	335	52,627	6,303	3,177	3,127	—266,755
Kansas City, Mexico & Orient	272	177,900	32,479	221,996	43,730	47,317	10,840	76,363	.....	11,526	189,776	32,220	12,000	20,185	21,988
Minneapolis & St. Louis R. R. Co.	1,647	1,350,145	370,494	1,823,239	257,781	300,410	36,355	578,758	166	44,007	1,217,477	605,762	82,917	522,477	87,593
Missouri, Oklahoma & Gulf	334	192,089	56,425	261,487	46,578	48,996	8,105	105,709	608	16,066	226,061	35,426	16,563	18,855	55,175
Oahu Railway & Land Co.	114	266,395	42,861	323,927	23,629	19,069	1,805	60,470	.....	9,494	114,434	209,493	19,000	190,493	—31,692
Port Reading	21	232,660	.....	284,292	18,656	31,589	77	104,851	.....	575	155,747	128,544	20,000	108,544	—1,716
Ulster & Delaware	129	81,920	141,388	264,934	24,455	24,243	4,828	96,229	605	6,596	156,956	107,979	8,000	100,022	1,207

Month of September, 1916

Alabama Great Southern	312	$341,658	$119,090	$496,167	$58,402	$106,265	$14,433	$125,142	$3,043	$9,812	$317,097	$179,070	$23,210	$155,838	$51,655
Ann Arbor	294	181,044	52,570	248,895	28,050	34,694	5,537	92,000	554	8,241	169,075	79,820	13,400	66,420	26,118
Arizona Eastern	378	255,312	46,913	324,094	64,811	31,083	2,257	62,822	2,851	11,707	175,497	148,597	17,200	131,365	28,179
Atchison, Topeka & Santa Fe	8,648	7,774,304	2,151,555	10,714,844	1,422,803	1,611,313	174,504	2,755,559	7,440	199,039	6,156,967	4,557,877	505,953	4,050,549	793,027
Atlanta & West Point	93	68,181	46,355	131,048	13,211	19,562	6,286	36,721	2,029	4,848	82,614	48,433	6,706	41,690	14,678
Atlanta, Birmingham & Atlantic	640	212,482	54,639	284,903	42,782	47,931	15,771	96,292	27	8,867	211,669	73,234	13,100	60,134	.....
Atlantic & St. Lawrence	167	98,377	29,961	139,089	36,238	26,037	4,201	78,715	.....	4,368	149,559	—10,470	9,895	—20,365	—31,993
Atlantic City	170	86,299	200,477	301,732	34,126	27,518	2,943	139,273	137	3,129	205,125	96,607	10,000	86,595	19,638
Atlantic Coast Line	4,747	1,855,778	659,851	2,743,401	395,821	497,289	55,365	928,198	7,754	73,834	1,955,781	787,619	162,000	625,202	184,710
Baltimore & Ohio	4,539	8,056,646	1,610,867	10,515,845	1,304,926	1,993,466	189,238	3,422,282	73,997	219,158	7,203,051	3,312,794	352,996	2,959,156	50,546
Baltimore, Chesapeake & Atlantic	88	88,094	42,856	137,521	6,387	31,939	866	63,867	.....	3,132	106,192	31,330	1,400	29,930	31,109
Bangor & Aroostook	632	265,940	72,003	356,660	43,207	54,381	3,588	86,426	3,927	12,725	203,981	152,679	13,660	138,996	74,677
Belt Ry. Co. of Chicago	31	.....	.....	268,389	24,995	35,863	1,506	110,414	.....	6,315	179,094	89,296	14,417	74,879	—6,128
Bessemer & Lake Erie	205	1,181,027	42,857	1,240,874	90,396	196,501	9,717	263,925	.....	16,249	562,259	678,616	69,679	608,936	—48,898
Bingham & Garfield	36	269,279	2,440	273,096	19,211	27,089	779	32,133	60	3,082	82,354	190,742	9,769	180,973	68,154
Boston & Maine	2,298	2,718,971	1,711,236	4,922,747	653,185	630,307	39,714	1,923,040	22,727	99,378	3,368,352	1,554,396	168,223	1,386,173	56,882
Buffalo, Rochester & Pittsburgh	586	1,022,200	111,666	1,184,737	161,383	286,655	11,696	384,342	1,499	21,849	867,424	317,313	22,000	295,269	12,436
Canadian Pacific Lines in Maine	234	78,676	17,466	104,224	20,878	13,823	5,944	41,829	.....	3,464	85,939	18,285	3,100	9,185	25,778
Carolina, Clinchfield & Ohio	283	219,458	22,631	251,472	25,291	38,201	16,074	62,374	.....	10,261	151,756	99,717	14,250	85,467	—17,513
Carolina, Clinchfield & Ohio of S. C.	18	9,289	1,071	10,713	397	84	2,346	3,051	.....	946	6,824	3,890	750	3,140	—2,523
Central of New Jersey	684	2,181,362	633,771	3,052,182	269,905	484,574	28,871	1,023,746	13,214	62,832	1,883,141	1,169,040	152,427	1,016,613	1,150
Central New England	301	402,004	42,531	466,521	49,420	31,109	907	130,359	.....	5,946	217,716	248,805	15,500	233,300	62,484
Central Vermont	411	239,417	100,450	376,498	49,119	47,034	11,412	148,259	2,788	9,474	268,086	108,413	15,565	92,844	15,242
Charleston & Western Carolina	342	133,839	29,094	170,007	30,053	28,522	4,866	49,738	.....	4,182	117,327	52,679	6,500	46,179	—1,766
Chesapeake & Ohio Lines	2,381	3,288,107	641,151	4,196,930	574,946	757,171	57,243	1,156,326	43,006	99,729	2,687,530	1,509,400	127,420	1,381,806	—24,210
Chicago & Alton	1,053	1,120,607	406,762	1,639,729	189,697	301,537	37,704	516,728	10,409	32,433	1,080,093	559,636	46,105	513,222	101,050
Chicago & Eastern Illinois	1,136	1,056,083	260,974	1,419,498	220,385	383,915	24,842	484,549	7,785	38,407	1,152,685	266,814	63,750	202,736	107,472
Chicago & Erie	297	638,565	60,351	755,233	77,347	68,183	18,294	270,270	2,355	17,350	452,639	302,594	22,330	280,264	5,807
Chicago & North Western	8,108	6,169,085	2,162,126	9,238,823	1,169,846	1,305,233	129,787	2,951,942	56,977	170,436	5,745,150	3,493,673	435,000	3,058,508	300,809
Chicago, Burlington & Quincy	9,369	7,369,978	2,120,164	10,374,092	1,015,170	1,455,379	129,585	2,733,181	80,247	188,307	5,601,870	4,772,222	431,048	4,341,174	921,367
Chicago, Detroit & Can. Gd. Trunk Jctn.	60	67,916	22,157	109,155	3,940	12,321	1,619	51,624	.....	1,484	70,989	38,166	3,487	34,679	12,929
Chicago, Indinapolis & Louisville	622	504,665	180,659	737,713	86,764	129,000	26,796	227,964	386	15,904	480,140	257,573	30,189	227,290	16,679
Chicago Junction	13	.....	.....	217,348	22,419	22,303	1,286	119,244	.....	4,853	170,105	47,243	3,010	44,233	—8,737
Chicago, Milwaukee & St. Paul	10,208	7,281,070	1,915,809	10,147,280	1,166,108	1,643,485	159,509	3,566,291	67,846	165,519	6,529,942	3,617,338	493,582	3,122,613	—242,076
Chicago, Rock Island & Gulf	477	223,526	65,814	309,364	43,198	41,259	9,958	84,357	1,188	7,853	187,807	121,557	7,152	114,392	56,573
Chicago, Rock Island & Pacific	7,653	4,913,345	1,788,279	7,203,318	962,980	1,139,714	134,117	2,228,418	45,636	156,796	4,648,997	2,554,321	312,142	2,240,973	898,185
Chicago, Terre Haute & Southeastern	373	220,506	17,216	244,622	33,154	84,148	4,091	68,274	1,212	7,488	198,367	46,255	10,883	35,365	—13,670
Cincinnati, Indianapolis & Western	322	155,588	53,427	228,044	31,495	27,263	6,407	78,654	405	6,279	150,413	77,631	9,441	68,190	.....
Cincinnati, New Orleans & Texas Pacific	337	731,293	193,636	983,937	78,070	231,304	25,834	253,634	6,002	22,160	617,004	366,933	45,500	321,432	109,859
Cincinnati Northern	246	153,020	19,199	179,209	26,770	31,589	3,109	52,662	.....	3,580	117,710	61,499	6,000	55,497	4,490
Cleveland, Cincinnati, Chic. & St. Louis	2,384	2,789,788	971,053	4,135,645	463,792	696,441	86,367	1,309,093	28,049	84,046	2,660,631	1,475,013	149,600	1,325,563	173,266
Coal & Coke	197	74,368	19,438	97,698	21,890	25,088	1,010	27,689	.....	2,830	78,507	19,191	5,000	14,191	5,203
Colorado & Southern	1,102	620,626	158,906	835,813	90,310	144,869	10,405	211,007	4,580	25,200	486,370	349,443	39,000	310,424	96,077
Cripple Creek & Colorado Springs	87	102,054	15,631	119,856	10,422	17,241	2,389	24,569	.....	2,886	57,508	62,349	7,603	54,746	9,508
Cumberland Valley	164	251,051	58,467	326,027	28,680	27,890	4,383	87,290	679	10,864	158,831	167,196	5,960	161,104	16,338
Delaware & Hudson Co.—R. R. Dept.	886	1,747,501	352,738	2,247,054	164,813	430,616	29,965	762,306	20,768	111,387	1,514,566	732,488	58,650	671,209	—155,586
Denver & Rio Grande	2,578	1,816,407	450,152	2,434,129	281,753	376,118	43,636	606,081	31,038	73,793	1,412,418	1,021,710	98,000	923,493	—84,255
Denver & Salt Lake	255	153,618	30,408	193,473	23,767	32,026	2,190	54,757	.....	4,831	117,571	75,902	11,005	64,898	—4,531
Detroit & Toledo Shore Line	81	140,297	.....	142,898	10,475	8,580	1,654	35,219	.....	3,625	59,553	83,345	6,800	76,545	20,073
Detroit, Grand Haven & Milwaukee	191	160,000	69,000	275,625	85,540	34,671	6,265	135,795	986	5,412	268,670	6,955	3,963	2,968	—88,519
Detroit, Toledo & Ironton	441	176,549	17,190	207,150	22,967	29,903	3,963	86,543	.....	6,110	149,487	57,662	6,000	51,629	11,622
Duluth, South Shore & Atlantic	601	209,335	95,715	336,379	63,975	42,843	7,406	106,865	4,583	12,570	238,242	98,138	19,000	79,134	—3,595
Duluth, Winnipeg & Pacific	191	118,669	19,090	141,731	17,894	26,008	1,892	44,075	643	4,796	95,309	46,423	7,087	39,336	8,609

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF SEPTEMBER, 1916—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total (inc. misc.)	Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Erie	1,988	$4,249,681	$848,327	$5,639,778	$562,329	$1,237,065	$93,034	$2,107,913	$39,379	$130,023	$4,167,297	$1,472,481	$194,147	$1,277,084	[illegible]
Florida East Coast	745	423,968	100,901	584,403	53,624	82,749	7,643	162,577	2,788	16,790	322,566	261,837	25,983	235,811	235,902
Fort Worth & Denver City	454	335,219	138,033	499,559	55,764	79,736	7,332	139,095	2,919	16,797	301,643	197,916	18,099	179,893	5,418
Georgia	307	230,363	72,314	326,519	25,212	45,721	13,384	102,776	107	9,909	197,086	129,433	4,865	124,551	78,159
Georgia, Southern & Florida	402	145,890	68,648	238,972	28,052	43,478	6,935	75,402	.....	8,854	162,711	76,261	11,115	65,097	18,068
Grand Canyon	64	719	14,528	21,473	12,164	1,104	1,854	10,286	.....	181	25,590	—4,117	1,797	—5,914	—67,509
Grand Rapids & Indiana	575	303,214	195,644	550,277	63,485	78,785	12,833	208,297	4,396	17,844	385,639	164,637	25,768	138,864	—14,495
Grand Trunk Western	347	512,000	173,000	744,204	95,581	131,181	18,626	286,628	7,557	16,657	556,230	187,974	36,637	151,073	—69,303
Great Northern	8,170	5,942,031	1,429,192	8,072,261	863,366	932,789	98,315	2,111,985	82,507	126,197	4,164,913	3,907,349	421,590	3,485,519	—554,018
Gulf, Colorado & Santa Fe	1,938	1,190 823	277,762	1,543,544	254,381	176,748	27,867	434,389	.....	51,879	945,149	598,395	59,591	538,350	321,417
Hocking Valley	350	666,981	87,986	811,730	74,456	185,715	9,003	212,103	.....	15,514	496,791	314,939	46,000	268,939	11,335
International & Great Northern	1,160	775.736	237,658	1,080,448	116,822	154,986	21,745	336,527	4,814	27,992	649,230	431,217	35,000	396,226	92,752
Kansas City, Mex. & Orient Ry. of Texas	466	100,167	17,858	124,427	16,957	22,920	3,599	48,167	.....	4,415	96.057	28,370	5,000	23,364	40,932
Lake Erie & Western	900	579,419	65,551	678,663	70,288	101,072	14,678	210,010	.....	11,727	407,775	270.888	27,000	243.723	44,524
Lehigh & Hudson River	97	169.423	11,264	189,526	31,054	31,099	1,592	72,590	.....	4,226	140,561	48,965	5,000	43,920	—17,369
Lehigh & New England	296	249,531	1,146	265,582	41,734	32,245	2,367	70,236	.....	7,421	154,002	111,580	9,720	101,860	—34,700
Long Island	397	386,712	875,703	1,458,491	142,677	124,155	12,889	530,235	6,375	37,527	852,346	606,145	74,234	526,970	95,096
Los Angeles & Salt Lake	1,154	638,488	250.062	967,877	76,168	127,610	30,955	256,158	18,699	19,175	523,596	444.281	50,171	393,782	158,248
Louisiana & Arkansas	279	85,885	17,615	107,498	23,152	18,311	3,764	34,181	.....	4,494	83,902	23,597	8,195	15,371	—31,859
Louisville & Nashville	5,071	3,878.882	1,152,700	5,390,806	715,100	1,092,283	116,161	1,553,996	20.355	113,626	3,602,684	1.788.122	226,611	1,561,070	68,450
Louisville, Henderson & St. Louis	200	99,135	41,476	149,335	34,719	25,663	4,972	42,643	.....	3,372	111,368	37,967	3,800	34.167	—4,314
Michigan Central	1,803	2.587,354	1,035,750	4,096,868	452,985	595,425	64,717	1,371,320	58.717	75,439	2,618,603	1,478,266	140,000	1,338,223	241,538
Midland Valley	385	142,240	42,069	190,407	35,382	30,539	2,628	56,992	.....	6,241	131,671	58,736	5,934	52,799	11,974
Mineral Range	120	90.316	3.429	97,172	15,310	16,867	435	43,074	.....	1,882	77,568	19,605	3,300	16,305	—8,641
Minneapolis & St. Louis	1,647	750,401	197,162	1,004,366	134,780	147,589	17,601	321.158	90	25,086	646,305	358,061	41,417	316.529	—72,245
Missouri & North Arkansas	365	73,896	36,374	118,458	19,725	12,509	4,477	35.824	.....	6.384	78,919	39,539	4,800	34.721	34,929
Missouri, Kansas & Texas System	3,865	2,353,899	836,380	3,403.155	647,052	638,271	63,837	1,046,033	19,910	96,516	2,511,573	891,582	133,972	756,722	173,354
Missouri, Oklahoma & Gulf	334	120.355	23,614	150,770	22,987	28,364	4,727	55,742	385	7,656	119,862	30,908	8,274	22,629	28,874
Missouri, Oklahoma & Gulf of Texas	134	30.510	594	31,282	3,320	3,094	1,746	11.042	.....	1,751	20.954	10.328	188	10,140	15,457
Missouri Pacific	3,931	2.317,799	481,035	3,042,465	558,032	572,319	73,593	995.347	9,748	79,738	2,285.372	757,093	114.442	641.552	38.862
Mobile & Ohio	1,160	829,440	121,876	1,009,135	123,688	273,152	38,740	322,617	2,419	31,040	791,656	217,479	41,089	176,130	—36,511
Monongahela	108	153.348	9,813	165,855	28,621	8,867	718	38,079	.....	4,140	80,425	85,430	11,000	74,430	—8,487
Monongahela Connecting	6	.....	.....	104,572	14,388	15,121	300	58.248	.....	2,979	91,037	13,535	1,636	11,899	—6,419
Morgan's La. & Texas R. R. & S. S. Co.	401	316,496	100,544	446,426	59,708	71,183	10,922	140,664	2,183	11,781	296,436	149,990	23,467	126.271	50,465
Nashville, Chattanooga & St. Louis	1,237	783,684	274,657	1,146,541	131,980	206,136	52,146	384,034	13,671	35,167	822,351	324,190	29,500	294,254	68,652
Nevada Northern	165	154,100	12,063	171,240	22,895	12,933	698	23,109	83	4,750	64,468	106,771	6,181	100,590	29,594
New Orleans & North Eastern	204	247,015	50,032	335,078	38,132	57,700	10,230	87,270	8,350	12,893	214,575	120,503	15,500	105,003	38,735
New Orleans Great Northern	285	108,820	27,170	143,248	14,732	24,339	2,705	40,194	199	6,676	88,845	54,403	5,372	48,992	4,397
New Orleans, Mobile & Chicago	402	139,096	27,727	174,160	22,222	29,346	4,090	51,009	26	6,673	113,667	60,793	6,490	54,268	16,614
New Orleans, Texas & Mexico	191	81,058	34,636	119,277	20,780	22,724	5,060	32,906	.....	6,414	87,884	31,393	1,346	30,047	—6,027
New York Central Railroad	6,093	11,792,262	5,124,799	19,775,777	1,916,673	3,336,022	254,813	5,999,043	271,587	423,047	12,201,186	7,574,591	741,231	6,829,296	767,421
New York, Chicago & St. Louis	571	1,101.362	138,826	1,291,788	127,853	388,663	54,816	503,620	5,065	29,093	1,108,521	183.267	42,000	141,222	—235,625
New York, New Haven & Hartford	2,005	3,228.364	2,897,977	7,105,636	858,926	956,489	39,921	2,527,167	98,586	172,384	4,653,040	2,452,595	265,000	2,187,436	—13,453
New York, Ontario & Western	568	462.891	186,251	770,850	133,031	116,164	7,838	282.157	.....	20,066	558,140	212,710	25,000	187,719	1,365
New York, Philadelphia & Norfolk	112	343,080	49,336	423,972	38,315	81,355	5,339	142,251	5,168	11,093	283,522	140,450	16,000	124,382	48,458
New York, Susquehanna & Western	140	173,956	50,453	255,270	22,721	40,499	1,894	117,732	.....	5,711	188,556	66,714	14,100	52,576	—23,671
Norfolk & Western	2,086	4.359.129	556,719	5,122,182	686,404	838,006	62,799	1,207,790	12,450	83,593	2,880.727	2,241,455	255,000	1,986.360	89.931
Norfolk Southern	908	279,293	119,874	423,814	61,692	59,760	7,822	135,086	101	18,165	282.625	141,189	15,015	126,097	32,127
Northern Pacific	6,505	5,589.635	1,345,201	7,576,477	904,940	669,300	93,739	1,940,477	88,973	105,262	3,714,184	3,862,293	516,200	3,344,247	293,335
Northwestern Pacific	507	235,209	185,330	468,554	43,133	46,022	5,685	137,747	720	9,085	241,179	227,376	18,155	209,220	47,618
Oahu Railway & Land Co	114	78,263	21,678	106,437	10,191	7,803	761	26,090	.....	5,014	49,855	56,581	9,500	47,081	—13,822
Oregon Short Line	2,254	1,943,142	439,071	2,558,826	210,370	218,596	30,468	534,386	31,337	59,673	1,080.465	1,478,361	136,100	1,342,161	380,802
Oregon-Washington R. R. & Nav. Co	2,053	1,220.578	442,016	1,809,045	221,928	178,341	43,820	542,516	25,135	71,228	1,081,281	727.765	94,050	633,612	47,683
Panhandle & Santa Fe	670	377,620	80,051	479,618	76,908	73,872	4,218	114,379	.....	11,191	280.543	199,076	12,452	186,386	19,012
Pennsylvania Company	1,755	5,091,296	1,174,201	6,905,912	849,403	1,154,814	90,404	2,226,728	39,081	143,230	4,501,430	2,449,482	393,029	2,056,158	—352,670
Pennsylvania Railroad	4,534	14,116,720	4,022,856	19,969,556	2,577,311	3,829,650	224,753	6,613,487	276,873	483,263	13,996,419	5,973,136	731,320	5,231,606	—396.229
Peoria & Pekin Union	19	11,027	4,836	87,105	10,931	12,897	66	42,076	.....	2,879	68.848	18.257	7,000	11.257	4,015
Pere Marquette	2,249	1,408,616	444,758	2,042,303	197,807	366,127	31,961	662,123	5,679	42,706	1,305,903	736,400	50.877	684.640	77,890
Philadelphia & Reading	1,127	4,269.367	641,941	5,189,409	346,759	755,032	50,090	1,637,240	11,557	84.913	2,884.060	2,305,349	116.743	2,187,965	438,466
Philadelphia, Baltimore & Washington	717	1,133.288	896,182	2,230,243	299,710	421,225	29,332	811,167	108	55,549	1,616,149	614,094	66,409	547.684	22,646
Pittsburgh & Lake Erie	225	1,818.889	188.868	2,149,081	199,559	318,977	14,161	458,661	3,799	34,421	1,029.579	1,119,503	84,400	1,035,102	—11,174
‡ Pittsburgh & Shawmut Railroad	95	77.121	2,904	80,458	8.888	7,727	553	23,425	.....	2,500	43,092	37.366	871	36,495	.....
Pittsburgh, Cincinnati, Chic. & St. Louis	1,489	3,125,847	912,339	4,501,232	632,185	808,936	72,305	1,427,143	29,675	101,121	3,069,426	1,431,806	216,313	1,215,192	129,761
Pittsburgh, Shawmut & Northern	205	117,444	5,445	125,350	26,220	48,305	1,070	49,333	.....	3,993	128,919	—3,569	2,706	—6,274	—58,039
Port Reading	21	153.502	.....	174.233	13,507	15,701	38	57,315	.....	246	86,806	87,426	10.000	77,426	21,399
Richmond, Fredericksburg & Potomac	88	136,281	96,152	272,768	29.456	36,222	3,757	84,222	1,987	8,730	164.375	108,394	7,909	100,480	31,385
Rutland	468	164,063	140,931	357,803	40.088	56,774	10,995	108,791	1,378	7,557	225,582	132,220	17.458	114,757	—9,149
St. Joseph & Grand Island	258	169.442	27.184	207,333	33,174	24,673	4,294	56,005	630	4,862	123,637	83,696	7,960	75.643	53,613
St. Louis & San Francisco	4,752	3,095,075	1,111,529	4,477,860	549,060	736,067	66,696	1,400,754	.....	103,327	2,788,640	1,689,220	172,969	1,516,498	505,067
St. Louis, Brownsville & Mexico	548	268,739	208 058	496,129	43,455	36,519	9,503	102,924	.....	9,889	201,904	294,225	8,600	286.144	171.091
St. Louis, Iron Mountain & Southern	3,555	2.328,224	604,031	3,156,085	594,941	483,570	64,343	828,007	10,477	75,698	2,039,550	1,116,535	136,344	979,450	364,729
St. Louis Merchants' Bridge Terminal	9	.....	366	220,552	34.147	10,908	842	94,377	.....	7,275	147.550	73,002	7,600	65,402	5,675

‡ Previously operated by Receivers of Pittsburgh, Shawmut & Northern as part of the latter company.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF SEPTEMBER, 1916—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of—										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
St. Louis, San Francisco & Texas	235	$70,866	$28,572	$107,253	$21,228	$17,868	$2,092	$40,128	.....	$4,493	$85,808	$21,445	$1,565	$19,851	$22,787
St. Louis Southwestern	943	588,667	132,923	766,141	50,232	150,694	30,475	175,558	$2,974	23,834	432,475	333,665	31,266	302,317	49,013
St. Louis Southwestern of Texas	811	362,069	92,119	486,773	48,492	105,481	12,028	147,650	1,638	19,193	334,019	152,753	16,758	135,958	84,085
San Antonio & Aransas Pass	726	356,513	100,170	480,889	53,611	52,011	6,468	159,692	.....	11,993	283,404	197,485	20,000	177,467	13,723
Seaboard	3,449	1,429,877	411,605	2,039,452	273,369	331,647	88,492	684,539	8,921	60,538	1,440,575	598,878	102,635	495,381	.....
Southern	6,983	4,330,964	1,581,239	6,527,904	1,058,237	959,363	170,559	1,973,404	36,783	174,908	4,346,561	2,181,343	263,978	1,915,297	176,015
Southern in Mississippi	281	54,823	34,015	96,115	23,877	8,385	2,675	34,534	.....	3,494	72,965	23,150	8,350	14,698	—1,441
Southern Pacific	6,949	7,696,439	2,503,037	11,161,515	989,408	1,612,839	164,116	3,540,281	151,793	235,605	6,644,304	4,517,211	460,906	4,046,054	255,113
Spokane, Portland & Seattle	555	323,879	132,585	502,082	55,198	38,424	8,327	106,897	4,515	15,463	227,923	274,159	57,445	216,643	3,247
Tennessee Central	295	102,122	41,168	152,031	22,419	18,337	5,666	49,779	.....	6,304	102,505	49,527	4,569	44,890	9,234
Terminal Railroad Ass'n of St. Louis	37	.....	251	258,269	27,199	13,374	894	70,702	.....	2,989	115,158	143,111	27,485	115,581	19,226
Texas & New Orleans	468	302,160	100,792	437,184	52,876	86,980	7,761	128,545	8,703	10,009	294,848	142,336	19,843	122,480	25,995
Texas & Pacific	1,944	1,207,266	455,617	1,783,298	214,970	240,441	38,795	627,423	12,029	53,447	1,185,218	598,080	84,500	513,251	225,481
Toledo & Ohio Central	436	453,706	62,154	551,460	70,972	102,290	6,420	183,203	1,918	10,580	375,383	176,077	23,501	152,575	36,515
Toledo, Peoria & Western	248	63,532	37,265	107,450	17,909	30,516	3,532	35,719	.....	3,788	91,464	15,986	6,500	9,486	—10,666
Toledo, St. Louis & Western	451	435,895	47,144	508,059	88,315	66,383	16,629	157,348	.....	8,930	335,530	172,529	19,000	153,452	20,446
Ulster & Delaware	129	35,576	35,570	89,618	12,428	12,677	1,265	40,473	310	4,016	71,170	18,448	4,000	14,405	—9,447
Union Pacific	3,622	5,047,204	1,020,814	6,616,721	818,656	694,028	91,179	1,448,562	96,377	138,466	3,268,725	3,347,995	245,400	3,102,337	722,498
Union Railroad of Baltimore	8	144,707	26,528	172,755	11,951	.....	.....	6,974	.....	2,357	21,283	151,472	8,924	142,548	28,982
Union Railroad of Pennsylvania	32	.....	.....	537,028	23,361	97,278	130	202,865	.....	5,337	328,969	208,059	21,000	187,059	—21,452
Vandalia	917	797,800	234,456	1,155,098	174,821	209,738	25,426	373,527	11,518	24,918	818,925	336,173	42,070	294,053	—3,880
Vicksburg, Shreveport & Pacific	171	91,358	43,183	150,159	20,913	23,770	3,490	41,428	1,841	5,663	97,105	53,054	9,180	43,874	14,585
Virginian	510	666,470	48,379	757,422	70,913	110,039	6,370	143,482	14,450	15,263	356,171	401,251	33,500	367,751	83,785
Wabash	2,519	2,374,979	673,266	3,309,717	366,185	467,129	90,098	1,078,739	18,551	63,973	2,079,510	1,230,208	98,844	1,130,979	280,629
Wabash-Pittsburgh Terminal	63	105,393	9,275	124,676	21,912	13,487	1,866	31,942	2,431	4,290	75,940	48,735	7,500	41,235	22,943
Washington Southern	36	45,187	58,330	136,238	15,540	13,637	1,262	40,399	884	4,097	75,818	60,419	3,866	56,549	17,972
West Jersey & Seashore	359	208,674	516,667	789,770	125,473	101,157	20,733	276,631	3,099	17,350	544,424	245,346	37,855	207,417	—38,149
Western Maryland	689	969,344	103,708	1,150,471	124,004	150,717	22,167	351,553	14,805	22,532	685,467	465,013	33,500	431,513	130,051
Western Pacific	939	681,116	108,829	833,390	129,929	67,627	19,050	218,422	10,405	19,219	464,652	368,737	32,750	335,987	107,564
Western Railway of Alabama	133	70,482	36,865	119,742	15,766	21,369	6,191	30,690	1,851	4,068	79,916	39,825	6,331	33,382	8,154
Wheeling & Lake Erie	512	792,251	58,694	932,625	141,988	133,565	9,823	274,953	1,528	14,801	576,657	355,968	40,266	315,702	51,768
Wichita Valley	257	49,287	21,299	74,254	11,437	7,813	74	21,752	.....	1,241	42,318	31,936	3,925	27,999	—2,825
Yazoo & Mississippi Valley	1,382	1,015,170	250,976	1,333,439	215,696	187,574	19,004	363,690	1,924	32,239	816,438	517,000	57,000	459,881	127,509

THREE MONTHS OF FISCAL YEAR 1917

Alabama & Vicksburg	143	$266,494	$116,479	$424,657	$53,581	$94,008	$10,702	$147,132	$7,285	$18,397	$331,105	$93,552	$25,800	$67,752	$18,124
Alabama Great Southern	312	955,443	362,004	1,438,923	152,906	301,345	42,139	390,423	9,429	34,088	930,329	508,594	57,338	451,148	125,557
Ann Arbor	294	511,145	171,940	727,919	75,151	105,992	16,114	278,114	2,019	25,074	502,464	225,455	40,200	184,972	58,314
Arizona Eastern	378	829,434	134,567	1,026,630	152,954	96,114	7,024	92,339	7,246	38,628	493,915	532,715	50,001	482,669	153,899
Atchison, Topeka & Santa Fe	8,648	22,395,697	7,214,861	31,924,211	4,163,971	4,782,518	543,794	8,160,660	9,006	584,288	18,205,231	13,718,980	1,453,233	12,261,357	2,499,754
Atlanta & West Point	93	174,922	130,963	351,495	39,306	58,861	19,307	99,647	5,775	14,514	237,368	114,127	19,976	94,071	38,627
Atlanta, Birmingham & Atlantic	640	593,876	161,824	814,766	128,606	144,778	43,968	285,650	71	27,317	630,390	184,376	39,300	145,060	.....
Atlantic & St. Lawrence	167	367,002	97,884	498,273	97,481	90,392	12,731	247,308	.....	13,739	461,652	36,621	29,685	6,933	4,312
Atlantic City	170	268,201	868,044	1,176,018	81,263	90,768	14,574	460,588	404	7,223	654,794	521,225	30,000	491,193	101,860
Atlantic Coast Line	4,747	5,355,143	1,974,665	7,956,504	1,154,820	1,517,772	170,439	2,787,563	23,544	226,821	5,873,111	2,083,393	482,000	1,597,670	834,346
Baltimore & Ohio	4,539	23,820,303	4,882,775	31,219,987	3,875,270	5,981,447	575,645	10,232,209	246,815	641,072	21,551,989	9,667,997	1,047,166	8,614,348	—196,509
Baltimore & Ohio Chicago Terminal	79	.....	1,867	462,646	64,244	73,378	2,737	211,858	6,368	19,013	371,836	90,810	68,066	21,308	—46,215
Baltimore, Chesapeake & Atlantic	88	282,285	168,323	470,048	31,095	90,493	6,463	205,850	.....	8,129	341,980	128,068	6,000	122,060	49,126
Bangor & Aroostook	632	581,196	189,228	825,108	133,484	154,248	11,823	229,710	10,730	38,614	577,548	247,560	39,820	207,717	72,087
Belt. Ry. Co. of Chicago	31	.....	.....	788,025	63,115	102,711	4,496	309,538	.....	18,172	498,031	289,993	41,307	248,687	14,102
Bessemer & Lake Erie	205	3,719,676	134,666	3,906,291	265,085	588,821	31,028	828,774	.....	43,400	1,707,226	2,199,065	113,709	2,085,345	—98,389
Bingham & Garfield	36	829,704	8,250	843,576	65,446	78,698	2,723	98,883	177	9,321	255,247	588,329	29,436	558,893	226,633
Boston & Maine	2,298	8,245,638	5,042,846	14,812,909	1,790,226	1,798,050	120,293	5,688,904	77,398	316,039	9,790,910	5,021,999	509,325	4,512,674	832,020
Buffalo & Susquehanna Railroad Corp.	253	407,953	19,055	435,223	67,052	101,215	4,409	116,623	.....	17,423	306,723	128,500	7,800	120,698	35,760
Buffalo, Rochester & Pittsburgh	586	3,003,527	357,750	3,508,082	482,021	799,471	39,861	1,094,859	4,842	66,361	2,487,416	1,020,667	66,000	954,630	175,066
Canadian Pacific Lines in Maine	234	184,900	57,078	267,960	75,493	43,128	17,289	107,064	.....	11,035	254,008	13,952	27,300	—13,348	38,683
Carolina, Clinchfield & Ohio	283	490,300	64,811	583,142	55,228	96,262	45,155	142,269	.....	32,954	370,738	212,404	42,750	169,654	128,038
Carolina Clinchfield & Ohio of S. C.	18	19,493	3,284	23,889	1,156	256	6,275	7,615	.....	2,380	17,678	6,211	2,250	3,920	—9,294
Central of Georgia	1,924	2,242,370	903,175	3,476,174	511,098	586,165	116,992	1,046,065	2,420	121,517	2,379,863	1,096,311	177,115	917,930	233,028
Central of New Jersey	684	6,145,688	2,130,597	8,957,649	738,409	1,435,515	96,497	3,055,631	45,467	222,214	5,591,515	3,366,134	432,428	2,933,698	276,765
Central of New England	301	1,267,865	131,515	1,468,416	145,734	123,783	3,333	385,278	.....	17,593	675,679	792,737	46,000	746,725	247,995
Central Vermont	411	718,538	310,527	1,139,669	171,645	166,396	29,456	468,442	6,687	27,388	870,014	269,654	46,695	222,897	24,791
Charleston & Western Carolina	343	315,294	92,769	433,244	84,398	78,699	13,141	137,705	.....	12,060	325,803	107,441	16,500	90,483	15,902
Chesapeake & Ohio Lines	2,381	9,718,426	1,921,372	12,476,516	1,611,330	2,270,126	171,541	3,383,584	104,427	267,617	7,803,776	4,672,740	382,260	4,290,367	381,555
Chicago & Alton	1,053	3,197,500	1,223,122	4,753,853	553,269	911,919	117,857	1,470,857	32,697	96,839	3,165,728	1,588,125	138,327	1,448,052	450,889
Chicago & Eastern Illinois	1,136	3,039,365	839,971	4,198,176	691,089	1,013,354	72,454	1,434,021	23,436	118,934	3,339,986	858,190	188,550	669,210	26,978
Chicago & Erie	270	1,828,099	200,698	2,185,137	226,106	202,016	55,161	778,270	6,180	48,885	1,307,948	877,189	66,690	810,499	203,822
Chicago & North Western	8,108	16,981,455	6,582,416	26,333,618	3,504,170	3,791,425	369,717	8,538,915	180,382	498,776	16,752,469	9,581,149	1,280,000	8,300,374	2,276,374
Chicago, Burlington & Quincy	9,369	19,825,647	6,544,494	28,868,796	3,324,398	4,366,817	418,859	7,772,649	244,029	569,998	16,696,749	12,172,047	1,193,109	10,978,938	2,923,120
Chicago, Detroit & Can. Gd. Trunk Jctn.	60	181,508	63,403	298,743	36,887	34,071	4,728	136,558	.....	4,522	216,766	81,977	10,461	71,515	2,193
Chicago Great Western	1,496	2,800,890	1,025,207	4,190,053	651,839	656,057	147,566	1,302,431	30,959	107,838	2,892,308	1,297,745	144,918	1,149,928	337,072
Chicago, Indianapolis & Louisville	622	1,502,288	523,899	2,183,336	232,142	365,070	61,791	674,048	1,414	49,082	1,379,760	803,575	89,092	714,343	163,777
Chicago Junction	13	.....	.....	629,842	67,370	59,881	3,669	342,810	.....	14,627	488,357	141,485	10,302	131,183	5,273

Traffic News

The Georgia Southern & Florida, in co-operation with the state agricultural officers of Georgia and Florida, is running a dairy instruction car over its lines. The itinerary extends from November 27 to December 17. Instruction on the best methods of cotton culture will be included.

The Virginia State Corporation Commission has finally refused to approve a long list of increases in freight rates on commodities proposed by the principal railroads of the state in 1915. Complaints were made by commercial bodies of a number of cities, and the present decision follows a long number of hearings.

The railroad commission of Georgia, which has been holding hearings for several weeks in connection with the application of the railroads of that state for authority to make new freight tariffs, increasing rates, and which has not been noted for special celerity, announces that a recess has been taken until February 5, when objections to the proposed new rates will be heard.

The Memphis Furniture Manufacturing Company recently entered a plea of guilty before Judge John E. McCall, in the Federal Court at Memphis, on a charge of violation of the Interstate Commerce Act, by misbilling freight and was fined $200 each on eight counts. One count was dismissed. The indictments charged that the company loaded rugs, blankets, window shades, etc., in carload lots of furniture, and lumped them in with the furniture.

The Pennsylvania Railroad's embargo on westbound freight which was noticed last week, and which was imposed at all eastern points, on freight going beyond Pittsburgh, Pa., was lifted on the 18th, after a week of strenuous work; though restrictions still apply against freight for the Youngstown district, with the exception of coal, coke, ore, limestone, dolomite, perishable freight, foodstuffs for human consumption and United States Government freight. The embargoes were placed on November 13, and almost completely suspended westbound traffic by the Star-Union Line. This was the first embargo ever laid by these lines, except at the time of the devastating floods in Ohio and neighboring states in the spring of 1913.

The Secretary of Agriculture has isued a circular, dividing the United States into 32 supervision districts for administration of the federal grain standards act, which will become effective December 1. The headquarters of the districts will be established in Boston, New York, Philadelphia, Buffalo, Pittsburgh, Baltimore, Jacksonville, Atlanta, Nashville, Louisville, Cincinnati, Indianapolis, Toledo, Cleveland, Detroit, Milwaukee, Duluth, Minneapolis, Omaha, Chicago, Peoria, St. Louis, Cairo, Kansas City (Mo.), Memphis, New Orleans, Galveston, Fort Worth, Oklahoma City, Wichita (Kan.), Denver, and Portland (Oregon). The boundaries of the districts are described in an announcement issued by the office of Markets and Rural Organization. The rules for inspection, and a copy of the law, are contained in Circular No. 70, issued by the Secretary of Agriculture November 6.

Twenty-four railroad companies operating in Illinois filed suit in the United States District Court at Chicago on November 20, applying for an injunction against the state public utilities commission, the attorney-general and all state's attorneys, to prevent them from interfering with the filing of new passenger tariffs by the carriers, in compliance with the orders of the Interstate Commerce Commission of July 12, and October 17, in the case of the Business Men's League of St. Louis vs. Atchison, Topeka & Santa Fe, et al. The aforementioned orders find that the passenger rate of 2.4 cents a mile, bridge tolls excepted, is reasonable between Illinois points and St. Louis, Mo., and Keokuk, Iowa. They further require that no undue preferences be shown to intrastate traffic by the contemporaneous maintenance between Illinois points of passenger fares, which, in combination with other fares, produce a discrimination against interstate commerce, and an undue preference in favor of intrastate commerce. The carriers interpret the orders as justifying a fare of 24 cents a mile for all of their intrastate passenger traffic. The hearing on the application for an injunction will be held on December 7.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended until March 18 proposed increased rates on lumber from certain points of origin in Texas and Louisiana to Beaumont, Tex., for export.

The Interstate Commerce Commission on Monday suspended all the tariffs which have been filed by railroads recently providing for a graduated scale of increased demurrage charges.

The Interstate Commerce Commission has suspended until May 19, 1917, proposed increased rates on cement plaster from Plasterco, Tex., to St. Louis, Memphis and other interstate points.

The commission on Wednesday suspended till March 31 tariffs filed by roads providing for revision of class rates in Central Freight Association territory which contained both advances and reductions.

The Interstate Commerce Commission has suspended from November 20 and later dates until March 20, 1917, tariffs providing for increased carload minimum weights on grain and wheat flour between points in Missouri, Kansas and other western states.

The Interstate Commerce Commission has suspended from November 20 until March 20 tariffs providing for the withdrawal of commodity rates on eggs and other dairy products from Chicago, Ill.; St. Louis, Mo.; Kansas City, Mo., and other points of origin to various destinations in Montana.

The Portland (Oregon) Traffic and Transportation has filed a complaint against the Southern Pacific, charging that freight rates from Portland to points in Oregon and northern California are not only excessive in themselves, but are discriminatory as compared with the class rates from San Francisco to the same points.

The department of justice has filed with the Interstate Commerce Commission a brief opposing the application of the New York, New Haven & Hartford for permission to continue the operation of its boat lines on Long Island Sound, on the ground that continued control of these lines by the railroad will result in the exclusion, prevention and reduction of competition. A. H. Elder, attorney for the Interstate Commerce Commission, has also filed a brief opposing the road's application. The brief outlines five courses which the commission my adopt, but states that only one of these, to deny the application without qualification, is open to the commission on the record as it stands, and that if such a course must be followed it is apparent that through rail and sound routes may for a time at least be interrupted. "In view of the policy pursued by the petitioner up to the present time, however," Mr. Elder says, "one is led to conclude that it may be necessary to sacrifice some of the advantages arising from railroad control if the public is to secure free and unrestricted competition on the sound."

Transcontinental Rate Hearing

W. M. Daniels, commissioner, at Chicago on November 20, reopened the entire question of fourth section applications respecting freight rates on commodities from eastern defined territory to Pacific Coast ports and intermediate points, and rates on commodities from Pacific Coast ports to eastern destinations. At this hearing the carriers presented evidence to show that there is no fixed relation between terminal rates, fixed for the purpose of meeting water competition, and rates to intermediate points. In their opinion carriers should make application on terminal rates showing the necessity therefor, and the commission should decide these rates on the showing made, without disturbing intermediate rates; intermediate communities have at all times the privilege of bringing before the commission the question of the reasonableness of intermediate rates. In line with this point of view the carriers propose to file tariffs, to take effect on December 30, increasing the present rates to

ocean ports 10 cents per 100 lb. on carload lots, and 25 cents per 100 lb. on less than carload traffic. F. H. Wood, general attorney, and L. J. Spence, director of traffic of the Southern Pacific, and P. P. Hastings, assistant general freight agent of the Atchison, Topeka & Santa Fe, opened the case for the railroads on the first day, explaining the proposed increases. J. C. Campbell, of the Spokane (Wash.) Chamber of Commerce, led the fight of inter-mountain cities against the new rates, claiming they should be higher. The hearings in Chicago were expected to terminate on the 23rd.

A large part of the testimony was devoted to a consideration of the proposed tariffs on Schedule C commodities, increasing the rate to Pacific Coast points 10 cents per 100 lb. c. l., and 25 cents on l. c. l. shipments. J. F. Townsend, of the National Tube Company, objected to the proposed rate on wrought iron tubing from Pittsburgh, which is higher than on cast iron tubing from Birmingham and from Chicago, claiming that Pittsburgh is as close to the water as Birmingham; and that the industry in general has been built upon the principle of long standing, that rates shall be equal to the coast from all points east of the Mississippi. W. J. Wood, speaking for the cast iron tube manufacturers of Birmingham, called for lower rates from Birmingham on account of its proximity to the Gulf. Representatives of the National Canners' Association protested against fixing eastbound rates from the Pacific Coast lower than those westbound. This and subsequent hearings at Salt Lake City, San Francisco, Portland and Spokane before Examiner Thurtell will reopen the whole question of trans-continental freight rates, the purpose of the commission being to ascertain the permanent principles by which to pass upon the reasonableness of rates in the future. The carriers contend that making rates to meet water competition has no relation to rates to intermediate points. The old percentage plan of determining the latter rates is to be abandoned.

STATE COMMISSIONS

The Public Utilities Commission of Ohio, acting on numerous reports of shortage of coal, ordered the railroads of the state last week to send in reports showing the status of the coal traffic at all points; cars loaded, cars empty, embargoes, etc.

The Montana Railroad and Public Service Commission held hearings last week on proposed increases in demurrage rates, which have been filed for intrastate application. These are identical with the demurrage rates under consideration by the Interstate Commerce Commission, and suspended by it until next March.

The railroads of Texas have filed a complaint with the state railroad commission that the existing car shortage is largely due to laxness of shippers in not loading and unloading cars promptly. It is proposed that the demurrage charges be increased; and a public hearing is to be held on December 12. Shippers propose that the reciprocal demurrage rules be changed, and that the railroads be required to move a car not less than 75 miles a day instead of the 30 miles a day required by law at present.

The State Public Utilities Commission of Illinois resumed hearings on November 20, at Chicago, on a proposed demurrage schedule for intrastate business identical with those filed with the Interstate Commerce Commission. W. H. Rotchford, of the Western Demurrage and Storage Bureau, Chicago, in his testimony said that more than $9,000,000 in demurrage charges was paid to the railroads of the United States in the fiscal year ending June 30, 1916, and that had shippers promptly unloaded, within free time, the cars upon which they paid this demurrage, over 32,000 additional cars per day would have been released for the use of other shippers. To show the more prompt release of cars under a high demurrage rate, F. A. Pontious (C. & N. W.) quoted from Mote's Exhibit No. 1, Investigation and Suspension Docket Nos. 83 and 83-A, 25 I. C. C., 314, showing results in California. Between July 1, 1909, and April 30, 1911, when a $6 rate on state traffic was applied, only 1.06 per cent of 1,850,000 cars, in intrastate traffic, were held overtime, as compared with 5.68 per cent of 440,000 cars, engaged in interstate traffic. Between May 1, 1911, and February 29, 1912, under a $3 demurrage rate on state traffic, 1.48 per cent of about a million cars engaged in state traffic were held overtime, and 5.32 per cent of 216,000 cars in interstate traffic.

PERSONNEL OF COMMISSIONS

Lawton T. Hemans, chairman of the Michigan State Railroad Commission, died at Battle Creek, Mich., November 17, at the age of 52.

COURT NEWS

Crossing Accident—Contributory Negligence

The Virginia Supreme Court of Appeals holds that the driver of a horse and wagon approaching a railroad crossing must exercise care commensurate with the known danger, and listen and look in every direction to make sure that the crossing is safe; and his failure to look and listen when he had an unobstructed view from a point 90 feet from the track to a point 40 feet from the track was negligence, even though the railroad was negligent in failing to give signals of its approach. Judgment for the plaintiff was reversed and a new trial granted.—Southern v. Mason (Va.) 89 S. E., 225.

Carrying Passenger Beyond Destination

A passenger was negligently carried beyond his station. There was evidence that when the train stopped about half a mile beyond the station, the conductor offered in the presence and hearing of the passenger to back the train to the station, and tending to show that the latter voluntarily left the train where it had stopped. In an action for damages the Georgia Court of Appeals held that the questions whether the passenger heard the conductor and whether he waived his claim to nominal damages by voluntarily leaving the train were for the jury, which found for the railroad.—Berry v. S. A. L. (Ga.), 89 S. E., 591.

Service Letters

Under the Oklahoma statute of 1910 any employee of a public service corporation doing business in that state, upon his discharge or the voluntary termination of his services, is entitled to have issued to him a service letter; but the Oklahoma Supreme Court holds that before a corporation will be guilty of any breach of duty in failing to issue a service letter, request for it must be made by the employee, either orally or in writing served personally or by mail upon the superintendent, manager, or contractor of the corporation.—Rock Island v. Hall (Okla.), 159 Pac., 851.

Assumption of Risk by Yard Detective

A railroad inspector employed to watch yards at night was assaulted and seriously injured by two men whom he found trying to break into a car The inspector, in an action against the railroad, alleged that an assistant, whom it was agreed he should have, had been withdrawn, and that the railroad had failed to furnish lights as agreed. The Georgia Supreme Court holds that if the plaintiff, knowing the dangerous character of his vocation, knowing of course of the withdrawal of his assistant, continued the work alone, he thereby assumed the additional risk of doing so. In the same way, if, knowing that the promised lights had not been put up, he continued in the work, he assumed the additional risk from the want of them.—Lowry v. Atlanta Joint Terminals (Ga.), 89 S. E., 832.

New Jersey Pass-Law Invalid

The New Jersey Court of Errors and Appeals on November 20 held unconstitutional an act of 1914 which provided that nearly 300 employees of the state should have free railroad transportation. The decision was in the case of L. Edward Herrmann, who was private secretary to Governor Fielder and is now counsel to the Board of Public Utility Commissioners. The suit was brought by the Pennsylvania Railroad to recover about $100 in fares from Mr. Herrmann because he refused to pay. This decision reverses the previous finding of the Supreme Court. It has been estimated that under the decision the state will have to pay annually approximately $100,000 more in railroad fares than it has paid in the last two years and a half. No state officers are entitled to free transportation, except those designated in the general revision of the railroad laws of 1904. About 300 passes are made void by the decision.

Stop, Look and Listen Rule

In a recent action in the federal district court, N. D. West Virginia, Mr. Justice Dayton stated the law, as it stands at present, as regards the duties and liabilities of the traveler about to cross tracks. Diverse conditions may arise in different cases. He may be afoot, on horseback, in a large cumbersome vehicle, a road wagon making much noise, a light buggy, making little, or in an automobile, noisy or not. He may be hard of hearing or not; his vision may or may not be defective. He may have one, or he may have several tracks to cross; the approach to the crossing may be clear, the track straight, and his vision for many rods unobstructed, or it may be obstructed, either by objects such as trees, curves, embankments and buildings, or by cars temporarily placed on side tracks by the company itself. Again, his hearing may be interfered with by noises of machinery, waterfalls, other than those created by the company, or by those of engines, machinery, etc., operated by the company in the vicinity. In any event however, he must never be unmindful that he is primarily responsible for his own safety; that the railroad, at a crossing, has the right of way; that at a railroad crossing the track is itself a warning. It is a place of danger. It can never be assumed that cars are not approaching on a track. The presence of noises or obstructions to view require a greater degree of caution to be exercised by him, and if he fails to meet these requirements he is, under the existing law, held guilty of contributory negligence, which will bar any recovery for damages, as against the railroad, whether the latter was negligent or not.

The only way the normal man can take these precautions is by control of his steps or the means he is using for locomotion, and the exercise of his senses of sight and hearing. Hence the rule to stop, look and listen. In the state of Pennsylvania this rule is made absolute. If he fails in any one particular, he cannot recover. This rule is somewhat modified in the federal courts, and in those of West Virginia and other states. The court cited authorities to show that in the Circuit Courts of Appeals for the Second, Third, Fourth, Eighth and Ninth circuits, the rule is established that, where the view is obstructed, it becomes the duty of the traveler in a conveyance liable to make noise calculated to interfere with effective hearing to stop, as well as to look and listen, and these cases strongly emphasize what common sense dictates should be so, that the stop must be made just before going on the track, and not so far before such approach as to run any risk of its being ineffective. An examination has failed to disclose any different ruling in the other federal courts.

The facts of the case at bar were undisputed. Dernberger, the deceased, was a middle-aged farmer, who used the crossing very frequently. At the time he was approaching the crossing he was driving a two-horse team attached to a low-wheeled farm wagon, and two friends were riding with him. He came to within 200 feet of the crossing, where the view was wholly obstructed, when one of the traces became detached. He stopped, got out and fastened the trace. He got back into the wagon, drove to within 150 feet of the track, where he slackened his speed to two miles an hour, until his horses' feet were substantially on the track, when he discovered for the first time that the train was coming, saying, "My God, there is the fast line!" His horses lunged across the track. One of the men jumped out of the wagon, before it was struck by the train. Dernberger and the other man were killed. The survivor testified that, at a point about 16 feet before reaching it, the track could be seen for a distance of 30 or 40 yards. Another witness testified that at that point the track could be seen 360 feet. The court said: "Recalling the fact that 5,280 feet constitute a mile, it is mathematically sure that Dernberger, driving at a speed of two miles an hour, would go 176 feet a minute. He therefore drove this 16 feet from where he could see the track in a little over five seconds; had he stopped the noise of his wagon at that point for these few seconds, so as to be able to look and listen effectively, he would have saved his life. Nay more, admitting that the train was running 45 miles an hour, it was then covering 66 feet a second. If Dernberger had stopped at the point 16 feet before reaching the crossing, where he could see the track for a distance of 150 feet or more, for 2 seconds, the train would have beat him to the crossing. Such mathematical demonstrations must startle us into a realization of how necessary it was for Dernberger to have obeyed the legal obligation of stop, look and listen." Final judgment was directed to be entered for the defendant railroad. Dernberger v. Baltimore & Ohio, 234 Fed. 405.

Railway Officers

Executive, Financial, Legal and Accounting

Sanford H. E. Freund, general attorney of the Great Northern at St. Paul, Minn., has been appointed assistant general counsel, with same headquarters.

John F. Finerty, assistant general solicitor of the Great Northern, with headquarters at St. Paul, Minn., has been appointed assistant general counsel with same office.

Charles S. Albert, attorney for the Great Northern at Spokane, Wash., has been appointed attorney for Idaho and eastern Washington, with the same headquarters as at present.

Frederic G. Dorety has been appointed attorney for the Great Northern at Seattle, Wash., having jurisdiction over the state of Oregon and western Washington. He succeeds F. V. Brown, promoted.

Guy Hopkins, vice-president and general superintendent of Morgan's Louisiana & Texas, with office at New Orleans, La., has tendered his resignation, effective on the appointment of his successor.

H. L. Dunham has been appointed general claim agent, in charge of personal injury claims, of the Chesapeake & Ohio, with headquarters at Richmond, Va. F. W. H. O'Meara has been appointed freight claim agent, in charge of loss and damage claims, with headquarters at Richmond.

Avery Turner, receiver for the St. Louis, San Francisco & Texas, which recently emerged from receivership, will resume his former position as vice-president of the Atchison, Topeka & Santa Fe, Pan Handle Lines, which he held when he was appointed receiver of the above lines in July, 1913.

Alexander Millar, secretary of the Union Pacific, with office at New York City, who was also recently elected secretary of the St. Joseph & Grand Island, was born October 24, 1849, in Scotland, where he was educated in private schools. He entered railway service in November, 1872, as a stenographer with the Union Pacific. From this time on he held the following positions with this same company: 1873 to 1885, bookkeeper; from 1885 to 1887, chief clerk in controller's office; from 1887 to 1888, assistant secretary; from 1888 to 1894, secretary; from 1894 to 1897, secretary and assistant controller. From December, 1897, to January, 1901, he was secretary of this same company. In January, 1901, he was appointed secretary of the Southern Pacific, with office at New York, N. Y., which connection he held until February, 1913, when he returned to the Union Pacific as secretary.

George H. Schleyer, former receiver of the St. Louis, San Francisco & Texas, the Ft. Worth & Rio Grande and the Brownwood, North & South, was elected vice-president and general manager of these lines at a recent meeting of the St. Louis-San Francisco board of directors. He was born in October, 1863, at Chillicothe, Ohio, where he received his early education. In September, 1881, he entered railway service as a telegraph operator on the Cincinnati, Hamilton & Dayton. From 1883 to 1885 he was train despatcher for this company, and from 1885 to 1887 he held a similar position on the Baltimore & Ohio. During 1887 and 1888 he held this same connection on the Cleveland, Cincinnati, Chicago & St. Louis. In 1888 he was made a train despatcher on the St. Louis-San Francisco, and in 1889 was promoted to chief despatcher. From 1895 to 1902 he was trainmaster, being advanced to superintendent in the latter year. On October 1, 1912, he was elected vice-president and general manager of this company's Texas lines, which position he held until July, 1913, when he was appointed receiver, jointly with Avery Turner, with office at Ft. Worth, Texas.

Operating

C. E. Hill has been appointed assistant to the general manager of the Atchison, Topeka & Santa Fe, Coast Lines, at Los Angeles, Cal.

W. G. Koch, chief despatcher for the Missouri, Kansas & Texas, at Tyler, Tex., has been appointed chief despatcher for the Ft. Smith & Western at Ft. Smith, Ark.

G. J. Fox has been appointed superintendent of the Schreiber division of the Canadian Pacific, with headquarters at Schreiber, Ont., vice F. W. Cooper, resigned.

P. C. Jamieson, trainmaster for the Oregon Short Line at Salt Lake City, Utah, has been appointed acting superintendent of the Ogden Union Railway & Depot Company, at Ogden, Utah, succeeding Harry L. Bell, resigned to accept service with another company.

I. L. Hibbard, general superintendent of the Atchison, Topeka & Santa Fe, Coast Lines, has been appointed assistant general manager, with headquarters at Los Angeles, Cal. The office of general superintendent has been abolished, but he will continue to perform his old duties in addition to those assumed under his new title.

Charles Forrester, superintendent of the Stratford division of the Grand Trunk at Stratford, Ont., has been appointed superintendent of the London division, with headquarters at London, vice W. R. Davidson, transferred to Western Lines, and R. H. Fish, trainmaster at Brantford, has been appointed superintendent of the Stratford division, with headquarters at Stratford, vice Mr. Forrester.

H. L. Bell, superintendent of terminals of the Ogden Union Railway & Depot Company of Ogden, Utah, has been appointed superintendent of the Wyoming division of the Union Pacific, with office at Cheyenne, Wyo., succeeding S. R. Toucey. W. A. Whitney, in addition to his duties as superintendent of transportation, has been acting division superintendent at this point during the interval of S. R. Toucey's resignation and the present appointment of H. L. Bell.

J. A. Gleason, chief train despatcher of the Chesapeake & Ohio, at Clifton Forge, Va., has been appointed superintendent of the Clifton Forge division, with headquarters at Clifton Forge, vice J. A. Fox, deceased. H. M. Eddins, assistant trainmaster at Charlottesville, Va., has been appointed trainmaster of the James River district, with office at Clifton Forge, vice H. E. Webb, who has been appointed trainmaster of the Logan coal district, with office at Logan, W. Va., succeeding J. B. White, resigned. George T. Davis has been appointed chief train despatcher, at Clifton Forge, Va., vice J. A. Gleason. M. C. Selden, division engineer at Richmond, Va., has been appointed trainmaster of the Rivanna district, vice Mr. Eddins. R. S. Anderson, assistant trainmaster at Richmond, has been appointed trainmaster of the Peninsula district, and the office of assistant trainmaster, Rivanna and Peninsula districts, has been abolished.

Traffic

J. T. Bryan has been appointed commercial agent of the Texas & Pacific, with office at Ft. Worth, Tex., succeeding A. L. Farrells, transferred.

E. E. Eckert, soliciting freight agent of the Akron, Canton & Youngstown, at Akron, Ohio, has been appointed commercial agent, with the same headquarters.

B. F. Jones, traveling freight agent of the Los Angeles & Salt Lake at Los Angeles, Cal., has been appointed district freight agent, with the same headquarters.

R. C. Smith has been appointed general agent, freight department, of the Atchison, Topeka & Santa Fe, with headquarters at Philadelphia, Pa., succeeding C. D. Buxton, resigned.

T. J. Widmeyre, automobile agent of the Los Angeles & Salt Lake at Los Angeles, Cal., has been appointed general agent at Chicago, Ill., succeeding William Warner, promoted.

C. B. Fox, traveling freight agent of the Texas & Pacific, with headquarters at Ft. Worth, Tex., has been appointed commercial agent at Shreveport, La., succeeding E. S. Vincent, resigned.

William C. Glynn, division freight agent of the Central division of the Pennsylvania Railroad at Erie, Pa. has been appointed assistant general freight agent with headquarters at Philadelphia, Pa., succeeding Charles E. Kingston. Edward S. Neilson, division freight agent of the Eastern Pennsylvania, Western Pennsylvania and Central divisions, at Altoona, Pa., succeeds Mr. Glynn at Erie and Clarence T. Mackenson, Jr., has been appointed division freight agent at Altoona, succeeding Mr. Neilson.

William Warner, general agent of the Los Angeles & Salt Lake, at Chicago, Ill., has been appointed assistant general freight and passenger agent, with office at Salt Lake City, Utah.



W. Warner

He was born in Toronto, Can., and at an early age went to Chicago, Ill., where he entered railway service with the Atchison, Topeka & Santa Fe in a clerical capacity. Later he became connected with the Chicago, Milwaukee & St. Paul in a similar position. In 1905, when the San Pedro, Los Angeles & Salt Lake opened an office at Chicago he obtained employment with this company and was rapidly advanced until he was made chief clerk. At the death of the general agent in 1914 he was appointed in his stead. He now succeeds J. H. Manderfield, resigned to become general manager of the Salt Lake City Union Stockyards Company.

Walter B. Wells, general freight agent of the Ft. Worth & Rio Grande and the St. Louis, San Francisco & Texas, with headquarters at Ft. Worth, Tex., the announcement of whose promotion to this office was recently made, was born on May 8, 1875, at St. Louis, Mo. He entered railway service in 1891 with the St. Louis & San Francisco as a messenger in the office of the auditor at St. Louis, Mo. He was connected with this office in various capacities for about nine years, when he was promoted to a position in the freight traffic department as bill of lading clerk to the general agent at St. Louis. He held this latter position for several years, and then was promoted to contracting freight agent with the same headquarters. Five years later he was appointed traveling freight agent, with office at Ft. Worth, Tex., which position he held for three years, being then transferred to Dallas, Tex., as commercial agent. About three years after this promotion he was transferred to St. Louis as industrial agent, and two years later he was again promoted to general agent of the traffic and operating departments, with office at Dallas, Tex. His present promotion to general freight agent of the Texas Lines of the St. Louis-San Francisco system became effective October 15, 1916.



W. B. Wells

R. Campbell Kennedy, the announcement of whose appointment as assistant general passenger agent of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at St. Louis, Mo., has just been made, was born in 1875, at Louisville, Ky. He received his education in the common schools of this city, and entered railway service with the above company in a clerical capacity in 1894, since which time he has been consecutively, city passenger agent at Cincinnati, Ohio; traveling passenger agent at Cairo, Ill.; southeastern passenger agent at Huntington, W. Va.; city passenger agent at Chicago, Ill.; general

agent at Dallas, Tex.; general traveling passenger agent at Indianapolis, Ind.; general agent, passenger department, at Louisville, Ky., and southwestern passenger agent at St. Louis, Mo. His present appointment became effective November 1, 1916.

George Stephen, assistant freight traffic manager of the Canadian Northern and the Duluth, Winnipeg & Pacific, at Winnipeg, Man., has been appointed freight traffic manager, lines west of and including Port Arthur, Ont., and Duluth, Minn., with headquarters at Winnipeg. A sketch of Mr. Stephen's railway career was published in the *Railway Age Gazette* of March 24, 1916, page 699. William Phillips has been appointed freight traffic manager, lines east of Port Arthur, with headquarters at Toronto, Ont.; Guy Tombs has been appointed general freight agent of the Canadian Northern, lines east of Port Arthur, with headquarters at Montreal, Que.; and M. A. Thomson, city freight agent at Ottawa, Ont., has been appointed district freight agent of the lines east of Port Arthur, with headquarters at Ottawa, in charge of territory east of North Bay to L'Orignal, inclusive, and south to Brockville, inclusive.

Engineering and Rolling Stock

R. G. Wyman has been appointed division engineer of the Atchison, Topeka & Santa Fe, Eastern Lines, with office at Amarillo, Tex., succeeding J. W. Walter.

Charles Leat has been appointed road foreman of engines on the Atchison, Topeka & Santa Fe, Eastern division, with office at Argentine, Kan., succeeding A. F. Bauer.

W. C. Pearce has been appointed division engineer of the Chesapeake & Ohio, with headquarters at Richmond, Va. F. D. Beale has been appointed acting division engineer, with headquarters at Clifton Forge, Va. J. W. Gleason has been appointed acting division engineer, with headquarters at Ashland, Ky., and H. A. Bertram has been appointed acting division engineer, with headquarters at Peru, Ind.

R. B. Burton, assistant to consulting engineer of the Southern Pacific Company at New York, will leave the service of that road on December 1, to accept a position with private interests. He entered the service of the Southern Pacific on the Western division, at Oakland Pier, Cal., in May, 1900, and served as rodman and chainman until August, 1902, when he was placed in charge of right of way and station ground leases at the same office. From June, 1904, to September of the following year he was draftsman at Oakland Pier, and then to November, 1906, was draftsman in the general office of the same road at San Francisco. From November, 1906, to June, 1907 he served as draftsman in the general office at Chicago under John D. Isaacs, consulting engineer of the Union Pacific System and the Southern Pacific Company. Mr. Burton then served as chief clerk to the consulting engineer until August, 1909, then to February, 1912, as assistant to the consulting engineer of the same roads at Chicago and New York. In February, 1912, he was appointed senior assistant to the consulting engineer of the Southern Pacific Company, with headquarters at New York, and on December 1 will leave the service of that company.

Purchasing

W. R. Culver, storekeeper of the Pere Marquette at Grand Rapids, Mich., has been appointed general storekeeper. The office of general storekeeper is now located at Saginaw, Mich.

OBITUARY

George Shepard Savage, for the last 30 years commercial agent for the Empire Fast Freight Line, with office at Chicago, Ill., died suddenly at his home in that city on November 15, aged 60 years.

STEEL AUTOMOBILE TIRES.—Steel tires for motor cars are now being used in Germany because of the scarcity of rubber. They consist of dozens of fine steel threads woven together and fixed over an inner band of rubber. After running about 3,500 miles the steel cover is worn out and has to be replaced. The rubber inner band remains intact. It is stated that the effect of the steel tires is to retard the speed and make the riding rough.

Equipment and Supplies

LOCOMOTIVES

THE CAMBRIA & INDIANA has ordered 2 locomotives from the Baldwin Locomotive Works.

THE WEST VIRGINIA NORTHERN has ordered one Consolidation locomotive from the Baldwin Locomotive Works.

THE RIVER TERMINAL RAILWAY, Wickliffe, Ohio, has ordered 6 small locomotives from the Baldwin Locomotive Works.

THE NEVADA CONSOLIDATED COPPER COMPANY, New York, has ordered 2 0-6-2 type locomotives from the Baldwin Locomotive Works.

THE NATIONAL SLAG COMPANY, South Bethlehem, Pa., has ordered 2 six-wheel switching locomotives from the Baldwin Locomotive Works.

THE R. A. MYER LUMBER COMPANY, Honey Island, Tex., has ordered one Mogul locomotive from the Birmingham Rail & Locomotive Company.

THE WHEELING STEEL & IRON COMPANY, Benwood, W. Va., has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

THE MARK MANUFACTURING COMPANY, Indiana Harbor, Ind., has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

THE FOSTER CREEK LUMBER & MANUFACTURING COMPANY, Gloster, Miss., has purchased one Consolidation locomotive from the Birmingham Rail & Locomotive Company.

THE UNION PACIFIC has ordered 20 Mikado locomotives from the Baldwin Locomotive Works, in addition to the 16 Santa Fe type locomotives reported in last week's issue.

THE BIRMINGHAM SOUTHERN has ordered 4 superheater Santa Fe type locomotives from the American Locomotive Company. These locomotives will have 28 by 32-in. cylinders, 57-in. driving wheels, and a total weight in working order of 353,000 lb.

THE NEW YORK, CHICAGO & ST. LOUIS was reported in last week's issue as having ordered 25 Mikado locomotives from the American Locomotive Company. These locomotives will have 25 by 32-in. cylinders, 63-in. driving wheels, a total weight in working order of 284,000 lb., and will be equipped with superheaters.

FREIGHT CARS

THE PERE MARQUETTE has dropped its inquiry for 1,000 freight cars.

THE CHICAGO, ROCK ISLAND & PACIFIC has issued inquiries for 2,000 box cars.

THE NORTHERN PACIFIC is inquiring for 1,000 box and 500 automobile cars.

THE LOS ANGELES & SALT LAKE has ordered 200 automobile cars from the Pullman Company.

THE MINNEAPOLIS & ST. LOUIS has issued inquiries for 1,000 box, 200 flat and 300 gondola cars.

THE UNITED RAILWAYS OF HAVANA are reported in the market for 25 gondola, 25 flat and 95 box cars.

THE BETHLEHEM STEEL CORPORATION has ordered 150 70-ton ore cars from the American Car & Foundry Company.

THE MILWAUKEE COAL & GAS COMPANY is reported as having ordered 200 hopper cars from the Pressed Steel Car Company.

THE RUTLAND has ordered one size 2 Russell wing elevator snow-plow and flanger from the Russell Car & Snow-Plow Company.

THE DENVER & RIO GRANDE has ordered 500 ballast cars from the Rodger Ballast Car Company, and is in the market for 1,300 box cars.

The Carnegie Steel Company is reported as having ordered 156 gondola and 42 hopper cars from the Pressed Steel Car Company.

The Lehigh Valley has ordered one size 2 Russell wing elevator snow-plow and flanger from the Russell Car & Snow-Plow Company.

The Delaware, Lackawanna & Western has ordered 500 box cars from the American Car & Foundry Company, and is still inquiring for 500 hopper cars.

The Connecticut Company has ordered one double truck combination snow-plow and express car, and six sets of flangers from the Russell Car & Snow-Plow Company.

The Wabash Pittsburgh Terminal, reported in last week's issue as having placed an order for 1,000 freight cars, ordered 1,000 hopper cars from the Pressed Steel Car Company.

The New York, Chicago & St. Louis, which recently ordered 500 automobile cars from the Western Steel Car & Foundry Company, has also issued inquiries for 750 gondola and 500 hopper cars.

The Great Northern has ordered 1,000 box cars from the Pressed Steel Car Company and 500 automobile and 500 refrigerator cars from the Haskell & Barker Car Company. It is still inquiring for 500 stock cars.

The Missouri, Kansas & Texas, reported in the *Railway Age Gazette* of October 27 as inquiring for 1,000 stock cars, has ordered these cars from the American Car & Foundry Company. It is understood that the inquiry for box cars has been dropped.

The Erie has transferred to the Haskell & Barker Car Company the order for 1,000 box cars, reported in the *Railway Age Gazette* of November 3 as having been ordered from the Standard Steel Car Company. The Erie is also reported as having ordered 1,000 steel frame box cars from the American Car & Foundry Company.

PASSENGER CARS

The Western Maryland has ordered 17 coaches, 6 combination baggage and express cars and 2 café parlor cars from the Pullman Company.

The Norfolk & Western, reported in the *Railway Age Gazette* of October 27 as being in the market for passenger cars, has ordered 22 coaches, 5 passenger and baggage cars, 13 baggage and express cars, and 10 mail and express cars, from the Harlan & Hollingsworth Corporation.

IRON AND STEEL

The Southern Railway has ordered 700 tons of bridge work from the Virginia Bridge & Iron Works.

The Great Northern has ordered 304 tons of miscellaneous bridge work from the American Bridge Company.

The New York, Philadelphia & Norfolk has ordered 600 tons of steel from the American Bridge Company for car floats.

The Minneapolis & St. Louis has ordered 210 tons of steel from the American Bridge Company for a plate girder span at Carver, Minn.

The Maine Central has ordered 4,000 tons of steel from the McClintic, Marshall Company for a bridge over the Kennebec river at Augusta, Me.

The Central of New Jersey has ordered 1,200 tons of steel from the Phoenix Bridge Company for the new passenger station at Newark, N. J.

The Northern Pacific has ordered 1,200 tons of steel from the American Bridge Company for an extension to an ore dock at Allouez Bay, Superior, Wis.

The New York, New Haven & Hartford has ordered 7,000 tons of steel from the American Bridge Company for the superstructure for the Thames river bridge.

The Chicago, Burlington & Quincy has ordered 3,000 tons of steel from the American Bridge Company for steel work for the Harrison street freight terminal buildings in Chicago.

Supply Trade News

The offices of the Boss Nut Company, Chicago, are now located at room 237, Railway Exchange, 80 East Jackson boulevard.

William Arnold Angell, formerly purchasing agent of the Pullman Company, and before that for many years first assistant to the late George M. Pullman, died at his home in Chicago on the evening of November 14, age 84 years.

The Midwest Forge & Steel Company, St. Louis, Mo., announces the purchase and acquisition of the good will, property, etc., of the Heller Forge Works and the Western Forge Company in East St. Louis, which were founded 25 years ago.

F. C. Yeates, purchasing agent of the Cambria Steel Company, has also been appointed purchasing agent of the Midvale Steel Company, the Worth Brothers Company and the Wilmington Steel Company, vice H. L. Murphey, resigned, effective November 20.

Robert D. Sinclair, first vice-president of Mudge & Co., Chicago, has been appointed vice-president, in charge of the sales, manufacturing and treasury departments. Mr. Sinclair was born at Chicago on April 12, 1878, and entered railway service in the auditing department of the Chicago & Eastern Illinois in 1892. The following year he accepted a position with the operating department of the Columbian Intramural Railway at the Chicago World's Fair. At the close of this exposition he entered the service of the Union National Bank of Chicago, and remained with it until its consolidation with the First National Bank in 1900, when he went with the larger institution. He left the banking business on September 1, 1910, to become secretary and treasurer of Mudge & Co. On June 9, 1912, he was elected second vice-president of this company, later being made first vice-president. On November 1, 1916, he was appointed vice-president in charge of all departments, as noted above.



R. D. Sinclair

W. F. Caspers, western sales representative for the Monarch Steel Castings Company, of Detroit, Mich., has been appointed sales representative for the Aurora Foundries Company and the Fox River Iron Company, manufacturers of brake shoes, babbitt metals, journal bearings and railway castings. Mr. Caspers will have headquarters at 707-708 Transportation building, Chicago, Ill.

The Becker Milling Machine Company, Hyde Park, Mass., has been acquired by the Manufacturers' Company at a price reported to be $2,000,000. Robert E. Herrick has been elected president, succeeding Eugene N. Foss. This adds another company to the "Herrick Group," which includes also the Reed-Prentice Company and the Wyman-Gordon Company, Worcester, Mass. It is understood that no changes will be made in the operating force.

The Adams-Bagnall Electric Company, Cleveland, O., is now completing an addition to its factory, with the installation of a complete vitreous or porcelain enameling plant. The primary object of this addition is to improve further the quality and service of the Abolite line of porcelain enameled reflectors for industrial lighting, the porcelain enameled reflectors used in the AB pendent fixtures for street lighting and AB enclosed arc

lamps, etc. The plant will be in full operation before January 1, 1917.

A committee representing influential business interests in America has been formed to foster American exports by means of the Lyons (France) Sample Fair. It is the aim of this committee and other committees in France, Great Britain, Russia, Italy, and neutral countries to bring together at the next fair to be held at Lyons, France, in March, 1917, a large and representative gathering of manufacturers and wholesale buyers from countries all over the world. American manufacturers are urged to place exhibits at the fair.

F. B. Gleason, formerly in charge of the Western Electric Company's business in the far east, with headquarters at Tokio, Japan, has been appointed manager of the southern district of the company, with headquarters at Atlanta, Ga. He will succeed E. J. Wallis, who, on January 1, will take up his new work as manager of the Pacific Coast district, with headquarters at San Francisco. Mr. Wallis will succeed F. H. Leggett, who, after three years on the coast, returns to the company's executive offices at 195 Broadway, New York.

William Barlow Ross, secretary and assistant treasurer of Mudge & Co., manufacturers of railway specialties, Chicago, has also been elected secretary and assistant treasurer of the Safety First Manufacturing Company, selling agents for railway supplies, with the same headquarters. Mr. Ross was born on December 24, 1868, at Belfast, Ireland, and was educated in Manchester, England. He came to America in April, 1889, and entered railway service with the Burlington, Cedar Rapids & Northern, as a trucker and checker at Cedar Rapids, Iowa. He was later transferred to the auditor's office, where he remained in various capacities until December, 1892. He was then appointed timekeeper in the superintendent's office, and later chief clerk. From June 30, 1895, to August 31, 1901, he was utility clerk to the vice-president and general superintendent, being then promoted to car accountant. When the Burlington, Cedar Rapids & Northern was absorbed by the Chicago, Rock Island & Pacific in June, 1902, he was made car agent. The following January he was appointed statistician to the general manager of the system. In September, 1903, he was appointed transportation clerk to the third vice-president, and up to December, 1909, was consecutively transportation clerk to the president, statistician to the president and chief clerk to the standardization committee. On January 1, 1910, he was elected secretary of the board of pensions, and later was made secretary of the pension and personal record bureau. On July 1, 1916, he resigned to become secretary and assistant treasurer of Mudge & Co.



W. B. Ross

New York Air Brake Company

Owners of shares of the New York Air Brake Company, which were placed on a 10 per cent dividend basis on August 16 last, are to receive 20 per cent in the coming year. At the directors' meeting Tuesday a regular dividend of $12.50 was declared, and an extra disbursement of the same amount. The $25 is payable, $5 on December 22, and the balance in four quarterly installments of $5 each on March 23, June 22, September 21 and December 21, 1917.

In announcing the increase President Starbuck said that net earnings for the first ten months of this year were in excess of $8,000,000, and that the directors felt that a beginning should be made in the matter of extra distributions, a policy which it is expected to continue. The company has $10,000,000 in cash on hand, or the equivalent of $100 a share for the stock outstanding.

Sherwin-Williams Company Anuual Convention

Managers, representatives and factory heads of the Sherwin-Williams Company held their 1916 convention in Cleveland, November 13, 14 and 15. They came from all over the United States and Canada, many of them in special trains from various state division centers; and from London, Australia, New Zealand, Cuba and South America. The many delegates were welcomed to Cleveland on Monday in addresses by Walter H. Cottingham, president, S. P. Fenn, vice-president and E. M. Williams, a member of the board of directors. Following the distribution of the Jubilee, Top-Notcher and Estimate prizes the party listened to a number of addresses on the many sides of the company's activities. On Monday, addresses were made on the manufacturing department by G. A. Martin and H. J. Hain, general manager and general superintendent, respectively, of that department. Mr. Martin detailed the history of the company and showed how speedy had been its growth from 1869 until the present day. In 1873 the company had 83 formulas producing 225 tons, in 1916, 45,000 formulas producing 163,000 tons. Following these addresses the delegates were addressed by Adrian D. Joyce, general manager of the sales and distribution department.

Mr. Joyce also addressed the convention Tuesday morning on the work of his department after which the delegates listened to addresses by J. O. Hasson, manager of the chemical and metal products sales department; by P. L. Maury, manager of the railway, street railway and marine sales department; by Otto A. Hasse, manager of the trade sales and specialty sales departments; by G. M. Minnich, assistant manager of the insecticides and insulating sales department; by P. F. Kinnison, manager of the varnish sales department and others on the part of the company's activities in which they are in charge. On Wednesday the discussion continued on the trade sales and specialties sales department. The convention took up also the department of sales and distribution and on Wednesday afternoon the work of the convention was completed with a consideration of the advertising sales promotion and decorative department, under the direction of C. M. Lemperly, manager of the advertising department.

On Tuesday evening there was a smoker and on Wednesday evening a banquet at the Hotel Statler at which ex-president William Howard Taft was the principal speaker.

The convention's work and all the papers read were reported in detail in the convention's daily paper, the Jubilee Chameleon which issued four numbers, respectively the Glad Hand Number, the Top Notcher, the Smoker Number and the Farewell Number.

The first issue, incidentally, announced the election of A. W. Frank, Adrian D. Joyce and G. A. Martin to the board of directors of the company.

Studying the Markets for Railway Supplies in the Far East

Frank Rhea, commercial agent of the Bureau of Foreign and Domestic Commerce, Department of Commerce, was due to arrive at Auckland, New Zealand, on November 12. Mr. Rhea, a graduate of civil engineering in the University of Pittsburgh, member of the American Society of Civil Engineers, the Railway Engineering Association and the Railway Signal Association, resigned as district engineer of the east district of valuations of the Interstate Commerce Commission, and on August 30 commenced his studies of Far Eastern markets for railway equipment, materials and supplies.

H. T. van Deusen, assistant chief of the division of commercial agents, Customhouse, New York, has stated that Mr. Rhea's itinerary will include New Zealand, Australia, Tasmania, Philippines, China, Chosen, Asiatic Russia, Japan, Siam, Dutch East Indies, Burma, India and South Africa. The scope of the investigation covers motive power of all kinds, roadway machines, work equipment of all kinds, wharf, dock and railway shop machinery, roadway cars and tools, bridge materials, ties, rails, rail fastenings, frogs and switches, building materials, roadway materials, railway signals and interlocking apparatus, telephone and telegraph equipment, repair and replacement parts for permanent way, and all classes of equipment, operating supplies and engineering supplies and tools.

The special agents of the bureau usually make a tour of the United States before going abroad, and Mr. Rhea consulted most of the manufacturers of railway equipment, materials and supplies. His reports on the various countries will be published in due course.

The United States Civil Service Commission has also announced examinations for 10 other special investigators on December 10. One is for a trade commissioner to investigate ports and transportation facilities of Russia and the Far East, one to investigate mineral resources in the Far East, and a third to investigate investment opportunities in Russia.

The men are to investigate foreign markets for American goods, and are to be paid a salary not to exceed $10 a day, with all transportation expenses paid, and $4 a day extra for subsistence. Examinations to secure the best men will be held in the larger cities of each state on December 6.

The duties of appointees to these positions will be to obtain information concerning the demand in foreign markets for the particular commercial line which they are to study, and to present the data obtained in straightforward, readable reports, which will enable American manufacturers and exporters to plan campaigns for the sale of American goods in the markets investigated. In the investigations, including Russia, French is required and an extra credit given for Russian. No foreign language is required for the investigation of the mineral resources in the Far East.

TRADE PUBLICATIONS

Bending Machines.—The Wallace Supplies Manufacturing Company, New York and Chicago, has issued Bulletin No. 12, descriptive of its various pipe and bar bending machines.

Taps.—Bulletin No. 34, recently issued by the Modern Tool Company, Erie, Pa., is a four-page folder detailing the special features, and containing a description and illustrations of Modern collapsible taps.

Pole Jack.—Templeton, Kenly & Co., Ltd., Chicago, has issued an eight-page folder describing its new pole jack for pulling, straightening and reinforcing telegraph and other poles. The pamphlet is illustrated with photographs of this jack in service, showing the numerous uses for which it is adapted.

Hydraulic Valves and Fittings.—Catalogue No. 94, recently issued by the Watson-Stillman Company, New York, describes the company's line of hydraulic valves and fittings. The booklet contains 96 well illustrated pages, and in them complete details, sizes and lists are given concerning valves and accessories of all kinds.

Alloy Steels.—The Vanadium-Alloys Steel Company, Pittsburgh, Pa., has issued a new pamphlet on Vasco Vanadium, in which information is given as to the study of alloy steels and their uses. The pamphlet also describes the various types of Vasco Vanadium steel, and contains a complete list of carbon steel extras.

Dust Guards.—A most attractive and well illustrated 16-page booklet, recently issued by the Virginia Equipment Company, Toledo, Ohio, details the advantages of proper journal lubrication, and shows how this can be assisted by the use of Virginia Compound Compensating Dust Guards. The pamphlet is in the form of a treatise. The author of it has shown just how much in actual money losses a railway can lose by using poorly made dust guards, both through additional axle journal turning and in losses in motive power by poorly lubricated journals. He shows further that the ordinary wooden and tin dust guard is not efficient, for it does not prevent sand from getting in the journals, nor does it permit proper packing of the journal box. He then goes on to show the advantages of the Virginia Compensating Dust Guard. This guard is built up of layers or plies of wood, placed with the grain running in opposite directions and cemented and riveted together under heavy hydraulic pressure. It is made in two segments, and so arranged that the compensating devices keep them in positive contact with the axle. Through this arrangement the wear is automatically taken up, the ingress of dust prevented, and there is insured a positive, dustproof resilient contact with the axle at all times.

Railway Construction

Buffalo, Rochester & Pittsburgh.—A contract has been given to the Millor Construction Company, Lock Haven, Pa., for grading work on a one-mile branch line, now under construction south from Marion Center, Pa. The line is being built to develop bituminous coal properties in Indiana county, Pa.

Gulf Coast Railway.—This company, which is building a line from Venice, Fla., south to McCall, 26 miles, has grading finished to a point near Manasota, a new development town. It is expected that all the work will be finished by April, 1917. E. B. Duncan, Venice, is the contractor (May 5, p. 1017).

Gulf, Texas & Western.—This company has engineers in the field surveying for a new line from Ft. Worth, Tex., to Graford, a point on its line. The road will run through Poolville, Booneville and Springtown. J. J. Jermyn, president, Dallas, Tex.

Lehigh Valley.—Important additions are to be made to the westbound freight yards of the Lehigh Valley at Coxton, Pa. Two tracks will be extended a total of 4,720 feet and this will make 10,200 feet of track available for switching which heretofore has not been available for this purpose.

Ozark & Arkansas Midland.—This company has an engineering party in the field making surveys for a new line from Rogers, Ark., to a point in Madison county, Ark., about 50 miles distant. No contracts have been awarded, and it is not known at this time whether actual construction will begin this winter or delayed until next spring. W. E. Talley, Rogers, Ark., is president of this undertaking.

Steelton & Highspire.—A charter has been granted in Pennsylvania to this company, which was organized with $250,000 capital to build a three-mile railroad in Pennsylvania from the Steelton branch of the Philadelphia & Reading to the Pennsylvania Railroad at Highspire. Q. Bent, president, Steelton, Pa. The incorporators include C. B. Ely, C. P. Turner, Harrisburg; E. H. Mengle, F. A. Robbins, Jr., Steelton.

Winchester & Western.—Construction work has been started on the line to be built from Winchester, Va., westward to Wardensville in Hardy county, W. Va. The new line will enter Winchester over the Baltimore & Ohio tracks from a junction to be established in the southern suburbs of the city. W. B. Cornwall, president, and J. S. Zimmerman, secretary. (September 15, p. 479.)

RAILWAY STRUCTURES

Baltimore, Md.—The report of the Baltimore & Ohio for the year ended June 30, 1916, shows that important improvements are being made at Baltimore. Work has been started on the new export pier, No. 6, and on the construction of open piers Nos. 5, 34 and 35, at Locust Point. It is expected that this work will be completed during the coming fiscal year. The reconstruction of the bridge over Gay street has been completed. At Curtis Bay, there is being constructed a modern fireproof coal pier. At New York, a new outbound freight house on the marginal way at Twenty-sixth street is under construction and the work of remodeling piers 21 and 22 is progressing. At Pittsburgh, Pa., the passenger station has been remodeled and enlarged and a new power plant for supplying steam for the passenger station and coach yard is under construction. The work of eliminating grade crossing at Thirty-third street and Liberty avenue, involving reconstruction of the Thirty-third street viaduct from Liberty avenue to Allegheny river, the construction of retaining walls and the raising of the city's Forfar street (Huron avenue) bridge is under way and will be completed during the coming year. The railroad company has contributed $18,000 for the reconstruction of the Sylvan avenue bridge, which work is being carried out by the city of Pittsburgh and will be completed during the coming year. A new freight house, tracks and retaining wall are being constructed at Allegheny, Pa. A new passenger station is under construction at Canton, Ohio, and passenger sta-

tions have been constructed at Washington Court House and Dresden, Ohio, and Aurora, Ind. Work on the Hopple street viaduct at Cincinnati, Ohio, has progressed and it is expected to be completed during 1916. Work has been started on the reconstruction of bridges for heavier power between Cumberland, Md., and Connellsville, Pa., and on other parts of the system. A number of bridges on the line between Midland City and Columbus, Ohio, have been renewed and others strengthened.

CHICAGO, ILL.—The Illinois Central is building two suburban passenger stations here, one at 103rd street, and another at 111th street. Both are approximately of the same type, and include brick waiting rooms, and long, wooden platforms with steel canopy. The cost will be about $10,000 each. Drumm Contracting Company, Chicago, Ill., have the work in hand.

CUMBERLAND, MD.—The Baltimore & Ohio has given a contract to the Vang Construction Company, Cumberland, for the substructure, and to the Fort Pitt Bridge Works, Fort Pitt, Pa., for the superstructure of Green street subway at Cumberland.

HAYNE, S. C.—The Southern Railway will make important improvements at Hayne, where its Washington-Atlanta and Knoxville-Charleston lines intersect. New engine terminal facilities will be provided and the capacity of the yard will be increased from 761 to 1,860 cars. The engine handling facilities will consist of a modern mechanical coaling plant of reinforced concrete construction, with capacity of 1,000 tons in its bins and 5,000 tons ground storage; frame enginehouse with four wash pits; 11 engine standing tracks; 100-ft. turntable operated by electricity; three cinder conveyors; frame boiler and air compressor house; sand house and water supply. The present passenger station will be relocated and two underpasses will be constructed, eliminating three important grade crossings. Work will be begun as soon as necessary forces and material can be assembled and will be rushed to completion. The improvements have been undertaken to allow the use of heavier locomotives.

LEAVENWORTH, WASH.—The Great Northern contemplates improvements to its roundhouse and terminal facilities at this point in the near future. No definite plans have as yet been made, nor is it known what expenditure will be involved.

MATTOON, ILL.—Contracts have been awarded for the erection of a new passenger station for the Illinois Central. The building will be two stories high, 160 ft. long and 36 ft. wide; it will have concrete foundations with a steel frame and brick walls with terra cotta trimming. A. W. Stoolman, Champaign, Ill., is the successful bidder. The approximate cost will be about $75,000.

ROANOKE, VA.—The Norfolk & Western proposes to build new freight-house facilities at Roanoke, to occupy a space about 200 ft. wide and 1,500 ft. long, bounded by Commerce street, Ernest avenue, Park street, and the present main tracks of the Norfolk & Western. A two-story brick freight office building 50 ft. by 140 ft. will be constructed, facing on Commerce street, and a freight wareroom 55 ft. by 740 ft. of brick and steel construction, having wide rolling steel doors, will be built parallel with Ernest avenue. Parallel with this will be two covered transfer platforms 18 ft. wide and 800 ft. long. These platforms, together with the freight house, will provide for the placing of 127 cars at one time, and the layout provides for a future extension of the platforms to provide for 40 cars additional. Unusually good driveway facilities are provided, there being four separate entrances to the station; one from Commerce street; one from Third street; one by a new driveway, which will be built from Salem avenue to Ernest avenue about midway between Third street and Park street; and another from Park street over Ernest avenue, which will be widened to about 30 ft. The estimated cost of the improvement is $380,000.

SUGAR CREEK, OHIO.—The Dover, Millersburg & Western (Electric) has plans under way for a new bridge over Sugar creek. The bridge will have concrete foundations, with steel spans and be about 200 ft. long. No contracts have as yet been awarded. D. F. A. Wheelock, chief engineer, Warren, Pa.

YOUNGSTOWN, OHIO.—The Erie Railroad has submitted a proposition to the city authorities of Youngstown, Ohio, for extensive improvements to be carried out by the railroad, including the construction of a large passenger station and the elimination of the grade crossings.

Railway Financial News

ATLANTIC COAST LINE.—The directors have declared a semi-annual dividend of 3½ per cent on the common stock, thus putting the stock on a 7 per cent annual dividend basis. In 1915 and the first half of 1916 the Atlantic Coast Line was on a 5 per cent annual basis. Previous to 1915 the annual rate had been 7 per cent.

BOSTON & MAINE.—A bill of particulars setting forth 14 specifications of alleged breach of duty and other unlawful acts on the part of the Boston & Maine directors, in connection with the receivership proceedings now pending against the road, has been filed in the federal court by representatives of the minority stockholders.

CHESAPEAKE & OHIO.—Directors have declared a dividend of 2 per cent on the Chesapeake & Ohio stock, thus apparently placing the stock on an annual 4 per cent basis. Nothing was paid in 1915, and 3 per cent was paid in 1914. In the fiscal year ended June 30, 1916, the property earned net available for dividends 10.96 per cent on its outstanding stock.

CHICAGO, ROCK ISLAND & PACIFIC.—In reply to a telegram from Charles G. Dawes, of Chicago, to Seward Prosser, chairman of the joint reorganization committee, N. L. Amster, a member of the committee, has given out the statement that the reorganization plan does not provide for a voting trust, and that all of the directors of the new company, which is to take over the Chicago, Rock Island & Pacific, are to be elected annually.

DELAWARE, LACKAWANNA & WESTERN.—The Supreme Court of New York has held void the lease by which the Delaware, Lackawanna & Western holds the Syracuse, Binghamton & New York. This road runs from Syracuse, N. Y., to Binghamton, operating a total of 81 miles. It has been leased to the Delaware, Lackawanna & Western since 1911 under an agreement by which the Lackawanna pays 12 per cent on the stock, the greater part of which is owned by the Lackawanna.

NEW YORK, NEW HAVEN & HARTFORD.—The United States district court has appointed Charles C. Sanford, president of the First National Bank of Bridgeport, Conn., and a member of the Federal Reserve Board, and M. B. Brainard, vice-president of the Aetna Life Insurance Company of Hartford, Conn., members of the board of trustees, which under the agreement between the government and the New York, New Haven & Hartford has supervision over the sale by the New Haven of its trolley and steamboat properties, succeeding George E. Hill and Lyman B. Brainerd.

SEABOARD AIR LINE.—This company has sold to the National City Bank and Guaranty Trust Company, New York, an issue of $12,800,000 first and consolidated mortgage 6 per cent bonds. These bonds are part of an authorized issue of $300,000,000, of which there are outstanding $25,644,000, series A, 6 per cent bonds.

SPOKANE INTERNATIONAL.—This road, which runs from Spokane, Wash., to Eastport, Idaho, 141 miles, has been bought by the Canadian Pacific and the Minneapolis, St. Paul & Sault Ste. Marie.

TENNESSEE CENTRAL.—A decree of foreclosure sale has been filed in the United States District Court. The sale is ordered to take place on February 15, 1917.

WELLSVILLE & BUFFALO.—The New York Public Service Commission has dismissed the complaint of shippers against the discontinuance of operation of the Wellsville & Buffalo, which is a part of what was formerly the Buffalo & Susquehanna system, and so far as the commission is concerned, the company can now abandon operation.

WESTERN MARYLAND.—Stockholders, at a meeting on November 17, voted unanimously to adopt the plan of reorganization recommended by the directors and described in these columns in the issue of November 3, 1916, page 785.

ANNUAL REPORTS

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY—SIXTY-SECOND ANNUAL REPORT

Chicago, July 1, 1916.

To the Stockholders of the Chicago, Burlington & Quincy Railroad Company:

The following is the report of your Board of Directors for the year ended June 30, 1916:

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY.
YEARS ENDED JUNE 30.

Per Cent.	1916	OPERATING REVENUES.	1915.	Per Cent.
69.94	$71,592,578.23	Freight	$62,509,483.62	68.60
20.68	21,168,051.65	Passenger	20,185,564.28	22.15
2.65	2,715,323.08	Mail	2,464,372.90	2.70
2.59	2,651,544.27	Express	2,176,214.07	2.39
2.11	2,152,964.44	Miscellaneous	1,893,988.61	2.08
1.96	2,004,702.09	Incidental	1,805,801.76	1.98
.07	73,729.19	Joint facility	89,635.43	.10
100.00	$102,358,892.95	Total operating revenue	$91,125,060.67	100.00
		OPERATING EXPENSES.		
		Maintenance of way and		
11.74	$12,014,208.39	structures	$11,360,210.26	12.47
15.23	15,592,109.89	Maintenance of equipment	15,415,122.75	16.92
1.57	1,610,626.55	Traffic	1,629,675.95	1.79
29.27	29,956,781.16	Transportation	29,117,163.60	31.95
.91	927,592.65	Miscellaneous operations	832,153.90	.91
1.97	2,017,687.18	General	2,087,040.58	2.29
		Transportation		
Cr..40	Cr. 405,844.80	for Investment—Cr.		
60.29	$61,713,161.02	Total operating expenses	$60,441,367.04	66.33
39.71	$40,645,731.93	Net operating revenue	$30,683,693.63	33.67
	$ 4,449,290.83	Railway tax accruals	$ 4,081,507.88	
	9,547.58	Uncollectible railway revenues	24,157.35	
	$ 4,458,838.41		$ 4,105,665.23	
	$36,186,893.52	Operating income	$26,578,028.40	
		NONOPERATING INCOME.		
	$ 1,311,916.89	Rents	$ 834,074.64	
	1,082,234.95	Miscellaneous interest	389,994.77	
	$ 2,394,151.84	Total nonoperating income	$ 1,224,069.41	
	$38,581,045.36	Gross income	$27,802,097.81	
		DEDUCTIONS FROM GROSS INCOME.		
	$ 1,627,199.28	Rents	$ 1,549,474.44	
	7,038,490.72	Interest on funded debt	7,118,898.27	
	747.15	Interest on unfunded debt	24,032.26	
		Amortization of discount		
	55,163.52	on funded debt	55,010.56	
	13,174.71	Miscellaneous income charges	12,762.86	
	$ 8,734,775.38	Total deductions	$ 8,760,178.39	
	$29,846,269.98	Net income	$19,041,919.42	
		DISPOSITION OF NET INCOME.		
		Appropriations for:		
	$ 1,817,679.41	Sinking funds	$ 1,753,006.79	
	8,867,128.00	Dividends	8,867,128.00	
	4,431,359.81	Additions and betterments	3,340,669.28	
		Fund for		
	2,400,000.00	accrued taxes, not yet due		
		Miscellaneous		
	6,000,000.00	appropriations of income		
	$23,516,167,22		$13,960,804.07	
	$ 6,330,102.76	Income balance	$ 5,081,115.35	

CAPITALIZATION.

CAPITAL STOCK.

Number of Shares.	Total Par Value Authorized and Outstanding.	Dividends Declared During the Year. Rate.	Amount.
1,108,391	$110,839,100.00	8%	$8,867,128.00

FUNDED DEBT.

Nominally Issued.	Actually Issued.				Interest Accrued During Year on Bonds "Actually Outstanding."
	Reacquired.				
In Treasury.	In Treasury.	Pledged.	In Sinking Funds.	Actually Outstanding.	
$9,873,000	$1,165,900	$31,000	$23,074,600	$179,858,500	$7,038,490.72

MILEAGE.

MILEAGE OF ROAD OPERATED ON JUNE 30, 1916.

STATE.	Line Owned. Main Line.	Branches and Spurs.	Total.	Operated Under Lease or Contract.	Total Mileage Operated.
Illinois	900.84	770.73	1,671.57	112.89	1,784.46
Iowa	371.68	993.44	1,365.12	73.44	1,438.56
Wisconsin	222.33	.....	222.33	.53	222.86
Minnesota	23.61	.....	23.61	14.84	38.45
Missouri	593.62	528.68	1,122.30	13.15	1,135.45
Kansas	12.71	246.61	259.32	.82	260.14
Nebraska	1,364.76	1,485.58	2,850.34	22.37	2,872.71
South Dakota	48.88	231.07	279.95	.....	279.95
Wyoming	571.54	120.91	692.45	30.76	723.21
Colorado	214.11	180.25	394.36	34.97	429.33
Montana	134.38	.....	134.38	49.54	183.92
Total	4,458.46	4,557.27	9,015.73	353.31	9,369.04

LINE OWNED.

STATE.	Miles of Road.	Second Track.	Third Track.	Yard Track and Sidings.	Total.
Illinois	1,671.57	378.11	42.40	969.63	3,061.71
Iowa	1,365.12	244.53	.....	347.41	1,957.06
Wisconsin	222.33	129.50	.....	77.27	429.10
Minnesota	23.61	2.25	.....	37.13	62.99
Missouri	1,122.30	107.22	.....	428.34	1,657.86
Kansas	259.32	.....	.....	24.44	283.76
Nebraska	2,850.34	17.96	.....	710.49	3,578.79
South Dakota	279.95	.....	.....	61.94	341.89
Wyoming	692.45	.....	.....	200.81	893.26
Colorado	394.36	.....	.....	140.88	535.24
Montana	134.38	.....	.....	34.97	169.35
Total	9,015.73	879.57	42.40	3,033.31	12,971.01

TAXES.

	1916.	1915.	Increase or Decrease.	
Illinois	$1,003,200.77	$927,813.36	Inc.	$75,387.41
Iowa	565,198.49	528,151.13	Inc.	37,047.36
Wisconsin	261,440.61	264,906.08	Dec.	3,465.47
Minnesota	31,464.31	31,568.25	Dec.	103.94
Missouri	314,542.85	399,978.10	Dec.	85,435.25
Kansas	74,135.25	67,244.30	Inc.	6,890.95
Nebraska	1,121,693.78	1,073,568.13	Inc.	48,125.65
South Dakota	110,710.20	108,817.83	Inc.	1,892.37
Wyoming	280,678.45	208,903.24	Inc.	71,775.21
Colorado	275,308.12	240,223.06	Inc.	35,085.06
Montana	68,453.23	61,330.50	Inc.	7,122.73
Other States	211.73	305.56	Dec.	93.83
Total States	$4,107,037.79	$3,912,809.54	Inc.	$194,228.25
United States Government	$342,253.04	$168,698.34	Inc.	$173,554.70
Grand Total	$4,449,290.83	$4,081,507.88	Inc.	$367,782.95

STATISTICS OF OPERATIONS.

ITEM.	1916.	1915.	Increase or Decrease.	
Average mileage of road operated (miles)	9,368.16	9,339.33	Inc.	28.83
TRAIN-MILES.				
Freight—ordinary	17,255,327	16,368,058	Inc.	887,269
" light	111,299	122,396	Dec.	11,097
" total	17,366,626	16,490,454	Inc.	876,172
Passenger	17,838,424*	17,487,156	Inc.	351,268
Mixed	706,297	853,620	Dec.	147,323
Special	29,273	25,339	Inc.	3,934
Total transportation service	35,940,620	34,856,569	Inc.	1,084,051
Work service	935,625	829,327	Inc.	106,298

STATISTICS OF OPERATIONS.

ITEM.	1916.	1915.	Increase or Decrease	
LOCOMOTIVE-MILES.				
Freight—principal	17,386,516	16,509,842	Inc.	876,674
" —helper	769,657	619,655	Inc.	150,002
" —light	826,271	765,933	Inc.	60,338
" —total	18,982,444	17,895,430	Inc.	1,087,014
Passenger—principal	17,773,488	17,422,420	Inc.	351,068
" —helper	159,898	162,017	Dec.	2,119
" —light	348,493	323,660	Inc.	24,833
" —total	18,281,879	17,908,097	Inc.	373,782
Mixed train—principal	706,393	853,739	Dec.	147,346
" " —helper	1,356	2,760	Dec.	1,404
" " light	6,184	5,788	Inc.	396
" " —total	713,933	862,287	Dec.	148,354
Special—principal	29,278	25,341	Inc.	3,937
" —helper	5,206	2,186	Inc.	3,020
" —light	2,630	1,399	Inc.	1,231
" —total	37,114	28,926	Inc.	8,188
*Includes 64,936 motor train miles.				
Train switching	1,051,584	1,000,955	Inc.	50,629
Yard switching—freight	8,679,464	8,028,422	Inc.	651,042
" " —passenger	667,029	689,981	Dec.	22,952
" " —total	9,346,493	8,718,403	Inc.	628,090
Total transportation service	48,413,447	46,414,098	Inc.	1,999,349
Work service	1,710,072	1,560,931	Inc.	149,141
LOCOMOTIVE TON-MILES.				
Freight train service	2,890,176,430	.....	.....	
Mixed train service	42,385,924	.....	.....	
Passenger train service	1,669,962,092	.....	.....	
Special train service	3,255,428	.....	.....	
Total transportation service	4,605,779,874	.....	.....	
CAR-MILES.				
Freight train—loaded	496,323,228	440,062,960	Inc.	56,260,268
" " —empty	216,095,449	214,309,441	Inc.	1,786,008
Sum of loaded and empty	712,418,677	654,372,401	Inc.	58,046,276
Freight train—caboose	17,618,806	16,706,006	Inc.	912,800
" " —total	730,037,483	671,078,407	Inc.	58,959,076
Passenger train—passenger	45,480,876†	44,548,919	Inc.	931,957
" " —sleeping, parlor and observation	29,488,437	27,828,938	Inc.	1,659,499
" " —dining	4,949,399	4,828,698	Inc.	120,701
" " —other	37,144,934	35,691,703	Inc.	1,453,231
" " —total	117,063,646	112,898,258	Inc.	4,165,388
Mixed train—freight, loaded	3,159,971	3,326,669	Dec.	166,698
" " —freight, empty	1,130,000	1,491,195	Dec.	361,195
" " —caboose	32,429	28,927	Inc.	3,502
" " —passenger	1,166,982	1,512,727	Dec.	345,745
" " —sleeping, parlor and observation	12,602	13,280	Dec.	678
" " —dining	106	.....	Inc.	106
" " —other passenger—train	295,302	505,075	Dec.	209,773
" " —total	5,797,392	6,877,873	Dec.	1,080,481
† Includes 64,936 motor car miles.				
Special train—freight—loaded	308,824	209,953	Inc.	98,871
" " —freight—empty	13,052	16,411	Dec.	3,359
" " —caboose	25,858	21,685	Inc.	4,173
" " —passenger	104,660	76,718	Inc.	27,942
" " —sleeping, parlor and observation	6,369	8,097	Dec.	1,728
" " —dining	1,137	1,502	Dec.	365
" " —other passenger—train	5,932	3,294	Inc.	2,638
" " —total	465,832	337,660	Inc.	128,172
Total transportation service	853,364,353	791,192,198	Inc.	62,172,155
Work service	4,374,369	4,349,836	Inc.	24,533
FREIGHT SERVICE.				
Tons—revenue freight	36,640,658	31,758,791	Inc.	4,881,867
" —non-revenue freight	9,378,387	8,581,211	Inc.	797,176
" —total	46,019,045	40,340,002	Inc.	5,679,043
Ton miles—revenue freight	10,087,483,894	8,527,444,254	Inc.	1,560,039,640
" miles—non-revenue freight	1,804,655,054	1,549,530,692	Inc.	255,124,362
" miles—total	11,892,138,948	10,076,974,946	Inc.	1,815,164,002
PASSENGER SERVICE.				
Passengers carried—revenue	23,008,252	22,708,392	Inc.	299,860
Passenger miles—revenue	1,117,675,741	1,079,264,875	Inc.	38,410,866
REVENUES AND EXPENSES.				
Freight revenue	$71,592,578.23	$62,509,483.62	Inc.	$9,083,094.61
Passenger revenue	21,168,051.65	20,185,564.28	Inc.	982,487.37
Passenger service train revenue	27,255,344.98	25,457,027.54	Inc.	1,798,317.44
Operating revenues	$102,358,892.95	$91,125,060.67	Inc.	$11,233,832.28
" expenses	61,713,161.02	60,441,367.04	Inc.	1,271,793.98
Net operating revenues	$40,645,731.93	$30,683,693.63	Inc.	$9,962,038.30

AVERAGES PER MILE OF ROAD.	1916.	1915.	Increase or Decrease.	
Freight-train miles	1,854	1,766	Inc.	88
Passenger-train miles	1,904	1,872	Inc.	32
Mixed-train miles	75	91	Dec.	16
Special-train miles	3	3	...	...
Transportation service train-miles	3,836	3,732	Inc.	104
Work-train miles	100	89	Inc.	11
Locomotive-miles—transportation	5,168	4,970	Inc.	198
Freight service car-miles	78,426	72,401	Inc.	6,025
Passenger service car-miles	12,666	12,316	Inc.	350
Freight revenue	$7,642.12	$6,693.14	Inc.	$948.98
Passenger service train revenue	2,909.36	2,725.79	Inc.	183.57
Operating revenues	10,926.25	9,757.13	Inc.	1,169.12
" expenses	6,587.54	6,471.70	Inc.	115.84
Net operating revenues	4,338.71	3,285.43	Inc.	1,053.28
Ton-miles—revenue freight	1,076,784	913,068	Inc.	163,716
" " —all freight	1,269,421	1,078,983	Inc.	190,438
Passenger-miles—revenue	119,306	115,561	Inc.	3,745
AVERAGES PER TRAIN-MILE.				
Loaded freight car-miles—freight trains	28.58	26.69	Inc.	1.89
" " " —mixed trains	4.47	3.90	Inc.	.57
Empty " " —freight trains	12.44	13.00	Dec.	.56
" " " —mixed trains	1.60	1.75	Dec.	.15
Ton-miles—revenue freight	558.15	491.66	Inc.	66.49
" —all freight	658.01	581.00	Inc.	77.01
Passenger train car-miles—Passenger	6.56	6.46	Inc.	.10
" " " —mixed trains	2.09	2.38	Dec.	.29
Revenue passenger-miles	60.27	58.85	Inc.	1.42
Freight revenue	$ 3.96	$ 3.60	Inc.	$ .36
Passenger service train revenue	1.47	1.39	Inc.	.08
Operating revenues	2.85	2.61	Inc.	.24
" expenses	1.72	1.73	Dec.	.01
Net operating revenues	1.13	.88	Inc.	.25
AVERAGES PER LOCOMOTIVE-MILE.				
Train-miles—freight trains	.91	.92	Dec.	.01
Car-miles—freight trains	38.46	37.50	Inc.	.96
Train-miles—passenger trains	.98	.98	...	...
Car-miles—passenger trains	6.40	6.30	Inc.	.10
Train-miles—mixed trains	.99	.99	...	...
Car-miles—mixed trains	8.12	7.98	Inc.	.14
Train-miles—special trains	.79	.88	Dec.	.09
Car-miles—special trains	12.55	11.67	Inc.	.88
AVERAGES PER LOADED FREIGHT CAR-MILE.				
Ton-miles—revenue freight	20.20	19.23	Inc.	.97
" " —all freight	23.81	22.73	Inc.	1.08
Freight revenue	$ .14333	$ .14098	Inc.	.00235
AVERAGES PER CAR-MILE—PASSENGER.				
Passenger-miles—revenue	14.68	14.60	Inc.	.08
Passenger revenue	$ .27798	$ .27313	Inc.	.00485
MISCELLANEOUS AVERAGES.				
Miles hauled—revenue freight	275.31	268.51	Inc.	6.80
" " —non-revenue freight	192.43	180.57	Inc.	11.86
" " —all freight	258.42	249.80	Inc.	8.62
Miles carried—revenue passengers	48.58	47.53	Inc.	1.05
Revenue per ton of freight	$1.95391	$1.96826	Dec.	$.01435
" " ton-mile of freight	.00710	.00733	Dec.	.00023
" " passenger	.92002	.88890	Inc.	.03112
" " passenger-mile	.01894	.01870	Inc.	.00024
Operating ratio	% 60.29	% 66.33	Dec.	% 6.04

EQUIPMENT.

CLASS OF EQUIPMENT.	Number on June 30, 1915.	Number Added During Year.	Number Retired During Year.	Number on June 30, 1916.	Average Tractive Power All Locomotives and Average Capacity All Freight Cars.
Steam locomotives	1,737	31	15	1,753	31,482 lbs.
Freight-train cars:					
Box cars	30,018	2,000	1,688	30,330	...
Flat cars	1,554	.....	9	1,545	...
Stock cars	7,679	130	390	7,419	...
Coal cars	23,001	1	53	22,949	...
Tank cars	213	.....	.....	213	...
Refrigerator cars	2,969	.....	38	2,931	...
Caboose cars	687	20	17	690	...
Other freight-train cars	80	.....	.....	80	...
All classes of freight-train cars	66,201	2,151	2,195	66,157	41.00 tons.
Passenger-train cars:					
Coaches	666	.....	18	648	...
Combination passenger cars	143	6	2	147	...
Other combination cars	107	.....	1	106	...
Dining cars	41	.....	.....	41	...
Parlor cars	14	.....	.....	14	...
Baggage and express cars	210	6	.....	216	...
Postal cars	53	.....	5	48	...
Other passenger-train cars	40	.....	1	39	...
All classes of passenger-train cars	1,274	12	27	1,259	...
Company service cars:					
Officers' and pay cars	33	9	.....	42	...
Ballast cars	2,628	50	309	2,369	...
Derrick cars	25	.....	3	22	...
Steam shovels	18	.....	Cr. 1	19	...
Wrecking cars	17	.....	.....	17	...
Other company service cars	2,608	410	258	2,760	...
All classes of company service cars	5,329	469	569	5,229	...
All classes of cars in service	72,804	2,632	2,791	72,645	...
Floating equipment:					
Steamboats and tugboats	3	.....	.....	3	...
Barges, car floats and canal boats	49	.....	2	47	...
Other floating equipment	11	...	...	11	..
Total floating equipment	63	...	2	61	...

REVENUE FREIGHT CARRIED DURING THE YEAR.

COMMODITIES	Number of Tons Originating on this Road.	Number of Tons Received from Connecting Carriers.	Total Number of Tons.	Total Percent of Whole.
Products of Agriculture—				
Grain	3,961,120	816,250	4,777,370	13.04
Flour	500,790	170,218	671,008	1.83
Other mill products	210,194	45,430	255,624	.70
Hay	205,518	90,157	295,675	.81
Tobacco	2,003	975	2,978	.01
Cotton	5,958	47,517	53,475	.15
Fruits and vegetables	616,356	743,072	1,359,428	3.70
Other products	118,318	109,674	227,992	.62
Total	5,620,257	2,023,293	7,643,550	20.86
Products of Animals				
Live stock	1,642,027	295,196	1,937,223	5.29
Dressed meats	200,208	7,044	207,252	.56
Other packing house products	124,277	10,159	134,436	.37
Poultry, game and fish	66,975	42,664	109,639	.30
Wool	8,227	10,151	18,378	.05
Hides and leather	22,044	7,468	29,512	.08
Other products	84,742	32,952	117,694	.32
Total	2,148,500	405,634	2,554,134	6.97
Products of Mines				
Anthracite coal	13,344	165,148	178,492	.49
Bituminous coal	8,554,145	2,088,963	10,643,108	29.04
Coke	33,676	189,051	222,727	.61
Ores	124,161	531,378	655,539	1.79
Stone, sand, etc	1,994,028	324,375	2,318,403	6.33
Other products	143,953	333,275	477,228	1.30
Total	10,863,307	3,632,190	14,495,497	39.56
Products of Forest—				
Lumber	252,720	1,726,414	1,979,134	5.40
Other products	141,852	127,783	269,635	.74
Total	394,572	1,854,197	2,248,769	6.14
Manufactures—				
Petroleum and other oils	476,976	428,189	905,165	2.47
Sugar	196,595	187,057	383,652	1.05
Naval stores	8,830	5,049	13,879	.04
Iron, pig and bloom	19,665	146,667	166,332	.45
Iron and steel rails	11,476	148,473	159,949	.44
Other castings and machinery	154,498	256,828	411,326	1.12
Bar and sheet metal	70,245	288,270	358,515	.98
Cement, brick and lime	1,378,393	473,663	1,852,056	5.05
Agricultural implements	179,869	69,669	249,538	.68
Wagons, carriages, tools, etc	47,211	108,440	155,651	.42
Wines, liquors and beers	126,655	40,326	166,981	.46
Household goods, etc	60,205	46,336	106,541	.29
Other manufactures	532,413	671,883	1,204,296	3.29
Total	3,263,031	2,870,850	6,133,881	16.74
Miscellaneous	740,144	313,885	1,054,029	2.88
Less Car Load	1,694,211	816,587	2,510,798	6.85
Grand Total, All Commodities	24,724,022	11,916,636	36,640,658	100.00

INVESTMENT IN ROAD AND EQUIPMENT DURING THE YEAR.

ACCOUNT	New Lines and Extensions.	Additions and Betterments charged to Road and Equipment.	Appropriated from Income.	Total.
Engineering	$10,227.86	.....	$78,316.09	$88,543.95
Land for transportation purposes	Cr. 8,741.61	$254,244.66	.....	245,503.05
Grading	377,683.30	.....	518,253.83	895,937.13
Tunnels and subways	130,653.60	.....	.....	130,653.60
Bridges, trestles and culverts	200,411.32	.....	526,190.90	726,602.22
Ties	47,978.34	.....	183,253.13	231,231.47
Rails	71,835.70	.....	487,700.92	559,536.62
Other track material	26,326.37	.....	377,760.03	404,086.40
Ballast	19,366.13	.....	187,628.87	206,995.00
Track laying and surfacing	83,991.23	.....	269,433.92	353,425.15
Right-of-way fences	22,482.24	.....	16,019.66	38,501.90
Snow and sand fences and snow sheds	456.03	.....	.....	456.03
Crossings and signs	7,237.39	.....	112,892.86	120,130.25
Station and office buildings	55,568.69	.....	196,821.22	252,389.91
Roadway buildings	889.20	.....	6,190.32	7,079.52
Water stations	23,159.60	.....	82,900.06	106,059.66
Fuel stations	180.49	.....	Cr. 17,038.57	Cr. 16,858.08
Shops and engine houses	1,757.23	.....	226,255.36	228,012.59
Storage warehouses	.....	.....	4,143.82	4,143.82
Wharves and docks	.....	.....	12,741.32	12,741.32
Telegraph and telephone lines	3,686.00	.....	3,849.37	7,535.37
Signals and interlockers	15,325.59	.....	114,097.92	129,423.51
Power plant buildings	.....	.....	5,260.79	5,260.79
Miscellaneous structures	17.58	.....	25,820.61	25,838.19
Paving	.....	.....	852.27	852.27
Roadway machines	.....	.....	6,826.10	6,826.10

ACCOUNT	Additions and Betterments charged to Road and Equipment. New Lines and Extensions.		Appropriated from Income.	Total.
Roadway small tools	.....	.....	259.36	259.36
Assessments for public improvements	.....	.....	40,068.88	40,068.88
Other expenditures—				
Road	18,607.19	.....	230,798.86	249,406.05
Shop machinery	.....	.....	77,645.97	77,645.97
Power plant machinery	.....	.....	6,666.34	6,666.34
Unapplied construction material and supplies	.....	.....	2,190.07	2,190.07
Total expenditures for road	$1,109,099.47	$254,244.66	$3,783,800.28	$5,147,144.41
Steam locomotives	.....	.....	$251,647.56	$251,647.56
Freight-train cars	.....	.....	649,626.16	649,626.16
Passenger-train cars	.....	.....	Cr. 67,457.13	Cr. 67,457.13
Floating equipment	.....	.....	Cr. 10,490.00	Cr. 10,490.00
Work equipment	.....	.....	Cr. 49,674.52	Cr. 49,674.52
Total expenditures for equipment	.....	.....	$773,652.07	$773,652.07
Law	$100.00	.....	.....	$100.00
Interest during construction	29,616.42	.....	$57,870.50	87,486.92
Other expenditures—General	2,750.00	.....	.....	2,750.00
Total general expenditures	$32,466.42	.....	$57,870.50	$90,336.92
Grand Total	$1,141,565.89	$254,244.66	*$4,615,322.85	$6,011,133.40

*Of this amount $183,963.04 was charged to previously appropriated surplus.

During the year lease has been made of the Colorado & Southern Railway Company's line between Orin Junction and Wendover, Wyo., which, with completion of our own track connecting Wendover and Guernsey, completes the connection of the main body of your property with the Great Northern and Northern Pacific Railways by way of the Big Horn River Basin; and also completes the through line between Denver and a connection with the same roads, via the Colorado & Southern Railway.

Work on the Chalco-Yutan Cut Off has progressed favorably, much of the grading having been completed and track being laid on the finished portions. This cut off shortens the line between Omaha and Sioux City. It should be ready for operation early in the year 1917.

On the Beardstown and La Crosse Divisions 34 miles of double track have been completed and an additional 51 miles is under construction. This double tracking work is at points of great density of traffic, the movement of which will be much facilitated thereby.

For the Paducah & Illinois Railroad Company's bridge across the Ohio River at Metropolis, Ill., the piers are all in place and the superstructure is being erected. The work should be completed during the year 1917 and will facilitate and expedite movement of business between your Company's lines and the territory south of the Ohio River.

The work of replacing your Company's bridge across the Missouri River at Kansas City is nearing completion, the piers being in and the superstructure well along, so that the rebuilt structure will probably be in use early in 1917.

A locomotive repair and machine shop with necessary power house is being built at West Burlington, Iowa, at a cost of approximately $1,500,000. The work should be finished and ready for use by June, 1917. These buildings replace the old shops which were built in 1880 and which have proven inadequate for repairing the heavier types of locomotives.

Action by the city has compelled us to elevate the tracks through Aurora, Ill., necessitating the purchase of a large amount of property and the re-location of part of the line. The work has been begun and the estimated cost is $3,250,000.

Work preparatory to the construction of the new Union Station in Chicago has been begun and satisfactory progress made. It is still too early to determine when the station will be completed.

Following is the report of the General Auditor with statements prepared by him.

By order of the Board of Directors.

HALE HOLDEN,
President.

INCOME ACCOUNT.

OPERATING INCOME.		
Railway operating revenues:		
Transportation:		
Freight	$71,592,578.23	
Passenger	21,168,051.65	
Excess baggage	257,260.13	
Parlor and chair car	517.40	
Mail	2,715,323.08	
Express	2,651,544.27	
Other passenger train	40,107.96	
Milk	422,540.49	
Switching	1,389,783.75	
Special service train	42,754.71	$100,280,461.67
Incidental:		
Dining and buffet	$ 668,324.42	
Hotel and restaurant	82,527.51	
Station and train privileges	8,580.65	
Parcel room	14,972.21	
Storage—Freight	40,449.72	
Storage—Baggage	18,744.93	
Demurrage	309,890.86	
Telegraph and telephone	254,316.27	
Stock yards	281,661.12	
Rent of buildings and other property	138,173.73	
Miscellaneous	187,060.67	$ 2,004,702.09
Joint facility—Cr.	$ 76,575.11	
Joint facility—Dr.	2,845.92	$ 73,729.19
Total railway operating revenues		$102,358,892.95

CHICAGO, BURLINGTON & QUINCY—GENERAL BALANCE SHEET.

June 30, 1916.

ASSETS.

Investments:		
Property investment—Road and equipment:		
Road	$368,454,535.28	
Equipment	78,627,020.18	
General expenditures	264,607.20	$447,346,162.66
Sinking funds:		
Book assets	$ 23,239,062.88	
Par value of Company's own issues included	23,074,600.00	164,462.88
Deposits in lieu of mortgaged property sold		51,941.05
Miscellaneous physical property		1,463,710.90
Investments in affiliated companies:		
Stocks	$ 27,552,292.12	
Bonds	1,331,122.93	
Advances	1,786,774.28	$ 30,670,189.33
Other investments:		
Stocks	$ 9,067.91	
Bonds	162,098.00	
Notes	172,259.76	
Miscellaneous	35.00	343,460.67
Total investments		$480,039,927.49
Current assets:		
Cash		$ 15,200,768.11
Demand loans and deposits		529,842.08
Time deposits		11,771,500.00
Loans and bills receivable		4,270,707.57
Traffic and car-service balances receivable		747,888.31
Net balance receivable from agents and conductors		3,013,529.69
Miscellaneous accounts receivable		2,457,072.86
Material and supplies		6,345,222.02
Total current assets		$ 44,336,530.64
Deferred assets:		
Working fund advances		$ 24,149.41
Other deferred assets		1,000.00
Total deferred assets		$ 25,149.41
Unadjusted debits:		
Insurance premium paid in advance		$ 143,299.45
Discount on funded debt		2,298,495.32
Other unadjusted debits		3,722,951.34
Total unadjusted debits		$ 6,164,746.11
Grand total		$530,566,353.65

LIABILITIES.

Capital stock:		
Common stock		$110,839,100.00
Long term debt:		
Bonds held by the public	$179,858,500.00	
Bonds held by trustees, account sinking funds	23,074,600.00	
Bonds owned by the Company, unpledged	11,038,900.00	
Bonds owned by the Company, pledged	31,000.00	
Total	$214,003,000.00	
Less bonds held by or for the Company, included in above	34,144,500.00	
Total long term debt		$179,858,500.00
Current liabilities:		
Traffic and car-service balances payable		$ 1,343,450.67
Audited accounts and wages payable		6,609,153.76
Miscellaneous accounts payable		420,708.67
Interest matured unpaid		1,702,740.50
Dividends matured unpaid		551.25
Funded debt matured unpaid		5,000.00
Unmatured interest accrued		1,105,819.16
Other current liabilities		31,681.27
Total current liabilities		$ 11,219,105.28
Unadjusted credits:		
Tax liability		$ 2,508,420.00
Insurance reserves		1,344,775.83
Operating reserves		440,000.00
Accrued depreciation—Equipment		34,045,922.59
Other unadjusted credits		1,560,834.87
Total unadjusted credits		$ 39,899,953.29
Corporate surplus:		
Additions to property since June 30, 1907, through income		$ 35,102,227.35
Funded debt retired through income		15,177,228.85
Sinking fund reserves		23,825,069.37
Appropriated surplus not specifically invested		9,556,893.05
Profit and loss		105,088,276.46
Total corporate surplus		$188,749,695.08
Grand total		$530,566,353.65

Railway operating expenses:			
Maintenance of way and structures	$12,014,208.39		
Maintenance of equipment	15,592,109.89		
Traffic	1,610,626.55		
Transportation	29,956,781.16		
Miscellaneous operations	927,592.65		
General	2,017,687.18		
Transportation for Investment—Cr.	405,844.80	$ 61,713,161.02	
Net revenue from railway operations			$40,645,731.93
Railway tax accruals		$ 4,449,290.83	
Uncollectible railway revenues		9,547.58	$ 4,458,838.41
Total operating income			$36,186,893.52
NONOPERATING INCOME:			
Hire of equipment		$590,559.37	
Joint facility rent income		454,368.14	
Income from lease of road		2,932.28	
Miscellaneous rent income		252,537.13	
Miscellaneous nonoperating physical property		9,141.27	
Separately operated properties—Profit		126.70	
Miscellaneous income		2,252.00	
Dividend income		10,554.05	
Income from funded securities		39,520.88	
Income from unfunded securities and accounts		1,029,259.92	
Income from sinking funds		2,900.10	2,394,151.84
Gross income			$38,581,045.36

DEDUCTIONS FROM GROSS INCOME:			
Hire of equipment		$204,865.16	
Joint facility rents		1,321,379.00	
Rent for leased roads		28,025.46	
Miscellaneous rents		21,041.81	
Miscellaneous tax accruals		13,165.96	
Separately operated properties—Loss		41,887.85	
Interest on funded debt		7,078,490.72	
Interest on unfunded debt		747.15	
Amortization of discount on funded debt		95,164.52	
Miscellaneous income charges		9.45	8,734,775.38
Net income			$29,846,269.98
DISPOSITION OF NET INCOME:			
Income applied to sinking funds		$1,817,679.41	
Dividend appropriations of income:			
2 per cent Sept. 25, 1915	$2,216,782.00		
2 per cent Dec. 27, 1915	2,216,782.00		
2 per cent March 25, 1916	2,216,782.00		
2 per cent June 26, 1916	2,216,782.00	8,867,128.00	
Income appropriated for investment in physical property		4,431,359.81	
Fund for accrued taxes—not yet due		2,400,000.00	
Miscellaneous appropriations of income		6,000,000.00	$23,516,167.22
Income balance transferred to profit and loss			$6,330,102.76

FUNDED DEBT OF THE CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY.

Designation of Bond or Obligation.	Term. Date of Issue.	Term. Date of Maturity.	Total Par Value Authorized.	Total Nominally or Actually Outstanding.	Nominally Outstanding, Held by or for Company. In Treasury.	Pledged as Collateral.	In Sinking Funds.	Actually Outstanding in Hands of Public.	Interest. Rate.	When Payable.	Accrued During Year on Bonds Actually Outstanding.
MORTGAGE BONDS.											
C. B. & Q. R. R.:											
General mortgage	Mar. 2, 1908	Mar. 1, 1958	$75,120,000	$75,120,000	$9,873,000	.....	.....	$65,247,000	4	M. & S.	$2,609,880.00
Illinois Division	July 1, 1899	July 1, 1949	50,835,000	50,835,000	384,000	.....	.....	50,451,000	3½	J. & J.	1,765,785.00
Illinois Division	July 1, 1899	July 1, 1949	34,165,000	34,165,000	189,000	.....	.....	33,976,000	4	J. & J.	1,359,040.00
Iowa Division mortgage sinking fund bonds.	Oct. 1, 1879	Oct. 1, 1919	3,000,000	1,944,000	13,000	.....	.....	1,931,000	5	A. & O.	97,105.00
Iowa Division mortgage sinking fund bonds.	Oct. 1, 1879	Oct. 1, 1919	12,502,000	5,048,000	18,000	.....	.....	5,030,000	4	A. & O.	202,165.55
Nebraska extension mortgage sinking fund bonds	May 1, 1887	May 1, 1927	29,441,000	21,341,000	314,000	$31,000	.....	20,996,000	4	M. & N.	853,784.44
B. & M. R. R. R. in Nebraska:											
Consolidated mortgage sinking fund bonds.	July 1, 1878	July 1, 1918	13,751,000	13,613,000	.....	.....	$12,770,800	842,200	6	J. & J.	80,559.20
Republican Valley R. R.:											
Mortgage sinking fund bonds	July 1, 1879	July 1, 1919	1,078,000	932,800	.....	.....	878,600	54,200	6	J, & J.	4,507.90
Tarkio Valley R. R.:											
Mortgage bonds	June 1, 1880	June 1, 1920	210,000	16,000	1,000	.....	.....	15.000	7	J. & D.	1,242.50
Nodaway Valley R. R.:											
Mortgage bonds	June 1, 1880	June 1, 1920	188,000	11,000	2,000	.....	.....	9,000	7	J. & D.	950.83
COLLATERAL TRUST BONDS.											
C. B. & Q. R. R..											
Sinking fund bonds (Denver Extension)	Dec. 1, 1881	Feb. 1, 1922	7,968,000	7,310,200	87,900	.....	6,058,200	1,164,100	4	F. & A.	50,602.86
PLAIN BONDS.											
C. B. & Q. R. R.:											
Sinking fund bonds	Sept. 1, 1881	Sept. 1, 1921	4,300,000	3,667,000	157,000	.....	3,367,000	143,000	4	M. & S.	12,867.44
Total	.....	.....	$232,558,000	$214,003,000	$11,038,900	$31,000	$23,074,600	$179,858,500	...	.....	$7,038,490.72

THE BALTIMORE & OHIO RAILROAD COMPANY—NINETIETH ANNUAL REPORT

OFFICE OF THE BALTIMORE AND OHIO RAILROAD COMPANY.
BALTIMORE, MD., October 26, 1916.

To the Stockholders of The Baltimore and Ohio Railroad Company.

The President and Directors of the Company submit herewith report of the affairs of the Company for the fiscal year ended June 30, 1916.

Except where otherwise indicated, the comparisons shown herein are with the figures for the preceding fiscal year.

MILEAGE AND EQUIPMENT.

The statements in this report show the results of the operation of the lines directly controlled and operated by your Company, embracing:

	FIRST MAIN TRACK.	TOTAL OF ALL TRACKS.
Miles (owned)	4,464.78	8,894.81
Miles (trackage rights)	74.60	146.71
Total miles operated	4,539.38	9,041.52

as shown in detail in Table 28.

The equipment of the Company at June 30, 1916, consisted of 2,328 Locomotives; 1,186 Passenger Cars; 84,943 Freight Cars; 2,738 Work Cars; and 155 pieces of Floating Equipment, as shown in detail in Table 27.

GENERAL RESULTS FROM OPERATION.

The General Income Account of the Company will be found in Table 1.

The Total Railway Operating Revenues were $111,668,680.34, an increase of $19,852,883.00, or 21.62 per cent.

The Total Railway Operating Expenses were $79,319,804.16, an increase of $15,394,296.42, or 24.08 per cent.

The ratio of operating expenses to total revenues was 71.03 per cent., which compares with 69.62 per cent. for the previous year.

The Net Revenue from Railway Operations was $32,348,876.18, an increase of $4,458,586.58, or 15.99 per cent.

The Gross Income from the year's operations was sufficient to enable your Company to meet its fixed and other charges; to pay the established four per cent. dividend upon the Preferred Stock; five per cent. upon the Common Stock; and to leave a surplus of $3,664,463.35.

The year was one of unprecedented business activity. The crops were unusually abundant and Mining and Manufacturing industries were exceedingly active throughout the year. The export demand, especially heavy because of the continuation of the Great War abroad, taxed the terminal facilities at all of the Atlantic ports and, with the absence of sufficient vessels to move the tonnage offering, caused a congestion of traffic on the Eastern railroads, which was particularly severe during the winter months.

Because of this congestion it was necessary at times to hold for considerable periods for delivery to connections and for export, a large amount of traffic which not only retarded the movement of cars, but added greatly to the transportation costs and hire of equipment charges.

Your Company, however, handled a largely increased tonnage, and the freight earnings and the total revenues were the greatest in its history.

The passenger traffic approached the maximum of former years, notwithstanding the entire suspension of immigrant travel, which formerly contributed approximately one million dollars per annum to the Company's revenue. There has been a steady increase in through passenger traffic via your lines, which was augmented during the past year by the general business activity and the special travel in connection with the Panama-Pacific Expositions at San Francisco and San Diego.

With the increased revenue available a liberal maintenance program was followed. The total expenditures for maintenance exceeded those of the previous year by something over twelve million dollars. While there were increases in practically all the maintenance accounts, the more important increases contributed to the improvement of track conditions and the repair and rebuilding of locomotives and freight cars, thereby increasing the efficiency of your Company's plant as a transportation agency.

These increased expenditures were necessary in part to offset curtailed outlay in previous years, but in general have contributed to improved conditions and to the higher efficiency of the property.

Except for the congestion above referred to and consequent detention of cars, the traffic was handled with reasonable despatch, and with such freedom of movement as to demonstrate a reserve carrying capacity over the unprecedented volume of business of the past year.

FREIGHT REVENUES AND STATISTICS.

Freight Revenue was $88,476,031.96, an increase of $17,695,123.15, or 24.90 per cent., and constituted 79.73 per cent. of Total Railway Operating Revenues, as against 77.09 per cent. last year.

The tons of revenue freight carried were 80,785,993, an increase of 16,410,398 tons, or 25.49 per cent., and the tons carried one mile were 15,793,944,856, an increase of 2,833,050,787 tons, or 21.76 per cent. The revenue ton-miles per mile of road were 3,479,318, an increase of 619,313 ton-miles, or 21.65 per cent. The average distance each ton was carried was 195 80/100 miles, a decrease of 5 99/100 miles compared with the previous year. Freight revenue per mile of road was $19,490.77, an increase of $3,884.02, or 24.89 per cent., and the revenue per freight train mile was $4.26 12/100, an increase of 48 31/100 cents, or 12.79 per cent. The average earnings per ton per mile were 5 60/100 mills, an increase of 14/100 mills. Freight Traffic Statistics are given in greater detail in Tables 10 and 11.

The Statement of Commodities Carried, Table 14, shows substantial increases in all the groupings, indicating renewed activity in all branches of business. Products of Mines increased 9,481,904 tons, or 22.98 per cent., and Manufactures increased 3,926,115 tons, or 36.05 per cent. Seventy per cent. of the total tonnage handled originated on the lines of the Company.

PASSENGER REVENUES AND STATISTICS.

Passenger Revenue amounted to $14,971,471.81, an increase of $911,531.40, or 6.48 per cent. These earnings constitute 13.41 per cent. of total earnings compared with 15.31 per cent. for preceding year.

The number of passengers carried was 21,410,358, an increase of 828,366, or 4.02 per cent.; the number of passengers carried one mile was 747,860,815, an increase of 33,492,392, or 4.69 per cent., and the average distance each passenger was carried was 34.93 miles, an increase of 22/100 miles. The average rate per passenger per mile for the year was 2 002/1000 cents, an increase over the previous year of 34/1000 cents. These and other statistics relating to Passenger Traffic will be found in Tables 12 and 13.

MISCELLANEOUS REVENUES.

Mail Revenue was $1,295,284.97, an increase of $59,208.29 over the preceding year.

Express Revenue was $2,229,323.01, an increase of $410,870.33, or 22.59 per cent., which is attributable to increase in general business; increase in express rates granted by the Interstate Commerce Commission, effective September 1, 1915, approximately equivalent to 3.86 per cent.; to the general efficiency of the Wells Fargo & Company express service; and to the extensive territory over which they operate, which enables them to offer to the public attractive service and facilities.

Other Transportaiton Revenue, which includes earnings from Switching and Special Train Service, Transportation of Milk, Excess Baggage, Water Transfers, etc., shows an increase of $350,763.78, or 20.74 per cent.

Revenue from sources other than Transportation, which includes earnings from Dining Cars, Station Privileges, Storage, Grain Elevators, Joint Facilities, etc., shows an increase of $425,285.75, or 19.08 per cent.

OPERATING EXPENSES.

The Operating Expenses for the year were $79,319,804.16, compared with $63,925,507.74 for last year, an increase of $15,394,296.42, or 24.08 per cent.

The Maintnance of Way and Structures expenses were $13,917,815.09, an increase of $4,932,188.23, or 54.89 per cent.

The Maintenance of Equipment expenses were $23,513,810.65, an increase of $7,511,222.12, or 46.94 per cent. Included in these expenses are charges for depreciation of equipment amounting to $3,263,343.16. Repairs to Locomotives and Freight Cars increased $5,497,276.03.

The total of all Maintenance Expenses for the year was $37,431,625.74, and compared with the same expenses for the preceding year shows an increase of $12,443,410.35, or 49.80 per cent. These expenses for the year represent 33.52 per cent. of Total Operating Revenues, as compared with 27.22 per cent. the preceding year.

The Transportation Expenses for the year were $36,835,920.84, and compared with last year show an increase of $2,581,348.79, or 7.54 per cent. These expenses were 32.99 per cent. of Total Operating Revenues, as compared with 37.31 per cent. the preceding year. The average revenue freight train load was 760.67 tons this year against 692.35 tons for the previous year, an increase of 68.32 tons, or 9.87 per cent. The revenue freight handled one mile increased 21.76 per cent., with an increase in revenue freight train miles of 2,028,785 miles, or 10.83 per cent. The average movement of freight cars per day increased 4.1 miles, or over 17 per cent.

The Traffic Expenses increased $31,892.32, or 1.67 per cent.

Miscellaneous Operations for the year increased $124,386.14, due mainly to increased expense of operating Grain Elevators, incident to the larger volume of business handled.

The General Expenses increased $258,246.21, or 11.59 per cent.

There was an increase of $44,987.39 in the credit item Transportation for Investment, which represents charges to property accounts during the year for the expense of transporting men and materials in connection with additions and betterments to the property.

TAXES.

Railway Tax Accruals amounted to $3,674,248.02, and taxes charged to Miscellaneous Tax Accruals amounted to $226,057.21, or a total of all taxes for the year of $3,900,305.23, an increase of $397,230.87, or 11.34 per cent. Taxes for the year were 3.49 per cent. of Total Operating Revenues.

INCOME ACCOUNT.

The Gross Income for the year was $34,483,439.22, an increase of $4,640,894.27. Deductions from Gross Income, in which are included Rentals paid for the use of Equipment and Property, Interest on Funded and Unfunded Debt, etc., show a net increase for the year of $1,729,328.93, due principally to a net increase of $1,600,399.81 in Interest on Funded and Unfunded Debt. The increased interest charge is incident to the issue and sale, December 24, 1915, of $60,000,000.00 Refunding and General Mortgage Five Per Cent. Bonds, due December 1, 1965, the proceeds of which were applied, so far as necessary, in the retirement at June 1, 1916, of the Company's $40,000,000.00 Two and Three Year Gold Secured Four and One-Half Per Cent. Notes, dated June 1, 1915.

The Net Income for the year amounted to $13,692,446.67, an increase of $2,911,565.34 over the preceding year, out of which dividends at the rate of four per cent. per annum, amounting to $2,354,527.28, were paid on the Preferred Stock of the Company. After deducting this amount and sundry appropriations for Sinking and other Reserve Funds, the balance transferred to Profit and Loss was $11,261,688.82.

PROFIT AND LOSS.

The amount to the credit of Profit and Loss at the beginning of the fiscal year was $32,575,513.91, which amount was increased to $43,837,704.73 by the addition of the surplus income earned during the year as shown above. Dividends at the rate of five per cent. per annum, amounting to $7,597,225.47, were declared on the Common Stock of the Company and charged to Profit and Loss, and there was also charged against this account during the year the further net amount of $15,633,891.33, included in which is $1,922,740.45 for discount and expenses on obligations disposed of during the same period and $10,892,323.23, the difference between the ultimate net investment of your Company in the Cincinnati, Hamilton and Dayton Railway, and what is believed to be a conservative estimate of the value of the securities of the new Company which your Company is to receive for its participation in the Plan of Reorganization. The balance to the credit of Profit and Loss at the close of the year was $20,606,585.93.

CHANGES IN CORPORATE RELATIONS.

During the year The Baltimore and Ohio Railroad Company acquired title in fee to the property of The Cleveland Terminal and Valley Railroad Company, a corporation owning a railroad in the State of Ohio, the operations of which property have heretofore been included in the System's Income Account. The circumstances in connection with the purchase of the property of the Cleveland Terminal and Valley Company are identical with those mentioned in the last annual report with respect to the acquisition of the properties of several other Ohio corporations, whose stock was owned by your Company.

The purchase of this property did not increase or change the miles of road of the System, but did increase the miles of road owned in fee by The Baltimore and Ohio Railroad Company to the extent of 83.43 miles. The length of road now owned in fee is 2,282 miles, or 51.15 per cent. of the mileage comprising the System.

GENERAL BALANCE SHEET.

The General Balance Sheet is shown in Table 2. The principal differences in the assets and liabilities of the Company, as compared with the previous year, are as follows:

Assets.

The grouping of Investments, which includes for the most part the permanent investments of the Company, shows a net increase for the year of $10,351,887.43
made up as follows, viz.:

Net charge to Road (Table 6)	$3,754,047.87	
Net charge to Equipment (Page 12)	4,573,791.54	
Net increase in Other Investments..	2,024,048.02	
		$10,351,887.43

There were increases and decreases in the several accounts comprising the grouping of Investments, due to book adjustments incident to transferring to "Road" account the total investment in property directly owned.

Current Assets increased $7,433,144.43
This is principally due to increases in Cash and Special Deposits, the latter representing funds on deposit for the retirement of Two and Three Year Notes, called but not presented for redemption. The remainder of the increase is mainly in current accounts and Materials and Supplies.

Securities of Carrier's Own Issue—Unpledged, representing securities in the Company's treasury, decreased $3,996,890.00, due to the cancellation of $5,000,000.00 of New York Division and Terminal First Mortgage Bonds, and the issue during the year of $1,000,000.00 of Baltimore and Ohio First Mortgage Bonds in recoupment of capital expenditures as provided in that mortgage.

Securities of Carrier's Own Issue—Pledged increase $1,650,000.00. This is occasioned by setting up the special issue of the Company's stock covering the Washington Branch. This is not a new issue of stock, but is now taken up as a liability of the Company for the first time in accordance with the requirements of the Interstate Commerce Commission.

Liabilities.

There was no issue of Capital Stock during the year. The stated increase of $1,650,000.00 is occasioned by taking up on the general books the entire issue of special Washington Branch Stock, held by your Company and carried as Securities of Own Issue—Pledged.

The grouping of Long Term Debt, otherwise known as Funded Debt, increased $14,635,630.00
and is accounted for in the following manner:

Obligations issued during the year—		
Refunding and General Mortgage 5% Bonds, Series "A"	$60,000,000.00	
issued to retire $40,000,000 Two and Three Year Notes, and for additions and betterments and other corporate purposes.		
First Mortgage 4% Bonds.....		1,000,000.00
issued under provisions of this mortgage for recoupment of capital expenditures, and held in the treasury.		
Jamison Coal & Coke Co., Car Trust of 1916.....$500,000.00		
Jamison Coal & Coke Co., Car Trust of 1911..... 230,000.00		
George's Creek Coal & Iron Co., Equipment Notes..... 40,000.00		770,000.00
These car trusts were assumed by the Company in part payment for equipment acquired.		
		$61,770,000.00
Obligations retired during the year—		
Two and Three Year Notes.	$40,000,000.00	
New York Division and Terminal First Mortgage.. . Mortgage cancelled.	5,000,000.00	
B. & O. Equipment Trust of 1912 ..... Series "D," paid at maturity.	1,000,000.00	
B. & O. Equipment Trust of 1913 ..... Series "C," paid at maturity.	1,000,000.00	
Real Estate Mortgages and Ground Rent Liens Liquidated (net)	134,370.00	47,134,370.00
		$14,635,630.00

Current Liabilities show an increase of $6,791,479.55
The larger portion of this increase is in Accounts and Wages Payable inci-

dent to the enlarged operations and to an increase in Funded Debt Matured Unpaid representing a part of this Company's Two and Three Year Notes called for redemption which has not been presented to the Trustee for payment.

Corporate Surplus shows a decrease of..... $8,955,050.79

There was charged to this account during the year $1,922,740.45, being discount on securities issued. There was also charged to this account $10,892,323.23, representing estimated and anticipated ultimate loss incident to the Cincinnati, Hamilton and Dayton Railway Co. transactions more particularly referred to hereinafter.

Neither The Baltimore and Ohio Railroad Company nor any of its subsidiaries has any notes or bills outstanding. There are available in the Treasury of the Company unpledged stocks and bonds of its own issue of a par value of $3,682,143. There are also in the Treasury unpledged stocks and bonds of other companies having a book value of over $22,000,000, and a market value, at prices prevailing June 30, 1916, more than $15,000,000 in excess of the book value.

REFUNDING AND GENERAL MORTGAGE.

On December 1, 1915, the Company executed its Refunding and General Mortgage which had been approved by the shareholders at their meeting on November 16, 1914. This mortgage provides a comprehensive basis for the Company's future financial requirements and for the refunding of its funded debt, including that of subsidiary companies, and is designed to become ultimately the first and only mortgage lien upon the properties comprising your Company's system of railroads.

The mortgage matures December 1, 1995, and is secured by lien on practically the entire system of railroads of your company, comprising 4,494 miles of first track, about 1,303 miles of second track and about 3,372 miles of other track, and upon the equipment of the Company or its interest therein. The mortgage is a direct lien upon 2,282 miles of first track, 645 miles of second track, and 1,797 miles of other track of the above mentioned mileage, and a lien upon the remaining mileage of the system through the deposit of bonds, and in most cases all, but in no case less than ninety-six per cent. of the capital stock of each of the Companies owning the same.

The Company's 4½ per cent. Convertible Gold Bonds, amounting to $63,250,000, in accordance with the terms thereof, are secured *pari passu* with the bonds issued under the new Refunding and General Mortgage.

The Refunding and General Mortgage provides for the reservation of bonds to retire about $282,000,000 bonds outstanding, which are prior liens on various parts of the system, and the $63,250,000 4½ per cent. Convertible Gold Bonds, and further provides for the reservation and future issuance of bonds for purposes stated therein, including construction, betterments, improvements, new equipment and the acquisition of property.

The authorized issue of bonds is limited to an amount which, together with all prior debts of the Company, after deducting therefrom the bonds reserved under the provisions of the mortgage to retire prior debts at maturity, shall not exceed three times the then outstanding capital stock of the Railroad Company, with the additional limitation that when the aggregate amount of the bonds outstanding and the bonds reserved to retire prior debts shall be $600,000,000, no additional bonds shall thereafter be issued, except the bonds so reserved to retire prior debt, without the further consent of the stockholders of the Company, and such additional bonds may be issued then only to an amount not exceeding 80 per cent. of the cost of the work done or property acquired.

The mortgage provides for the issue of bonds in series in such form as may be determined by the Board of Directors, at varying rates of interest, and with such provisions respecting redemption, convertibility, registration, etc., etc., as may be deemed necessary or desirable at the time of issue. The mortgage thus affords opportunity for elasticity of action to meet varying conditions.

Bonds of Series "A" to an amount of $60,000,000, bearing interest at the rate of 5 per cent. per annum, payable June 1 and December 1, redeemable in whole but not in part on June 1, 1925, or any interest day thereafter, at a premium of five per cent. and accrued interest, were issued and sold December 24, 1915. A part of the proceeds of the bonds sold has been applied, as provided in the mortgage, to the redemption on June 1, 1916, of the Company's $40,000,000 Two and Three Year 4½ per cent. Secured Gold Notes.

Of the bonds now authorized, there remain to be issued under the terms of the mortgage and for the purposes therein stated, other than for the refunding of outstanding prior debt, over $180,000,000.

ADDITIONS TO ROAD AND EQUIPMENT.

The total expenditures for new construction aggregated $5,678,950.15, and after applying credits for property retired, occasioned a net increase in Road Account of $3,754,047.87. These expenditures are shown in detail in Table 6, where they are grouped under the more important accounts of the Road and Equipment Classification.

The total expenditures on account of equipment added during the year aggregated $9,412,011.68, and after applying credits, as shown on page 12, the net increase in Investment in Equipment was $4,573,791.54. Table 27 shows the equipment in service and the various changes occurring therein during the year.

ROAD.

A new outbound freight house on the Marginal Way at 26th Street, New York City, is under construction, and the work of remodeling Piers 21 and 22 is progressing, and will be completed during the coming fiscal year.

The Lancaster Avenue bridge, Wilmington, Del., has been raised to standard clearance and the approaches widened.

At Baltimore, Md., important improvements are being made. Work has been started on the new export pier, No. 6, and on the reconstruction of open piers Nos. 5, 34 and 35, at Locust Point, and it is expected that these structures will be completed during the coming fiscal year. The reconstruction of bridge over Gay Street, made necessary by the widening of this thoroughfare, has been completed. At Curtis Bay, there is being constructed a modern fireproof coal pier, together with unloaders inshore with belts leading to movable towers on the pier, from which coal can be loaded into vessels on each side of the pier. The maximum capacity will be 6,000 tons per hour. On account of the freezing of coal in the cars during severe winter weather, and the resultant expense and loss of time in getting it out, a thawing plant for use in connection with the coal pier has been constructed, which will enable the handling of coal with equal facility throughout the year.

To meet the increased demand for conditioning grain for export, an additional grain drier was installed at Locust Point, in elevator "B."

To reach the large plant of the Security Cement and Lime Company and serve other industries in that vicinity, a branch line 3.86 miles in length is under construction near Hagerstown, Md. It is expected to complete this line and put it in operation during September, 1916.

At Bloomington, Md., bridge No. 79 over the Western Maryland Railway and North Branch of the Potomac River is being widened, to provide standard clearance, to relieve a restricting condition and to provide additional track.

A ventilating plant has been installed at Tunnel No. 21, near Eaton, W. Va., and a smoke plant is under construction at Tunnel No. 6 at Central, W. Va., both on the Pittsburg Branch.

The Wilson Creek Branch is being extended about one mile to reach several new coal developments.

At Pittsburgh, Pa., the passenger station has been remodeled and enlarged to provide more waiting and toilet facilities for handling suburban, and a new power plant for supplying steam for the passenger station and coach yard is under construction. The work of eliminating grade crossings at 33rd Street and Liberty Avenue, involving reconstruction of 33rd Street viaduct from Liberty Avenue to Allegheny River, the construction of retaining walls and the raising of the city Butler Street (Third Avenue) bridge, is under way, and will be completed during the coming year. To provide proper overhead clearance, the Company has contributed generously toward the expense of reconstructing the Sylvan Avenue Bridge, which work is being conducted by the city of Pittsburgh and is to be completed during the coming fiscal year.

A new freight house, tracks and retaining wall are being constructed at Allegheny, Pa., the completion of which is expected early in the coming year.

A new passenger station is under construction at Canton, Ohio, and passenger stations have been constructed at Washington Court House and Deshler, Ohio, and Aurora, Ind., the first named being for joint use with the Cincinnati, Hamilton and Dayton and Detroit, Toledo and Ironton Railroads.

The bridge crossing Main Street at East Madisonville, Ohio, has been completed.

The second track work, involving the elimination of grade crossings at Defiance, Ohio, and erection of a new bridge over Auglaize River, is under way and will be completed during the coming fiscal year.

Work on the Hopple Street Viaduct at Cincinnati, Ohio, has progressed and it is expected that same will be completed and open for traffic in September, 1916.

Work has been started on the reconstruction of bridges for heavier power between Cumberland, Md., and Connellsville, Pa., and other points on the System. A number of bridges on the line between Midland City and Columbus, Ohio, have been renewed, and others strengthened, to permit the operation of heavier equipment.

Automatic signals were installed for 10.6 miles of single track, 37.5 miles of double track, 4.48 miles of three-track and 1.4 miles of four-track road.

There were two interlocking plants and twenty-six crossing bells installed during the year.

EQUIPMENT.

Total Book Value of Equipment, June 30, 1915, was.....		$109,838,137.41
During the year the following additions to the equipment were made: 29 Locomotives, 50 Passenger Cars, 7,936 Freight Cars, 6 Work Cars, and 10 pieces of Floating Equipment, and the equipment account was charged....	$8,848,733.64	
And 6 Passenger Cars, 2,030 Freight Cars, and 6 Work Cars were reconstructed, involving a net charge to the equipment account for additions and betterments of.....	563,278.04	9,412,011.68
		$119,250,149.09
During the year the following equipment was put out of service and credited to Investment in Equipment: 100 Locomotives, 24 Passenger Cars, 8,687 Freight Cars, and 934 Work Cars, having a book value of.....		4,838,220.14
Making the Gross Book Value of Equipment.....		$114,411,928.95
From this should be deducted:		
Accrued Depreciation on Equipment in Service, as follows:		
Amount at credit, June 30, 1915.....$16,129,754.08		
Amount charged to Expenses for depreciation, year ended June 30, 1916... 3,263,343.16		
$19,393,097.24		
Less: Charges against this account for depreciation accrued on equipment put out of service during the year, and for adjustment 1,723,161.49		
Balance to Credit of Accrued Depreciation on Equipment in Service, June 30, 1916.....		17,669,935.75
Making Net Value of Equipment, June 30, 1916.....		$96,741,993.20

Following the general practice, the freight cars rebuilt during the year were reconstructed with steel underframes and body bolsters, and equipped with heavier and improved draft gear.

The percentage of steel freight cars, including cars with steel underframes and steel center-sills, to the total revenue freight equipment at June 30, 1916, was 90.80 per cent., as compared with 81.88 per cent. last year, and 38.63 per cent. at June 30, 1909. The average capacity of freight car equipment owned is 45 tons, compared with 42 tons at June 30 of the preceding year.

Of the equipment acquired during the year, 1,494 were steel gondola cars, purchased from the Jamison Coal & Coke Company, subject to that Company's Equipment Trust Notes, aggregating $770,000.00.

RELIEF DEPARTMENT.

RELIEF FEATURE.

The total membership of this Feature, which provides accident, sick and death benefits for employes, is 55,543. The benefits paid during the year amounted to $1,531,681.46, bringing the total payments for all benefits since the inauguration of this feature, May 1, 1880, to June 30, 1916, to $21,628,564.59. A statement of the operations of this Feature is shown in Table 26, p. 43.

SAVINGS FEATURE.

During the past year this Feature paid to depositors $468,742.58, being five and one half per cent on deposits, after which there was a balance of $36,037.82 carried to the Surplus Account. On June 30, 1916, there were 9,233 depositors, with total deposits of $9,316,274.84, an average of $1,009.34. During the year 1,179 new loans were made and 197 loans were paid off, leaving in force at June 30, 1916, a total of 6,796 loans, amounting to $5,619,736.70. Since the establishment of this Feature, August 1, 1887, loans to the aggregate amount of $17,305,713.73 have been made, assisting employes in acquiring real estate to this extent. A statement of the operations of this Feature will be found in Table 26, p. 44.

PENSION FEATURE.

Pension payments to superannuated and infirm employes, constitute a special payroll and are charged to Operating Expenses, the total amount so charged during the year being $292,588.26.

During the year 138 names were added to the pension roll and 112 were removed by reason of death, leaving 1,062 as the total number of pensioners on June 30, 1916. The average age of pensioners was slightly less than seventy-one years.

A report of the operations of the Department will be distributed to members.

INDUSTRIAL DEPARTMENT.

Two hundred and thirty-one new industries, manufacturing and commercial, were located on or immediately adjacent to the line during the year, from which the Company expects to derive substantial freight revenues. One hundred and seventy-six side tracks were constructed—one hundred and thirty-eight to newly located industries, and thirty-eight to industries previously located but without side track facilities.

INSURANCE FUND.

A summary of the operations of this feature for the year ended June 30, 1916, and a statement of the assets and liabilities, are shown in Table 25. The surplus in this Reserve of the Company at June 30, 1916, was $1,575,389.56.

SUBSIDIARY LINES.

The capital stock of the following lines, which are operated separately, is owned by your Company. The Income Accounts of these companies are stated in the exhibits on pp. 50-53.

	MILES.	NET INCOME.
"A" (p. 50) The Staten Island Railway Company....	12.65	$24,504.19
"B" (p. 51) The Staten Island Rapid Transit Railway Company	10.89	210,179.59
"C" (p. 52) The Sandy Valley and Elkhorn Railway Company	31.76	136,744.32
"D" (p. 53) The Baltimore and Ohio Chicago Terminal Railroad Company	79.42	132,087.40
	134.72	$503,515.50

The Net Income of the Sandy Valley and Elkhorn Railway Company, as shown above, was transferred and included in the Income Account of The Baltimore and Ohio Railroad Company, and the remainder, $366,771.18, was credited to the Profit and Loss Accounts of the respective Companies.

CINCINNATI, HAMILTON AND DAYTON RAILWAY, REORGANIZATION.

Your Company has united in a Plan and Agreement of Reorganization, dated February 15, 1916, to be carried out by Messrs. Kuhn, Loeb & Company, as Reorganization Managers, under which it is proposed that The Baltimore and Ohio Railroad Company shall acquire all the securities to be issued by the New Railroad Company which is to be organized to acquire the interest of the present Cincinnati, Hamilton and Dayton Railway Company in the main line between Cincinnati and Toledo, certain main line branches and the line from Dayton to Wellston, comprising approximately 400 miles of road, being the more important part of the original C., H. & D. Ry and that portion which can be operated to best advantage as part of the Baltimore and Ohio System.

The Plan provides that the Baltimore and Ohio Company will issue, to be distributed in exchange for the existing securities provided for under the Plan and for other purposes of the reorganization, its own direct obligations, to be known as its Toledo-Cincinnati Division Bonds, to be secured by the pledge of all the Refunding Mortgage bonds to be issued by the New Company. The bonds to be issued in exchange for the existing securities are to mature in 1959, are to bear interest at the rate of four per cent. per annum and are to be redeemable on any semi-annual interest date, in whole or in part, at 102½ per cent. of their face value and accrued interest. The total authorized issue is not to exceed $35,000,000.

The above properties are to be acquired subject to guaranteed stocks and bonds, which are to remain undisturbed, aggregating..		$11,336,200
And there will be presently issued of The Baltimore and Ohio Railroad Company Toledo-Cincinnati Division Bonds referred to, in exchange for existing securities for which provision is made under the Plan, not to exceed.....	$11,250,450	
And there will also be presently issued to provide the cash requirements under the Plan, including the retirement of Equipment Trust Notes, and the purchase of new equipment.....	5,000,000	16,250,450
Making a total of guaranteed stocks and funded debt outstanding and to be issued to the public, not to exceed		$27,586,650

The Toledo-Cincinnati Division Bonds not presently issued (viz.: $18,749,550) are to be reserved to retire at maturity, or earlier, the bonds which are to remain undisturbed under the Plan, for the acquisition of underlying securities and for capital expenditures for equipment, additions and betterments and additional property.

The Plan further provides for the surrender by The Baltimore and Ohio Railroad Company of the obligations held by it of the old Company, aggregating $22,695,143, together with the collateral securing the same, excepting certain collateral of the estimated value of $3,368,000, which is to be retained, and for the payment by The Baltimore and Ohio Railroad Company of such an amount in cash as may be required to pay $700.86 for each of the General Mortgage Bonds of 1939 of the Cincinnati, Hamilton and Dayton Company, which may become subject to the Plan, and for the delivery to The Baltimore and Ohio Railroad Company (1) of the entire capital stock of the New Company, and (2) of the Adjustment and Improvement Mortgage Bonds of the New Company to an amount approved by the Reorganization Managers, and now proposed to be..... $20,000,000

With the insolvency and Receivership of the Cincinnati, Hamilton and Dayton Railway Company, and other then existing conditions, a number of grave questions arose under the provisions of the various agreements made in pursuance of the Plan of Adjustment of 1909 affecting the General Mortgage Bonds of 1939, which, in the opinion of counsel, created such a situation that your Company, with the desire to carry out its obligations whatever they might be, was unable to take action under the above mentioned agreements. The subsequent partial dismemberment of the System through action of certain branch line bondholders caused the situation to become even more complex.

With a view to assist, so far as possible, in solving the difficulties of the situation thus created, The Baltimore and Ohio Railroad Company united in the provisions of the Plan of Reorganization under which arrangement is made for the purchase by the Reorganization Managers of the General Mortgage Bonds at the rate of $700.86 per $1,000 bond. This was believed to be an equitable basis under all the circumstances, and upon the recommendation of the Committee representing these bonds, the holders of ninety per cent. of them have already accepted the terms provided in the Plan.

Practically all of the contentions of the various other interests of the old Cincinnati, Hamilton and Dayton Railway Company have been adjusted and foreclosure proceedings are progressing, and it is anticipated that the Reorganization Plan may now be concluded promptly.

The ultimate outcome under the reorganization can now be foreseen, and a reasonable estimate made of the value of the assets accruing to The Baltimore and Ohio Railroad Company. The net ultimate investment of your Company on account of the Cincinnati, Hamilton and Dayton Railway Company will approximate $35,892,000, while a conservative estimate places the value of the securities of the New Company which your Company is to receive under the plan at $25,000,000. It has seemed proper, therefore, to restate this investment on the books of the Company and in consequence to make charges to Profit and Loss on this account of $10,892,000, being the difference between the net ultimate investment of your Company and the estimated value of the securities to be received by it under the Plan of Reorganization. These charges will have no effect on the income of your Company, as no interest has been accrued on the advances to the Cincinnati, Hamilton and Dayton Company for the past three years, and the full weight of any income loss has already been met.

The operations of the properties embraced in the Plan for the year ended June 30, 1916, show a surplus available for rentals and interest in excess of $1,800,000. Deducting interest charges on the $16,250,450 of new Baltimore and Ohio Division Bonds to be issued under the Plan and the rentals and interest charges on underlying securities which are not disturbed, would leave a balance of over $600,000, and it is anticipated that somewhat larger earnings will accrue to your Company when it can have a direct interest in the operations, because, it is believed, the properties can be more profitably operated under a close alliance with a large System than if operated independently.

* * * * * *

The President and Directors renew their acknowledgment of the loyal and efficient services of the officers and employes during the past year.

By order of the Board,

DANIEL WILLARD,
President.

CONDENSED INCOME ACCOUNT FOR YEAR.

	1916.	INCREASE OR DECREASE.
TOTAL RAILWAY OPERATING REVENUES, RAIL LINES	$111,668,680.34	$19,852,883.00 Inc.
TOTAL RAILWAY OPERATING EXPENSES, RAIL LINES	79,319,804.16	15,394,296.42 Inc.
Net Revenue from Railway Operations	$32,348,876.18	$ 4,458,586.58 Inc.
Percentage of Expenses to Earnings	71.03%	1.41% Inc.
Railway Tax Accruals	$3,674,248.02	$384,636.98 Inc.
Uncollectible Railway Revenues	35,564.23	16,582.85 Inc.
	$3,709,812.25	$401,219.83 Inc.
Railway Operating Income	$28,639,063.93	$ 4,057,366.75 Inc.
Total Non-operating Income	5,844,375.29	583,527.52 Inc.
Gross Income	$34,483,439.22	$ 4,640,894.27 Inc.
Deductions from Gross Income	20,867,223.12	1,747,926.52 Inc.
Net Income	$13,616,216.10	$ 2,892,967.75 Inc.
Net Corporate Income		$13,616,216.10
Dividend payments on Preferred Stock, 4%		2,354,527.28
Income Balance Transferred to Profit and Loss		$11,261,688.82
Amount to Credit of Profit and Loss, June 30, 1915	$32,575,513.91	
Less Sundry Adjustment—Net Debit Balance.	15,633,391.33	16,942,122.58
		$28,203,811.40
Dividends on Common Stock, 5%		7,597,225.47
Amount to Credit of Profit and Loss, June 30, 1916		$20,606,585.93

CONDENSED GENERAL BALANCE SHEET FOR YEAR.

ASSETS:	1916.	INCREASE OR DECREASE.
Investments in Road and Equipment.	$343,428,258.41	
Investments in Constituent and Affiliated Companies	285,118,869.20	
Other Investments	30,841,060.20	
Total Investments	$659,388,187.81	$10,351,887.43 Inc.
Current Assets—Cash, Materials and Supplies, etc	42,780,229.58	7,433,144.43 Inc.
Other Assets—Insurance Fund, Securities of own issue, etc.	5,345,189.03	3,916,594.96 Dec.
Separate Stock—Washington Br. (in Treasury) (*per contra*)	1,650,000.00	1,650,000.00 Inc.
Unadjusted Debits	1,079,913.96	423,039.07 Dec.
	$710,243,520.38	$15,095,397.83 Inc.
LIABILITIES:		
Common Stock	$152,317,468.00	
Preferred Stock	60,000,000.00	
Separate Stock—Washington Br. (in Treasury) (*per contra*)	1,650,000.00	$ 1,650,000.00 Inc.
Total Stock Issues	$213,967,468.00	$ 1,650,000.00 Inc.
Funded Debt	420,961,239.81	14,635,630.00 Inc.
Total Capital Obligations	$634,928,707.81	$16,285,630.00 Inc.
Current Liabilities	24,601,336.94	6,791,479.55 Inc.
Deferred Liabilities	3,102,721.29	290,938.12 Inc.
Unadjusted Credits—Accrued Depreciation, etc.	19,969,334.26	682,400.95 Inc.
CORPORATE SURPLUS:		
Additions to Property through Surplus	7,034,834.15	3,013,877.19 Inc.
Profit and Loss—Balance	20,606,585.93	11,968,927.98 Dec.
	$710,243,520.38	$15,095,397.83 Inc.

Railway Age Gazette

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Safety First in the Despatcher's Office

Safety first committees have never discussed—or at least have never published—much about the work of the train despatcher. In an article in another column a western despatcher, J. L. Coss, inquires about this, and mentions a number of items in which the safety of the conditions of work in the despatcher's office could be improved. The reason why committees have not entered this field is, no doubt, very simple; the despatcher's office is the one place where, it seems reasonable to assume, safety has *always* been placed first. It is here that the smallest error produces the worst results. The promotion of safety—the elimination of chances of error—was the subject of thorough and careful study at least thirty years ago, as will be recalled by everybody who has read J. A. Anderson's book, "The Train Wire." But ideals are sometimes neglected, here as in other fields, and there is ample need today for Mr. Coss' warning. We heard recently of a safety first committee, on which there was a train despatcher, but which always met without him!

Improvements in Switching Engines

Of the many mechanical devices for improving the efficiency of locomotives, the superheater and power reverse gear are responsible for a large increase in the work performed by switch engines. The power reverse gear enables the engineer to reverse the engine in a much shorter time, and with less effort than with the ordinary hand-operated reverse gear. In the article describing the new switching engines for the Louisville & Nashville, published elsewhere in this issue, it is stated that the engineers operating engines so equipped find they can handle 10 to 15 per cent more cars. This has been found to be true on other roads. On one road the increase in work was so great that many times the switching screws that worked with the engines so equipped would become tired out before the end of their working period, and would be allowed to quit early, the number of cars handled by them being so much greater than that handled by the crews working with the ordinary switch engines. The superheater, and to this should be added the brick arch, increases the boiler capacity to such an extent that greater tonnage can be handled at greater speeds than with switch engines not so equipped. This is particularly true where the switch engines are required to make long hauls, such as in transfer service. The engines are smarter, and will pick up and get away with a string of cars more quickly than the saturated steam engines. In addition to this, the saving in fuel for which both the superheater and the brick arch are responsible is no small item. In several instances these savings have been found to be greater than those made with the same devices in road engine service. The saving in fuel and water shown in the article referred to above is exceptional, and is undoubtedly due to the fact that the saturated steam switch engines were much too small for the work they were called upon to perform.

New Demurrage Rates Suspended

One of the most weighty bits of news printed in the *Railway Age Gazette* last week filled only three lines—the statement on page 960, that the proposed higher demurrage rates for freight cars had been suspended by the Interstate Commerce Commission, until March 31, 1917; or until, quite possibly, no increase will be needed or justified. As the commissioners are doing their best to get at the facts of the car shortage, they cannot be said to be ignorant of the gravity of the situation; and probably the great pressure of prior questions on their time may be the main reason for imposing such a long delay; but the situation is deplorable, nevertheless. In the railroads' latest plea for a revision of the federal regulatory laws, the need of shortening the time to be allowed the commission in which to approve or disapprove rates is placed sixth, and nearly the last in the list; but the present crisis shows that it is by no means last in importance. In scores of the large freight stations of the country it is of the first importance, at this time to impose, in the interest of all concerned, shippers, consignees and carriers, a stiff charge *for the use of the ground* occupied by each car, let alone the value of the car itself. To forbid the increases in these charges until they will be too late to benefit anybody, is the acme of back handed economy. It may be true that

an increased demurrage charge will work some injustice; so do many decisions of the courts. Freight car service is full of small injustices; it is inevitable. A considerable degree of uniformity in practice is essential, and no one has discovered how to secure this uniformity except by the use of rough averages. Is the Interstate Commerce Commission's quest of exact justice to be kept up until the national transportation machine comes to a dead stop from internal friction?

THE CASE FOR BETTER RAILROAD REGULATION

A REMARKABLY broad and sound foundation for the case which the railroads are to present before the Newlands Joint Committee on Interstate Commerce in favor of a radical change in our system of railroad regulation has been laid by Alfred P. Thom, counsel for the Railway Executives' Advisory Committee, in his opening statement before the Newlands committee which is reported elsewhere in this issue.

As an argument Mr. Thom's statement was an example of logical thinking seldom surpassed and the entire subject was presented from the broadest and sincerest standpoint of real statesmanship, fairly and with just regard for the viewpoint of those whose position he was opposing. Mr. Thom did not criticise or impugn the motives of those who were responsible for the system of regulation the defects in which he was calling attention to, nor of the state authorities whose differing views have resulted in the inconsistencies of the present system. He asked nothing for the railways from the standpoint of private interests. He approached the subject entirely from the position of the public, asking that the government direct its powers for the purpose of assisting in obtaining better transportation service for the public.

He accepted regulation as a necessary exercise of government authority, frankly recognizing the occasion for the calling into existence of the present machinery of regulation, but insisted that its present character is due to the fact that it was based on the principles of correction and repression, which while justified by the conditions which were responsible for it do not meet the requirements of the conditions of the present nor of the future. He argued that it is time to follow President Wilson's suggestion for a "fresh assessment of circumstances" with a view to accomplishing a result to which the assistance of the government did not seem necessary when the present policies of regulation had their inception.

Instead of criticising those who are responsible for the conflicting and discriminatory action of the state authorities that is interfering with the possibility of a uniform and consistent governmental policy toward transportation, Mr. Thom showed that such inconsistency is a necessary result of allowing the regulatory authority of the public over transportation instrumentalities to be exercised by so many different bodies and asked that such a vital element of national life be placed under the complete authority of the only body that represents the nation as a whole.

Mr. Thom did not even oppose the doctrine of "states' rights." It is true that the carrying out of the plans he advocated would restrict to some extent what some of those whose horizon is bounded by state lines call the right to regulate their own local affairs, but he showed that most of these affairs are no longer local but part of a national system of commerce, and that by too great insistence on the local rights which the states reserved when they became a part of the federal union they have allowed to become obscured some of the even more important rights which they acquired by entering the union. In fact he used the same arguments which led the states to enter the union and which led them to delegate to the federal government jurisdiction over the navigable waterways of the country, the principal means of transportation known at that time, to show that the states collectively can obtain better results from their efforts to regulate the nation's commerce today than they can by acting separately.

In brief Mr. Thom showed that the present policy of government toward transportation had its genesis in the abuses of the past and was therefore punitive rather than constructive in character; that it has practically accomplished the direct results which it was intended to accomplish by preventing abuses and protecting against exorbitant rates, but that it has failed to insure to the public adequate transportation facilities because it was not designed for that purpose. He showed that recent events, such as the present car shortage, the recent congestion of traffic and the practical cessation of railway construction, have demonstrated that it is time to instil into the system of railroad regulation the element of helpfulness and encouragement and to place upon those who are opposing any change the burden of proving that the present system is adequate. He has therefore undermined in advance the arguments of those who may be expected to tell the committee that the present method of regulation only needs to be supplemented by the passage of additional laws, of the same character as those that make up the patchwork of which our present system consists, giving various commissions power to take over still more of the functions of management but without imposing upon them any of the responsibility that should be inseparable from authority.

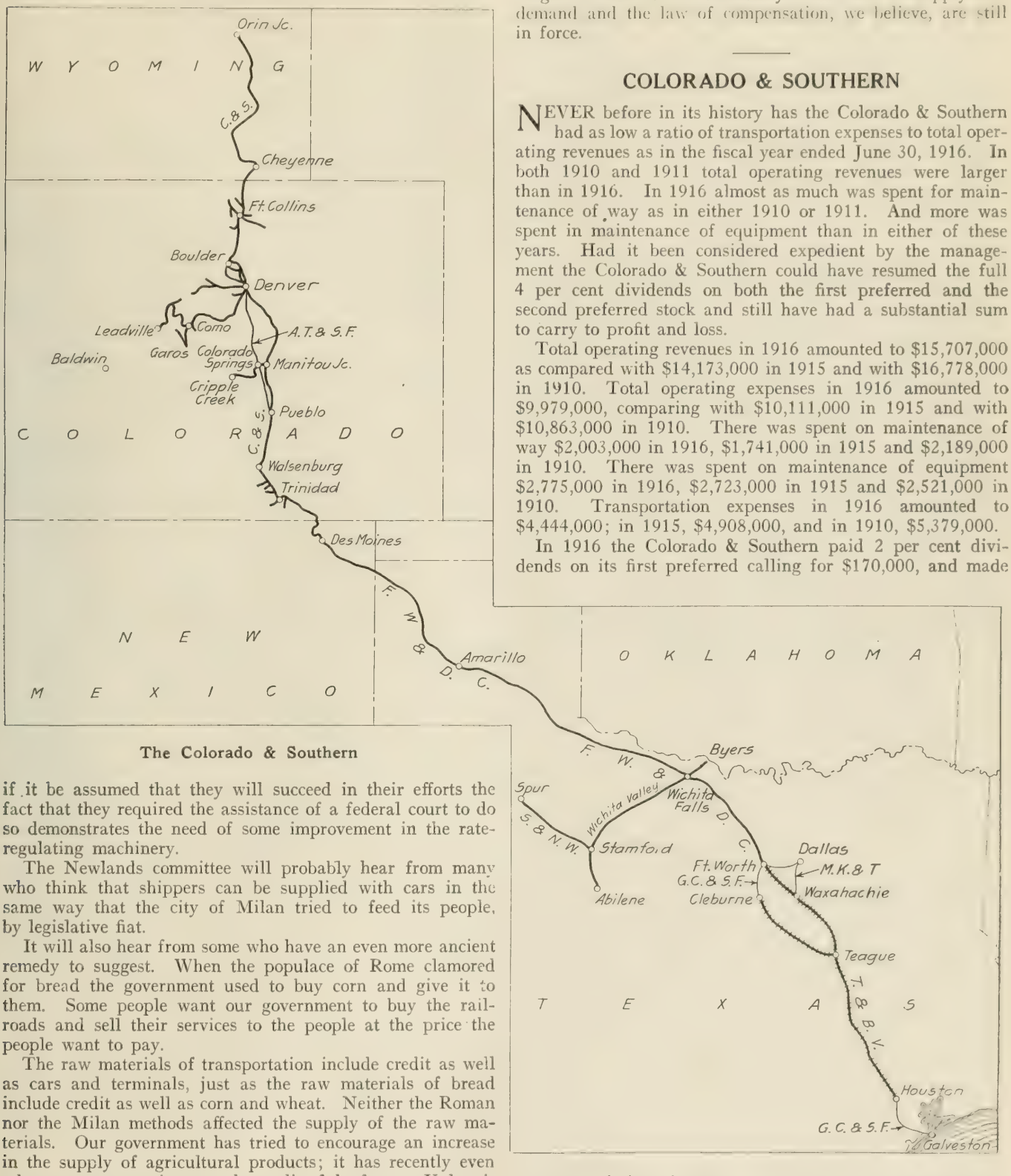
A pertinent example of this kind of argument is afforded by the action of the National Association of Railway Commissioners in appointing a committee to urge an amendment to the commerce law giving the Interstate Commerce Commission jurisdiction over car distribution. It has been announced that this committee desired to appear before the Newlands committee. It will doubtless have a great deal to say about the evils of a car shortage and will propose to remedy the condition by the passage of another law. The railroads have not made such a conspicuous success of their own efforts to make an inadequate supply of facilities meet an abnormal demand for them to be able to present a very effective argument against a claim that the commission could make a better job of it, but we venture to predict that the next time we have a car shortage it would be found that the proposed law had not created any new cars, had not moved the cars any faster and had not increased the amiability of the shipper who cannot get a car when he wants one. Then perhaps the next crop of state commissioners will ask Congress to enact a law requiring the railroads to buy cars.

The whole proceeding reminds us of the efforts of the city of Milan, Italy, in the seventeenth century, to regulate the price of bread by law at a time of famine by forcing the bakers to sell at the legal price. As long as the immediate supply lasted the law was exceedingly popular but it soon became necessary to enact another law limiting the quantity which any one might buy. The next step was to pass a law fixing the price at which the raw materials should be sold to the bakers. People from the neighboring territory flocked to Milan to enjoy the low prices but the scheme appears to have fallen down at the point where the crops were exhausted, because nature was not subject to the laws of Milan.

What the railroads ask is that since the government has elected to fix the price at which transportation shall be sold it shall give some one body the authority to fix a price high enough to cover the cost, which includes the cost of the capital required to buy enough cars and enough terminal facilities to furnish the transportation demanded. If the price should ever be found to be too high the government's representative already has the power to reduce it.

At the present time the representative of the national government, the Interstate Commerce Commission, has fixed certain prices for transportation which some of the states have chosen to nullify to the best of their ability. On the very

day that the Newlands committee began its hearings the railroads of Illinois asked the United States district court at Chicago to restrain the state of Illinois from interfering with their efforts to obey an order of the Interstate Commerce Commission fixing a rate for passenger transportation. Even



The Colorado & Southern

if it be assumed that they will succeed in their efforts the fact that they required the assistance of a federal court to do so demonstrates the need of some improvement in the rate-regulating machinery.

The Newlands committee will probably hear from many who think that shippers can be supplied with cars in the same way that the city of Milan tried to feed its people, by legislative fiat.

It will also hear from some who have an even more ancient remedy to suggest. When the populace of Rome clamored for bread the government used to buy corn and give it to them. Some people want our government to buy the railroads and sell their services to the people at the price the people want to pay.

The raw materials of transportation include credit as well as cars and terminals, just as the raw materials of bread include credit as well as corn and wheat. Neither the Roman nor the Milan methods affected the supply of the raw materials. Our government has tried to encourage an increase in the supply of agricultural products; it has recently even taken some steps to improve the credit of the farmer. Unless it approaches the subject of railroad credit in a similar spirit it will have to adopt the Roman method and furnish the railroad credit itself.

In any event the fact should be borne in mind that somebody paid for the corn that was given to the people of Rome, and that transportation must also be paid for. If it is not paid for directly by those who use it, it will be paid for by taxation. The Milan method did not last from one harvest to another. The American system of railroad regulation has endured somewhat longer. The Roman empire had a still longer life but it fell eventually. The law of supply and demand and the law of compensation, we believe, are still in force.

COLORADO & SOUTHERN

NEVER before in its history has the Colorado & Southern had as low a ratio of transportation expenses to total operating revenues as in the fiscal year ended June 30, 1916. In both 1910 and 1911 total operating revenues were larger than in 1916. In 1916 almost as much was spent for maintenance of way as in either 1910 or 1911. And more was spent in maintenance of equipment than in either of these years. Had it been considered expedient by the management the Colorado & Southern could have resumed the full 4 per cent dividends on both the first preferred and the second preferred stock and still have had a substantial sum to carry to profit and loss.

Total operating revenues in 1916 amounted to $15,707,000 as compared with $14,173,000 in 1915 and with $16,778,000 in 1910. Total operating expenses in 1916 amounted to $9,979,000, comparing with $10,111,000 in 1915 and with $10,863,000 in 1910. There was spent on maintenance of way $2,003,000 in 1916, $1,741,000 in 1915 and $2,189,000 in 1910. There was spent on maintenance of equipment $2,775,000 in 1916, $2,723,000 in 1915 and $2,521,000 in 1910. Transportation expenses in 1916 amounted to $4,444,000; in 1915, $4,908,000, and in 1910, $5,379,000.

In 1916 the Colorado & Southern paid 2 per cent dividends on its first preferred calling for $170,000, and made an appropriation of $280,000 from income for additions and betterments. There was also an appropriation for purposes not specified of $500,000 from income and the company carried $1,202,000 to profit and loss. Besides the "miscellaneous" appropriations from income of $500,000 there was an appropriation of $500,000 from profit and loss. This

makes a total at the end of 1916 of $2,000,000 carried on the balance sheet as appropriated surplus not specifically invested. Presumably this is to cover any loss which may develop in connection with the Trinity & Brazos Valley, which had previous to the Chicago, Rock Island & Pacific receivership been controlled jointly by the Colorado & Southern and the Rock Island and which is now being operated at a deficit.

The quite remarkable saving made in transportation expenses is, from the operating man's point of view, the most interesting thing in this year's report. The total ton-miles of revenue freight in 1916 amounted to 1,187,559,000, an increase of 21 per cent. The total number of passengers carried one mile amounted to 131,812,000 in 1916, an increase of 5 per cent. Freight train miles totaled 2,854,000 in 1916, a decrease of 163,000 as compared with 1915, and passenger train miles totaled 2,403,000, a decrease of 148,000. The revenue trainload in 1916 was 389 tons, an increase over the previous year of 81 tons; this is an increase of over 26 per cent. Loaded car miles totaled 55,944,000 in 1916, an increase of 6,004,000 over 1915, while empty car miles totaled 23,399,000 in 1916, a decrease of 1,734,000. This much smaller percentage of empty car mileage obviously helped to bring up the average trainload. Before, however, seeking an explanation of the smaller empty car mileage it is interesting to compare mileage and transportation cost figures in 1916 and 1910. The mileage of road operated in 1916 was 1,836, and in 1910 2,042. The revenue ton mileage in 1910 was 1,249,390,000, or slightly greater than in 1916. The revenue passenger mileage was 159,880,000 in 1910, or considerably more than the passenger mileage in 1916. Freight train mileage in 1910 totaled 4,079,000, comparing with 2,805,000 in 1916. The revenue trainload in 1910 was 306 tons, comparing with 389 tons in 1916. The number of passengers carried one mile in 1916 was 159,880,000; in 1916, 131,812,000. Passenger train mileage in 1910 was 3,387,000, and in 1916 2,402,000. Here is indicated the great saving which has been made to offset increased wage scales and material costs—a reduction of train mileage per unit of business done.

In 1916 the total tonnage of all freight carried by the Colorado & Southern was 7,409,000; in 1915, 6,450,000, and in 1910, 8,357,000. The average ton-mile rate in 1916 was 9.58 mills; in 1915, 10.13 mills, and in 1910, 9.64 mills. Of the total tonnage carried in 1916 62.66 per cent originated on the Colorado & Southern lines; in 1915, 65.11 per cent, and in 1910, 66.74 per cent. Of the total tonnage carried in 1916 22.35 per cent was bituminous coal, 8.78 liknite and 7.14 coke, with 3.01 per cent furnished by precious ores and 8.30 per cent. by iron ores. Products of agriculture furnished 20.59 per cent. of the total tonnage. In 1915 bituminous coal furnished 23.17, and in 1910 29.67; lignite, 9.72 in 1915 and 9.23 in 1910; coke, 5.74 in 1915 and 7.98 in 1910; precious ore, 3.26 in 1915 and 6.10 in 1910, and iron ore, 5.94 in 1915 and 7.71 in 1910. Products of agriculture furnished 24.84 per cent of the total in 1915 and only 11.91 per cent in 1910. The total tonnage of products of agriculture in 1916 amounted to 1,526,000; in 1915 to 1,602,000, and in 1910 to 995,000.

At the end of 1916 the Colorado & Southern had $3,642,000 cash on hand, no loans and bills payable, and during the year had spent $318,000 for additions and betterments and paid off $320,000 of indebtedness. No new securities were issued during the year.

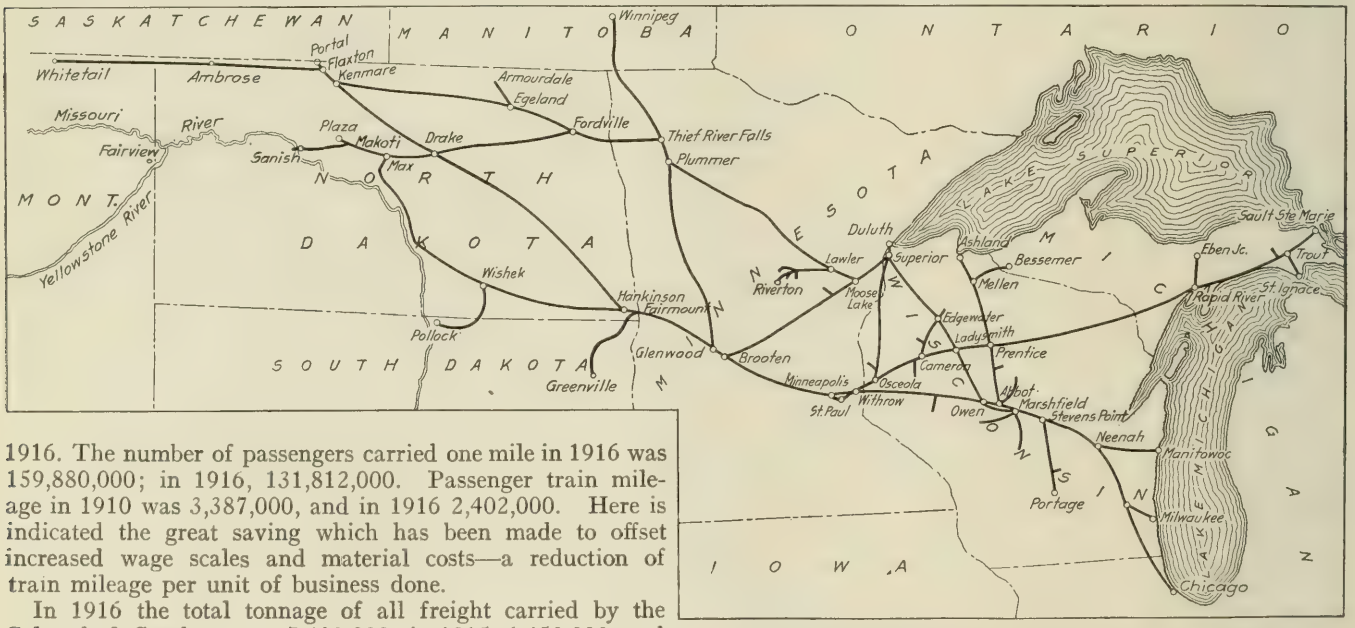
The table below shows principal figures for 1916 and 1915:

	1916	1915
Average mileage operated	1,836	1,840
Freight revenue	$11,371,287	$9,960,044
Passenger revenue	3,378,626	3,294,688
Total operating revenue	15,707,311	14,172,978
Maintenance of way and structures	2,002,136	1,741,313
Maintenance of equipment	2,775,183	2,723,292
Traffic expenses	204,168	215,497
Transportation expenses	4,443,906	4,908,458
General expenses	474,026	441,091
Total operating expenses	9,978,609	10,110,875
Taxes	735,781	616,053
Operating income	492,565	3,445,566
Gross income	5,589,594	4,100,438
Net income	2,222,994	615,149
Sinking funds	70,298	61,383
Dividends	170,000	.....
Additions and betterments	280,220	.....
Miscellaneous appropriations	500,000	.....
Surplus	1,202,475	553,767

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE

A BIG wheat crop means pretty surely large gross earnings for the Minneapolis, St. Paul & Sault Ste. Marie, and the wheat crop that was moved in the fiscal year ended June 30, 1916, in the territory served by the Soo was the greatest in the history of the country. Total operating revenues of the Soo amounted to $22,805,000, comparing with $17,818,000 in the previous year. The greater part of this large increase in gross earnings was saved for net. Operating expenses amounted to $12,160,000 in 1916, comparing with $11,060,000 in 1915. Net income available for dividends amounted to $6,170,000 in 1916 as against $2,974,000 in 1915.

The Minneapolis, St. Paul & Sault Ste. Marie operates 3,148 miles of road. It controls the Wisconsin Central, operated as the Chicago division of the Soo but with accounts kept separately. The mileage of the Wisconsin Central is 1,120. In 1916 total operating revenues of this



The Minneapolis, St. Paul & Sault Ste. Marie

company amounted to $12,205,000, comparing with $9,945,000 for 1915. Operating expenses amounted to $6,921,000, comparing with $6,752,000. There was available for dividends in 1916 $2,057,000, and in 1915 $137,000. The Soo itself paid 7 per cent on both its preferred and common stock in both 1915 and 1916. The Wisconsin Central paid 4 per cent on its preferred stock in both 1916 and 1915.

There is a striking difference in the character of the traffic on the Soo itself and its Chicago division. The total tonnage carried on the Soo was 9,323,000; on the Chicago division the tonnage amounted to 7,536,000. Of the total tonnage of the Soo 25.40 per cent was grain, while of the total tonnage of the Chicago division only 5.67 per cent was grain in 1916. Bituminous coal furnished only 4.83 per cent of the total tonnage of the Soo and 8.41 per cent of the total tonnage of the Chicago division. Ores furnished 14.28 per cent of the Soo's tonnage and 19.72 per cent of the Chicago division's tonnage. The effect of the bumper wheat crop in the fall of 1915 is reflected in a total tonnage of grain carried by the Soo of 2,368,000 tons, comparing with 1,386,000 tons carried in the year ended June 30, 1915. The tonnage of grain carried by the Chicago division was 427,000 in 1916, comparing with 249,000 in 1915.

The Soo got no better balanced traffic in 1916 than in 1915, the average number of empty cars per train being 7.93 in 1916 and 7.83 in 1915. No new road engines were received during the year or in the previous year. Nevertheless, trainloading in 1916 showed a big gain over 1915. The average number of tons per train was 463 last year as against 396 in the previous year. The gain in trainloading is in large measure the reason why the management was able to hold down transportation expenses so well. These expenses amounted to $6,263,000 in 1916 as compared with $5,496,000 in 1915. Besides the saving attributable to heavier trainloading there was a substantial saving made in loss and damage to freight. The payments on this account in 1916 amounted to $136,000 and in 1915 to $195,000.

Neither the Soo nor the Wisconsin Central sold any new securities during the year and the Soo reduced its outstanding indebtedness by the retirement at maturity of $982,000 equipment trust bonds. The Wisconsin Central reduced its outstanding funded debt by the retirement of $368,000 equipment trust certificates and $776,000 Chicago, Wisconsin & Minnesota first mortgage bonds. The net expenditure for the two companies for additions and betterments amounted to $465,000. At the end of the year the Soo had $6,735,000 cash, with $1,463,000 matured interest and dividends unpaid and the Wisconsin Central had $1,555,000 cash, with $546,000 matured interest dividends and funded debt unpaid.

The following table shows the principal figures for operation in 1916 as compared with 1915:

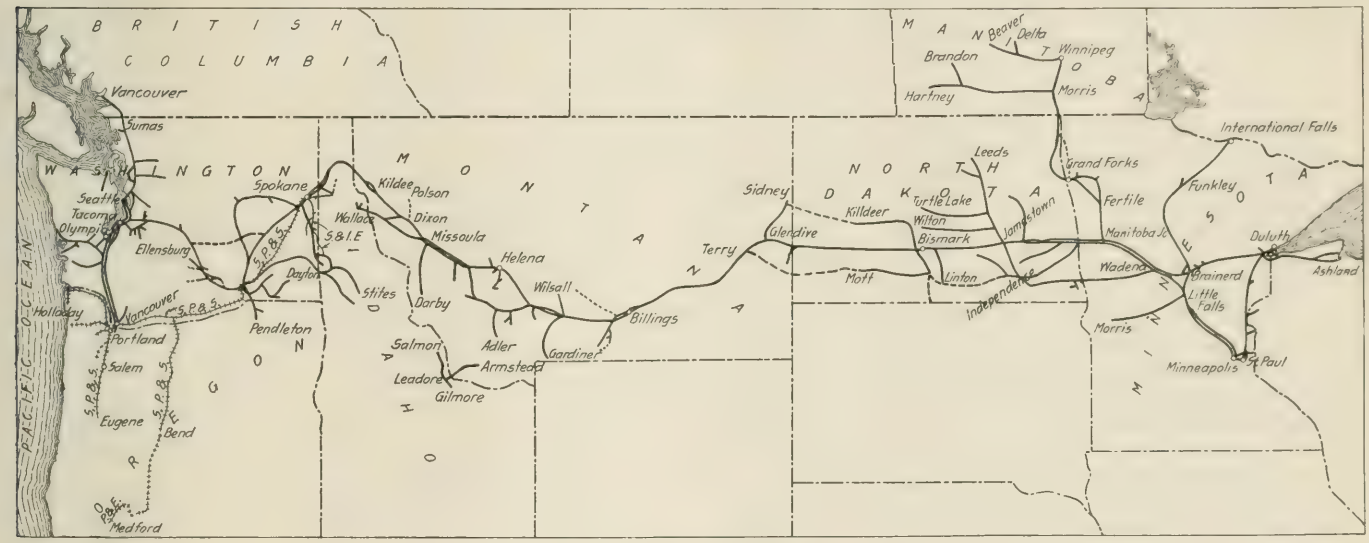
	Soo		Wisconsin Central	
	1916	1915	1916	1915
Average mileage operated..	3,148	3,044	1,124	1,120
Freight revenue	$16,873,152	$12,576,374	$9,308,075	$7,237,916
Passenger revenue	4,259,209	3,810,891	2,098,364	1,994,824
Total operating revenue...	22,804,829	17,817,855	12,205,239	9,945,370
Maintenance of way and structures	2,117,844	2,096,307	1,113,103	1,211,190
Maintenance of equipment	2,867,740	2,724,036	1,325,935	1,252,718
Traffic expenses	370,749	337,332	262,078	260,189
Transportation expenses..	6,263,033	5,495,980	3,905,342	3,734,415
General expenses	462,723	384,840	242,077	225,586
Total operating expenses...	12,160,318	11,059,594	6,920,750	6,751,780
Taxes	1,537,712	1,135,439	766,464	667,614
Operating income	9,106,795	5,622,822	4,518,025	2,525,976
Gross income	10,654,211	6,666,787	4,569,871	2,587,257
Net income	6,169,576	2,974,004	2,056,858	136,732
Dividends	2,646,714	2,646,714	450,612	450,688
Surplus	3,522,862	327,290	1,606,246	*313,956

*Deficit.

NORTHERN PACIFIC

HIGH prices for grain are more likely to be reflected in an increased total operating revenue for the Northern Pacific than a large grain crop with low prices, because the general prosperity of the territory served is more important in effecting revenues than is the increase in tonnage of the single commodity grain. In 1916, however, the Northern Pacific's income was most favorably affected not only by the general prosperity of the territory served, due to very high prices for grain, but also by an extraordinarily large crop, and furthermore by an extraordinarily heavy movement of ores and consequent prosperity in the mining regions in Montana. The heavy increase in traffic was handled with no additions to freight locomotives, with a much larger increase in proportion of empty freight car mileage, and yet with an average trainload of 717 tons, or 7.27 per cent greater than in 1915. The operating ratio of the Northern Pacific in the fiscal year ended June 30, 1916, was 53.16, comparing with 58.74 in 1915. This is one of the lowest operating ratios of any large railroad in the country. After paying 7 per cent on its stock, calling for $17,360,000, there was a surplus in 1916 of $8,370,000, notwithstanding a decrease of $1,855,000 in income from securities owned, due to the fact that no dividends were paid by the Northwestern Improvement Company or the Northern Express Company in 1916, whereas the Improvement Company dividends in 1915 amounted to $1,355,000 and the express company dividends to $500,000.

The Northern Pacific operated 6,461 miles of road June



The Northern Pacific

30, 1915. There was a slight increase only in mileage during the year—40 miles, due to two short branches being added to the mileage operated, one in Montana and one in Washington. The company is about to begin construction of a line from Dixon, Mont., to Polson, through what is known as the Flathead country to the south shore of Flathead lake, and another line from Billings, Mont., north and west into the Lake Basin country. This line will serve a very rich agricultural country.

Of the total Northern Pacific mileage 2,882 miles is main line and 3,622 branch lines. The total revenue per mile of road in 1916 was $11,373. This was an increase of 19 per cent over the previous year and was divided $8,727 from freight and $2,646 from passenger-train service. The increase in revenues was almost entirely from freight, there being an increase of less than 2 per cent in the revenues from passengers per mile of road. The passenger business increased a little more than this would indicate, the number of passengers carried one mile being 616,681,000, an increase of 2.73 per cent; but the average rate per passenger per mile was 2.246 cents, a decrease of slightly over one per cent. The total tonnage of freight carried amounted to 20,996,000, an increase of 19.12 per cent, and the average haul was 334 miles, an increase of 41 miles, or a little over 14 per cent, making the increase in ton mileage 35.88 per cent. The average receipts per ton per mile were 7.93 mills, a decrease of 6.60 per cent.

The table below shows the tonnage of each of the general classes of commodities in 1916 and 1915, and the percentage of the tonnage of each class to the total for the year:

	1916		1915	
	Tonnage	Per cent	Tonnage	Per cent
Products of agriculture	5,204,752	24.79	4,283,812	24.31
Products of animals	448,460	2.13	351,344	1.99
Products of mines	6,305,738	30.03	5,075,091	28.79
Products of forests	6,013,969	28.64	5,176,410	29.37
Products of manufactures	1,746,555	8.33	1,461,894	8.30
Miscellaneous	379,843	1.81	377,217	2.14
L. C. L.	896,376	4.27	899,457	5.10
Total	20,995,693	100.00	17,625,225	100.00

Total operating expenses amounted to $40,366,000, an increase of only $3,258,000. Of this increase $529,000 was in maintenance of equipment and $310,000 in maintenance of way, leaving an increase in transportation expenses of $1,913,000, the total for transportation in 1916 being $20,900,000. This is an increase of only 10.08 per cent in the out-of-pocket cost of doing the business, with an increase of 35.88 per cent in the tons of revenue freight carried one mile, and of 2.73 per cent in the passenger mileage.

There was a substantial saving made in payments for damage to property, the total on this account being $102,000 in 1916, or $35,000 less than in the previous year. On the other hand, the payments for injuries to persons were greater by $101,000, the total in 1916 being $520,000. The increase in cost of fuel was a little more proportionately than the total increase in transportation expenses. Fuel for train locomotives in 1916 cost $4,817,000, an increase of 12.7 per cent. Presumably the Northern Pacific was affected by the higher prices for fuel coal, which were general in the West.

During the year a total of $4,182,000 was spent for extensions and additions and betterments, exclusive of equipment. This included $781,000 for real estate in Superior, Wis., $994,000 for grade separation work in Spokane, Wash., and $723,000 for station buildings and fixtures. No bonds were issued during the year and $557,000 bonds were purchased and cancelled under sinking fund provisions. At the end of the year the company had $18,305,000 cash on hand, and no loans and bills payable.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	6,501	6,461
Freight revenue	$55,656,395	$43,833,637
Passenger revenue	13,852,254	13,619,114
Total operating revenues	75,939,231	63,171,653
Maintenance of way and structures	8,833,210	8,523,657
Maintenance of equipment	7,846,259	7,317,074
Traffic expenses	1,177,971	1,191,567
Transportation expenses	20,900,055	18,987,056
General expenses	1,134,020	1,104,712
Total operating expenses	40,366,412	37,108,049
Taxes	5,073,415	4,470,959
Operating income	30,493,190	21,588,494
Gross income	38,972,448	32,031,453
Net income	25,729,874	18,822,820
Dividends	17,360,000	17,360,000
Surplus	8,369,874	1,462,820

NEW BOOKS

Standards of the American Society for Testing Materials. Edited by Edgar Marburg, secretary-treasurer. 737 pages, illustrated, 6 in. by 9 in. Bound in cloth. Published by the American Society for Testing Materials, Philadelphia, Pa. Price $7.50.

Beginning with 1910 the standards adopted by this society have been published annually in a year book which also contained the proposed tentative standards which had not yet been accepted by the association. Beginning with the present volume the standards will be published bi-annually and will include only those which have been formally adopted by the society, excluding those which are only tentative.

Among the specifications of most interest to railway men are those for rails, splice bars, track bolts, bride steel, axles, forgings for locomotives and car wheels, tires, boiler and firebox steel, staybolt iron, copper wire and Portland and natural cement. As this society is composed of representatives of the manufacturers and the users of these materials, the specifications which have been adopted from time to time may be considered to represent the best practices from their combined view points.

The Railway Library and Statistics for 1915. Compiled and published by Slason Thompson, director Bureau of Railway News and Statistics. 460 pages, 8¼ in. by 5½ in. Bound in cloth. Price $1.

This is the seventh edition of Mr. Thompson's valuable annual collection of addresses and papers on railway subjects compiled for the purpose of bringing together in one volume some of the more noteworthy publications bearing on important phases of the railway problem which have appeared during the year. Following the practice of preceding issues, the volume for 1915 begins with several articles descriptive of early railroading in the United States, including the story of how 186 separate organized companies have been consolidated into the New York Central and a brief skeetch of the life of the late James J. Hill, which naturally brings in much interesting history of early railway extension into the far west. Then follow brief discussions of the railway situation in some of the principal countries of Europe as affected by the war, and a discussion of the relation of American railways to preparedness. The various questions relating to government regulation of the railways, which are especially prominent just now because they are to be made the subject of investigation by the joint congressional committee on interstate commerce, are discussed in Otto H. Kahn's paper on "The Government and the Railroads," Senator O. W. Underwood's address on "Government Regulation and Our Transportation System," a paper by Walker D. Hines on "The Conflict Between State and Federal Regulation," and an article on "Government Ownership in Canada" by Frank Trumbull.

The volume also includes timely articles on traffic matters, federal valuation, railway mail pay, the waterways movement and the railway wage question. Some interesting comparisons between American and German railways are presented in two translations, one of which includes statistical comparisons, and another a comparison of sleeping car travel in America and Germany. As in former issues, the concluding chapter consists of the annual statistical report of the bureau.

Letters to the Editor

WHY MAINTAIN CROSSING BELLS?

New Rochelle, N. Y.

To the Editor of the Railway Age Gazette:

I have read with interest your editorial of November 24, suggesting that highway crossing signals should be visual rather than audible. You have opened up a large question. If you once start it where are you going to stop?

I think that in these days the money spent in installation and maintenance of a crossing alarm bell is money wasted, for to the automobile driver, our greatest "risk," it gives no protection whatever. He comes on at such a furious pace that no warning is of any value to him unless he apprehends it some distance before he reaches the crossing. He needs a distant signal just as much as does the Twentieth Century Limited. There are, of course, a few cautious and careful motorists; but it is the highflyers that we have to deal with.

Again, when you consider the cost of the bell-ringing apparatus, bear in mind that any device dependent upon the track circuit for operation is of no value in territory where trains are frequently stopping, or where there is switching.

The question in my mind is, if we should all agree that the audible signal is of no use as a means of protection and that visual signals should be installed, why not go a step further, and do away with the automatic feature at every crossing? Simply have the standard caution approach sign, to notify the traveler on the highway that he is approaching a crossing, and then let him depend on his eyes to get over the tracks safely. I believe that the man who will not stop for the fixed sign, will pay but little attention to an automatic device, where there is real danger. Money not used in the maintenance of crossing alarm bells can be used for watchmen at crossings equipped with gates.

However, the end to work for is to make the motorists and other travelers do their part. Until that can be done the "accidents" will go on, in spite of all the protection that can be devised.

G. M.

FURTHER CRITICISMS

New York.

To the Editor of the Railway Age Gazette:

Your editorial suggesting that highway crossing signals ought to be visual rather than audible is a reminder that we are today asking a good many things of the automatic apparatus. We shall be obliged before long to modify our position. These signals sometimes fail; and there is trouble, instead of peace, if a signal cries wolf when there is no wolf. Exasperated citizens, annoyed by a poorly-cared-for bell will hold a grudge against the railroad for years. I think the general idea is well worth attention, as regards places where an automatic warning is appropriate. A competent signal department can keep automatic block signal failures down to 1 in 20,000 and false-clear failures down to 1 in a million; and why cannot an equally good record be made with crossing warnings?

But why all this expense, anyway? The traffic on many highways is now so dense and the chances that a careless driver will get no benefit from any warning (howsoever good it may be) seem to be increasing so rapidly, that we may well consider whether a gate, and a strong one, is not the only suitable protection. If motorists and other drivers would do their part, no moving or changing signal would be necessary. A sign, sufficient to show the exact location of the crossing is all that is needed. At a railroad crossing—crossing of one track with another—no one would think of going to the expense of putting up and maintaining signals, *where all movements on one of the roads are made with speed under control,* unless in case of dense traffic. And for dense traffic at highway crossings there is no problem; gates are provided already.

You have printed, recently, a proposed law requiring automobiles to stop before crossing a track. This is only a reasonable proposition. I say this deliberately, though I know that every speed fiend, and many respectable people also, will laugh at me. It should apply as well to people driving horses. Surely the stop rule is reasonable, at least to the extent that in every case of a person crossing a track the whole responsibility for safety rests on him, not on the railroad company. To any one who controverts this view—who thinks that it is too liberal toward the railroad—I say, Would you like to have all railroad trains reduce speed at every crossing to six miles an hour? That is the only logical process, if you are going to throw the responsibility on the railroad; and, of course, every person who rides in a passenger train knows that he would not consent to such a return to slow-coach days.

Did you ever stop to think that these hundreds of electric crossing bells, all over the country, have been installed for just this one reason; that people approaching crossings may indulge themselves in the lazy and shortsighted practice of *not* using their eyes and ears!

C. N. B.

THE COST OF WATER

Tamaqua, Pa.

To the Editor of the Railway Age Gazette:

P. M. LaBach, in the issue of Sept. 1, page 368, demonstrates that it is impracticable to arrive at any true comparison of the efficiency of the water service department on the various railroads. Conceding this and recognizing the wide range of conditions it is difficult to see what benefit can be secured by attempting to establish unit costs for water service. Improved practices and proper supervision may be conducive to efficiency, but the present tendency is towards greater expenditures for water in order to supply a better quality of boiler water, to ensure an ample supply for all requirements and to deliver the water at such locations as will contribute to efficiency of operation as a whole. Any attempt to make a feature of the unit cost of such relatively insignificant items as water and oil may draw attention from such larger items as fuel, train crews, engine repairs, etc.

The writer recalls a recent instance where a desire to reduce the cost of water led to the abandonment of water treatment where the scale-forming material was close to the low limits recommended for treatment. A few months' trial showed a material increase in scale and a test of fuel conducted by the officer recommending the abandonment, showed such results as to bring urgent action for a return to treatment.

It may also be noted that the great supply of the Pennsylvania Railroad in the Pittsburgh district was not installed to reduce the unit cost of water, but to facilitate the handling of freight, and there is no question that the benefits secured by this supply so greatly improved operating conditions along the old line that little has since been heard of the development of a new freight line north of Pittsburgh. An ample supply of water for railroads and manufacturers at Syracuse and Rochester, N. Y., are examples of increased efficiency secured by increasing the unit cost of water.

Let us give proper consideration to the smaller items of operating cost, but not at the expense of such major items as fuel consumption, train speed, tonnage or engine maintenance.

E. T. Reisler.

Congressional Inquiry on Railroad Regulation

Opening Statement Presented by Alfred P. Thom, Counsel For Railway Executives' Advisory Committee

ALFRED P. THOM, counsel for the Railway Executives' Advisory Committee, last week presented the opening statement on behalf of the railroads at the hearing before the Newlands Joint Committee on Interstate Commerce at Washington. Mr. Thom occupied three days, November 23, 24 and 25, in outlining the case for the carriers as to what they regard as the defects in the present system of railway regulation and their proposed remedies for its improvement, and he was questioned by the committee on Monday and Tuesday of this week. On Saturday he outlined the suggestions of the railroads as to the principles which they believe should be incorporated in any system of regulation, as follows:

The Proposals of the Railways

"1. The entire power and duty of regulation should be in the hands of the national government, except as to matters so essentially local and incidental that they cannot be used to interfere with the efficiency of the service or the just rights of the carriers.

"2. As one of the means of accomplishing this, a system of federal incorporation should be adopted, into which should be brought all railroad corporations engaged in interstate or foreign commerce. Such a system of federal incorporation should be compulsory and not elective. It should also preserve to corporations reincorporating under it, not only all their contract rights and other assets of all sorts, but also their existing charter powers, except as to any feature contrary to an act of Congress, and should also confer upon them the general powers conferred upon all corporations by the federal act.

"3. The Interstate Commerce Commission has, under existing law, too much to do and is consequently forced to confide to subordinates important functions which the regulating body ought to be in a position to perform itself. The Interstate Commerce Commission is likewise clothed with different functions which are inconsistent and violate the principle that the legislative, executive and judicial departments should be kept separate and distinct.

"To reduce the pressure upon the Interstate Commerce Commission and to separate these inconsistent functions, there should be withdrawn from the Interstate Commerce Commission all duties except those which are judicial and constructive, such as the power over rates and routes, and powers affecting the revenues of carriers, and the remaining duties, being mainly those of supervision, detection, prosecution and correction, should be conferred upon a new commission, which may be named the Federal Railroad Commission.

"In order to co-ordinate and harmonize the system of regulation, the Interstate Commerce Commission should be made the supreme regulating body and should have a right of review of any order made by the Federal Railroad Commission.

"The salaries of the members of the Interstate Commerce Commission should be increased and their terms of office extended. The salaries of the members of the Federal Railroad Commission, who should be appointed by the President and confirmed by the Senate, should also be made adequate, and they should be given long terms.

"Regional Commissions should be established which should assist the interstate Commerce Commission in exercising its jurisdiction, and to that end should make all such investigations, and hear and determine all such complaints, and should perform such other duties, as the Interstate Commerce Commission may from time to time by general or special order direct. The members of these regional commissions should be presidential appointees, at adequate salaries and for long terms. The orders of the regional commissions should not become effective until approved by the Interstate Commerce Commission but should stand approved, as of course, unless excepted to within a time to be limited. The regions should be created with reference to lines and systems of transportation and need not be defined geographically. Each regional commission should be located in such place in its district as the Interstate Commerce Commission directs, but it should be authorized to hold its sessions and perform its duties in any other district when so directed by the Interstate Commerce Commission.

"4. The power of the Interstate Commerce Commission over rates should be extended so as to authorize it to prescribe minimum rates in addition to its present power to prescribe maximum rates; and it should also be given the express power to determine the relation of rates or differentials whenever necessary or appropriate to establish or maintain a rate structure or a relation or a differential found to be just and proper by the Interstate Commerce Commission.

"5. It should be made the duty of the Interstate Commerce Commission, in the exercise of its powers to fix reasonable rates, to so adjust these rates that they shall be just at once to the public and to the carriers. To that end, and as a means of properly safeguarding the credit of the carriers, of protecting the just rights of the owners and of providing a basis for additional facilities from time to time as the needs of commerce may require, the Interstate Commerce Commission should be required, in ascertaining and determining what is a reasonable rate for any service, to take into account and duly consider the value of the service, the rights of the passengers, shippers, and owners of the property transported; the expenses incident to the maintenance and operation of the carrier property; the rights and interests of the stockholders and creditors of the corporation; the necessity for the maintenance in the public service of efficient means of transportation and for the establishment from time to time of additional facilities and improved service; and, in addition thereto, any other consideration pertinent to be considered in arriving at a just conclusion.

"The power of the commission to suspend rates should be confined to 60 days from the date the tariff is filed. If the commission is not able within this time limit to reach a conclusion, the rate should, at the expiration of that time, be allowed to go into effect, with appropriate provision for reparation for a period not exceeding one year in case the rate should be subsequently declared to be unreasonably high.

"6. The Interstate Commerce Commission should be vested with the power, and it should be made its duty, to prescribe, upon the application of the postmaster general, or of any interested carrier, reasonable rates for all services and facilities connected with the carrying of the United States mails.

"7. There should be in the federal government the exclusive governmental power to supervise the issue of stocks and bonds by railroad carriers engaged in interstate and foreign commerce.

"8. The law should recognize the essential difference between things which restrain trade in the case of ordinary mercantile concerns and those which restrain trade in the case of common carriers.

"While the question of competition may be a fair criterion in the case of ordinary mercantile concerns, it is not a fair criterion in the case of common carriers. In the case of carriers the test should be: whether common ownership or control promotes trade and commerce by affording facilities for the interchange of traffic or by supplementing facilities for transportation, to a substantially greater extent than such common ownership or control restrains trade by suppressing competition.

"9. The law should expressly provide for the meeting and agreement of traffic or other officers of railroads in respect of rates or practices. This should, however, be safeguarded by requiring the agreements to be filed with the Interstate Commerce Commission and to be subject to be disapproved by it."

As to these suggestions, Mr. Thom said, the railways are practically in accord.

In beginning his statement Mr. Thom traced the history of railroad development and railroad regulation in the United States, outlining what the railroads regard as the defects and shortcomings in our present methods of regulation and the changes in the present policy which they believe must be adopted in order to assure to the public adequate transportation facilities.

Regulation Corrective Rather than Constructive

He pointed out that the present system of governmental regulation of common carriers had its genesis in the abuses of the past and is based on the principles of repression, correction and punishment, rather than on constructive principles. He contrasted this with the spirit which has governed the plan of bank regulation, which, he said, "was born of a spirit of helpfulness and encouragement intended to build up and make adequate for the American people its system of national banks."

He referred to the conflict between the theory that railroads were private enterprises and the theory of the public character of the instrumentalities of commerce, saying that when the victory came, on the side of the public conception, it was "a victory won in anger, and the terms which were imposed were the terms of the victor upon the vanquished."

"We are confronted today," he said, "with the question whether it is possible to have that policy of correction the permanent policy of the government and whether the time has not come to introduce principles of encouragement, helpfulness and constructiveness into the system of regulation."

First Duty to Public

The railroads accept the view that regulation is a permanent and enduring part of government in America, Mr. Thom said, and that the first duty of the carriers is to the public. That duty is to afford adequate facilities on reasonable terms and at reasonable rates and this must be done before any private interests can be considered. They ask that all their proposals be measured by the standard of public interest and appreciate that if any proposal fails to come up to this standard it must be discarded.

Mr. Thom contended that the real interest of the public is in being assured of certainty, safety and sufficiency of transportation facilities rather than in rates. The first consideration of the public is to obtain transportation facilities. What the cost is, is in reality a second consideration.

Present Facilities Inadequate

This is illustrated, he said, by the sentiment of the country last summer, when it was menaced by the prospect of an entire suspension of transportation, when business men would have been willing to pay almost anything to get their goods to market. It is illustrated again by the present car shortage when the comfort and business of the public is seriously menaced by the failure to obtain cars. The present systems of regulation are entirely adequate to protect the public against exorbitant rates but are not adequate to insure to the public sufficient facilities for its present and future requirements.

That there can be no reasonable contention that an adequate supply of transportation facilities is now assured the public, either for its present or future needs, he said, is illustrated by the embargoes placed last spring, largely due to inadequate terminals in some parts of the country, which laid their oppressive hand upon business to such an extent that Interstate Commerce Commissioner Clark put himself at the head of a committee of railroad men to try to work out the problems, and the difficulty is still unremedied because of the fundamental lack of facilities. It is also illustrated by the difficulty experienced in the handling of the large increase of business at the present time.

Mr. Thom proposed an increase of transportation facilities as a method of securing relief from the high cost of living, saying that less than 1,000 miles of new railroad has been constructed in the United States during the past year, less than any year since 1848, except the period of the Civil War, and yet the cost of living is daily advancing owing to a shortage of supplies which might be remedied by securing access to new areas of production.

As illustrating the inequality of transportation facilities at a time when new railroad building has nearly stopped, Mr. Thom showed that while New Jersey has 31 miles of railroad per 100 square miles of territory, the average for the United States is only 8.53 miles and in Idaho there are only 3.35 miles per 100 square miles. Pointing to a large map of Idaho, he showed the territory in that state containing a vast wealth of agricultural and mineral lands as yet untouched. Less than 33 per cent of the resources of the state now have railroad facilities, Mr. Thom said.

This leads us to the consideration, he said, as to whether railroad credit is as good as the public interest requires. It is impossible for railroads to earn enough to supply the necessary new facilities from current revenue. They must be provided from credit. Investors cannot be coerced but must be attracted.

Among the conditions affecting railroad credit which deter investors, he mentioned the following:

The European market for railroad securities is no longer available and after the war Europe will be a borrower rather than a lender of capital.

Railroad revenues are not controlled by investors but are fixed and limited by governmental authority, and not by one but by several governmental authorities, which do not recognize responsibility for assured results to investors and are entirely unco-ordinated.

Railroads cannot control and the government cannot and does not limit the expense account.

The present system of regulation is based on a policy of repression and correction and not on a policy of helpfulness and encouragement.

The oustanding obligations of the railroads have already exceeded the financial rule of safety and involve a disproportionate amount of obligations bearing fixed charges.

The investor must accept a sub-ordinate obligation or security with no assurance of a surplus of earnings to support it.

Other competitive lines of investment present superior attractions.

The railroad business is largely controlled by political instead of business considerations.

Those who oppose any change, he said, must make their appeal on the ground that the present system assures the public of the continued adequacy of transportation facilities. If they are not adequate, no argument based on the desirability of the present dual system of regulation will be accepted by public judgment. If the public is not assured of adequate railroad service the question of "states' right" is not involved, for such a situation would necessarily mean either larger and better

national regulation or government ownership. If the regulation of transportation facilities privately owned should fail, government ownership must follow and then all power of the states over the railroads would disappear.

Railroad credit is not alone a matter in which the owners of the railroads are interested, he said, because if the credit of the railroads breaks down or is insufficient, then the public is denied the opportunity of growth and expansion and of an avenue for the current of its commercial business. If railroad credit fails either the country will be blighted by an insufficient supply of railroad facilities or the government must take them over and supply the credit itself. If the government ever does become an operator of the railroads it will be because the public must take over the railroads in order to supply the credit.

The Line of Safety

Mr. Thom pointed out that the business man who borrows all his capital is not considered a preferred risk and that a railroad can no more go on exhausting its assets by mortgages and loading itself up on the application of fixed charges than can the individual. There comes a point in railroad credit, he said, where the line of safety between the input of capital which can be borrowed and the input of capital which should be made by the owner of the property and be evidenced by stock without fixed charges is reached. The accumulation of fixed charges and the necessity of paying them constitutes a burden, if this line is exceeded, which may mean, in the end, default and bankruptcy.

A great many economists and financiers will say that the line of safety between debt and stock is at 50 per cent, Mr. Thom said, but he had heard of no contention that the proportion of borrowed money should be higher than 60 per cent. He pointed out that in 1900 the bonded indebtedness of the railroads of the United States was only 49.78 per cent of the entire capitalization; that in 1914 the percentage had grown to 61.80 and that in 1916, it is approximately 65 per cent.

In order that a railroad may finance itself by stock issues Mr. Thom said, it must have earnings sufficient to make the investors certain of a return of 6 per cent, with 3 per cent surplus. By this test 39 railroads, having a mileage of 47,363 miles could probably be financed by the issue of stock at par, while 137 railroads, having a mileage of 185,219 miles, could not be financed by the issue of stock at par.

Mr. Thom said he was not contending that gilt-edge railroad securities, such as first or prior liens, have no market, but that the problem is whether or not the railroads have margins of equity which they can use as the basis of getting new money into the enterprises. Railroad credit is reflected, he said, not in the quotations of the stock exchange, of bonds already in the hands of the public, but in the ability to market new securities.

The Burden of Proof

The view held by some that the present situation of the carriers has been brought about by mismanagement and wrongdoing in the past totally ignores the needs of the public in the present and in the future. The public will not excuse inadequate transportation facilities now because someone tells them that the condition is the result of mistakes that may have been made in the past. The burden of proof is on the man who wants merely to look to the past to show that every need of commerce now and in the future will be supplied merely by the removal of abuses. The abuses have practically ceased and are no more prevalent in the railroad business today than in any other business humanly conducted. The great question now is whether the existing system of regulation gives the public reliable assurance of sufficient present and future railroad facilities. If not, it will be admitted that there must be such a change as will provide them.

State Regulation a Burden to Commerce

The financial needs of the railroads, the unjust burden imposed upon commerce by the existing dual system of state and federal regulation and the relation of states' rights to the federal control of railroad regulation were discussed by Mr. Thom, on the second day of his appearance before the committee.

"In our effort to ascertain what are the reasonable needs of the future," said Mr. Thom, "we have studied the growth of population, industries and commerce during the past 20 or more years, and the growth and development of railway traffic and of facilities and equipment during the same period. We have tried to show what the percentage of increase year by year has been during that period; how the property has grown; how the traffic has grown, and how the railroad facilities have grown to take care of it. The result is this,—from the growth of population, industries and commerce during this period, this has been found:

"First, that the wealth of this country has increased at the rate of eight to nine per cent per year, and that the same ratio of increase has held good in the demand for transportation.

"Second, that the forces that have operated in this growth and development in the past apparently continue still in full operation, and may reasonably be expected to so continue for the next 10 or 15 years.

"Third, the investment in railway facilities in order to meet the enlarged requirements of the future, because of this continued growth, and in order to fulfill the duties and obligation imposed upon the railways by the public, must also proceed at a corresponding annual rate of increase.

Roads Need $1,500,000,000 a Year

"We take, then, eight per cent as the result of those figures, to indicate the annual growth that must be provided for in railroad facilities of all sorts, in order to keep up with the eight per cent of increase in the business of the country; and the result of that is that during the next 10 years there will be needed approximately $1,250,000,000 a year, in order not to constrict the business and productive energies of the country, and in order to supply them reasonably with the facilities which this growing business will require. Those figures apply only to the amount that will be required to increase facilities; they do not include the amount that will be required to refund maturing debt. From the best information that we can obtain, there will be required to refund maturing debt during that time a sum approximating $250,000,000 a year; so that the requirements of the railroads for new money during the period to which I allude are estimated by us to be $1,500,000,000 a year.

"Is it not fair to ask of a system which limits revenue but does not limit expenses, where this money is to come from? Is it not fair to ask that in any constructive measure which is favored by the Congress of the United States, this essential need of the people shall not be overlooked and that some method shall be provided which will reasonably assure the necessary input of capital to bring and to keep these instrumentalities of commerce up to the requirements of public needs?"

Present Conditions of Repel Capital

If conditions now imposed upon investments in railroads had existed in the early days, said Mr. Thom, does anyone suppose that our railroads would have been built by private enterprise? He cited government ownership as the only possible alternative to the establishment of conditions which will make it possible for the railroads to enjoy credit and earnings sufficient to meet the growing demands of the country. "The evils we now have are as nothing compared with those we would have under government ownership," he commented. "It is time to be careful."

Turning to the question of simplification of the system of regulation, Mr. Thom suggested that this should be considered from two viewpoints: the discouragement to the investor which this dual system creates and the effect of regulation by one state upon the interests of other states and upon interstate commerce.

"We all know," he said, "that the courts have been full of cases where state-made systems of rates have been attacked because the railroads regarded them as actually confiscatory in their character.

We all recognize the fact that the cases which have charged confiscation in this country have been almost entirely cases in regard to state-made systems of rates and seldom in regard to nation-made systems."

Calling attention to the fact that commerce had ceased to be a neighborhood affair, but was broader than states or nations even, Mr. Thom pointed out that railroad systems had come into existence in obedience to the law of commercial necessity, that they took no note of state lines, but joined the fields of production to markets and ports.

Economic Laws Will Prevail

"Any system of regulation of an economic question which throws itself athwart the path of economic progress," he continued, "is destined ultimately to failure. The logical operation of economic laws will prevail over human-made laws, and human intelligence, sooner or later, will begin to recognize it, and when it is recognized the adjustment that is made will be by the laws to the economic conditions, for it is impossible to adjust economic conditions to the laws."

Mr. Thom cited numerous cases in which the railroad laws or regulations of the various states injuriously affected the commerce of other states of the nation. "Between the Potomac and the Mississippi," he said, "there is not a state that does not make the state rates and the commerce of no two of the states moves on the same terms." He referred to the variation in state laws imposing penalties for failure to supply cars which cause the state imposing the heaviest penalty to be favored at the expense of others imposing smaller penalties or no penalties.

Interference With Security Issues

As an instance of one state imposing burdens on other states, he referred to the recent case in which the New York Central, with not over 150 miles of line in Illinois, was taxed $600,000 by that state as a condition of its consent to the issue of certain securities and asked why the states of New York, Ohio, Indiana and the others through which the road runs could not with as much reason exercise the same right. "And if all had done it," he inquired, "what would have become of the possibility of making that financial transaction?"

As another illustration of the conflict of state laws, he mentioned the experience of the New York, New Haven and Hartford, which recently arranged for the sale of $67,000,000 of convertible bonds, part of the issue to be used to refund maturing obligations and the balance of $25,000,000 to be used to provide needed public facilities. The states of Rhode Island and Connecticut gave their approval, but while the Massachusetts commission approved the plan it was held that the laws of that state forbade their consent to it. The result was that the issue could not be made and the consequent inability of the road to furnish the proposed new facilities in the way of new equipment and enlarged terminals is largely responsible for the great congestion of business and interruption of commerce throughout the whole of New England and the surrounding regions.

"Extra Crew" Laws Cost $1,700,000 a year

The action of the states of Pennsylvania and New Jersey in passing "extra crew" laws was mentioned as a further example of burdens imposed by state legislation upon the commerce of other states.

"The results of the action of New Jersey and Pennsylvania," said Mr. Thom, "is to impose an annual charge upon the railroads amounting to $1,700,000 a year, which is interest at 5 per cent on $34,000,000. The commerce of those states does not pay that charge. It pays only their proportion of it. The commerce of Ohio, Indiana and Illinois and of Delaware, Maryland and West Virginia is called upon to contribute.

"What justice is there in the commerce of these other states being burdened with that charge which they do not approve, to carry out a policy which they have not adopted, simply because some other state has adopted it? What soundness is there in the view that one state should thus possess the power of encumbering with charges the business of other states in order to carry out a policy in which those other states do not participate?"

"Should not such a power," he asked, "be lodged in the hands of the federal government which can act inpartially toward all the states?" He pointed out that 19 states have the power of regulating securities issues, although the security issues apply to the whole line, not merely to the part located within a single state. In this way a railroad located in several states can be prevented from making a mortgage or issuing stock by the action of any one state. He also referred to the fact that a large issue of bonds proposed by the Southern Pacific, part of the proceeds of which was to be used for improvements in California, although approved by the California commission, was not approved by the state of Arizona, which withheld its consent unless a certain part of the proceeds should be expended in that state.

State Discriminations in Rates

Attempts of states through rate regulation to discriminate against the commerce of other states were reviewed by Mr. Thom, who mentioned the Shreveport case, complaints made by Missouri of alleged discrimination by Illinois, of Tennessee against Arkansas and numerous other cases of a similar nature.

"Now is any system of jurisprudence sound which permits that result?" he asked. "Is any system of governmental regulation sound which puts at the mercy of one of the states the commercial policies and interests of every one of the other states, dependent upon the same carrier for facilities?"

Turning to the question of states' rights in relation to the national regulation of commerce, Mr. Thom showed that it was largely to insure free trade among the states and to prevent the erection of artificial barriers to trade as state boundaries that the original 13 states entered the Union. He elaborated the view that by union the states acquired certain rights which they considered more valuable than the rights they surrendered and that among these were the right to national defense, the right to a national post-office system, the right to a uniform system of tariff charges and the right to a uniform system of regulation of the instrumentalities of interstate commerce, which is no less important and valuable than the others mentioned.

State Right to Uniform Regulation

"The power was given as an acquired right of each state," said Mr. Thom, "that its commercial policy should not be made by its neighbor, but should be controlled by the national authority, which should act impartially between the states, and which alone speak for all. So when I come to hear of a question of states' rights involved in this matter, I hasten to accept the comforting realization that the right which each state acquired by entering the Union, as high, as complete and as important as any other, is that the commerce of my state shall not be controlled by the different policy of a state across the border, but that I can come here where the most

am in my father's house and where each one of your represent me as much as you represent any other section of the Union, and can plead for an impartial, a fair, a helpful and a comprehensive regulation of my commerce and expect to be answered with some just and equitable and comprehensive and equal system of regulation throughout the Union; where I am not dependent on what the people across the border may do in throwing burdens upon me, but where the burdens that come shall come from the representatives of us all, and be distributed with an equal hand among all the people of this country.

"Am I intruding upon any sacred rights of anybody by asking that? Am I disregarding any just power of anybody else when I ask that? Am I violating any constitutional right of anybody else when I ask for that? I feel that merely I am coming to the constitutional fountain of all our rights, and asking that a policy which shall apply to all, that shall affect all, that shall protect all, shall be the outcome of the universal judgment, and not of the judgment of a small fractional part.

"And when I make that request, I am not asking the disregard of a states' right; I am asking for the enforcement of a state right, and it seems to me that that issue should be decided, not by jealousy of the distribution of governmental power, but by the determination of the issue whether in the interest of all the people and all commerce, there should be a regulation by one central and all-comprehensive authority. It is manifest that the only way to exercise a complete and a protecting and a helpful regulation is to take hold of the instrument of interstate commerce. You cannot divide its business, you cannot leave one part of its business to somebody else's regulation and you regulate the other, because the influence of a regulation of any part may have destructive consequences upon the instrument of interstate commerce and the different states dependent upon the same interest may be most unfortunately and most hurtfully affected."

"My legal proposition," Mr. Thom said, "is that the constitution as it now is gives full authority to Congress to regulate the instrumentalities of interstate commerce in all their parts. If the power of regulation is to reach the public requirements, it must be co-extensive with the instrumentalities of commerce."

Mr. Thom explained that the roads are not asking either of the committee or of Congress any increase in revenues, but that they are merely asking the perfection of a system which will be responsive to any need that may arise.

Mr. Thom Questioned

Having completed his opening statement before the committee on November 25, Mr. Thom appeared before the committee on November 27 and was questioned by Chairman Newlands and Vice-Chairman Adamson concerning various details of the proposals of the railways.

Mr. Thom said that it was his idea that the states would reserve the right of taxation and the exercise of police power, in case the plan of federal incorporation should be adopted and that Congress should take over only those powers which it is essential for the national government to exercise in order to prevent interference with the rights of the states or with interstate commerce. While on the subject of taxation he said that the capital stock tax imposed in some states results in double taxation and acts on the same principle as taxing a farm and also the deed which represents the title to the property.

State control of rates, he said, results in placing an undue burden on the commerce of other states and on interstate commerce.

Chairman Newlands asked whether, if railways should be allowed to earn 6 per cent for dividends and 3 per cent for surplus, the dividends should be limited to 6 per cent. Mr. Thom replied that dividends should not be limited unless the government were willing to guarantee them, saying that otherwise the investor would be taking the chance of losing everything without an offsetting opportunity of earning more than 6 per cent, and that he would prefer 6 per cent farm mortgages to such an investment.

Railway executives have only recently accepted the idea of federal incorporation with favor, Mr. Thom said, because some of them that operate under favorable state charters were reluctant to give them up. But he thought that federal incorporation should be made compulsory rather than that roads should be allowed to choose between state and federal charters.

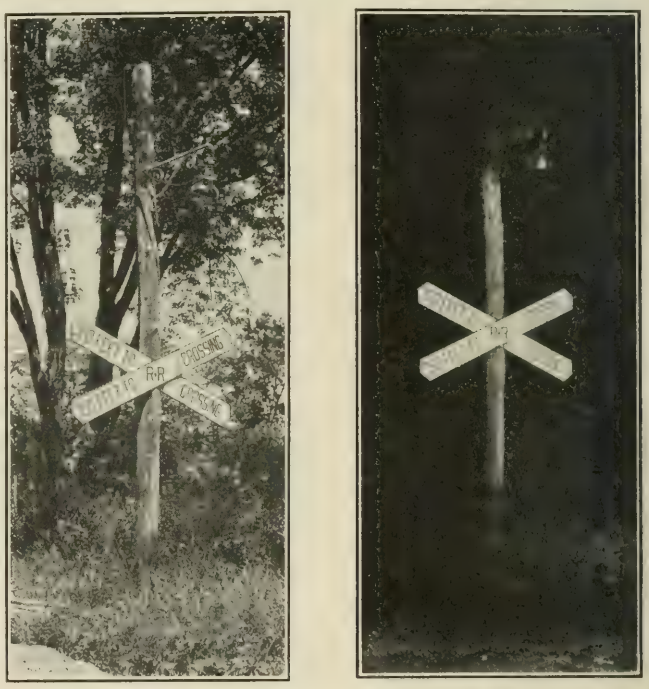
Asked whether it was thought that a plan of federal incorporation would facilitate the taking over of the roads by the government, he said that nothing was needed to facilitate such an operation if such a step were decided upon. He added that some railway executives "are leaning toward government ownership."

Chairman Newlands inserted in the record at the opening of the session, copies of various bills providing for federal incorporation which he has introduced in Congress since 1905.

At the conclusion of his address on Saturday Mr. Thom read to the committee a memorandum advocating federal incorporation, by Richard Olney, secretary of state under President Cleveland, who wrote that he was unable to appear personally before the committee.

ILLUMINATED CAUTIONARY HIGHWAY CROSSING SIGN

A correspondent, G. M., whose letter appears in another column—and who, by the way, is a well-known general manager—suggests that, with suitable landmarks, making plain to all travelers on the highway the exact location of railroad crossings, everything in the nature of automatic signals, at such crossings, to announce the approach of trains could, with good reason, be done away with.



Cautionary Highway Crossing Signal

In this connection the reader will be interested in two photographs, herewith reproduced, which we have received from an officer of the Baltimore & Ohio. These pictures

show a sign which has been set up, recently, at a crossing on that road. The electric light which makes the sign visible at night stands out about 3 ft. from the post.

MECHANICAL DESIGN OF ELECTRIC LOCOMOTIVES*

By A. F. Batchelder

The purpose of this paper is to bring to the attention of the Society some of the important features in the mechanical design of electric locomotives, with a view of having a more common understanding of the requirements and the method of meeting them. These features may be listed in the order of their importance as follows:

1—Safety of operation
2—Adaptability to service conditions
3—Reliability in service
4—Convenience of arrangement as affecting safety and efficiency of operation
5—Power efficiency (affected by mechanical design)
6—Service time factor (ratio, time available for service to total time)
7—Cost maintenance of permanent way
8—Cost maintenance of locomotives
9—First Cost.

Safety of Operation

The steam locomotive has been developed by degrees to such a state of perfection that it is common to see it operate at near 80 m. p. h. and with perfect safety; but no one would think of operating at this speed backwards. With the coming of the electric locomotive, the railroad operator is not content with single end operation, but must have a locomotive that will operate equally well in either direction. This does not impose any serious difficulties in the design of locomotives which operate at speeds under 50 m. p. h., but with locomotives for the higher speeds it presents new problems or at least it requires the most careful consideration of the running gear details, to obtain the most satisfactory results as to tracking and the effect on the rails and road bed.

The steam locomotive has what now seems to be natural characteristics to allow high speed operation in one direction. These characteristics are low center of gravity at the front end carried on the center pin of a two axle guiding truck, tending to prevent rolling over and having but little effect on the guiding, and high center of gravity on the rear end with inside journal bearings, allowing the locomotive to roll and increasing the time element, which thus reduces and distributes the lateral pressure against the rail over a longer distance. This increases the vertical pressure on the rail, thus holding it more firmly in place. These same characteristics can be obtained in electric locomotives by the sacrifice of double end operation.

The advantages gained in operating the electric locomotive in either direction are so important that means should be provided for satisfactory double end operation. One way of doing this is by using a four-wheel guiding truck at each end of the locomotive. With the use of the extra truck, however, the importance of a high center of gravity largely disappears. The lateral pressure against the rail at the rear end now appears at the truck flanges rather than at the flanges of the driving wheels and the high center of gravity no longer provides the same increased vertical pressure on the outer rail at the point of the maximum lateral pressure. The lateral stresses from guiding the main frame being taken at the center pin of the two guiding trucks, the additional vertical pressure on the outer rail is dependent upon the height of these center pins rather than upon the height of the center of gravity of the main frame above the wheel hubs, thus leaving less advantage to be derived from a high center of gravity.

To demonstrate more clearly, it is well to see what happens to a locomotive when entering a curve, which is also illustrative of its action on tangent track when oscillating from one side to the other. A locomotive having a high center of gravity and with two driving axles guided by a two-axle swivel truck will serve to illustrate the action. As the locomotive enters the curve, its tendency is to continue on in a straight line but the flange of the leading wheel gradually comes in contact with the outer rail, giving the guiding truck an angular motion about its outer rear wheel and exerting a lateral pressure against the center pin, thus giving the main frame an angular motion around its outer rear wheel.

The lateral pressure tending to displace the rail at the leading wheel is the amount required to slip the two inner wheels, and to accelerate the truck around its outer rear wheel, plus one-half the amount required to slip the two leading drivers and the rear inner driver, and to accelerate the main frame around its rear driving wheel, plus its relative portion of the centrifugal force of the whole locomotive. The lateral pressure tending to displace the outer rail at the rear wheel of the leading truck is the amount of reaction from slipping the two inner wheels and the angular acceleration of the truck plus one-half of the amount required to slip the two leading drivers and the rear inner driver and to accelerate the main frame around its rear outer driving wheel, plus its relative portion of the centrifugal force of the whole locomotive.

The lateral pressure tending to displace the outer rail at the rear wheel of the main frame is the amount of reaction from slipping the two leading drivers, the inner rear driver and the angular acceleration of the main frame plus its relative portion of the centrifugal force of the whole locomotive. The greater weight being concentrated at the drivers, and the distance of the truck center pin from the main truck wheels being greater, and the fact that there is but one wheel to take the strain, it follows that the point of the greatest concentrated lateral pressure is at the rear outer driving wheel.

The above disregards the important factor of time, in the accelerating and centrifugal forces due to the rolling, governed by the height of the center of gravity above the wheel hubs, which tends to reduce the lateral pressure at the rear outer driving wheel. With a high center of gravity above the wheel tread the accelerating and centrifugal forces also tend to tip the locomotive upon the outer driving wheels, relieving the weight from the inner wheels and thus lessening the force required to slip them, at the same time increasing the adhesion between the outer rail and tire by the additional weight. On good road bed and rails the locomotive described is capable of being run at above 80 m. p. h. without any apparent bad effect on the track.

If this locomotive is operated in the opposite direction, the lateral stress at these wheels are of the reverse order, the guiding force now being applied at the driving wheel flanges and the reaction taken through the center pin to the truck wheel flanges. The swivel truck, now trailing, is free to oscillate from one side to the other, and the reaction from the force of turning the main frame may be applied at the center pin when the truck wheel flanges are tight against the inner rail. The force is thus allowed to accelerate the truck as well as the main frame through the gage clearance to the outer rail, thus adding momentum, the value of which depends upon the lateral distance through which the truck is moved. As the vertical pressure on the rail is limited to the normal weight at the wheels plus the vertical component of the force applied only at the height of the center pin of the truck, the relative lateral to the vertical pressure at the wheels of the truck may be greatly increased. A number of observations have appeared to confirm the fact that the action of the trailing truck above described is one of the most

*Abstract of a paper which will be presented at the annual meeting of the Railroad Section of the American Society of Mechanical Engineers, held December 8, 1916, in New York.

important in producing excessive lateral pressures against the rail in a symmetrically built electric locomotive with similar trucks at both ends. It will be seen therefore that while the swivel truck is desirable as a guiding agent at the front end, it is not as desirable at the rear end, and means must be provided to prevent oscillation of the truck and to accomplish the same results as the high center of gravity in a single end locomotive.

To accomplish these results, it is necessary to reduce the momentum effect and to reproduce the equivalent of the time element factor and of the increase of vertical pressure on the outer rail that is characteristic of the high center of gravity single end locomotive.

The momentum effect can be reduced by introducing resistance against swivelling, thus restricting the truck from oscillating from one side of the track to the other, the amount of this resistance to be determined by the allowable amount that can safely be applied to the truck when leading. To reproduce the time element factor, lateral movement can be given to the truck center pin by any of the several methods for giving lateral movement to the leading truck center pins on locomotives. However, the writer has obtained the best results with the method that is the nearest to constant pressure and dead beat, as it also tends to prevent oscillating. To increase the vertical pressure on the outer rail the center bearing of the truck can be made wide, thus allowing the vertical component of the lateral pressure at the center of gravity to be transferred through the bearing to the wheel, or with the narrow center bearing the height may be made such that the lateral pressure at that point will result in an increased vertical component independent of the height of the center of gravity.

It is the writer's opinion that the double end locomotive, while its characteristics are different, can be designed for high speed with safety equal to the single end locomotive, and this regardless of the height of the center of gravity.

Adaptability to Service Conditions

The electric locomotive, besides being required to operate in either direction, is often also required to be adapted for operating high speed passenger trains and heavy low speed freight trains over main line tracks, to negotiate sharp curves, and to be easy on light track and bridge structures. With locomotives having geared motors, the requirement of operating the passenger and freight trains can often be met by changing the gearing to obtain the proper speed and draw bar pull. The running gear can be made with trucks of short wheel base and coupled together, the number of trucks depending upon the required weight of the locomotive for its maximum draw bar pull, and also on the allowable weight per axle. With such a design curves of very short radius can be operated over and the weight per axle can be such as to allow operation over light structures.

Reliability in Service

When the design is such that it is safe to operate at the required speeds and is proper for the curves and other service requirements, and a liberal factor of safety is provided for the parts subjected to strain, the reliability in service affected by the mechanical part of the locomotive depends mainly upon the bearings, their lubrication, and the method of power transmission from the motors to the drivers. It is necessary therefore to provide effective lubrication and as few bearings and as simple driving mechanism as the design of the motors will allow.

After providing all the safety appliances recommended by the Interstate Commerce Commission, it is important to arrange for the most convenient location of the operator to allow him an unobstructed view of the track and signals, to place within easy reach the air brake valve and locomotive signal device handles, as well as the reverser and power controller handles, keeping in mind the importance of making them so free from complication that the operator will require the least amount of thought to manipulate any of the devices and be free to respond to signals and look out for emergencies.

Power Efficiency

The power efficiency as affected by the mechanical design is governed largely by the type of the traction motors. It is apparent that the gearless motor mounted directly on the axle allows the design of the maximum efficiency on account of its few bearings and its absence of gearing and moving parts. The gearless motor which is mounted on a quill and driving through springs to the wheels may be considered second in its possibilities for high efficiency design, it having additional bearings and a greater number of moving parts. The single reduction geared motor with its additional bearings and gear losses can be given third place in its possibilities for high efficiency design. The single reduction geared motor driving through gears and side rods to the wheels may be placed fourth. The gearless motor driving through side rods and jack shaft to the wheels should be placed fifth.

Service Time Factor

The service time factor is dependent upon the ability of the locomotive to operate under all its service conditions and without undue strains which requires a liberal design of its wearing parts. In addition to this it depends on the simplicity of its design and the ease with which its parts can be inspected, adjusted, repaired, or replaced.

Cost of Maintenance of Permanent Way

The cost of maintenance of the permanent way is a very important item and can be increased or reduced by the design of the locomotive. The lowest cost is obtained when the locomotive meets its service requirements without undue strains, when the rotating parts are balanced, the weights per axle are suitable for the structures, a suitable equalizing system is provided to maintain the proper weight distribution, and when provision is made to protect against flange wear.

Cost of Maintenance of Locomotives

The cost of maintenance of the locomotive is dependent upon its safety of operation, its adaptability to service conditions, its reliabilty, its convenience of arrangement, and the same items that enter into its service time factor. It is also governed by the same conditions as affect the maintenance of the permanent way. The care with which the material is selected, the quality of workmanship, the ease with which the parts can be inspected, adjusted, repaired or replaced, and the simplicity of the design are the most important features that govern the maintenance cost.

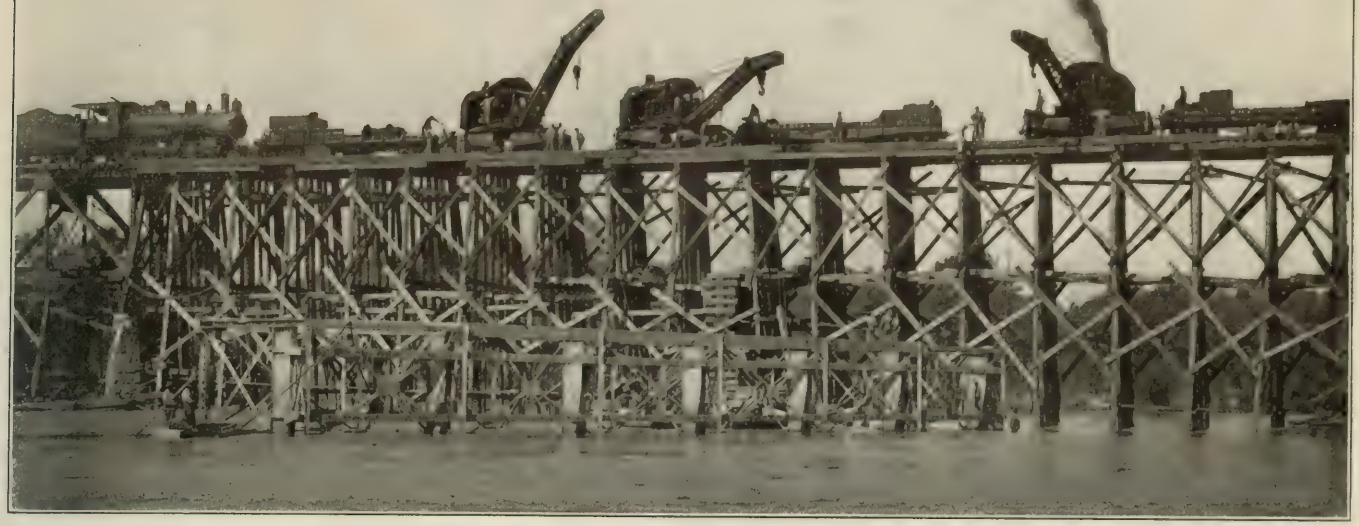
First Cost

The first cost of a locomotive will depend largely upon the design chosen, but its importance, except at the time of purchase, becomes of little moment when taking into consideration the eight foregoing features. With two locomotives designed for the same service the cost of the difference in the efficiency and in the locomotive maintenance alone for one year may when capitalized amount to a sum representing a considerable proportion of the first cost of one of the locomotives.

The writer feels that too much importance cannot be given to developing to the utmost the mechanical parts of the electric locomotive that are the simplest in design and the highest in efficiency. From the present outlook, the locomotive for high speed passenger service with the gearless motor, its armature being mounted directly on the axle, and the locomotive for freight and switching service with the single reduction geared motor, mounted on and geared to the axle, lend themselves best to simple design and low cost of maintenance.

Repairing Flood Damage on the Southern

Excellent Esprit de Corps Displayed in Restoring Traffic on Lines Destroyed by Storms of Unprecedented Severity



Replacing Spans, Catawba River Bridge—Columbia Division

THE operating, maintenance and construction forces of the Southern were severely tried during the last four months in restoring to traffic and proper operating condition the lines of the system which suffered severe damage as the result of two storms occurring in rapid success on during the summer. About 680 miles of line in North Carolina, South Carolina and Tennessee were put out of service, causing a loss estimated at approximately $1,250,000. This does not include the loss of traffic, the cost of detouring trains, or the extensive permanent work now in progress to replace the temporary structures, built rapidly to restore traffic. By the strenuous efforts of the Southern's forces, working in many cases as independent units, isolated by the flood, most of the lines were restored to traffic in a little more than a week, although one line, that between Salisbury and Asheville, was out of service for nearly six weeks.

The principal damage occurred in North Carolina, following a storm that raged on July 15 and 16, but an earlier storm, which struck Mobile, Ala., on July 5, and spread northward over the state in the shape of a fan, caused washouts and inundations of the various lines, and resulted in considerable interruption of traffic. At Mobile the Southern's dock property suffered injury to the extent of $75,000.

Traffic had hardly been restored after the earlier storm when a second one originating in the Caribbean Sea struck Charleston, S. C., on the morning of July 14, passing northwest across South Carolina and western North Carolina. It reached the Blue Ridge mountains about noon of the 15th, but unlike most storms of the same character, which turn to the north and northeast into Virginia and the North Atlantic states, this storm was delayed by a high pressure condition in the north-eastern states, with the result that it practically exhausted itself in a limited area on the eastern foothills and crest of the Blue Ridge. Here the rainfall was enormous. In a territory having roughly the shape of an ellipse, 80 miles long and 30 miles wide, lying just northwest of the towns of Asheville, Morganton and Wilkesboro in North Carolina, 15 inches of rain fell on July 15 and 16, most of it within 24 hours. Within this ellipse is a smaller one 40 miles long and 15 miles wide, in which the rainfall was in excess of 20 inches for the same period. At Altapass, in the Blue Ridge, a fall of 22.22 in. was recorded for a 24-hour period, the greatest ever reported in the United States for an equal length of time.

The results of the heavy downfall were aggravated by the fact that much of the territory covered had been subjected to local rains for a period of seven to nine days preceding this storm. In consequence, the ground was saturated and the streams were bank-full when the storm broke. The rain continued almost uninterruptedly for nearly two weeks after the storm, thereby interfering seriously with the work of restoration. At Altapass, where the record rainfall took place, some rain fell on each of 18 successive days.

The area of high rainfall, as described above, embraces the head waters of the Yadkin, Catawba and Broad rivers, which flow in a generally southeasterly direction across the coastal plane to the Atlantic ocean. Much of the damage was the result of flood conditions in these streams and their tributaries. The Catawba river carried out nine railway bridges and all of the highway bridges which cross it. The Southern, having a network of lines in the direct path of the storm and crossing these streams repeatedly, suffered more severely than any other railroad in the affected district.

The flood discharge of many of these streams was entirely beyond any previous record, as indicated by the following quotation from the Climatological Data for July, 1916: "At Asheville the French Broad river reached a stage of 18.6 ft. at 9 a. m. of the 16th, or 8 ft. above the previous high record; by 10 a. m. the bridge to which the river gage was attached was swept away and the water continued to rise until 1 p. m., reaching an estimated stage of 21.0 ft., or 10.4 ft. above the record flood. The Catawba river at Mount Holly reached a stage of 45.5 ft. on the morning of the 17th, or nearly double the 1901 record, the bridge to which the gage was attached being also washed away. The upper waters of the Yadkin were the highest ever observed."

Line Cut in Many Places

Four bridges of the Southern over the Catawba river were carried out—at Catawba on the Salisbury-Asheville line, at Belmont on the Charlotte-Spartanburg line, at Catawba river on the Charlotte-Columbia line, and at Wateree on a

branch of the Charleston division. The Broad river wrought destruction at many points on the Spartanburg-Columbia line which it parallels for a distance of 40 miles, while the line from Columbia to Branchville, in the direction of Charleston, was put out of service by general inundations. Smaller streams caused repeated washouts between Spartanburg and Asheville. The French Broad river flowing northeast on the other side of the Blue Ridge watershed caused heavy damage at Asheville, where it flooded a large part of the town and all of the railway property and washed out the line of the Southern between Asheville and Morristown, which follows its course as far as Rankin, a distance of 67 miles. In a similar manner the Yadkin river destroyed 61 miles of the line between Wilkesboro and Greensboro.

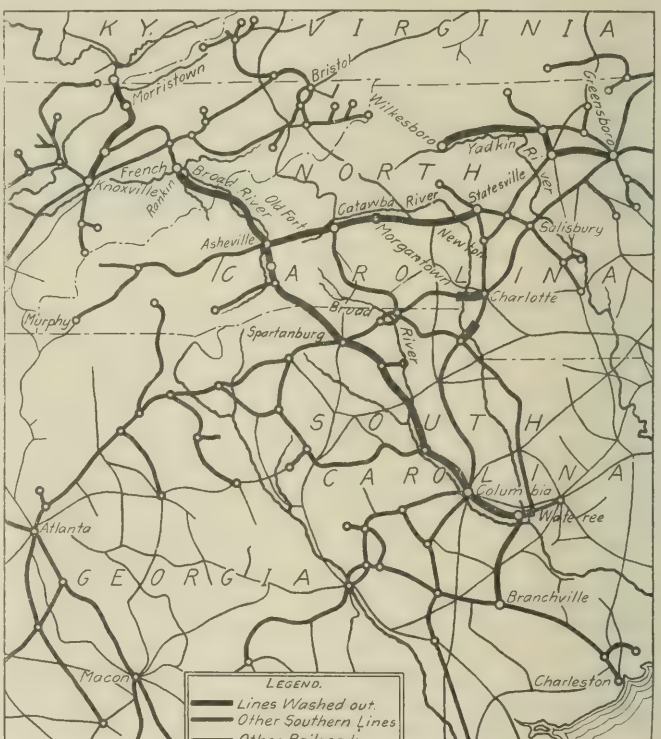
The greatest damage, however, was done to the Salisbury-Asheville line, a large part of which lies within or just outside of the area of the extreme rainfall. Aside from the break caused by the loss of the Catawba river bridge, the damage to this line was caused by the heavy flood discharges of the smaller streams, and to a large extent by the direct effect of the extreme rainfall. There were many landslides closing up the mouths of tunnels, choking up cuts and carrying away embankments. A mica bearing schist abounds in this region, and although stable enough while dry, it assumes a semi-liquid state when wet and causes untold trouble.

Although there had been some warning of the storm, and certain preparatory measures were taken before the damage was actually done, there was insufficient time for organized preparation. After the troubles had commenced rail communication and to a large extent also telegraphic communication were interrupted, and each fragment of the operating, maintenance and construction organizations was compelled to carry on its portion of the restoration work as an indepedent unit with such equipment, tools and materials as were in stock or could be purchased locally. After some of the lines had been restored large quantities of supplies, which had been gathered in the meantime, were shipped in all possible haste to the points where needed. Much of this material was ordered by telegraph and shipped on special trains, and some very quick deliveries were made. An order was placed by telephone in Pittsburgh for 900 kegs of spikes, 200 kegs of boat spikes, and 400 kegs of nails, which were shipped by special train on the same day. A 90,000-gal. water tank which was ordered from Batavia, Ill., on July 20, was shipped on July 25, and was erected by the time the track was restored. The more common points of shipment were Norfolk, Richmond, Atlanta, Chattanooga, Louisville and Baltimore, although an order for pumps was placed as far west as Dubuque, Iowa. The following partial list gives some idea of the equipment that was shipped into the affected district on short notice: 300 gas torches, 3 carloads of explosives, 8 Milburn lights, 50 drag scrapers, 700 wheelbarrows, 8 carloads of steel sheet piling, 2,000 tons of new rails, 500 tons of relay rails, 6,346 piles, 6,350,000 ft. of lumber and 65 carloads of concrete pipe.

The Asheville-Salisbury Line

The line most severely devastated and most completely isolated was the Asheville-Salisbury line running west from the Catawba river. It was the last line to be restored. The first train passed through on August 20, the passenger schedule being restored a week later. This line traverses a difficult country, crossing the Blue Ridge at Ridgecrest, making the east approach along Mill creek, a tributary to the Catawba river, and the west approach along a branch of the French Broad river. Of the 115 miles of this line between Statesville and Asheville only the 20 miles from Newton to Connelly Springs was intact. Between Old Fort and Asheville, a distance of 30 miles, there was not more than one-half mile of continuous track. Thus, in addition to the blocking of the line by the destruction of the Catawba river bridge, the principal damage to this line was at its western or mountain end. In consequence the major portion of the line was entirely isolated, making it necessary to carry on most of the repair work without outside assistance. The line was without communication with the rest of the system for a period of three weeks.

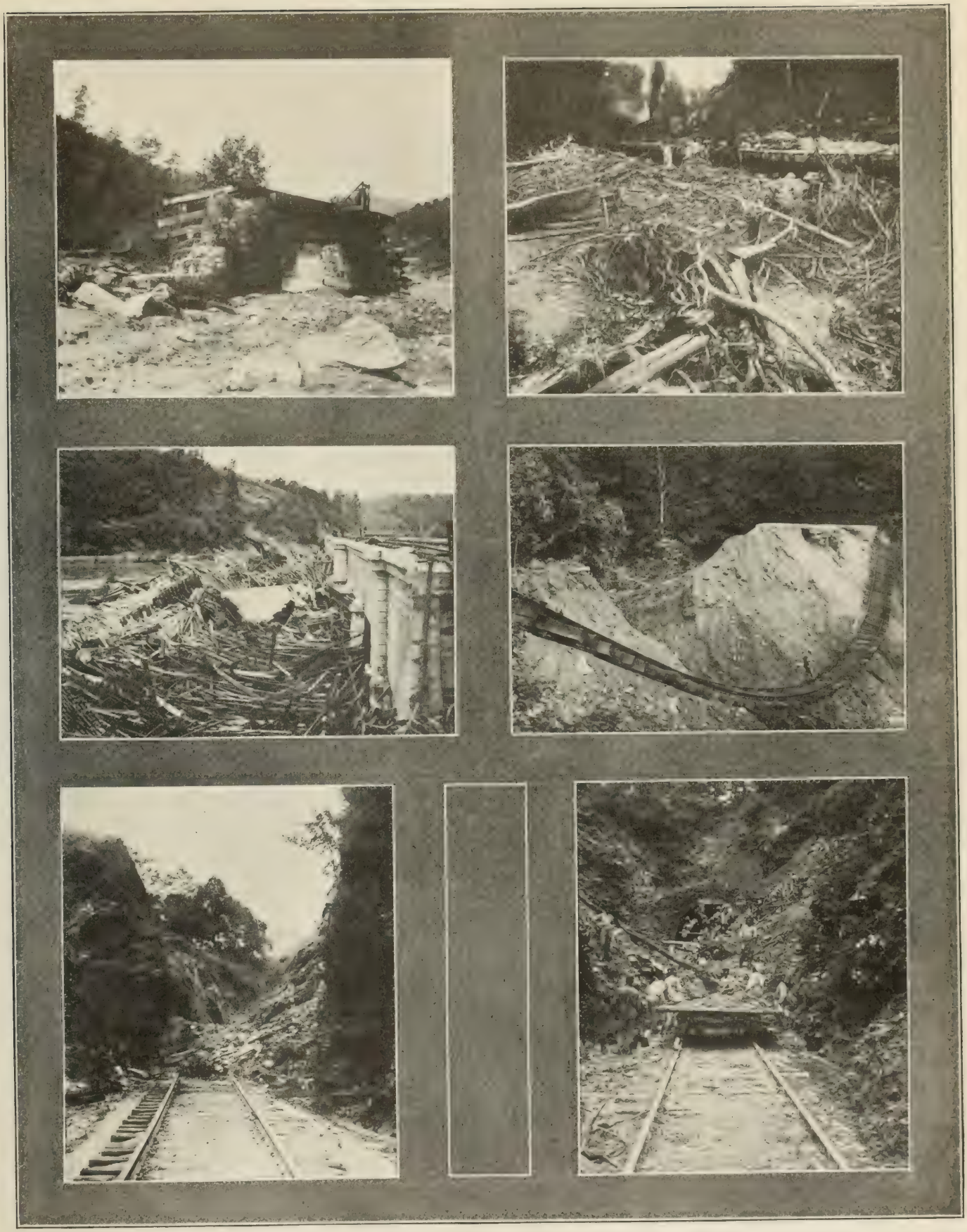
The homes and property of the inhabitants were so severely damaged by the storm that the people were largely in a dazed and helpless condition, and, with highways as well as the railroads destroyed, there was a limited food supply in many sections, resulting in some suffering before steps could be taken to prevent it. It was necessary for the railroad organization to assume control of the situation, taking advantage of whatever local resources the country afforded in order to carry on the work. Whatever materials were found in cars that had been marooned within the affected district, such as food, building material, tools, and the like, were commandeered for the use of the restoration forces.



Map of the Affected District

Requisitions were placed on all hardware, grocery or general stores within the district for whatever could be had. Cash was paid for everything purchased. The lack of adequate tools offered a serious handicap to the work. After the stores had been exhausted scouts were sent out through the country to bring in axes, kitchen hatchets, shovels, or any other utensils that could be used to equip the working forces. Local lumber mills were set at work as soon as possible cutting lumber of all kinds needed.

The working force was necessarily recruited locally. Employment was facilitated to a certain extent by the scarcity of the food supply. Men were anxious to get on the rolls in order to be admitted to the camps. As many as 2,000 men were employed on this line at one time. This force made the shelter and feeding of the men a problem by itself. Owing to the fact that only a limited number of cars were available, it was necessary to provide temporary buildings to house a large portion of the men. This required quick work. A camp at Dendron, near Old Fort, equipped to care for 700 men, was completed in four days. Another at Old Fort was



Destruction of Embankment Isolated Bridge
Debris Stopped by Southern Bridge at Asheville
Cut Blocked by Slide

Debris Left by the Flood
Track Spanning Break in Fill
Mouth of Tunnel Choked by Debris

provided to house 600 men in cars and temporary buildings. Four other smaller camps were also provided. Special attention was given to secure maximum comfort and good sanitation, and as a result of these measures there were only 13 cases of contagious diseases during the course of the entire work. Special attention was given to the water, all of which was boiled before it was used. The camps had to be placed close together, owing to a lack of a sufficient number of hand cars or motor cars to carry the men to and from the work. The camp at Dendron, however, was particularly advantageous in this respect, being located about six miles east of the summit, where the development of the elevation is made by a series of loops in close proximity.

Transportation proved a difficult problem. Rolling equipment included only that of the trains which had been marooned within the flooded district. A 32-ton geared engine belonging to the Kistler Tanning Co., at Morganton, N. C., and loaned to the railroad proved a valuable addition to the equipment. Some 60 miles of highway and trails were repaired, built new or re-located to move material in advance of the track restoration. At one time a force of 90 wagons were in service between Marion and Old Fort.

The repair work was carried on principally by hand labor. Tunnels and cuts were cleaned out by hand. In some cases it was necessary to go high up on the hillsides and remove the overburden that was slipping into the cuts in its water-soaked condition. Subsided or washed-out embankments were overcome by building trestles or changing the line sufficient to permit of side hill locations that would entail the least amount of earth work. In some cases a sag was placed in the grade line, such that the embankment would temporarily afford a sufficient width to place the track. Work is now in progress replacing masonry culverts, steel and concrete bridges that were carried out and where frame or pile trestles are now serving temporarily, and in rebuilding embankments on the correct alinement, where run-arounds or shoo-flies are now being used.

Restoration of the Other Lines

Asheville served as one center from which the repair work was directed. Extensive damage was done at this place, although the new reinforced concrete bridge of the Southern withstood the flood, and, acting as a dam, saved a number of other structures from destruction. Asheville was isolated from railroad communication, except by means of the Murphy branch of the Southern, which lies west of the Blue Ridge and was out of the path of the storm. By its connection with the Louisville & Nashville at Murphy this line served as a single circuitous route for the delivery of supplies and equipment.

Pile drivers and crews from other roads came in over this route. Damage east of Asheville was done principally on the 16th. Forces were sent in that direction first, encountering the first serious break at Arden, where the embankment was side washed for a distance of 800 ft. At Blake's Pond the track was washed off the roadway for a distance of 500 ft. At Melrose the bridge over the Pacolet river was washed out.

The damage between Asheville and Rankin along the French Broad river was not done for some hours after the greatest destruction had taken place east of Asheville. Advantage was taken of this delay to bring a pile driver from Knoxville to Asheville on July 16, the special train being the last one to pass over this line for two weeks. The French Broad river line suffered principally from side wash, as stated above, and as the embankment was not high as a rule it was not difficult to restore the line, although the extent of the damage was considerable. A large amount of chatts secured from the Mascot zinc mills proved of great help in the repair work, from 50 to 75 cars of this material being used daily for a considerable period.

On the main line between Charlotte and Spartanburg efforts were directed principally to the replacing of the Catawba river bridge at Belmont, a deck structure consisting of 3 deck truss spans of about 150 ft. and five deck girder spans on high piers. The superstructure was carried away, save one span, with the loss of the lives of eight employees who were on the bridge at the time. All of the substructure was destroyed except an abutment and one concrete pier, while 250 ft. of embankment at each end of the bridge was washed away. On the south end the embankment was restored by a steam shovel and dump cars, while at the north end it was leveled down and the gap was closed with a pile driver. The bridge opening was closed by driving piles with track drivers working from each end with a third driver that was hoisted piecemeal and erected on top of the remaining standing span.

On the Columbia-Charlotte line the forces were engaged principally in securing a crossing of the Catawba river where the bridge was carried out at Catawba River. This consisted of nine spans of 125 ft. deck trusses, eight of which were washed away. Two of the accompanying photographs show the conditions before the work of restoration had been started, and the manner in which the temporary repairs were made. Three Bucyrus derricks dragged the spans from the positions to which they had been washed to a location alongside the bridge where they were raised up on crib work to the final elevation.

An interesting commentary on the flood damage is that no all-concrete structure was destroyed, although many ashlar masonry bridge piers and abutments, like those shown in some of the pictures, suffered a gradual or piecemeal disintegration, one stone after another being carried away. As the concrete piers were monolithic they did not afford this opportunity for the action of the flood and drift. This particular phenomenon was noted also in culverts. Many stone masonry culverts were destroyed by washing out progressively from the downstream end, but no concrete culverts failed in this manner, and in several cases where old stone culverts had been extended at the end to permit the widening of embankments or the raising of the grades, these concrete ends were the only portions remaining.

WASHINGTON CORRESPONDENCE

Washington, D. C., November 28, 1916.

Eight-Hour Law Test Case Selected

Attorneys for the government and for the railroads having reached an agreement that the issues involved in the Adamson law shall be submitted to the Supreme Court in a test case, it is expected that the appeal from the decision of Judge Hook of Kansas City will be taken up by the Supreme Court when it reconvenes on Monday, December 4. On that date counsel for both sides will ask that an early date be set for argument. After negotiations between the government and railroad attorneys, both in Washington and at Kansas City, a stipulation has been signed selecting the case of the Missouri, Oklahoma & Gulf, in which Judge Hook gave a decision that the law is unconstitutional, for the test.

The objection raised by the railroad lawyers that the issues presented in the Missouri, Oklahoma & Gulf case might not afford a proper test because the road is a short line, having only 334 miles of trackage, and does not present the complicated situation as to wage schedules which prevails on a large railroad system, has been met by a provision in the stipulation that the railroads may also present the wage schedules of other companies which they may deem necessary to illustrate the provisions of the act.

There has been a suspicion in Washington that the selection of the Missouri, Oklahoma & Gulf case by the department of justice was in some way connected with the visit of the brotherhood leaders to the attorney general's office last week. The government's motion for an immediate decision in this case was filed in the court at Kansas City last week

Tuesday, on the day after the conference with the brotherhood leaders, and at about the same time that a committee of railroad lawyers, A. H. Harris, vice-president and general counsel of the New York Central, Chester M. Dawes, general counsel of the Chicago, Burlington & Quincy, and Francis I. Gowen, general counsel of the Pennsylvania, called at the office of the attorney general, in entire ignorance of the steps already taken by the department of justice, to see if a test case could be arranged. The railroad lawyers had expected that the case of the Atchison, Topeka & Santa Fe, which had been set for hearing at Kansas City on November 23, or that of one of the other larger roads, would be selected, but after several conferences an agreement was reached and was immediately wired to the attorney general's assistants in Kansas City. The Santa Fe and Union Pacific cases were then postponed and an agreement was signed providing for making use of the wage schedules of other roads where the facts in the Missouri, Oklahoma & Gulf case are not sufficiently illustrative.

A statement issued by Walker D. Hines, chairman of the committee of the railroad counsel, says that the main allegations of the bill in the test case as to grounds of attack and as to general facts are identical with the main allegations in the bills filed by the railroad companies generally. The agreement provides for postponement of the injunction suits filed by other railroads in various courts and the department of justice agrees not to institute prosecutions under the law before the determination of the test case. The stipulation also includes a provision that books and accounts shall be kept in such manner that if the act is upheld the amounts due the employees under the court's construction of the act may be ascertained and paid. This is not only in accordance with the suggestions of Judge Hook, but with the position taken by the railroads from the outset and the wishes of the department of justice.

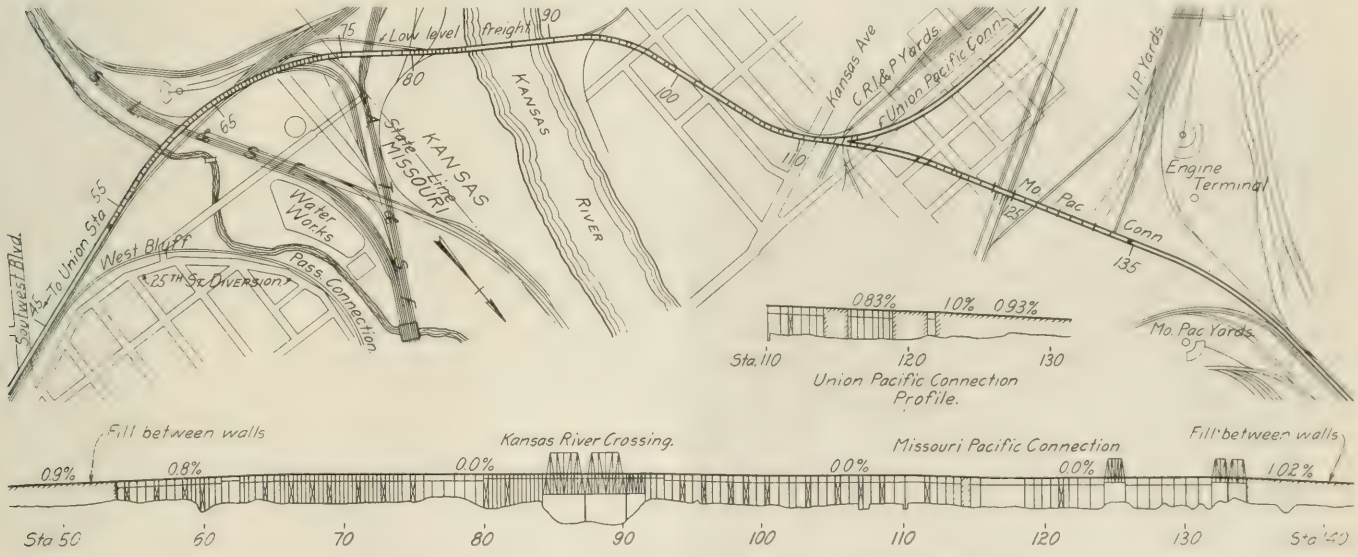
The principal question in the case now is as to how soon the Supreme Court may be able to pass upon the case. The department of justice is said to hold the opinion that a decision may be obtained before January 1.

President Wilson's message to Congress to be presented next Tuesday has been printed and it is the understanding that it contains a reiteration of the recommendation he made in his message of last August for an amendment to the Newlands arbitration law to prohibit strikes until after there has been public investigation of the issues involved. It is said that the President intends to insist that the Adamson law shall be supplemented by some such legislation in order to prevent a recurrence of the situation which existed last August in spite of the disapproval of such a plan which has been plainly manifested both by the brotherhoods and the American Federation of Labor.

In his opening statement before the Newlands Joint Committee on Interstate Commerce, in which he outlined the proposals of the railways for changes in the methods of railway regulation, Alfred P. Thom, counsel for the Railway Executives' Advisory Committee, made no suggestions on the labor question. He told the committee that all of the proposals which he had outlined were agreed upon by the railroads before the labor situation became such a menace to the commerce of the country. "When we prepared for these hearings," he said, "we did not expect to introduce that subject, notwithstanding its importance, because of its hotly contested character. It may be that recent events have put the labor controversy in such a situation that Congress will have to confront it and to deal with it. Whether that will be done by this committee or by some other committee of Congress we are not advised. Therefore, for the present I shall make no suggestions in respect to the labor situation because it seems to me that that situation ought to be met when it arises and with proper opportunity for exchange of views in regard to various proposals."

NEW KANSAS CITY TERMINAL VIADUCT

With the recent letting of a contract for the construction and the ordering of 25,000 tons of steel, the Kansas City Terminal Railway has undertaken the building of a double track, double deck bridge and a double track approach via-



Map and Profile Showing the Viaduct and Connections

duct across the Kaw river and bottoms to afford a more convenient entrance to the new Union Station for roads from the North and West. These roads include the Union Pacific, the Chicago, Rock Island and Pacific (from the west), the Missouri Pacific (from the north) and the Chicago Great Western, all of which are now required to pass through the industrial district and the network of tracks in the Kaw river bottoms at grade.

The new structure will consist of an approach embankment 983 ft. long held between retaining walls, a double track steel viaduct 2,989 ft. long, the Kaw river bridge 743 ft. long and a viaduct 4,280 ft. long with an approach embankment at the west end 3,760 ft. long.

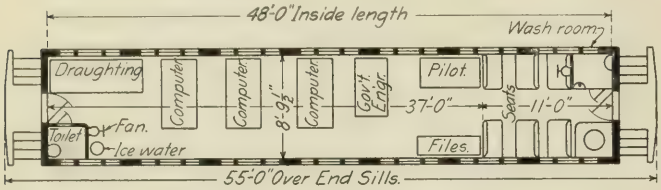
The viaduct will consist of standard double track deck plate girder construction designed for Coopers E-60 loading, while the river crossing will consist of two 300 ft. pin-con-

nected spans and a 132 ft. riveted span. This structure has been designed for Coopers E-80 loading, using 25 per cent increase of unit stresses. The tracks on the lower level will be for freight service while those on the upper level will be used by passenger trains and will connect with tracks leading direct to the passenger station.

This structure has been designed and will be built under the direction of John V. Hanna, chief engineer and George E. Tebbetts, bridge engineer of the Kansas City Terminal Railway.

A CAR FOR A VALUATION PARTY

The photograph and drawing illustrate a passenger car which has been remodeled for use as an office car by a party engaged in making the valuation of the Bessemer & Lake Erie. As will be noted from the illustrations the seats have



Plan of the Arrangement

been removed from the car except at one end and have been replaced by desks for the use of the pilot, the Government engineer and the computers. The members of this party are provided with a convenient permanent office, which is at the same time portable as the car can be moved from place to



Interior of the Valuation Car

place with the progress of the work. It is lighted with both oil and electric lights. The parcel racks have been left in place to provide storage for papers, while a filing case is also provided in one corner of the car.

CHANGE IN NAME OF RUSSIAN PORT.—The name of the new Russian town and ice-free port at the terminus of the Murman Railway has been changed from Port Murman to Romanoff-on-Murman.

THE TRAIN DESPATCHER AND SAFETY FIRST

By J. L. Coss

With all that has been written and all the money that has been spent in teaching "Safety First," during the past five years, I have yet to see anything on the subject in connection with the train despatcher or his surroundings. If there is any place on the railroad where Safety First should prevail in all its phases it certainly is in the despatcher's office, where a blunder might cost many lives and thousands of dollars' worth of property.

In the first place, the location and surroundings of the office should be taken into consideration. The surgical fraternity would hesitate to locate a hospital in close proximity to a boiler shop. If the despatcher's office is located near the yard, or in the yard, where switch engines are drilling all day and throughout the night, blowing off steam and whistling, it stands to reason that there is more liability of mistakes than in a quiet office, and more especially where the telephone is used, and at times (summer) when the windows of the office must be kept open.

Where clerks are allowed to go into the despatcher's office and paw over the train sheets while on the despatcher's table, in search of some bit of information—as to when a train or an engineman will be in, because some of his folks called up on the telephone, or to fill in an item on some report—it will, beyond question, distract the despatcher's attention from his duties. There is no report so important that it cannot be withheld until the sheets have served their purpose on the despatcher's desk.

It will be conceded by any experienced railroad officer that the most dangerous time in the despatcher's office during the twenty-four hour period is that when the despatchers are making the transfer from one to the other. At this very hour it seems to be the custom of some chief despatchers to become particularly interested in the crews and engines; and to commence to check the sheets on the despatcher's table. They want to use the old sheet for a while and to question the outgoing man as to what he knows about this, that and the other. With all this uproar going on at the time of transfer there is a chance that the outgoing man may fail to apprise his relief of some point concerning an important order; and all because they were not left undisturbed during the transfer.

Telephone conversations should never be permitted on the despatcher's wire, under any circumstances, unless entirely impossible to use the regular wire; but it seems as though at the transfer period there is always some one or more who want to talk. Every one—operators, agents and officers—should bear in mind the transfer periods and remember that such are critical times; hold off a few minutes unless it is necessary to speak about something connected with the movement of a train.

Another bad practice is that of the fellow who enters the office abruptly and squalls out something at the despatcher; who, at that particular moment may be checking a wait or a meet order. A mistake would result in a disaster. With the telegraph wire, it is possible to partly carry on a conversation and know what the sounder is saying, but not so with the telephone.

When carpenters have to repair the despatcher's office the men should be moved to other quarters. The noise will interfere with their work and it is a strain on the mind to try to work under such conditions.

When the chief despatcher finds it absolutely necessary to ask something of the trick man, the question should be noted on a piece of paper and laid before him on the desk, instead of calling to him about it. No employee would think of rushing into the superintendent's private office and calling out something in a loud voice; the despatcher's office demands the same respect.

New Influences Affecting Passenger Traffic*

The Automobile Successfully Competing With Railway Service Uses Roads Railway Taxation Helps to Pay For

By Samuel M. Felton
President of the Chicago Great Western

BEFORE our day the railways had to meet and overcome the stage coach, the canal and the steamboat. Today the first named is to be found only in museums. The state of New York has invested over a hundred million dollars in an attempt to make the old Erie canal an efficient competitor of the New York Central and other railway lines between Buffalo and New York. The activities of the steamboat are largely confined to the Great Lakes, the Sound and our two ocean coasts, with the aid of the Panama Canal. I presume we will always have the canal with us, barring a slide now and then.

About twenty years ago, the railways found themselves confronted with a new competitor in the suburban electric railways. No sooner had these children of electricity relegated the horse car to the scrap-heap than they began extending their field of operations in every direction from the great cities and in connecting up the smaller towns. In 1890 less than one-sixth of all street railways were operated by electrical power. In 1912 over 41,000 miles were so operated. In 1902, the revenues of the electric railways were less than $250,000,000; in 1912 they were more than $567,000,000, an increase of nearly 130 per cent. In the meantime the passenger revenues of the railways increased but 67 per cent. It is, of course, impossible to tell how much steam railway passenger travel was diverted to the electric, but with the latter paralleling the former wherever the density of population invites, coupling all the large cities with the smaller ones in their vicinity, with the gradual improvement of electric cars, in size, speed and conveniences, to the standard of steam passenger cars, it is a conservative guess that in 1916 the loss of the steam railways to the electrics was over $100,000,000. And this was clear loss, for the steam railways have maintained a service more than equal to handling the greater traffic.

The direct effect of this electric railway competition is shown in the increase in the average journey per passenger from 24.06 miles in 1890 to 33.6 miles in 1915. Remember that as the density of population increases, the tendency is all the other way. Between the same years, the average journey in Interstate Commerce Commission Group II, which includes New York, New Jersey and Pennsylvania, increased from 16.73 to 24 miles, or 43.45 per cent. This tells the story of a wholesale transfer of the short, or commuter, haul from the steam to the electric railways.

But the latest Richmond to appear in the field promises to be a more universal and troublesome customer to deal with. No fixed rails have to be laid and paid for to contract its sphere of operations. It has no charge for maintenance of way and structures. Anyone with the price of a Henry Ford a few gallons of gasoline in his blue jeans can enter the lists with the most costly twelve car Pullman train in the land. The whole vast continent affords the field for its operations. It multiplies its numbers, adaptability and efficiency, and reduces its initial cost in a night and no man can place a limit on the sphere of its usefulness. It is free to pick up its owner or its passenger at any place and hour, and bear him whither he would go—not quite as straight as the crow flies, but almost as rapidly and surely as the rabbit runs.

You have only to stand on the corner of any main thoroughfare leading into our great cities to see a procession of possible railway passengers numbering in the thousands going in and out every night and morning. At a point eight miles from the City Hall in Chicago these automobiles flit by for two hours night and morning at the rate of over a hundred a minute at an average speed of twenty to twenty-five miles an hour. Is it any wonder that between a paralleling trolley line and automobile competition the Chicago & North Western, which formerly had a monopoly of the Chicago north-shore passenger traffic, should see its average passenger journey lengthened from about 27 to 35 miles during the last 16 years?

But automobile competition is not confined to the suburban traffic. There seems to be no limit on the touring range of the automobile. There were something like 50,000 visiting automobiles registered in the state of Massachusetts last summer. Now no one can tell within approximate figures how this affected the passenger revenues of the New England roads. It probably cut into the receipts of the electric lines as well.

However, there is one barometer by which we can arrive at some idea of the effect of this competition on railway passenger revenues. During the seven years 1907 to 1914, in the face of active trolley competition, the passenger revenues increased at the rate of over 3 per cent per annum. We know that passenger revenues respond more quickly than freight revenues to any general prosperity and we know from observation that in 1916 Americans, on account of the European war, traveled all over this continent in swarms beyond anything known in its history, and yet railway revenues from passengers for 1916, while showing an increase over 1915, when depression ruled the land, were actually $7,000,000 below those for 1913 and more than $12,000,000 below those of 1914. Had our passenger revenues in 1916 shown the normal increase over 1914 they would have yielded the railways of the United States more than $750,000,000 in passenger revenues. In fact, they were less than $696,000,000. This loss of $54,000,000 cannot be traced to any other cause than the automobile.

Nor is this surprising, for the government recently announced that there were 2,445,664 automobiles registered in the United States. These averaged a carrying capacity of at least five per car, or over twelve million. This is more than three times the seating capacity of all the railway passenger cars in the United States.

The total number of passengers carried by the railways last year was slightly over a billion. It would have been no trick at all for the automobiles registered in 1916 to carry this billion passengers their average journey of 33 or 34 miles in one hundred days.

I present these figures to emphasize the potentialities of the motor in competition with the steam railway. On the other side of the ledger, carrying automobiles and auto supplies adds to the freight revenues and carrying the heavy trunks of tourists adds to express revenues.

There is another angle to this motor competition that does not strike the funny bone of the railway manager as you might fancy it would. The improved roads throughout the union, which are making this motor transportation increasingly popular at the expense of the railways, are themselves built, repaired, and maintained out of the funds raised by

*From an address delivered before the Nebraska Bankers' Association at Omaha, Neb., on October 24.

general taxation to which in 1916 the railways contributed over $152,000,000.

On top of this loss in passenger traffic comes a sure loss through motor truck competition. The radius of motor truck daily delivery is now well over 30 miles and every mile of improved road the railways help lay adds to its length and efficiency. In England, where good roads have encouraged motor truckage, the railways have met the competition by going into the motor business themselves.

In Nebraska something over 81,000 automobiles are in use this year and the railways paid nearly $2,600,000 in taxes to build roads for these motors to operate on; so you see we cannot escape this competition. How we will meet it has not yet been worked out and I confess the problem stumps me.

Let us see how it is in the neighboring state of Iowa. According to the latest census it had a population of over two and a quarter million. On the first day of July last, 169,700 automobiles were reported in use in Iowa. That is one automobile to every thirteen persons in the state. In other words, the automobiles of Iowa could carry over forty per cent of its entire population every twenty-four hours. In seating capacity they far out-rank that of all the railroad passenger cars used in Iowa.

Let us take another version of this novel situation. The average cost of an automobile is about $500, its average life four years, its average cost of operation including chauffeur, where employed, say $400, making a total of $525 per car, or in round numbers $89,000,000 per annum. This is more than four times the entire earnings from passengers both state and interstate of all the railroads in Iowa for the year ended June 30, 1915, and eight times their earnings from passengers whose journeys began and ended in the state. One-twentieth of the money spent in Iowa for automobiles, added to the railway earnings, would have sufficed to pay the taxes levied on railway property in that state last year. And a part of those taxes went to provide better roads for the joy-riders.

In spite of the fact that there are fewer passengers to carry, the railways are required to operate as many local trains as prior to the introduction of the trolley and automobile. Their trains have always been able to carry more passengers than were in sight and every year the public has demanded better and more expensive service. It is a conservative estimate to say that owing to the advance of everything entering into the service, it costs fifty per cent more to carry a passenger today than it did prior to 1907 when the two cent law was passed. The increased travel which was the theory upon which the economic excuse for that law rested has not materialized. On the contrary, owing to the competition I have mentioned, net passenger revenues have decreased and yet every effort to secure a repeal or modification of that law has failed. The legislatures of Iowa and its sister two cent states refuse to listen to pleas of the railways for a restoration of the three cent rate, although a 2.4 cent rate was pronounced reasonable by the Interstate Commerce Commission for interstate traffic.

Not only have the automobiles cut into the passenger revenues of the railways very seriously but they have added to the hazard and expense of operation to an extent little dreamed of outside of the engine cabs and the loss and damage departments. How many drivers of the 170,000 automobiles owned in Iowa or the 81,000 in Nebraska observe the signs to "Stop, Look, Listen"? It is such a small percentage that the engineers believe that all ignore the warning. Anyhow accidents due wholly to automobiles are increasing to an alarming extent. And although in ninety-nine cases out of a hundred these accidents are due to the recklessness of the automobilists the assessment of damages against the railways for injuries to these trespassers increases in almost exact ratio with the increase of automobiles. And the demand for the abolition of all grade crossings promises to impose added millions to the enormous sums already irrevocably invested in the railways of the United States.

These are no fancy figures or fictitious conditions that I have hurriedly presented for your consideration. In the presence of an almost universal prosperity they intrude themselves upon the attention of the railway managers. They are a few of the death's heads continually present at our feasts over increased traffic. To the sober minded railway official there is little to rejoice over the enormous traffic that taxes his resources and facilities beyond their economic capacity. This is especially true, if the rate at which that traffic is handled does not in itself provide a reasonable return on investment and sufficient surplus for tomorrow's losses.

You bankers are or should be interested in this matter almost as much as railway officials. The financing of railways new and old is a part of your business. You have influence with your state legislators. It is in your power to persuade them that in squeezing the life blood out of the railways with two cent laws and a thousand and one arbitrary requirements they are killing the transportation goose upon which the business of this vast continent depends. In its infancy the goose may have been a wild one. Today it is the tamest bird that is permitted to fetch and carry for a great people.

SWITCH ENGINES FOR THE LOUISVILLE & NASHVILLE

The Louisville & Nashville has recently built eight 8-wheel superheater switch engines, road numbers 2100 to 2107, at its South Louisville shops, that are giving excellent results. These locomotives weigh 219,000 lb. on drivers in working order, and have a tractive effort of 46,900 lb. at a working boiler pressure of 170 lb. They are equipped with the sectional fire brick arch on water tubes, Schmidt superheater, Walschaert valve gear and a power reverse gear* designed by M. F. Cox, assistant superintendent of machinery. These were the first superheater switch engines to be used on this road, and in order to obtain more accurate knowledge of the working service rendered by them, a practical running test of a month's duration was made in comparison with a six-wheel, non-superheater switch engine previously used in the same service in which the new engines are now regularly employed. The following table gives the principal dimensions of these two terminal engines, the average boiler pressure and the actual working time during the test:

	6-Wheel Switcher Saturated Steam	8-Wheel Switcher Superheated Steam
Weight on drivers	138,000 lb.	219,000 lb.
Cylinders (diameter and stroke)	19 in. by 26 in.	23½ in. by 30 in.
Diameter of driver	52 in.	51 in.
Boiler pressure	180 lb.	170 lb.
Tractive effort	27,600 lb.	46,900 lb.
Average boiler pressure during test	174.4 lb.	162.3 lb.
Actual working hours	654½	749

The report shows that during the test the eight-wheel switcher evaporated 28,000 gal. of water more than the other, and consumed 19,600 lb. less coal. At the same time it performed three times as much work; that is to say, it moved three times the actual tonnage per hour of the smaller engine. This exceptionally large difference in tonnage handled by the superheater engine is due to several reasons: The new engine is powerful enough to handle the freight trains intact, whereas the lighter switch engine found it necessary to move them in sections; the superheater engine is much smarter than the saturated steam engine, and will pick up and get away with a load in a much shorter time; where long hauls are necessary the superheater engine will operate at greater sustained speeds, and with a larger num-

*A description of this power reverse gear was published in the *Railway Age Gazette*, November 10, page 839.

ber of cars than the saturated steam engine. In addition to this the quickness with which the cars can be switched, due to the power reverse gear, is responsible for a large part of the increased work performed by the superheater engine. Engineers who handle these engines state that the power reverse gear alone enables them to accomplish from 10 to 15 per cent more work than with those engines which do not have this gear. This has been found to be true on other railroads operating switch engines with the power reverse gear. During the test the maintenance cost for the two engines was practically the same.

These new engines have a weight per axle of 54,750 lb. and a factor of adhesion of 4.68. The boiler is made in two courses, the first course having an outside diameter of 80 in. It is designed for a working pressure of 200 lb. The frames are 5 in. wide, and have a depth of 7 in. in the pedestal jaws. The engines are well proportioned, unusually free steamers with an abundance of firebox heating surface. They have a superheater heating surface of 525 sq. ft., and a total equivalent heating surface* of 3,167 sq. ft. The general dimensions and important data concerning these locomotives are as follows:

General Data.

Gage	4 ft. 8½ in.
Service	Switch
Fuel	Soft coal
Tractive effort	46,900 lb.
Weight in working order	219,000 lb.
Weight on drivers	219,000 lb.
Weight of engine and tender in working order	358,000 lb.
Wheel base, driving	15 ft.
Wheel base, total	15 ft.
Wheel base, engine and tender	54 ft. 4 in.

Ratios.

Weight on drivers ÷ tractive effort	4.68
Total weight ÷ tractive effort	4.68
Tractive effort × diam. drivers ÷ equivalent heating surface*	755.00
Equivalent heating surface* ÷ grate area	59.70
Firebox heating surface ÷ equivalent heating surface,* per cent	7.01
Tube heating surface ÷ firebox heating surface	9.70
Weight on drivers ÷ equivalent heating surface*	69.10
Total weight ÷ equivalent heating surface*	69.10
Volume both cylinders	15.1 cu. ft.
Equivalent heating surface* ÷ vol. cylinders	210.00
Grate area ÷ vol. cylinders	3.5

Cylinders.

Kind	Simple
Diameter and stroke	23½ in. by 30 in.

Valves

Kind	Piston
Diameter	14 in.
Greatest travel	6 in.
Lap	1 in.
Exhaust clearance	0 in.
Lead in full gear	3/16 in.

Wheels.

Driving, diameter over tires	51 in.
Driving journals, main, diameter and length	10 in. by 12 in.
Driving journals, others, diameter and length	9½ in by 12 in.

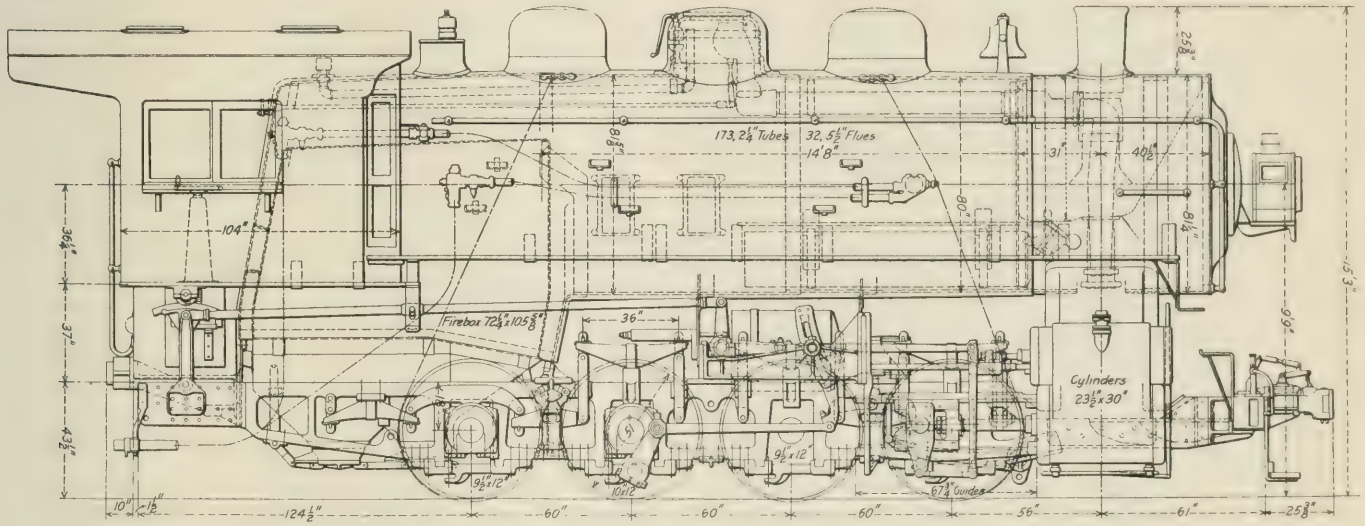
Boiler

Style	Straight
Working pressure	170 lb. per sq. in.
Outside diameter of first ring	80 in.
Firebox, length and width	105⅝ in. by 72¼ in.
Firebox plates, thickness	⅜ in.
Firebox, water space	4½ in. and 5 in. (front)
Tubes, number and outside diameter	173 2¼ in.
Flues, number and outside diameter	32 5½ in.
Tubes and flues, length	14 ft. 8 in.
Heating surface, tubes	1,485 sq. ft.
Heating surface, flues	672 sq. ft.
Heating surface, firebox	202 sq. ft.
Heating surface, arch tubes	20 sq. ft.
Heating surface, total	2,379 sq. ft.
Superheater heating surface	525 sq. ft.
Equivalent heating surface*	3,167 sq. ft.
Grate area	53 sq. ft.
Smokestack, diameter	16 in.
Smokestack, height above rail	15 ft. 3 in.
Center of boiler above rail	9 ft 9 in.

Tender

Tank	Water bottom
Weight (light)	58,565 lb.
Water capacity	7,000 gal.
Coal capacity	12 tons

*Equivalent heating surface = total evaporative heating surface + 1.5 times the superheating surface.



Eight-Wheel Switch Engine Built by the Louisville & Nashville

ELECTRIC HEADLIGHT CASE

The Interstate Commerce Commission has taken under advisement without comment, after all-day oral arguments on November 27, the controversy concerning the proposed rule to adopt high power locomotive headlights. The details of the hearings which were held on October 30 and 31 and November 1, 2 and 3 were reported in the *Railway Age Gazette* of November 3 and 10.

In the closing oral argument, Solicitor Charles C. Paulding of the New York Central, as chairman of a special committee including Duane E. Minard of the Erie and Stacy B. Lloyd of the Pennsylvania, declared that every contention of the carriers as to the danger and impracticability of the "searchlights" in many cases had been fully established and corroborated by a preponderance of the most credible testimony. He urged that the only proper rule for the commission to adopt would be to prescribe a reasonable minimum power for headlights, to be made capable of exact measurement by beam candle power, which would enable different railroads to adapt their headlights to the widely-varying conditions on different lines in different localities, which the testimony showed is essential to safe and efficient operation.

Grand Chief Warren S. Stone of the Brotherhood of Locomotive Engineers, made the only argument for the electric headlights, speaking for two hours and citing the testimony of member engineers that they had had no trouble whatever in using the intense headlights on western roads,

such as being blinded by the dazzling glare when trains meet, misreading of signals through false colors, phantom lights and reflections, as described by a score of engineers called by the carriers and testified to as the result of numerous tests. He insisted that the electric headlights should be considered a safety device.

Solicitor Paulding pressed the point upon the commission that what might be satisfactory and safe on one railroad might be impracticable and dangerous on another, because of the variance of local conditions, and that what can be used on the single-track lines in the sparsely-settled regions of the West might be utterly impossible on the multiple-track roads of the East and in the congested districts and suburbs around the big cities. He reviewed the voluminous testimony at length to support the insistent declaration of operating officials and many enginemen that the "searchlights" would be a serious menace to safe operation where traffic is dense and many trains are constantly passing one another at high speed on adjoining tracks, setting at naught the elaborate systems of block signals, through which safe operation has been achieved and the accurate operation of which depends upon correct reading of colored lights by engineers.

Attorney Lloyd made the closing argument, answering the plea of Grand Chief Stone, and briefs were filed by both sides.

Charges Violation of Penal Law

A sensational feature of Solicitor Paulding's vigorous argument was the statement that the brotherhood chiefs, in expelling engineers from membership for testifying to their belief that the electric headlights are dangerous, had violated the Federal Penal Code, which prescribes a fine of $5,000 and six years' imprisonment for intimidation or wrongful influencing of witnesses in a proceeding before a United States court or commissioner.

The railroads' counsel scathingly denounced the brotherhood constitution's provision providing that "any member who interferes with a legislative matter being conducted by the legislative board shall be expelled." He called attention to the warnings sent broadcast to engineers that they were subject to expulsion if they testified, and cited the case of David Trostle, an engineer who admitted under oath that while he was waiting to take the witness stand, Alonzo G. Pack, assistant chief inspector on the government staff of Frank McManamy, had "reminded him of the brotherhood rule that he could be expelled for interfering in legislative matters" even within the hearing chamber of the Interstate Commerce Commission. With the testimony of the brotherhood witnesses so directly contradictory of all the mass of testimony of engineers and others who testified of difficulties in vision through false colors, reflections and blinding glare from the high-power lights, as produced by the railroads, the two could not be reconciled and it resolved itself into a matter of the credibility of the witnesses, said Solicitor Paulding.

He urged the commission to consider that 85 engineers had appeared voluntarily to testify against the "searchlights" on October 30 in spite of the drastic punishment inflicted upon a score of their fellows for giving evidence previously and in face of the fact that under the law of the brotherhood they could be expelled for attending. He said that the sworn testimony given at such great personal risk, all corroborative of the contentions of the railroad operators, was entitled to the utmost credence. Counsel regretted that the commission had not been able to observe the character and demeanor of these engineers on the witness stand, having delegated the taking of testimony to Examiner-Attorney Hines. He quoted numerous expressions, including that of one engineer that he had voluntarily come "to protect myself and the public against the enforced use of a device which means death."

STATE RAILROAD LEGISLATION IN 1916

Statutes affecting the operation of railroads, as passed by eight legislatures in 1916, are abstracted below:

Louisiana

In its 1916 session the legislature of Louisiana passed four bills affecting the operation of railroads. Senate Bill 178 prohibits the malicious removal or interference with journal bearings or brasses, parts or attachments of any locomotive, tender or car, or any fixture or attachment belonging to or connected with such equipment. Proof of the possession of any of the above named articles without the authority of the railroad constitutes prima facie evidence that they were stolen.

Senate Bill 179 makes it unlawful for any person to purchase or receive for sale, in pledge, on storage, or for safe keeping any link, pin, bearing, journal or other article of iron, brass or metal, which is used exclusively for railroad purposes, without the written consent of the president, vice-president or purchasing agent of the railroad owning the same.

House Bill 375 prohibits any person or firm from requiring employees to purchase food, clothing or merchandise from any individual person, firm or corporation, or to exclude from work, punish or blacklist any employee for failure to deal with such parties.

Senate Bill 174 authorizes municipal corporations to require railroads within the limits of the municipality to maintain at intersections of tracks with streets, gas or electric lights, similar to, and of equal power, to those used for municipal street lighting. Railways may appeal to the courts to test the necessity for, and reasonableness of, any individual ordinance affecting the installation of lights.

South Carolina

At the last session of the South Carolina legislature the following laws were passed:

House Bill 1368 provides for the appointment by the governor of a board of conciliation the duties of which are to investigate industrial disputes, strikes or lockouts, to report their findings to the governor and the general assembly, to act as arbitrators when requested by both parties, and to remove, as far as possible, the causes for such disputes. The board shall consist of three members, one an employer, one a member of a labor union and the third neither an employer nor an employee.

House Bill 1470 requires every railway receiving live stock for transportation to load it not more than two hours before the scheduled departure of trains, and to unload within two hours after arrival at destination. This act does not apply at stations where no unloading pen is maintained, or where there is no agent on duty when the train arrives. A longer time may be allowed for loading or unloading if voluntarily consented to in writing by the owner or shipper. A consignee desiring a longer time for unloading must make his request in writing.

House Bill 1256 amends Section 4 of an act approved February 19, 1915, making it unlawful for any railroad to remove its line from any incorporated town of more than 500 inhabitants through which it runs.

Senate Bill 1007 amends a locomotive headlight statute by extending the time in which all locomotives must be equipped with headlights of a specified character from February 2, 1916, to February 2, 1917.

Kentucky

Railroad legislation passed in the last session of the Kentucky legislature includes a statute requiring railways to pay employees as often as semi-monthly all wages earned up to not more than eighteen days prior to the date of payment. Another law applying to restaurants or other public places where food is sold, incidentally applies to railroads.

It includes provisions for the proper lighting, draining, plumbing, ventilation and sanitation of such places, and the protection of food from flies, dust and dirt.

Virginia

The following laws were passed in the last session of the Virginia legislature:

Senate Bill 99 and House Bill 405 prohibit the use of common towels in any public lavatory or washroom in any building, or any railroad train or steamboat.

House Bill 208 requires railways to equip locomotives, operated through or near wooded country and not burning oil, with appliances to prevent, as far as possible, the escape of sparks from smokestacks, and of fire from ash pans and fireboxes.

House Bill 321 prohibits a common carrier or innkeeper from discriminating against persons in the military or naval service of the United States, provided that such persons are sober, orderly and willing to pay civilian rates.

Massachusetts

In its last session the Massachusetts legislature passed two amendments to the arbitration act of 1914, one providing that the act shall cease to be operative when the State Board of Conciliation and Arbitration determines that the business of the employer, implicated in labor trouble, is being carried on in the normal and usual manner and to the normal and usual extent. The board can make this determination upon application of the employer only after a full hearing of all persons involved. The other amendment modifies the penalty section of the act by providing that investigation, which is required before fines can be assessed, be made by the State Board of Labor and Industries, instead of the Board of Conciliation and Arbitration.

New Jersey

The state legislature of New Jersey passed a law in its last session authorizing boards having charge of public park lands through which a railway passes, to make agreements with the railway for changing the location of tracks when such a change is desired by the board, to make an agreement as to the payment of costs, and to grant the road a right of way for new location.

New York

In the last session the legislature of New York passed the following laws affecting railroads:

House Bill 176 amends Section 21, Chapter 481, Laws of 1910, relating to crossings by requiring railways which cross highways at grades to construct and maintain roadways of planking, or equally serviceable material. Such roadways must be at least 16 ft. wide, must extend one foot outside of the rails and cover the entire space between the rails.

House Bill 995 amends Section 193 of the penal law by extending the time during which livestock in transit may be confined from 24 to 28 consecutive hours.

House Bill 408 amends Section 1982 of the penal law, making it a misdemeanor for a railway to employ in or about the operation of an engine or train, men unable to read time tables and ordinary handwriting, unable to speak, hear or understand the English language, or to see and understand signals required by the book of rules governing the operation of trains. This act does not apply to flagmen at street crossings.

Mississippi

The state legislature of Mississippi passed the following laws affecting railroads at its last session:

House Bill 684 requires railroads to erect warning strings at a distance of not less than 100, nor more than 250 ft., on both sides of bridges or overhead objects which have not a clearance of at least 22 ft. from the top of the rails, and at least 7 ft. between running board of cars and lowest projection.

House Bill 379 imposes a license fee on individuals or corporations contracting to operate grab cars, boarding cars or commissaries in box cars, of two or more outfits, for supplying employees or others with goods or merchandise. A fee of $100 is levied for each county in which they operate that has a city, town or village of 10,000 inhabitants or more; $50 for each county that has a city, town or village of less than 10,000 or more than 5,000; and $10 for each county having only smaller towns. This act does not apply to roads operating their own grab cars for furnishing merchandise to their employees only.

TRAIN ACCIDENTS IN OCTOBER[1]

The following is a list of the most notable train accidents that occurred on the railways of the United States in the month of October, 1916:

Collisions

Date	Road	Place	Kind of Accident	Kind of train	Kil'd	Inj'd
1.	Atlantic C. L.	Folkston.	rc	P. & P.	0	32
4.	Atlantic C. L.	Hobgood.	rc	P. & F.	0	2
*5.	Penn.	Lewistown.	rc	P. & F.	2	22
8.	C. C. C. & St. Louis.	Fern Bank.	xc	F. & F.	3	2
12.	W. Maryland	Cumberland.	xc	P. & P.	2	13
12.	Mobile & Ohio	Corinth.	bc	F. & F.	0	3
†15.	Chicago, B. & Q.	Elwood, Neb.	rc	F. & F.	10	11
24.	Union Pac.	Bushnell.	xc	P. & F.	2	3
26.	Missouri Pac.	Lake Junc.	bc	P. & P.	0	6
28.	C. C. C. & St. Louis.	Rushsylvania.	rc	F. & F.	0	5

Derailments

Date	Road	Place	Cause of derailment	Kind of train	Kil'd	Inj'd
3.	N. Y. N. H. & H.	Bridgeport.	acc. obst.	P.	0	0
6.	Chicago & A.	Granite City.	unx	P.	0	6
10.	Augusta So.	Gibson.	unx	P.	0	5
15.	Seaboard A. L.	Clinton.	unx	P.	1	0
16.	Southern Pacific	Watsonville.	unx	P.	..	..
19.	Chicago & N. W.	Manitowoc.	malice	P.	2	0
21.	Southern Pacific	Pinto, Tex.	malice	P.	0	3
23.	Phila., B. & W.	Perryman.	.....	F.	2	1
*26.	Illinois Trac'n.	Edwardsville.	malice	P.	1	2
27.	Georgia	Union Pt.	malice	P.	3	0
29.	Missouri, K. & T.	Lancaster.	loose tire	P.	0	12

The trains in collision at Folkston, Ga., on the evening of the first of October were northbound passenger trains, the "Dixie Flyer" and the "Southland." The engineman and fireman and five other employees, and 25 passengers were injured. The "Southland" was standing at a water tank, and its rear car was wrecked for several feet at the rear end. The collision was due to the failure of the engineman of the "Dixie Flyer" to heed automatic signals, a distant and a home, set against him.

The trains in collision near Hobgood, N. C., on the morning of the 4th, were a northbound passenger and a northbound freight, the passenger running into the rear of the freight. The engineman and fireman were injured. Responsibility for the collision is attributed to the conductor of the freight, who neglected to drop off a fusee.

The trains in collision at Lewistown, Pa., on the morning of the 5th, were eastbound passenger No. 6, the Mercantile Express, and a preceding freight train, which was crossing from one track to another. The conductor of the freight train and a drover were killed, and fourteen passengers and eight mail clerks were injured. The collision occurred in a dense fog, about 1 a. m., and the passenger train appears to have passed distant and home signals set against it. The cars in the passenger train were of steel, and the injuries on this train were not severe. In the freight train, four cabooses and seven cars of cattle were destroyed. A fire broke out in the wreck and the body of the drover was burnt up.

[1]Abbreviations and marks used in Accident List: rc, Rear collision——bc, Butting collision——xc, Other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——Malice, Malicious obstruction of track, etc.——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

The trains in collision at Fern Bank, Ohio, on the 8th, were a westbound and an eastbound freight, and one engine and three cars were wrecked. Three trainmen were killed and two were injured. The collision occurred within interlocking limits, during a dense fog. The cause was the disregard, on the part of the westbound train, of a distant and a home signal, set against it.

The trains in collision, near Cumberland, Md., on the 12th, were an excursion train bound for Hagerstown, and a yard train carrying employees. Two employees were killed, and 17 employees and 13 passengers were injured. There was a dense fog at the time. The collision was due to misunderstanding or misconstruction of orders (or rules) on the part of the excursion train, which was running as an extra.

The butting collision near Corinth, Miss., on the 12th, was between through freight trains. Both engines were wrecked and three trainmen were injured. The cause of the collision was a mistake on the part of an operator, allowing one of the trains to pass the station where it should have waited for the other.

The trains in collision at Elwood, Neb., on the 15th, were eastbound cattle trains. The leading train had come to a stop, and its caboose was wrecked by the engine of the following train. Twenty or more men, including a number of drovers, were in the caboose of the leading train, and of these men, ten were killed and eleven were injured. The cause of the collision was the failure of the men in charge of the standing train to properly signal the train following.

The trains in collision near Bushnell, Neb., on the 24th, were a westbound freight, standing on the center passing track, and an eastbound freight, which had run past distant and home automatic block signals set against it. A part of the wreck fell on the westbound main track, and was run into by a passenger train. Two trainmen were killed, and three injured.

The trains in collision at Lake Junction, Mo., on the 26th, were eastbound and westbound passenger trains, the eastbound train being on a side track. The westbound train entered the siding by reason of a switch being misplaced by the station man a moment before the train reached it. Four passengers and two trainmen were injured.

The trains in collision at Rushsylvania, Ohio, on the 28th, were a freight and a wrecking train. The freight was standing on a side track and was run into at the rear by the wrecking train. Five employees were injured.

The train derailed at Bridgeport, Conn., on the 3rd, was a southbound passenger. At the crossing of a street the train struck a cart, killing the driver and his horses; the wreck of the cart turned a switch, and because of this the train ran on to a side track where the engine was knocked off the track by striking a car and fell off a wall to the street. Here another cart was wrecked, but its driver escaped. The engineman and fireman escaped by jumping off.

The train derailed near Granite City, Ill., on the 6th, was westbound passenger No. 3. Six passenger cars were overturned, injuring a mail clerk and several passengers.

The train derailed near Gibson, Ga., on the 10th, was a southbound special carrying a show. Two box cars were overturned, and five passengers were injured. The cause of the derailment was not discovered.

The train derailed at Clinton, S. C., on the 15th, was southbound passenger No. 5. The train was running at low speed around a curve; three cars were overturned. The fireman was fatally injured by jumping off.

The train derailed near Watsonville, Cal., on the 16th, was a northbound express. The mail car was overturned.

The train derailed near Manitowoc, Wis., on the 19th, was northbound passenger No. 111. The engine and three cars were ditched. The engineman and fireman were killed. The derailment was due to a misplaced switch. The switch had been thrown by some malicious person who had changed the light to indicate all-right.

The train derailed at Pinto, Tex., on the 21st, was eastbound passenger No. 8, and the engine and four coaches were ditched. Three trainmen were slightly injured. The cause of the derailment was a malicious obstruction.

The train derailed at Perryman, Md., on the 23rd, about 2 a. m., was a southbound freight. The train was moving on a side track, and, its speed not being properly controlled, the engine was ditched at the derailing switch at the outgoing end of the siding. The engineman and fireman were killed.

A locomotive, without a train, northbound, coming along a few minutes afterward, ran into the wreck and its fireman was slightly injured.

The engineman of the southbound train evidently lost control of his engine soon after entering the siding as his speed increased considerably after leaving the main track.

The train derailed on the Illinois Traction Line near Edwardsville, Ill., on the 26th, was southbound passenger No. 79, consisting of a single coach. The coach fell down a bank and took fire from its heating stove. One passenger was burned to death and two were injured. The derailment was due to a loose rail, spikes having been pulled, by persons unknown, on both sides of the track.

The train derailed at Union Point, Ga., on the 27th, was westbound passenger No. 1. The engine was overturned and the three men on it were killed. The cause of the derailment was a maliciously misplaced switch.

The train derailed at Lancaster, Tex., on the 29th, was a northbound passenger. Three coaches left the rails and twelve passengers were slightly injured. The derailment was due to a loose driving-wheel tire.

A NEW TELEGRAPHIC CIPHER CODE

A new telegraphic code has been prepared by J. Edwin Dempsey, Chicago, for general railroad use; and it has already been adopted by a number of prominent roads. It aims not only to take the burden off wires by reducing the length of telegrams, but to be so simple and well adapted to the needs of the user that the economy in transmitting messages is not overbalanced by the added cost of coding and decoding. As a bulky code book may defeat the end it is designed to accomplish, i. e., ready use, the Dempsey book was not prepared for general application to all railroads, but is modified to suit the peculiar requirements of individual lines, as determined after a thorough study of its telegraphic messages. All Dempsey books, however, contain standard expressions to cover the needs of interline messages, thus preparing the way for a universal system of intercarrier coding, as more roads adopt this system. The code book is a small volume, 4¼ in. by 6¾ in. and ⅜ in. thick, containing 219 pages. It includes a vocabulary of words and phrases commonly used in carrying on the business of an individual road, arranged alphabetically, thumb indexed and cross indexed, all phrases being classified according to the prominent word in the phrase. The back part of the handbook is devoted to special departments (also alphabetically arranged and thumb indexed), covering freight classification terms, the names of railroads, railway associations and standing committees, common commodities, numerals and rates, prominent shippers on the line, officers, titles and stations peculiar to the carrier.

A valuable feature of the system is the utilization wherever possible of tables to cover the large number of stereotyped messages which differ only as to detail. Tables have been prepared to cover sleeping and parlor car reservations and cancellations, ticket deliveries, requests for domestic and export freight rate quotations and answers thereto, embargoes, the tracing of c. l. and l. c. l. freight, the handling of

baggage, references to incoming and outgoing letters and their dates, etc. For example, one table covers reservations for accommodations on standard sleeping and tourist sleeping cars and parlor cars. The code words are classified under the general headings, "standard sleeping car," "tourist sleeping car" and "parlor car"; under the primary sub-headings, "drawing room," "compartment," "section," "lower berth," "upper berth," and "seats"; and the secondary sub-headings, "answer by wire" and "answer by mail." The code words are alphabetically arranged in columns under each secondary sub-heading, a different word being provided for each date of the present and coming month. To illustrate: If a reservation is to be made for a lower berth on a standard sleeper and a prompt reply to the request is desired, the code word will be used which is in line with the proper date in the column under the general heading "standard sleeping car," the primary sub-heading "lower berth" and the secondary sub-heading "answer by wire." If for instance the code word under these heads were "plate," to apply to the date, November 25, and the name and address of the party desiring the berth were Appleton, New York, the message would read: "Plate Appleton, New York." It is understood with each message that the reservation will be claimed at the point of application unless otherwise specified, when the name of the station where it will be claimed is added to the message, as for example, "plate Appleton, New York, Philadelphia." An advantage of the tabular system is that a table may be placed under a glass before each clerk, covering his particular branch of service, thus relieving him of the necessity of referring to a book to codify or decodify messages.

In negotiations with a railroad which has since adopted this code, Mr. Dempsey, the originator, took one month's messages from a city ticket office of that road—which was using the old Dempsey code—and recoded them according to his new system, with the following results:

Commercial wires:

Western Union messages sent	841
Total number words sent	12,092
Cost	$454.74
Total number of words by new Dempsey system	2,812
Cost by new Dempsey system	$159.54

Railroad Wires:

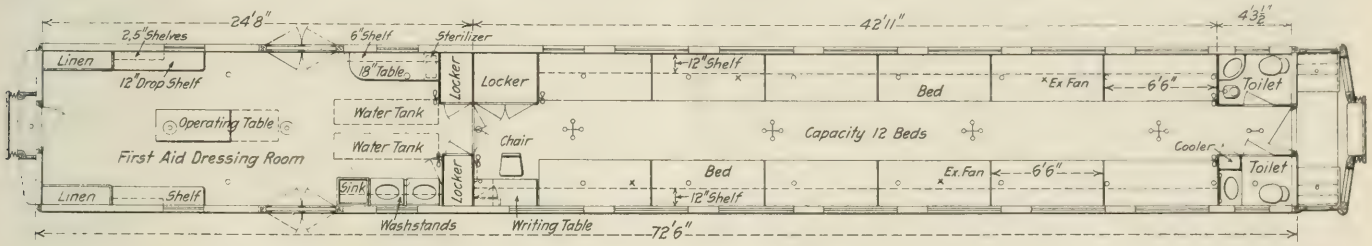
Messages sent	1,191
Total number of words sent	16,674
Total number of words by new Dempsey system	3,573

It will be noticed that the saving in words effected by the new Dempsey system amounted to 9,280, or 76 per cent, for commercial messages, and 13,101, or 78 per cent, for messages over railroad wires. The monetary saving on commercial messages that would have accrued under the new code was $159.54, or 54 per cent.

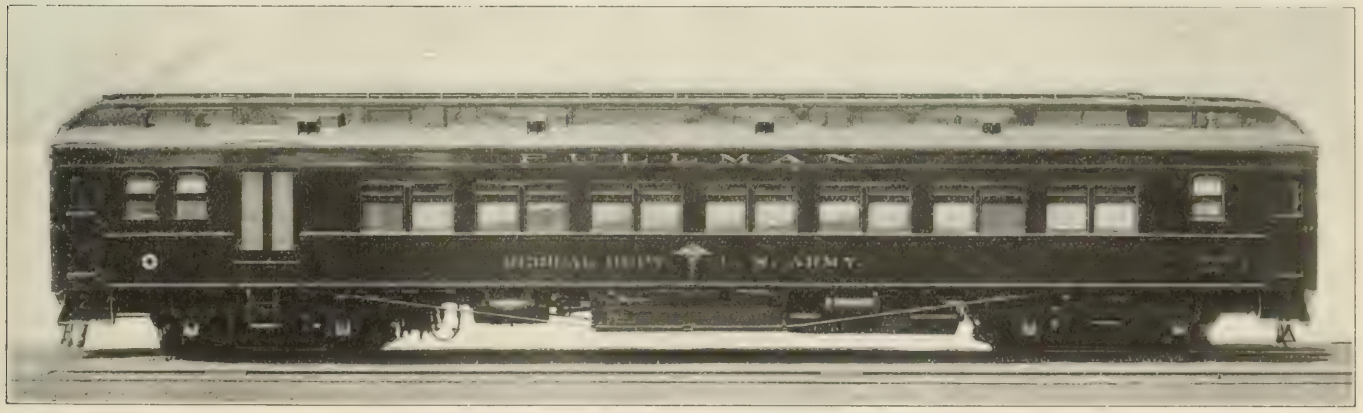
The Dempsey system was completed in 1915. It was recommended for the use of its members by the American Association of Passenger Traffic Officers at its meeting at Washington, D. C., in October. The system was adopted by the Chicago, Milwaukee & St. Paul last January for application in its traffic department, and has since been adopted, for use in all departments, by the Grand Trunk, the Grand Trunk Pacific, the Central Vermont, the El Paso & Southwestern and the Northern Pacific.

HOSPITAL TRAIN FOR THE UNITED STATES ARMY

The Pullman Company has recently delivered to the United States Government a train made up of 10 cars for use by the Medical Department of the U. S. Army at the Mexican border. This train has a berth and bed capacity for 258 persons, including the attendants accompanying the train and the patients. The first two and the last cars are to be used by the attendants and officers in charge. The other seven cars are arranged especially for the patients and contain 52 standard government hospital beds, 16 lower berths and 14 upper berths. The first car contains the



Floor Plan of "First-Aid" Car



Side Door Patient Car for U. S. Hospital Train

kitchen for the entire train. This occupies a space the full width of the car and is 16½ ft. long. This car is made from a standard tourist sleeper with a steel underframe and contains 14 lower berths and 15 uppers. Portable tables are provided for use in the berths, on which the meals are served. This car has ample locker space, a shower bath and a hot water heater for heating the car.

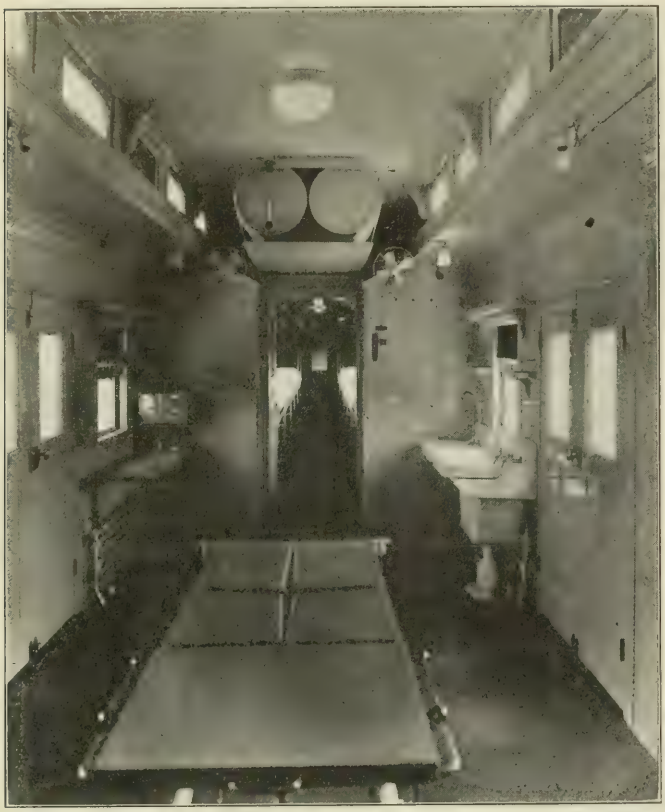
The second car is a standard 16-section tourist sleeper.

the berths in one section of which are removed and the space made into an "office" which contains a field desk, such as is used in the United States Army. This car is also provided with large locker space, a hot water heater and a shower bath, and is used by the attendants accompanying the train. The third, fourth and seventh cars in the train are identical. They are made from tourist cars with the lower berths removed and 3-ft. side doors added for convenience in moving the patients in and out of the car. Each of these cars contains 14 regulation government hospital beds, which are securely attached to the floor. The upper berths are retained, to be used by the moderately ill patients. These cars contain lavatories, toilets and hot water heaters for heating the cars, together with ample locker space.

The fifth car in the train is designated as the "first-aid patient car." It contains a dressing-room, which occupies 24 ft. 8 in. of the length of the car and in which is provided an operating table. This car was made from a parlor car and contains 12 hospital beds with no upper berths. Four-foot side door openings were made in the end, in which the dressing-room is located. The dressing-room is equipped with suitable closets, overhead water tanks, and a sterilizer for sterilizing the operating instruments, bandages, etc. It is painted with regulation interior hospital finish. It is not provided with any hot water heater, being heated directly from the steam line in the train. The seventh car is a remodeled tourist car and contains 14 hospital beds and 14 upper berths. It also has 3-ft. side doors with lavatories and ample locker space, and it is heated by a hot water heater.

The eighth car has a 24 ft. 8 in. storage room at one end of the car for the purpose of storing the various supplies and equipment for the entire train. It is a remodeled parlor car and contains 12 hospital beds. This car is heated directly from the steam line in the train; 4-ft. side door openings open into the storage room. The ninth car of the train is a standard tourist car with 16 lower and upper berths, with lavatory, toilet and locker facilities at each end. This car is heated by a hot water heater. It is used for patients suffering from minor injuries and ailments. The tenth car in the train is a standard drawing-room steel-underframe Pullman sleeper for the officers accompanying the train. This has 14 complete sections with one drawing-room. A shower bath is provided in each end of the car.

All the cars are lighted by electricity from a 30-volt axle generator system applied to each car. All the doors and windows are thoroughly screened, and each car is fitted out with at least four electric fans. There is a large locker space and plenty of extra blankets and wide overhead racks in the patients' cars for the men's equipment. Extra large water carrying capacity is provided, particularly in the kitchen and "first-aid" cars. The outsides of the cars are painted with the Pullman standard finish, with a red cross emblem on each side of the car. These cars were turned over to the government 20 days after the order for them was received.



Interior of "First-Aid" Car Showing Dressing Room and Hospital Beds



Interior of Patient Car with Hospital Beds and Upper Berths

FRENCH RAILWAYS SEEK INCREASES.—The railroad situation in France has arrived at a point where the roads have asked permission to raise rates, both freight and passenger. Since the beginning of the war the losses of the state railroads have been 370,000,000 francs, ($71,410,000) while the other roads have lost 790,000,000 francs, ($152,470,000) and all indications are that next year they will be nearly double the losses of last year. At the same time that receipts are going down, expenses are increasing. Coal, rails, oil, grease and wood all are much higher, and the roads see no hope unless they are allowed to increase their rates.

General News Department

At Shenandoah, Va., November 25, the shops of the Norfolk & Western were badly damaged by fire; estimated loss, including damage to four locomotives, $100,000.

The Woodstock & Sycamore, an interurban road operating a line about 26 miles long between Sycamore, Ill., Genoa, and Marengo, and using gasolene cars, contemplates electrifying the road in the early spring.

At the Reading (Pa.) shops of the Philadelphia & Reading last Saturday afternoon the general manager, Charles H. Ewing, presented to the Reading shop baseball team the A. T. Dice cup. This team won the pennant in competition with several other Reading system teams during the past season. There was music by the shop band, and singing by some of the shopmen.

On the Buffalo, Rochester & Pittsburgh, when some act of more than ordinary merit is performed by an employee, a letter of commendation is entered on his record, and his name is placed on the Roll of Honor, which appears in each issue of the monthly Employes Magazine. During the past four years over 1,000 names have been placed on this roll. Having a place on this honor roll stamps an employee as alert, observing and interested.

The tenth annual cement show will be held at Chicago next February, from the 7th to the 15th, inclusive. The exhibition will be housed under one roof, the balcony as well as the main floor and annex of the Coliseum being used. Over 150 prospective exhibitors have signed for space, 60 of which will be assigned to the balcony. The exhibits are expected better to represent the cement industry as a whole than those of any previous shows.

The college of engineering of the University of Illinois will dedicate, on December 6 and 7, a ceramic engineering building, with laboratories equipped with the latest types of apparatus needed for instruction and research in the manufacture of brick, tile, sewer pipe, terra cotta, cement, glassware, electrical and thermal insulating materials and other ceramic products. The building is three stories in height and covers a ground area of 67 ft. by 189 ft.

Two masked bandits robbed the express car of a Chicago & North Western passenger train, running from Minneapolis to Chicago, on Thursday night, November 23. The men boarded the train near Barrington, Ill., walked into the express car, the door of which had been left open, and bound and gagged the express messenger. After breaking the safe, they secured over $600 in cash, largely consisting of remittances from local railroad agents along the line, and left the train at Clybourn Junction, three miles from the Chicago terminal.

The Railroad Young Men's Christian Association at Brunswick, Md., was rededicated November 15, and there were present Oscar G. Murray, chairman of the board of directors of the Baltimore & Ohio, and other officers. They took part in the dedication of a pipe organ which Mr. Murray gave to the employees. Other gifts which were accepted on behalf of the employees at the evening's exercises were a pulpit, given by Vice-President A. W. Thompson; a bible from James S. Murray, and a set of offering plates from T. Carroll Roberts.

The Pennsylvania Railroad, as part of its campaign to teach children the dangers of taking "short cuts" over railroads and playing on the tracks, has issued an illustrated calendar for use in schoolrooms. It will be supplied for that purpose throughout the cities and towns on the Pennsylvania Lines, both east and west of Pittsburgh. A picture at the top of the calendar shows a typical crowd of children just out of school, hurrying across the tracks. One boy is seen stumbling on the track in front of an approaching train. On the first sheet of the calendar is printed an explanation of the purpose for which it is issued, and each month has some warning. An extra sheet inserted before the opening of the New Year urges some good resolutions, including: "I will STOP, LOOK AND LISTEN at railroad crossings. . . . I will endeavor to persuade others from recklessly inviting danger."

The New York, New Haven & Hartford, on the occasion of the Yale-Harvard football game, on Saturday, November 25, carried into New Haven, in the space of three hours, 11 minutes, 32,423 passengers; and it is said that from 8,000 to 10,000 visitors had arrived in New Haven on the day before. On Saturday, the number of trains carrying passengers from New York to New Haven in the morning was 31, and the number of passengers 18,108. The trains ran through, 74 miles, in two hours. The passengers leaving New Haven Saturday afternoon numbered 33,779, and they traveled on 71 trains, starting between 4 p. m. and midnight. The number of cars used for the football traffic, in addition to the normal movement, was 612—175 Pullman cars and 437 coaches.

The arrests made by the police department of the Baltimore & Ohio during the past year, as reported by Edmund Leigh, general superintendent of police, numbered 12,704. This number included 12 murderers, 2 bootleggers, 7 pickpockets, a gang of counterfeiters, another gang of train bandits, 4 who had committed arson, and 101 others who had received stolen goods. The majority of arrests, however, was for violations of laws against trespassing, train riding, vagrancy, etc. Of the persons arrested, 43 were sentenced by the courts to the penitentiary, 4,194 to jail, 603 to workhouses, 108 to reformatories, 3 were committed to asylums, 3,899 were fined, 1,836 were paroled, 1,773 were released, and 245 are pending. The scarcity of labor has made it possible for the industrious and the honest to earn a comfortable livelihood; but the indolent class have taken advantage offered of traveling from place to place with less difficulty under the guise of seeking employment. The number of tramps and other derelicts is increasing with alarming rapidity, says Mr. Leigh.

The United States Civil Service Commission announces examinations for designing engineers in the Bureau of Yards and Docks, Navy Department, Washington, D. C., at salaries ranging from $10 to $15 a day. The duties of the position embrace the design and supervision of design of large and various engineering works in steel, concrete, reinforced concrete, etc., for the navy yards and naval stations. Competitors will not be required to report for examination at any place, but will be rated on certified statements as to their technical education, experience and fitness. All applicants must have a degree in engineering from a school of recognized standing with subsequent experience of not less than 15 years in general design work, of which five years must have been in responsible charge of the successful design of important engineering. Applicants desiring to file statements should apply at once to the United States Civil Service Commission for Form 1312, stating the title of the examination desired. Applications must be filed with the commission at Washington by December 11.

Railroad Y. M. C. A. Membership Campaign

The membership campaign for 30,000 new members, which was carried on by the Railroad Young Men's Christian Associations of North America for ten days, November 14-24, far exceeded the expectations of its promoters, and resulted in 38,124 new members. This is an addition of 42 per cent to a membership of 90,000 at 250 points, and brings the present membership to between 125,000 and 130,000. The plans for the campaign were carefully worked out in detail during a period of several months preceding the opening of the campaign, and included a continental membership committee of 10,000 railroad men. The record for a single association was established at Trenton, N. J., where 1,521 new men were enrolled. The record for any one railroad went to the Pennsylvania, with a total of 8,874.

REVENUES AND EXPENSES OF RAILWAYS

THREE MONTHS OF FISCAL YEAR, 1917

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses								Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of—											
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.					
Chicago, Milwaukee & St. Paul	10,208	$20,575,498	$5,890,590	$29,404,862	$3,299,233	$4,318,853	$524,099	$9,943,480	$208,239	$496,762	$18,313,515	$11,091,346	$1,472,628	$9,608,710	$925,185	
Chicago, Peoria & St. Louis	255	352,670	85,722	464,575	63,362	104,616	16,997	179,403	.....	17,155	381,533	83,043	18,000	65,043	4,736	
Chicago, Rock Island & Gulf	477	644,235	207,754	911,961	145,266	118,880	29,901	264,492	3,325	25,933	587,740	324,221	24,304	299,682	169,558	
Chicago, Rock Island & Pacific	7,653	13,614,705	5,704,622	20,815,410	2,891,815	3,371,231	407,227	6,614,489	141,768	463,520	13,844,737	6,970,673	896,248	6,070,492	2,873,737	
Chicago, St. Paul, Minn. & Omaha	1,753	3,396,797	1,593,265	5,403,296	762,166	680,508	92,175	1,807,307	50,754	125,941	3,512,974	1,890,323	265,781	1,622,324	515,469	
Chicago, Terre Haute & Southeastern	373	632,208	52,004	702,971	95,802	239,115	12,024	191,499	3,475	22,976	564,597	138,374	32,650	105,717	—10,854	
Cincinnati, Hamilton & Dayton	622	2,224,255	363,138	2,925,815	407,083	384,546	45,855	993,949	10,498	55,727	1,890,390	1,035,425	90,727	943,433	191,811	
Cincinnati, Indianapolis & Western	322	438,982	153,635	650,067	93,771	83,570	21,142	231,297	1,297	19,150	449,777	200,290	28,323	171,967	.....	
Cincinnati, New Orleans & Texas Pacific	337	2,130,060	560,649	2,865,735	232,616	678,522	76,770	754,355	19,729	59,087	1,821,079	1,044,656	110,500	934,038	337,942	
Cincinnati Northern	246	446,426	64,067	530,246	79,089	87,605	10,515	153,258	.....	9,124	339,591	190,655	18,000	172,652	56,559	
Cleveland, Cincinnati, Chic. & St. Louis	2,384	8,185,117	3,000,002	12,228,372	1,390,910	2,206,619	275,899	3,833,585	81,261	235,227	8,000,733	4,227,639	447,000	3,778,964	781,196	
Coal & Coke	197	224,555	57,317	292,986	62,781	75,499	3,023	83,206	.....	8,671	233,180	59,806	15,000	44,806	—6,292	
Colorado & Southern	1,102	1,645,054	534,437	2,344,580	289,557	426,453	35,894	622,370	14,708	68,244	1,457,226	887,354	116,000	770,990	293,627	
Colorado Midland	338	371,612	85,557	495,120	99,273	92,360	21,662	195,893	5,793	16,132	431,113	64,007	27,000	37,000	40,232	
Cripple Creek & Colorado Springs	87	286,563	70,214	363,578	32,636	45,154	7,865	85,309	.....	9,509	180,474	183,104	22,808	160,296	3,048	
Cumberland Valley	164	671,142	185,078	905,082	92,692	92,238	13,900	255,494	2,135	27,177	480,460	424,622	17,879	406,521	60,253	
Delaware & Hudson Co.—R. R. Dept.	886	5,351,520	1,096,679	6,888,527	547,925	1,378,861	97,419	2,324,933	67,520	265,705	4,677,075	2,211,453	175,950	2,032,874	—396,802	
Delaware, Lackawanna & Western	955	9,466,479	2,481,493	13,269,266	1,520,961	1,956,480	224,578	4,093,091	114,950	258,787	8,152,525	5,116,741	667,500	4,448,695	729,582	
Denver & Rio Grande	2,578	5,047,009	1,348,875	6,891,349	878,549	1,078,760	126,813	1,667,975	101,795	200,619	4,054,511	2,836,837	282,000	2,554,167	272,970	
Denver & Salt Lake	255	399,319	139,583	566,585	88,845	97,829	8,138	161,311	.....	15,054	371,177	195,408	31,047	164,360	27,114	
Detroit & Mackinac	383	212,336	99,326	337,571	39,022	54,288	6,038	108,148	1,147	8,537	217,180	120,391	24,165	96,226	39,230	
Detroit & Toledo Shore Line	81	386,723	.....	390,490	28,482	23,364	4,812	103,134	.....	9,589	169,382	221,108	20,400	200,708	50,364	
Detroit, Grand Haven & Milwaukee	191	511,000	203,000	854,776	156,748	105,189	17,180	400,847	3,239	15,071	698,275	156,501	11,889	144,250	—130,996	
Detroit, Toledo & Ironton	441	509,642	53,441	605,833	66,974	90,987	12,504	251,320	.....	17,903	439,687	166,146	18,000	148,055	24,422	
Duluth & Iron Range	277	2,769,597	64,639	2,911,233	250,497	243,770	4,298	574,322	6,647	34,527	1,106,507	1,804,726	179,122	1,625,604	69,239	
Duluth, Missabe & Northern	411	5,780,655	97,022	6,141,229	412,056	349,428	9,012	890,045	3,538	38,297	1,702,377	4,438,853	401,420	4,037,433	1,027,201	
Duluth, South Shore & Atlantic	601	626,984	315,163	1,043,591	189,165	120,272	22,470	323,738	13,544	30,020	699,208	344,383	57,000	287,371	31,321	
Duluth, Winnipeg & Pacific	191	342,848	60,276	415,323	49,823	60,157	5,743	134,738	1,841	14,851	267,153	148,170	20,693	127,477	15,880	
El Paso & Southwestern Co	1,028	2,593,141	644,780	3,405,965	319,444	354,009	54,449	753,524	19,856	75,651	1,576,933	1,829,032	118,587	1,710,374	934,126	
Elgin, Joliet & Eastern	799	3,275,875	112	3,485,719	302,484	840,853	19,131	963,081	.....	60,023	2,184,478	1,301,241	119,331	1,181,910	—100,120	
Erie	1,988	12,729,696	2,803,875	17,213,815	1,631,570	3,523,345	278,929	6,180,748	123,490	399,330	12,119,751	5,094,064	582,441	4,509,692	—1,532,783	
Florida East Coast	745	1,197,604	313,692	1,678,943	165,741	241,462	21,262	492,488	9,078	49,311	972,476	706,467	77,998	628,364	544,196	
Fort Worth & Denver City	454	982,372	431,014	1,490,413	178,108	255,490	24,238	395,988	8,741	48,669	911,235	579,178	50,400	528,755	133,732	
Galveston, Harrisburg & San Antonio	1,361	3,043,897	960,680	4,219,973	454,740	513,610	90,687	1,272,232	30,053	110,296	2,459,188	1,760,786	145,506	1,614,127	848,976	
Galveston Wharf	14	.....	.....	301,853	3,579	6,533	1,295	79,403	61,042	1,113	152,966	148,887	30,900	117,987	112,888	
Georgia	307	599,382	221,379	885,395	73,206	128,909	40,792	295,967	357	27,498	566,705	318,691	14,595	304,041	184,886	
Georgia, Southern & Florida	402	378,142	188,017	632,060	81,473	123,009	22,654	220,123	45	25,686	472,971	159,088	33,344	125,492	26,975	
Grand Canyon	64	2,843	59,271	80,403	40,309	2,491	1,960	32,941	.....	516	78,217	2,186	4,973	—2,787	—334,263	
Grand Rapids & Indiana	575	883,303	605,378	1,635,954	192,933	238,461	32,775	616,973	11,503	52,159	1,144,804	491,150	73,930	417,162	10,978	
Grand Trunk Western	347	1,759,000	504,000	2,414,636	235,908	409,597	52,302	789,909	23,825	44,725	1,556,266	858,370	109,911	747,684	140,228	
Great Northern	8,170	17,078,711	4,467,332	23,705,541	2,845,913	2,717,151	300,581	6,034,253	261,909	358,979	12,345,688	11,359,853	1,382,537	9,976,363	947,685	
Gulf & Ship Island	308	383,463	95,993	506,816	47,822	86,399	10,146	153,479	920	23,904	322,670	184,146	22,490	161,603	3,283	
Gulf, Colorado & Santa Fe	1,938	3,116,990	893,019	4,220,278	780,909	568,351	83,247	1,356,954	.....	141,727	2,929,109	1,291,169	178,470	1,111,005	618,342	
Hocking Valley	350	1,947,070	277,978	2,407,987	229,908	547,564	25,136	630,892	.....	51,346	1,484,845	923,142	128,700	794,435	73,452	
Houston & Texas Central	895	1,454,882	455,996	2,031,528	229,715	250,644	48,501	560,528	13,694	52,621	1,153,058	878,469	98,453	779,610	377,210	
Houston, East & West Texas	191	275,448	91,569	392,547	67,802	50,589	6,458	121,479	2,385	9,353	257,757	134,790	18,391	116,203	62,659	
Illinois Central	4,767	13,317,984	3,864,714	18,797,604	2,856,599	4,567,038	324,133	5,417,632	103,422	468,335	13,692,802	5,104,802	993,000	4,107,729	1,125,539	
Indiana Harbor Belt	109	.....	.....	1,175,105	143,317	128,840	8,243	436,039	.....	23,926	740,365	434,740	23,789	410,819	129,744	
International & Great Northern	1,160	1,886,948	712,202	2,794,517	363,440	481,544	65,501	946,538	15,011	86,133	1,909,155	885,361	95,000	790,141	487,062	
Kanawha & Michigan	177	777,806	109,889	912,679	134,603	236,791	8,866	220,179	28	20,875	621,341	291,338	42,500	248,837	—39,625	
Kansas City, Mex. & Orient Ry. of Texas	466	271,381	57,141	347,451	56,842	62,720	10,898	143,208	.....	12,826	286,494	60,957	15,000	45,935	99,363	
Kansas City Southern	837	2,123,889	457,699	2,860,375	290,776	375,827	83,101	842,175	.....	104,023	1,692,594	1,167,781	144,977	1,021,264	94,915	
Lake Erie & Western	900	1,656,135	220,987	1,983,668	204,590	308,475	41,720	600,023	.....	36,459	1,191,268	792,399	81,000	711,094	277,287	
Lehigh & Hudson River	97	515,770	30,715	599,991	82,841	101,328	4,551	207,456	.....	13,007	409,182	190,808	15,000	175,763	6,656	
Lehigh & New England	296	674,755	3,900	725,979	120,455	106,120	6,122	197,136	.....	18,607	448,279	277,700	27,360	250,318	—176,968	
Lehigh Valley	1,444	10,686,848	1,462,179	13,052,105	1,639,450	2,313,392	250,257	4,575,233	52,569	248,136	9,071,975	3,980,130	464,500	3,514,315	244,940	
Long Island	397	1,099,384	3,021,934	4,746,068	432,333	406,738	47,041	1,572,363	18,719	103,574	2,576,692	2,169,376	218,044	1,945,376	227,923	
Los Angeles & Salt Lake	1,154	1,887,669	844,321	2,984,920	250,207	407,197	92,921	776,050	59,210	58,097	1,629,803	1,355,117	150,517	1,204,196	150,714	
Louisiana & Arkansas	279	302,206	55,478	370,513	74,741	53,882	10,901	104,708	.....	12,773	257,005	113,508	24,311	89,132	—20,622	
Louisiana Railway & Navigation Co.	350	429,505	78,550	536,557	82,815	68,362	19,915	167,346	.....	20,212	358,650	177,907	33,000	144,884	201	
Louisiana Western	208	400,703	188,305	626,878	66,857	93,293	21,393	141,098	5,146	20,377	348,132	278,746	33,300	245,098	123,267	
Louisville & Nashville	5,071	11,618,945	3,465,252	16,143,249	2,232,043	3,118,369	355,370	4,629,493	57,367	336,187	10,703,873	5,439,376	651,876	4,785,757	786,300	
Louisville, Henderson & St. Louis	200	285,059	124,101	436,459	84,729	70,651	14,820	124,157	.....	9,048	303,405	133,054	11,400	121,599	50,994	
Maine Central	1,221	1,968,505	1,214,253	3,456,812	445,934	423,811	44,964	1,223,455	28,426	84,823	2,250,969	1,205,843	148,777	1,056,958	200,392	
Michigan Central	1,803	7,278,385	3,369,312	12,027,532	1,483,285	1,728,056	196,658	3,925,714	170,009	214,591	7,718,313	4,309,219	420,000	3,886,423	884,557	
Midland Valley	385	401,509	130,600	550,232	107,114	92,197	8,133	154,521	.....	19,998	381,678	168,554	17,802	150,386	31,543	
Mineral Range	120	265,966	10,879	285,523	48,949	48,651	1,227	116,129	.....	4,788	219,744	65,778	9,900	55,878	—19,305	
Minneapolis & St. Louis	1,647	2,100,546	567,655	2,827,605	392,561	447,999	53,956	899,916	256	69,094	1,863,782	963,823	124,334	839,005	15,348	
Minneapolis, St. Paul & S. S. Marie	4,227	6,645,039	2,014,390	9,377,165	903,969	1,069,388	144,360	2,468,976	53,892	186,094	4,816,613	4,560,552	423,181	4,137,371	1,122,891	
Missouri & North Arkansas	365	216,511	121,300	360,945	50,547	36,318	11,667	107,680	.....	15,978	222,190	138,755	14,400	124,324	114,028	
Missouri, Kansas & Texas System	3,865	6,562,417	2,580,096	9,775,014	1,887,456	1,847,483	180,592	3,041,704	63,433	293,086	7,309,494	2,465,520	384,430	2,073,854	342,374	
Missouri, Oklahoma & Gulf	334	312,444	80,039	412,257	69,565	77,360	12,832	161,451	993	23,722	345,923	66,334	24,837	41,484	84,049	
Missouri, Oklahoma & Gulf of Texas	134	74,343	1,702	76,644	9,505	8,536	5,024	30,609	.....	4,891	58,564	18,080	563	17,517	23,685	
Missouri Pacific	3,931	6,703,026	1,512,758	8,918,838	1,597,002	1,794,628	232,285	2,922,575	28,663	210,576	6,762,806	2,156,032	332,442	1,818,337	367,158	

REVENUES AND EXPENSES OF RAILWAYS

THREE MONTHS OF FISCAL YEAR, 1917—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Mobile & Ohio	1,160	$2,394,798	$376,720	$2,941,025	$382,344	$708,812	$108,140	$991,333	$7,434	$93,133	$2,291,196	$649,829	$115,192	$534,142	—$2,958
Monongahela	108	461,720	31,399	501,985	81,144	32,228	2,192	111,339	.....	12,457	239,360	262,625	19,000	243,625	20,302
Monongahela Connecting	6	.....	.....	333,479	48,285	44,246	900	167,685	.....	8,764	269,880	63,599	6,252	—41,530	—98,708
Morgan's La. & Texas R. R. & S. S. Co.	401	800,163	286,154	1,169,659	175,585	218,596	33,246	396,327	6,377	35,061	864,118	305,542	69,050	235,022	115,871
Nashville, Chattanooga & St. Louis	1,237	2,343,261	817,482	3,412,848	404,011	639,308	156,688	1,119,761	29,824	108,615	2,455,964	956,883	86,500	869,013	237,427
Nevada Northern	165	493,847	37,663	546,480	66,653	40,224	2,234	82,539	250	14,380	206,281	340,199	18,674	321,525	100,025
New Orleans & North Eastern	204	700,184	165,004	970,203	113,006	174,300	29,908	274,563	22,643	37,249	651,670	318,533	46,900	271,633	68,604
New Orleans Great Northern	285	352,964	89,030	464,261	45,648	64,814	8,356	124,899	643	19,806	264,166	200,095	14,335	185,682	40,126
New Orleans, Mobile & Chicago	402	396,498	84,772	503,967	76,227	78,884	12,404	155,777	315	19,875	343,481	160,486	19,471	140,854	41,095
New Orleans, Texas & Mexico	191	223,136	69,255	302,778	55,759	56,822	15,816	84,039	.....	19,571	232,006	70,771	4,074	66,697	—28,376
New York Central Railroad	6,093	34,834,158	15,551,637	58,695,434	5,855,828	9,786,029	892,158	17,666,274	797,303	1,217,432	36,215,024	22,480,410	2,208,854	20,264,399	4,106,562
New York, Chicago & St. Louis	571	3,217,213	496,983	3,878,285	371,297	864,119	149,975	1,457,135	16,237	82,384	2,940,109	938,177	126,000	812,071	—28,656
New York, New Haven & Hartford	2,005	10,000,182	8,494,596	21,222,713	2,433,234	2,631,242	133,562	7,532,863	276,943	506,334	13,512,322	7,710,391	779,000	6,930,703	460,014
New York, Ontario & Western	568	1,387,168	931,093	2,728,404	357,097	365,829	24,429	882,509	.....	55,791	1,682,953	1,045,450	75,000	970,425	54,438
New York, Philadelphia & Norfolk	112	1,166,472	157,618	1,423,794	121,269	283,386	14,118	466,946	15,534	33,812	934,475	489,318	42,000	447,081	113,093
New York, Susquehanna & Western	140	538,599	150,797	783,238	68,681	104,891	6,094	353,491	.....	22,330	555,446	227,792	42,300	185,451	—57,337
Norfolk & Western	2,086	12,955,741	1,685,459	15,310,316	2,100,461	2,556,565	186,227	3,626,257	31,234	251,506	8,695,995	6,614,322	666,000	5,948,032	551,597
Norfolk Southern	908	776,397	371,801	1,231,836	184,857	188,397	25,153	398,787	380	55,330	852,905	378,931	40,044	338,434	65,134
Northern Pacific	6,505	15,235,351	4,217,602	21,349,766	2,967,312	2,206,138	308,524	5,538,874	287,213	319,160	11,420,590	9,929,176	1,419,564	8,505,302	1,629,241
Northwestern Pacific	507	694,409	653,389	1,502,423	155,217	133,067	16,766	420,850	2,680	27,123	753,080	749,343	54,466	694,579	125,044
Oahu Railway & Land Co.	114	314,658	64,539	430,364	33,819	26,872	2,566	86,560	.....	14,507	164,289	266,075	28,500	237,575	—45,515
Oregon Short Line	2,254	5,245,202	1,404,400	7,163,279	800,211	647,510	98,185	1,485,907	100,795	176,294	3,299,237	3,864,042	485,300	3,378,417	835,438
Oregon-Washington R. R. & Nav. Co.	2,053	3,460,133	1,332,462	5,234,638	829,335	510,329	136,053	1,549,064	73,480	211,219	3,299,621	1,935,017	283,650	1,650,924	5,153
Panhandle & Santa Fe	676	1,138,518	272,132	1,473,471	225,335	224,649	12,412	346,703	.....	33,906	842,435	631,037	36,739	594,060	260,379
Pennsylvania Company	1,755	15,596,834	3,467,018	21,147,974	2,452,734	3,350,296	274,272	6,539,444	114,837	433,886	13,146,406	8,001,567	988,055	7,010,422	665,572
Pennsylvania Railroad	4,534	42,439,232	12,469,904	60,274,286	7,514,132	11,407,088	643,986	19,906,550	815,142	1,452,691	41,720,586	18,553,700	2,209,008	16,325,447	631,680
Peoria & Pekin Union	19	33,323	13,596	259,339	24,134	39,403	353	127,539	.....	8,362	199,791	59,549	20,500	39,048	23,108
Pere Marquette	2,249	3,829,816	1,393,803	5,798,539	559,185	1,040,445	106,595	1,887,616	17,317	126,883	3,736,590	2,061,948	153,730	1,906,795	432,184
Philadelphia & Reading	1,127	12,118,672	1,951,234	14,934,903	1,034,549	2,189,698	153,933	4,842,241	35,896	241,622	8,492,722	6,442,181	350,511	6,089,812	1,679,391
Philadelphia, Baltimore & Washington	717	3,538,849	2,588,332	6,718,272	859,805	1,274,148	86,644	2,491,015	308	163,952	4,872,291	1,845,981	194,606	1,651,040	209,307
Pittsburgh & Lake Erie	225	5,419,684	591,640	6,417,504	568,253	951,247	40,453	1,390,646	12,493	97,364	3,060,455	3,357,049	220,200	3,136,849	230,408
Pittsburgh, Cincinnati, Chic. & St. Louis	1,489	9,120,576	2,671,651	13,245,541	1,841,974	2,462,686	221,015	4,157,835	85,791	309,046	9,073,665	4,171,876	565,175	3,605,273	634,402
Pittsburgh, Shawmut & Northern	205	482,065	26,607	516,343	94,536	164,634	4,133	175,223	.....	13,172	451,697	64,645	7,000	57,645	—72,669
Port Reading	21	386,162	.....	458,524	32,163	47,290	115	162,165	.....	820	242,554	215,971	30,000	185,971	19,683
Richmond, Fredericksburg & Potomac	88	506,392	274,423	881,727	65,772	113,157	11,560	270,505	6,282	24,122	491,399	390,329	27,540	362,761	127,289
Rutland	468	508,585	389,982	1,051,317	131,413	166,401	32,289	333,958	3,741	21,054	688,856	362,461	51,861	310,595	22,292
St. Joseph & Grand Island	258	456,961	87,458	579,618	90,260	70,285	13,066	158,516	1,550	14,534	348,211	231,406	23,876	207,386	164,315
St. Louis & San Francisco	4,752	9,033,662	3,536,313	13,384,953	1,820,673	2,679,647	204,056	4,063,156	.....	322,616	8,969,036	4,415,916	520,282	3,892,045	906,638
St. Louis, Brownsville & Mexico	548	766,541	570,694	1,420,021	157,598	122,541	26,540	350,949	.....	29,705	685,931	734,090	24,000	709,560	466,621
St. Louis, Iron Mountain & Southern	3,555	6,619,940	1,921,798	9,174,814	1,866,201	1,519,158	208,483	2,419,889	28,237	202,552	6,196,702	2,978,112	399,544	2,576,172	717,935
St. Louis Merchants' Bridge Terminal	9	.....	1,094	645,538	102,245	36,721	2,438	264,385	.....	20,932	426,722	218,816	22,800	195,996	56,254
St. Louis, San Francisco & Texas	235	212,857	89,300	318,334	58,752	58,809	6,950	125,385	.....	14,751	264,646	53,688	4,696	48,963	26,229
St. Louis Southwestern	943	1,652,700	428,189	2,207,267	159,311	395,658	92,907	523,832	9,261	72,639	1,252,104	955,163	107,508	847,223	229,018
St. Louis Southwestern of Texas	811	880,464	296,757	1,269,932	155,913	295,780	43,954	448,025	4,980	58,853	1,005,911	264,021	50,322	213,531	118,383
San Antonio & Aransas Pass	726	793,663	316,486	1,178,843	166,218	145,897	21,710	445,859	.....	37,660	816,420	362,423	60,000	302,396	109,542
Seaboard	3,449	3,862,349	1,293,487	5,700,153	787,169	950,416	228,044	1,987,603	29,453	183,702	4,159,456	1,540,697	310,141	1,228,748	.....
Southern	6,983	12,089,656	4,747,291	18,506,090	2,788,935	2,869,384	494,607	5,899,177	115,519	525,601	12,590,733	5,915,357	768,567	5,142,327	606,684
Southern in Mississippi	281	157,095	87,830	267,091	68,638	25,845	6,794	103,193	.....	10,482	214,952	52,139	25,050	26,919	25,557
Southern Pacific	6,949	22,932,756	7,914,238	33,632,863	3,017,535	4,798,470	508,728	10,297,440	474,898	720,107	19,738,119	13,894,744	1,341,037	12,553,897	653,582
Spokane, Portland & Seattle	555	877,834	473,764	1,490,906	172,656	121,738	25,687	308,326	14,749	45,783	686,980	803,926	172,335	631,204	31,289
Tennessee Central	295	303,638	119,767	447,347	70,401	58,011	16,988	150,963	.....	19,764	316,125	131,223	13,702	117,446	33,388
Terminal Railroad Ass'n of St. Louis	37	.....	752	719,403	82,390	48,990	2,645	209,911	.....	8,281	352,217	367,186	82,454	283,988	24,075
Texas & New Orleans	468	837,560	295,399	1,235,905	154,680	237,947	23,252	367,444	33,656	31,474	847,905	388,000	59,583	327,936	126,276
Texas & Pacific	1,944	3,278,087	1,395,083	5,016,880	599,964	654,884	120,490	1,771,225	34,927	165,444	3,341,949	1,674,931	244,000	1,430,086	543,355
Toledo & Ohio Central	436	1,448,707	193,505	1,762,209	222,245	351,172	21,842	564,168	5,530	32,653	1,197,610	564,599	70,504	493,960	184,457
Toledo, Peoria & Western	248	172,367	111,479	308,134	51,940	87,519	7,515	108,717	.....	11,966	267,656	40,478	19,500	20,978	—5,677
Toledo, St. Louis & Western	451	1,270,813	168,303	1,518,641	233,124	211,734	49,194	463,849	.....	26,382	980,171	538,469	55,500	482,892	117,216
Ulster & Delaware	129	117,495	176,958	354,553	36,883	36,920	6,094	136,702	915	10,612	228,125	126,427	12,000	114,427	—8,240
Union Pacific	3,622	13,813,815	3,164,997	18,608,480	2,741,950	2,009,030	301,554	4,074,288	292,697	409,846	9,749,317	8,859,163	982,200	7,876,005	1,889,253
Union Railroad of Baltimore	8	420,408	78,264	504,096	36,839	.....	.....	17,940	.....	7,217	61,996	442,100	22,669	419,431	116,364
Union Railroad of Pennsylvania	32	.....	.....	1,675,839	86,818	280,425	347	623,407	.....	13,435	1,003,393	672,446	37,702	634,745	—22,429
Vandalia	917	2,279,903	723,820	3,388,856	551,613	637,279	77,122	1,106,028	33,856	80,019	2,482,709	906,147	122,418	783,073	47,706
Vicksburg, Shreveport & Pacific	171	245,553	129,664	420,676	60,741	79,032	11,358	127,667	5,951	15,812	300,560	120,116	27,540	92,576	40,190
Virginian	510	1,865,984	141,441	2,139,156	228,349	336,629	17,352	427,470	46,747	45,890	1,097,306	1,041,829	93,500	948,298	134,212
Wabash	2,519	6,646,146	2,146,476	9,584,564	1,011,081	1,481,939	272,278	3,215,329	59,329	201,021	6,214,654	3,369,911	296,533	3,072,422	974,247
Wabash-Pittsburgh Terminal	63	322,673	27,710	376,303	59,913	45,208	5,637	93,834	5,822	13,195	223,608	152,694	22,500	130,194	97,383
Washington Southern	36	167,623	159,418	422,786	39,195	43,881	4,118	130,597	2,795	10,993	231,578	191,207	11,959	179,242	64,992
West Jersey & Seashore	359	621,120	2,062,553	2,892,637	393,343	321,972	46,415	878,958	9,704	54,431	1,704,687	1,187,950	114,229	1,073,578	9,803
Western Maryland	689	2,623,335	345,398	3,192,254	351,818	439,646	70,792	946,419	38,071	65,093	1,910,307	1,281,947	98,500	1,183,447	334,494
Western Pacific	939	1,921,406	355,618	2,413,149	372,759	207,311	59,856	635,699	32,238	55,871	1,363,734	1,049,414	98,227	951,152	217,164
Western Railway of Alabama	133	178,016	105,608	318,822	45,580	65,249	19,062	86,573	5,249	12,625	234,309	84,514	18,003	66,355	25,059
Wheeling & Lake Erie	512	2,428,743	198,576	2,850,668	446,093	400,436	29,816	819,008	4,714	45,586	1,745,654	1,105,014	121,007	983,930	359,747
Wichita Valley	257	149,173	65,278	225,367	38,455	22,381	271	61,005	.....	3,927	126,039	99,328	11,600	87,716	6,417
Yazoo & Mississippi Valley	1,382	2,745,237	701,266	3,635,681	622,821	557,059	61,548	1,056,999	5,378	97,732	2,389,061	1,246,619	171,000	1,075,234	357,670

"Arkansas on Wheels"

The exhibition train, which recently made the run "around the circle" of 14 states to advertise Arkansas, and which stopped at 42 cities and towns, reached every night stop ahead of time. The train started from Little Rock October 17. It was in charge of W. B. Folsom, T. E. Wood and H. M. Gregory. The train, of 10 steel cars, was made up of five baggage cars for exhibition purposes, and four Pullmans and a dining car for the accommodation of its 118 passengers. It traveled 3,600 miles in 13 days, traveling only by daylight; stayed two days in Washington, one in Richmond and one in St. Louis, and the 42 exposition stops were of from 30 minutes to two hours long. From 500 to 8,000 people viewed the exhibits at each stop. The lines traversed were the Rock Island, the Frisco, the Southern, the Richmond, Fredericksburg & Potomac, the Baltimore & Ohio, the Big Four and the Missouri Pacific.

The Goethals Commission

The Federal Commission, appointed by President Wilson to investigate the workings of the Adamson Eight Hour bill and to report to Congress, held its first informal conference in New York City November 23, and met Robert S. Lovett, chairman of the Union Pacific; Hale Holden, president of the Burlington; Daniel Willard, president of the Baltimore & Ohio; W. H. Truesdale, president of the Lackawanna; W. W. Atterbury, vice-president of the Pennsylvania; B. F. Bush, receiver for the Missouri Pacific; L. F. Loree, president of the Delaware & Hudson, and F. D. Underwood, president of the Erie. This week the commissioners were to meet the heads of the four brotherhoods. The members of the commission are Major-General George W. Goethals, retired, chairman; Edgar E. Clark, member of the Interstate Commerce Commission, and George Rublee, member of the Federal Trade Commission. Dr. Max O. Lorenz, assistant statistician of the Interstate Commerce Commission, is secretary.

Report on Knobmount Collision

The Interstate Commerce Commission has issued a report, dated October 24, giving the conclusions of H. W. Belnap, chief of the division of safety, on a butting collision on the Western Maryland, October 12, last, near Knobmount, W. Va. (which is within the yard limits of Cumberland). Two employees were killed and thirteen passengers and seventeen employees were injured. The westbound train consisted of an engine and two cars, carrying employees to their work, about 7 a. m. The eastbound was an excursion train, running as an extra; and the collision occurred within yard limits. There was a dense fog at the time. The employees' train had no rights, except those of a yard engine, and it was running about 15 minutes later than its usual time. The despatcher's order carried by the extra was No. 21, and gave it the right to the road, as an extra train, to Knobmount Tower, a short distance within the yard limits. By a second order, No. 22, the despatcher ordered it to "use passenger speed, W. V., to Knobmount Tower." The extra entered within yard limits not under control and almost immediately met the employees' train. As an extra, the excursion was bound to run under control within yard limits; but the conductor and the engineman, at the hearing, claimed that their second order, authorizing passenger speed, was understood by them to mean that they could maintain that speed fully up to the tower; and that the yard engine would keep out of their way.

The despatcher said that he gave right of road to the tower so as to expedite the movement of the excursion train, but without intending to relieve it from observing yard-limit rules. The assistant chief despatcher, who had had some discussion with the despatcher as to running this train, said that he had intended to have both orders terminate at the entrance to the yard; and that not until after the collision did he know that the right of road had been given so far as the tower.

The inspector holds mainly responsible the men in charge of the excursion train—the trainmaster was on the train—but says that the despatcher exercised exceedingly poor judgment in issuing orders which might easily mislead or confuse the man in charge of the train. The trainmaster is held at fault for not having ordered the use of standard form G 3, by which the despatcher gives an extra a schedule. The assistant chief despatcher is also censured in this connection; and these officers are charged with maintaining "an attitude of indifference with regard to the operation of this excursion train; . . . the lack of ordinary precautions and safeguards surrounding its operation is disconcerting and to be deplored." The decision to run this train had been reached a week before, but no bulletin had been issued to employees. It is held that with an order of form G 3, the rights of a train are more clearly defined than under the orders issued in this instance; and had form G 3 been used, a "much greater degree of protection would have been afforded." All of the employees were experienced and they had been on duty only a short time.

Valuation of the N. O. T. & M.

The Interstate Commerce Commission has submitted a tentative valuation report on the New Orleans, Texas & Mexico Railroad. The division of valuation finds the total cost of reproduction, new, as $8,865,636, and the cost of reproduction, less depreciation, as $7,572,886. These figures include refrigerator cars owned by the New Orleans, Texas & Mexico, but used by the St. Louis & San Francisco, as to which the commission finds the cost of reproduction, new, as $1,196,661, the cost of reproduction, less depreciation, as $1,100,902, and the original cost as $1,196,661. The total capitalization of the road on the date of the valuation is given as $40,938,031. The report says that the company is the creditor of affiliated carriers for advances and interest due amounting, as shown by the records as restated by the commission, to $21,368,179. The present value of these items, it is stated, cannot now be determined. The original cost to date of road and equipment shown by the records as rewritten by the commission amounts to $12,194,231. This amount, the report says, has been unduly increased by the inclusion therein of certain items which are not fully approved, including an item of $849,608 paid to the Gulf Construction Company by the Colorado Southern, New Orleans & Pacific for the construction of part of the line and which, the report states, "can be accounted for only on the theory that it was profit realized by the Gulf Construction Company."

Objection is also made to the method of calculation of interest during construction, and the record cost of road and equipment is said to be unduly large. No report is made as to the original cost, except for the item of equipment, which is placed at $2,888,363. On June 30, 1914, the date for which the report is made, the company owned 228.39 miles of line and operated 341.54 miles. It has since been reorganized as the New Orleans, Texas & Mexico Railway. The company and other interested parties are given 30 days from December 1 in which to file a protest.

American Society of Mechanical Engineers

The annual meeting of the American Society of Mechanical Engineers will be held in the Engineering Societies building, New York, December 5 to 8.

The railroad session will be held Friday morning, December 8, at 10 a. m., and papers will be read as follows: Clasp Brakes for Heavy Passenger Cars, by T. L. Burton; Pulverized Fuel for Locomotives, by J. E. Muhlfeld; Mechanical Design of Electric Locomotives, by A. F. Batchelder. Mr. Batchelder's paper will be found elsewhere in this week's issue. A copy of Mr. Burton's paper appeared in the *Railway Age Gazette* of November 10.

Many other papers of interest to railway men will be read at the several sessions. Among these are the following:

The presidential address by Dr. D. S. Jacobus, on the Relation of Education to Engineering will be made Tuesday evening at 8:30, and will be followed by a reception.

At the Miscellaneous Session, at 11:30 a. m., on December 6, among others, will be papers on the following subjects: Water for Steam Boilers—Its Significance and Treatment, by Arthur C. Scott and J. R. Bailey; Steam Safety Valves, by George H. Clark; Standardization of Power Plant Operating Costs, by Walter N. Polakov; Bearing Lubrication, by Boynton M. Green.

At the Industrial Safety Session, to be held at the same time, a report will be presented on Safety Standards for the Operation of Cranes. At the Miscellaneous Session, at 2 p. m., the same day, papers will be presented, among others, on: The Utilization of Waste Heat for Steam-Generating Purposes, by Arthur D. Pratt; Graphic Methods of Analysis in the Design and Operation of Steam Power Plants, by R. J. S. Pigott; and Power Plant Efficiency, by Victor J. Azbe.

At the Machine Shop Session, the same time, papers will be read by Carl G. Barth on the Standardization of Machine Tools, and by H. K. Hathaway, on a Proposed Plan for the Activities of the Machine Shop Section of the American Society of Mechanical Engineers.

On Thursday, December 7, there will be a Valuation Session at 10 a. m., second Valuation Session at 2 p. m., and a Gas Power Session also at 2 p. m. At the Valuation sessions the following papers will be presented: Accurate Appraisals by Short Methods, by J. G. Morse; How Does Industrial Valuation Differ from Public Utility Valuation?, John H. Gray; and Relation Between Perpetual Inventory Value and Appraisal Value, by Charles Prez.

Valuation of Industrial Properties vs. Valuation of Industrial Methods, by Walter N. Polakov; Productive Capacity a Measure of Value of an Industrial Property, by H. L. Gantt.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City. Next annual convention, May 1-4, 1917, Memphis, Tenn.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Next convention, October, 1917, San Francisco, Cal.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, East St. Louis, Ill. Next meeting, June, 1917, Denver.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—H. G. McConnaughy, 165 Broadway, New York.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, St. Paul, Minn.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 20-22, 1917, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June, 1917, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetting, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Next convention, December 5-8, 1916, Engineering Societies' Bldg., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Annual meeting, May 30, 1917, Richmond, Va.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J. Next meeting, May, 1917, Louisville, Ky.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connely, Superintendent of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting, September 18-20, 1917, Washington, D. C.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York. Next meeting, December 12-13, 1916, Ansley Hotel, Atlanta, Ga.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Tom Lehon, The Lehon Company, Chicago. Meetings with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Annual convention, June 19, 1917, Banff, Alberta.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next annual meeting, August, 1917, Chicago.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago. Next meeting, May 14-17, 1917, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMAN'S ASSOCIATION. Wm. Hall, 1126 W. Broadway, Winona, Minn.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA. A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 11, 1917, Chicago.

MASTER CAR BUILDERS' ASSOCIATION. J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June, 1917, Atlantic City, N. J.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Wm. H. Connolly, 1319 Columbia Road, Washington, D. C. Next annual convention, October 16, 1917, Washington, D. C.

NATIONAL RAILWAY APPLIANCES ASSOCIATION. C. W. Kelly, 349 Peoples Gas Bldg., Chicago. Next convention, March, 1917, Chicago.

NEW ENGLAND RAILROAD CLUB. W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB. Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS. F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUP OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Annual meeting, January 16, 1917, Waldorf-Astoria Hotel, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Annual meeting, May 9-11, 1917, Louisville, Ky.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Office of the President's Assistant, Seaboard Air Line, Norfolk, Va.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September, 1917, Atlantic City, N. J.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Associations.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Chicago.

ST. LOUIS RAILWAY CLUB. B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, N. & W., Philadelphia, Pa.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular metetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB. Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month. Boody House, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK. C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next meeting, June 19, 1917, Fresno, Cal.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Traffic News

Freight agents in Newark, N. J., and in other places, are notifying consignees that bulk freight not unloaded within ten days from arrival will be summarily removed to storehouses.

J. T. Money, examiner of the Interstate Commerce Commission held a hearing in New York City this week in a proceeding begun by the Lehigh Valley Coal Sales Company against the Lehigh Valley Railroad Company to recover $320,658 which the complainant alleges was paid in excess of the present freight rates on coal carried by the railroad company.

Arthur Hale, who, up to last March, was chairman of the Committee on Relations Between Railroads of the American Railway Association, and who then resigned to take a position with the Consolidation Coal Company, has been elected vice-president of that company, in charge of transportation and traffic. His office is at Baltimore, Md. A sketch of Mr. Hale's life was given in the *Railway Age Gazette* of March 24, last, page 698.

The Federal grand jury for the western district of Arkansas recently returned four indictments each, on 25 counts, for violations of the interstate commerce law, as follows: Against the Louisiana & Arkansas for granting concessions on shipments of yellow pine logs and against the Bodcaw Lumber Company for receiving concessions from the Louisiana & Arkansas; against the St. Louis Southwestern for granting rebates on lumber shipments, and against the Louisiana & Arkansas and William Buchanan, president, for receiving rebates from the St. Louis Southwestern.

The Traffic Club of Kansas City held its annual election on November 7, the following officers being named: President, James Spencer Adsit, general agent, Chicago, Milwaukee & St. Paul; first vice-president, George I. Tompkins, vice-president and general manager, Missouri-Interstate Paper Company; second vice-president, R. M. Ritchey, general agent, St. Joseph & Grand Island; secretary-treasurer, Alfred A. Wild, traffic manager, Merchants' Association. The annual banquet of the club took place at Hotel Muehlbach on November 15, 250 members and guests being present. Among the speakers were E. F. Kearney, president of the Wabash, who discussed "Modern Politics and Transportation."

As a result of a conference between the Public Utilities Commission of Illinois, the railroads and coal and grain shippers at Springfield, on November 22, the ruling of the commission that cars be distributed in proportion to the number used by individual shippers over a period of four years was definitely suspended. The carriers have been given a week in which to file briefs, and the other interests a week in which to file briefs in reply, following which another conference will be held for the purpose of coming to some agreement as to the proper method of car distribution.

H. C. Barlow, freight claim adjuster of the Erie, has prepared a 16-page booklet entitled "Links in the Chain of Transportation," for distribution among all employees concerned in the movement of freight from the time of its receipt until its delivery. In his foreword Mr. Barlow states that inasmuch as a chain is no stronger than its weakest link, each link in the chain by which a shipment passes from a shipper to a consignee must be constantly watched and guarded to insure no breaking down of the machinery. In the remainder of the pamphlet he enumerates 12 distinct links, emphasizing the importance of the proper execution of each.

In Georgia, where railroad officers and shippers have been spending many weeks in hearings and discussions before the State Railroad Commission, which is investigating the propriety of a general advance in intrastate freight rates, and which hearings have now been suspended for a few weeks, attention is now centered on a hearing by the Interstate Commerce Commission, which seems to be equally extensive. Commissioner Clements, sitting at Atlanta, is listening to a general complaint, headed by the Atlanta Freight Bureau, concerning advances which have been made in the rates on freight from western, northern and southwestern points to the cities in Georgia.

A. R. A. Car Orders

The Conference Committee on Car Efficiency, sitting at Washington, reports that there is a great excess of box cars in the northeastern quarter of the United States. Roads which have in use more box cars than they own have been called upon to send the excess of cars, loaded or empty, toward the roads which have less than their ownership of cars. In carrying out this order cars must be routed homeward to the greatest extent consistent with a quick accomplishment of the required relief.

The committee has announced that railroads in the Northwest have agreed to put into coal-carrying service about 16,500 ore cars. According to the conference committee's record the New York Central on November 1 had 9,732 more cars in service than it owned; the Pennsylvania 30,963, and the Boston & Maine, 11,118. Group 2 has an excess of 73,263.

Demurrage

Applications for authority to issue a new demurrage tariff, identical with that recently submitted to the Interstate Commerce Commission, are being made by the railroads to the state railway commissions. As recently noted in the *Railway Age Gazette*, the commissions of Colorado and Kansas have granted an increase in demurrage charges and the Public Utilities Commission of Illinois has been conducting hearings on the subject. The State Corporation Commission of New Mexico has authorized a straight demurrage charge of $3 a day after the expiration of free time, effective November 1, which is the same rate granted by the Public Utilities Commission of Colorado. The commissions of Oregon and Nebraska had hearings on the proposed new rates beginning November 24, and the following commissions will have hearings beginning on the dates specified: Wyoming, December 4; Iowa, December 5; Arkansas, December 7; Missouri, December 18.

The railroad commissions of South Carolina and of Florida have held a number of hearings to investigate the car shortage.

Illinois Coal-Car Problems

The Public Utilities Commission of Illinois on Tuesday issued an order requiring all railroads to return coal cars, received in intrastate traffic, to the owning roads immediately after they are emptied. The commission has also called a special meeting, to be held at Chicago this week, of carriers and coal dealers, to consider a proposed increase in demurrage and reconsignment charges to apply only to coal traffic. The carriers have proposed the same demurrage schedule that was suspended by the Interstate Commerce Commission and they propose changes in the reconsignment rules as follows: A charge of $2 per car if the reconsignment order is filed with the company before the arrival of the car at its original destination; $5 if the car is held at an intermediate point for orders and reconsigned therefrom; $5 if consigned within 24 hours after arrival at destination or at a terminal yard serving the destination station. Only one reconsignment, on a through rate, will be permitted after the shipment reaches its original destination. It is provided also that this coal traffic be subject to demurrage at a reconsigning point after the expiration of the usual free time period. It is believed that the commission will reach a decision this week and that an order will soon be issued.

Lumber Association Wants to Retain Reconsignment Privileges

The Lumbermen's Association of Chicago has published a brief on reconsignment and diversion in connection with the case before the Interstate Commerce Commission entitled "In the matter of rates on, and classification of lumber and lumber products, No. 8131," on which protracted hearings were recently held in Chicago. The association argues that the curtailment of reconsigning privileges on cars loaded with lumber would prove disastrous to small lumber manufacturers, and would concentrate the control of the lumber market in the hands of the large producers. At the present time small mill operators set up portable mills in scattered patches of yellow pine, owned by farmers or settlers desirous of clearing the land. A land owner

has the choice of killing his trees and burning the stumps or selling his timber holdings to small operators. To kill the trees they are merely girdled and left to die, usually being blown down and burned. But the mill operator, by setting up a small portable mill, can conserve the timber for the market. Small operators also operate in cut-over land where the timber of standard sizes has been already cut by the large manufacturers. It is not possible for the small operator to cut to order, as he must saw his timber into such miscellaneous sizes as conditions may permit. Furthermore, he is not able to secure empty cars as readily as the large manufacturer, and therefore must suit the time of the shipment of his product to the arrival of empty cars at his plant. In periods of car shortage the transit car of the small operator is disposed of quickly to fill in the stocks of large wholesalers in odd sizes, which could not be obtained otherwise, except by placing a specific order with a large manufacturer—a proceeding which would consume time.

The brief further claims that many errors are prevented by the shippers' practice of reconsigning and diverting. The statement is made that probably less than 50 per cent of the expense bills covering lumber shipments today show gross, tare and net weights, so as to allow shippers to be assured of stake allowance, but by having the car billed to a regular reconsigning point or to a terminal, shippers may insist upon this information being furnished before the car is delivered. That such insistence is justifiable is recognized by the action of weighing associations in practically refusing to recognizing weight claims unless supported by at least one re-weight and sometimes by two or three re-weights. In this way many claims will be prevented which are too costly for the carriers to investigate. Further than this, the billing of cars to reconsigning points is in itself valuable as preventing one carrier from discriminating against another by misrouting, which is often followed.

Abuse of Reconsignment by Coal Dealers

That coal brokers and mine operators are using the car shortage as an excuse to break their contracts and sell coal at higher prices on the open market is being confirmed. A large Michigan company, reincorporated about a year ago, was offered prompt delivery of "free" coal, under its old corporate name, by the same mine which, on the grounds of car shortage, refused to deliver its contract coal. A large miner of silica in Illinois reported to the State Public Utilities Commission that although he was able to secure cars sufficient to ship his product to glass manufacturers (an average of 20 cars a day), he had been forced to shut down repeatedly because of his inability to get deliveries of contract coal from a mine only six miles distant. On the other hand, he has experienced no difficulty whatsoever in securing prompt delivery of "free" coal at greatly advanced prices.

Recent investigation, by the Illinois commission, of railroad freight yards in Chicago have disclosed the fact that large numbers of cars loaded with coal are being held for reconsignment for periods ranging from a few days to several weeks. On the 22nd of November 215 loaded cars were found in the Wildwood (Chicago) yards of the Illinois Central, which had been held from 1 to 19 days. On the same day, 108 loaded cars were found in the yards of the Chicago & Alton, which had been detained for reconsignment for similar periods. It has been conservatively estimated by those in close touch with the situation that at least 500 cars may be found in Chicago yards any day which have been detained an average of seven days each. It is obvious that with coal which formerly sold at 90 cents a ton now selling at three times that much and steadily advancing in price, every incentive exists to hold the cars until their lading can be disposed of to advantage at open market prices. It has been found that detention is not only practiced by large coal mine operators and established brokers, but by "shoestring" brokers, without capital or offices, who buy loaded cars in the yards and hold them until they can be resold at a profit.

Another interesting discovery of the Illinois commission is that coal shippers are making false complaints regarding their failure to secure cars, in the hope of receiving more cars than the pro rata system of distribution permits. One coal shipper, who reported that he had received only one empty car in nine days, was found, upon investigation, to have received seven cars in that period. A practice commonly followed for the purpose of avoiding payment of demurrage is the repeated reconsignment of cars to allied dealers before the expiration of free time.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended until May 29, 1917, a proposed increase in class rates from points of origin on the Maryland, Delaware & Virginia, the Chesapeake & Atlantic, and the Long Island, to western lake ports and Minneapolis via Cleveland, O., and the boats of the Great Lakes Transit Corporation.

PERSONNEL OF COMMISSIONS

James H. Wilson, a member of the Iowa State Board of Railroad Commissioners, died at Washington, D. C., November 22, at the age of 70.

Joseph S. Gray, a member of the Georgia State Railroad Commission, has resigned that place to become general manager of the Ocilla Southern Railway; and the governor has appointed in his place John P. Boifeuillet, hitherto clerk of the lower house of the Georgia Legislature.

STATE COMMISSIONS

The Massachusetts Public Service Commission, following its investigation of the recent street car disaster at Boston, when 45 persons were drowned, has issued an order requiring street cars always to be brought to a stop before being run over a drawbridge, and also requiring the maintenance of gates to stop cars a reasonable braking distance from each draw. The gates must be painted with alternate black and white diagonal stripes and must be lighted at night; and there must also be a suitable sign, all to be approved by the commission. Further, the gates must be interlocked with the bridge machinery so that the bridge cannot be opened until the gates are closed. If in any case the installation of gates is not practicable, the order requires the installation of a "smash signal," suitably interlocked.

The New York State Public Service Commission, Second district, has declared that it is without power to alter the terms of a contract on the back of a commutation ticket, and has dismissed the complaint of Frederick L. Perine, who asked that the New York Central be compelled to accept his commutation ticket between Crestwood and New York as part payment of his fare when he rode between White Plains and New York on an express train, not stopping at Crestwood. The contract signed by the purchaser limits the ticket to trains regularly scheduled to stop at the stations between which it is sold. Inasmuch as commutation tickets and the regulations for their limited use form part of the basis of the entire passenger rate structure of a railroad, the commission says that even if it had authority to make an order compelling the company to relax these limits, such an order could only be made as the result of a general investigation into the company's passenger tariffs.

The Louisiana Railroad Commission is confronted with a case similar to the Shreveport rate case, in which the state of Louisiana charged discrimination against interstate shippers by the low rates made by the Texas Railroad Commission. The Louisiana commission has given notice that it has taken up for hearing and consideration an application filed by the Kansas City Southern for permission to advance cotton rates from Louisiana points to New Orleans. The application states that on account of the decision of the Interstate Commerce Commission in the Memphis case, the Louisiana lines have been confronted with the proposition of either advancing the cotton rates to New Orleans or reducing the rates to Memphis, St. Louis and other points. In compliance with the commission's order, the lines have published for interstate application, effective on December 1, cotton rates from Louisiana points to New Orleans showing advances. They do this rather than reduce the rates to Memphis, and they desire the authority of the Louisiana commission to make the same rates effective for intrastate application. The Kansas City Southern letter states that should the road not be authorized to make the advances

desired, there is no question but that the order of the Interstate Commerce Commission will force it to make substantial reductions in its interstate rates, and this would be a benefit to no one, while yet it would materially reduce the carriers' revenues.

COURT NEWS

Twenty-Eight Hour Law

Where the initial carrier of live stock confines the animals for more than 28 hours and then hands them over to a connecting carrier, which, after having the stock in its possession for less than 28 hours, delivers it to a terminal carrier, which unloads it for food, water and rest, the Federal District Court, N. D. Iowa, holds that the intermediate carrier is not liable for a penalty under the 28-hour law by its acceptance of the stock, the offense of the initial carrier having been already completed.—United States v. St. Paul, 234 Fed. 386.

Broad Application of the Hours of Service Law

The United States Circuit Court of Appeals, eighth circuit, in a case against the Denver & Interurban Railway Company, decided October 11, last, holds that the hours-of-service act, unlike the employers' liability act, applies to all employees actually engaged in or connected with the movement of any interstate trains, regardless of whether at the exact time the offense was committed they were so employed. The decision was by Judge Carland, concurred in by Judges Trieber and Van Valkenburgh. The decision affirms that of the district court in Colorado, imposing a fine of $200 on the road for permitting a telegraph operator at Globeville, Colo., to remain on duty more than nine hours in a twenty-four-hour office.

It appears that only on infrequent occasions, when there is some little disturbance of the train movement, does the operator at Globeville handle orders for interstate trains; and the defendant claims that on the occasion when the alleged offense was committed he was not engaged in interstate commerce, nor had he been at any time during that day. The employers' liability act is limited to employees who are injured "while engaged in interstate business," but the hours-of-service act has no such qualifying clause; it applies to all "actually engaged in or connected with" the movement of interstate trains. This operator was at all times subject to the orders of a despatcher who had control of all the trains on an interstate railway.

No Rebate Allowable for Hauling by Shipper After Delivery Within Plant

The New York Court of Appeals has just handed down its decision reversing the judgment of the Appellate Division in the action by the New York Central against the General Electric Company for freight charges of $618, the defendant counterclaiming for $114,880 for switching cars within its plant, in which the Appellate Division gave judgment absolute on the defendant's counterclaim. The facts were undisputed. The defendant switched cars within its plant under an agreement that the service would be compensated by an allowance from the published rates. The validity of that agreement was the point in dispute. In July, 1907, after the amendment of the interstate commerce law permitting a charge to be made by consignees against the carrier for terminal services rendered, the electric company filed its petition with the Interstate Commerce Commission asking for compensation for switching. On June 27, 1908, the commission dismissed the petition (General Electric Co. v. New York Central, 14 I. C. C. 237), holding that the service rendered was not part of the service undertaken by the carrier. Its instrumentalities were characterized as plant facilities. In 1910 the railroad company began its action in the state courts for freight charges and the point was litigated anew. The trial term of the New York Supreme Court came to the same conclusion as the Interstate Commerce Commission and this has now been upheld by the Court of Appeals. The result of the decision is that when a railroad has hauled the cars from the main line and on to tracks within the limits of the consignee's yard it has then made the customary and a reasonable delivery. A further movement of cars to mills and warehouses is no part of the carrier's work of transportation, and no rebate can be made from the published tariff rates therefor. N. Y. C. v. G. E. (November, 1916.)

Railway Officers

Executive, Financial, Legal and Accounting

John F. Finerty, announcement of whose appointment, effective November 1, as assistant general counsel of the Great Northern, with office at St. Paul, Minn., has been made in these columns, was born May 27, 1885, at Chicago, Ill. He graduated from the law department of Northwestern University, Chicago, in 1906, and then entered general law practice for several years. In 1908 he was appointed attorney in the legal department of the New York Central, which connection he held until November 25, 1912, when he became general solicitor for the Great Northern. He now is promoted to be assistant general counsel.

Sanford H. E. Freund, general attorney for the Great Northern, with office at St. Paul, Minn., the announcement of whose appointment as assistant general counsel has been made in these columns, was born June 26, 1880, at New York City. He was educated at Phillips Academy, Andover, Mass., graduating from this institution in 1897, and then entered Harvard University. From 1901 to 1903 he attended the Harvard Law School, receiving a degree as bachelor of law. For several years thereafter he was engaged in the general practice of law at Boston, Mass., being a member of the firm of Saltonstall, Dodge & Carter, trial attorneys for the Boston Elevated. In May, 1910, he was appointed eastern attorney for the Chicago, Rock Island & Pacific, with office at New York City. He held this latter connection until November 25, 1912, when he joined the legal forces of the Great Northern at St. Paul, Minn., as general attorney.

Robert S. Hoxie, the announcement of whose election, effective November 1, as auditor of the St. Louis-San Francisco, with office at St. Louis, Mo., was made recently in these columns, was born near Cambridge, N. Y., on July 28, 1874. He entered railway service with the Delaware & Hudson in its local office at Cambridge, N. Y., in 1889, and was employed there and at other points along the line as clerk, telegraph operator, cashier and agent until 1894, when he entered Union College at Schenectady, N. Y. He graduated from this institution in 1898, and reëntered railway service with the St. Louis-San Francisco in the auditing department at St. Louis, Mo. In May, 1902, he was appointed chief freight clerk in the accounting department, and in May, 1906, was promoted to assistant auditor of freight accounts. He was made first assistant auditor of freight accounts in full charge of overcharge accounts in September, 1911, and auditor of freight accounts in March, 1913. During his first few years of service with the St. Louis-San Francisco he studied law at Washington University, St. Louis, graduating in 1900.



R. S. Hoxie

Operating

E. Crawford has been appointed superintendent of car service of the Canadian Northern on lines east of Port Arthur, Ont.

William T. Heeran, soliciting freight agent of the Lehigh Valley, at New York, has been appointed supervisor of mail traffic, a new position. Mr. Heeran's office is at New York City.

D. Crombie, superintendent of transportation at Toronto, Ont., of the Canadian Northern, has been appointed general superintendent, Ontario division, with headquarters at Toronto; and

the position of superintendent of transportation of eastern lines has been abolished.

J. A. Jones has been appointed superintendent of telegraph of the Southern Railway, with headquarters at Washington, D. C., vice W. H. Potter, resigned, and A. W. Beauprie has been appointed assistant superintendent of telegraph, with headquarters at Washington, D. C.

S. V. Rowland, trainmaster of the Chicago Great Western, at St. Paul, Minn., has been appointed assistant superintendent, with headquarters at Red Wing, Minn., vice J. M. Baths, resigned to accept service with another company. George G. Rutherford is appointed trainmaster, with headquarters at St. Paul, vice Mr. Rowland.

J. A. Gleason, who has been appointed superintendent of the Clifton Forge division of Chesapeake & Ohio with headquarters at Clifton Forge, Va., as has already been announced in these columns, was born on February 10, 1859, at Portsmouth, Va., and was educated in the common schools at Charlotte, N. C. He began railway work in September, 1875, with the Richmond, York River & Chesapeake, now a part of the Southern Railway. From 1876 to 1882, he was telegraph operator outside of railway service. In the latter part of 1882 he returned to railway work as operator on the Richmond & Danville, and from 1883 to 1887, he served as despatcher on that road. He then went to the Norfolk & Western, as despatcher, remaining in that position until January 1, 1889, when he entered the service of the Chesapeake & Ohio and served as despatcher and chief train despatcher until the latter part of 1890. Mr. Gleason was then out of railway work until 1891, when he returned to the service of the Norfolk & Western and served as despatcher and night chief train despatcher until 1899. He returned to the service of the Chesapeake & Ohio as despatcher in August, 1899, and from the following November served as chief train despatcher until his recent appointment as superintendent of the Clifton Forge division of the same road as above noted.



J. A. Gleason

Traffic

Charles E. Kingston, assistant general freight agent of the Pennsylvania Railroad at Philadelphia, Pa., has been appointed special agent of the Philadelphia, Baltimore & Washington, with office at Wilmington, Del.

V. H. Smith, general freight and passenger agent of the Webbers Falls Railroad, at Webbers Falls, Okla., has been appointed freight traffic manager, with office at Okmulgee, Okla., and his former position has been abolished.

W. W. Hall, general agent in the freight department of the Chicago, Milwaukee & St. Paul in New York City, has been appointed division freight and passenger agent at Des Moines, Ia., succeeding C. E. Hilliker, transferred.

W. C. McLaughlin, freight tariff agent of the Baltimore & Ohio Southwestern, and the Cincinnati, Hamilton & Dayton at Cincinnati, O., has been appointed assistant general freight agent, with office at Cleveland, Ohio, succeeding A. J. Anderson, transferred.

T. E. Harris, division freight agent of the Georgia & Florida at Valdosta, Ga., has been appointed general freight and passenger agent, with headquarters at Augusta, succeeding H. C. McFadden, traffic manager, resigned to accept service with another company, and W. D. Cook has been appointed assistant general freight agent, with office at Augusta.

James F. Mead, assistant general freight agent of the Atlantic Coast Line at Savannah, Ga., has been appointed assistant general freight agent, with office at Jacksonville, Fla., and jurisdiction in Florida. W. C. Ragin has been appointed assistant general freight agent, with office at Savannah, Ga., and jurisdiction in Georgia and Alabama; Robert Taylor has been appointed division freight agent, with office at Orlando, Fla.

William C. Glynn, who has been appointed assistant general freight agent of the Pennsylvania Railroad, with headquarters at Philadelphia, Pa., was born at Rouseville, Pa., on October 24, 1872. He entered railroad service on December 15, 1890, as a telegraph operator and agent. Beginning on February 11, 1892, he was joint clerk of the Allegheny Valley and the Western New York & Pennsylvania (now absorbed in the Pennsylvania) at Oil City, Pa., where he remained until April, 1900, when he was promoted to chief rate clerk in the office of the general freight agent of the Western New York & Pennsylvania at Buffalo, N. Y. On August 1, 1900, he was transferred as chief rate clerk to the division freight agent's office of the Buffalo & Allegheny Valley division of the Pennsylvania, which embraces the roads above named. He was advanced to the general freight agent's office at Philadelphia on June 1, 1906, as chief clerk to chief of tariff bureau, and on July 15, 1908, was promoted to chief clerk to the division freight agents at Pittsburgh. He returned to the general offices at Philadelphia in June, 1911, as chief clerk to the general coal freight agent, and in October, 1912, was promoted to division freight agent at Altoona, Pa. Mr. Glynn was appointed division freight agent at Erie, Pa., on March 1, 1916, which position he held until his promotion on December 1, as assistant general freight agent, with headquarters at Philadelphia, as above noted.



W. C. Glynn

Purchasing

M. E. Towner, the announcement of whose appointment, effective November 1, as purchasing agent of the Western Maryland, with headquarters at Baltimore, Md., was recently made in these columns, was born October 3, 1875, at Branford, Conn., where he received his early education. He entered railway service on September 1, 1894, with the New York, New Haven & Hartford, in the general auditing department at New Haven, Conn., being transferred to New York City on July 1, 1902, as a clerk in the purchasing department. On May 31, 1907, he was appointed assistant to the vice-president of the Chicago, Rock Island & Pacific at Chicago, Ill., and on July 3, 1908, became purchasing agent of the St. Louis & San Francisco, at St. Louis, Mo. He resigned this latter connection in July, 1910, to assume the presidency of the Southern Railway Supply Company. On May 1, 1914, he was appointed special representative of the Whitman & Barnes Company, with office at St. Louis, Mo.



M. E. Towner

Engineering and Rolling Stock

W. M. Jacklin, supervisor of roadway at Hornepayne, Ont., of the Canadian Northern, has been appointed inspector of maintenance of way for lines east of Port Arthur, with headquarters at Toronto, Ont.

OBITUARY

George Lincoln Sands, formerly general superintendent of the Atchison, Topeka & Santa Fe, and more lately receiver for the Missouri & North Arkansas, died on November 21, age 73.

Allen E. Morrison, formerly division superintendent of the Chicago, Milwaukee & St. Paul, at Wausau, Wis., who retired from active service about four years ago on account of ill health, died at his home in Chicago, November 20, age 57 years.

John C. Haile, passenger traffic manager of the Central of Georgia at Savannah, Ga., died on November 20 at his home in that city. A portrait of Mr. Haile and a sketch of his railway career were published in the *Railway Age Gazette* of August 11, 1916, page 257.

David McNicoll, who resigned as senior vice-president of the Canadian Pacific in January, 1915, died on November 26 at Guelph, Ontario. He was born in April, 1852, at Arbroath, Scotland, and began railway work in August, 1866, as a clerk in the goods manager's office of the North British Railway in Scotland, and in 1873 went in the same capacity to the Midland Railway in England. The following year he went to Canada and was appointed billing clerk on the Northern Railway of Canada, and from 1874 to 1881 was chief clerk in the general manager's office of the Toronto, Grey & Bruce, now a part of the Canadian Pacific. From 1882 to 1883 he was general freight and passenger agent of the same road, and then was general passenger agent of the Eastern and Ontario divisions of the Canadian Pacific until 1889, when he became general passenger agent of all lines, rail and steamship, of the Canadian Pacific. He then served as passenger traffic manager until April, 1899, when he was appointed assistant general manager. One year later he was elected second vice-president and general manager, and from December, 1903, until his resignation in January, 1915, was senior vice-president of the same road.



D. McNicoll

Robert S. Dousman, auditor of traffic of the Lehigh Valley at Philadelphia, Pa., died on November 27 at his home in that city. Mr. Dousman was born in 1860 at Milwaukee, Wis., and began railway work in 1880 in the local freight office of the Chicago, Milwaukee & St. Paul at Milwaukee. He was subsequently transferred to the general office, and served in the various capacities of clerk, general bookkeeper, assistant ticket auditor and assistant general auditor, until April, 1897, when he was appointed freight auditor of the same road. Since May, 1903, he was auditor of traffic of the Lehigh Valley.

P. H. Morrissey, assistant to vice-president of the Chicago, Burlington & Quincy, at Chicago, died at Galesburg, Ill., on November 28. He was born on September 11, 1862, at Bloomington, Ill., and began railway work in 1879 as call boy in the locomotive department of the Chicago & Alton, at Bloomington. He became a brakeman, and in 1890 was chosen vice grand master of the Brotherhood of Railroad Trainmen, which organization he had joined in 1885. He subsequently was promoted to be grand master, which office he retained until January, 1909, when he became president of the American Railroad Employees' and Investors' Association, a short-lived organization. Later he served as arbitrator in a large number of controversies between railways and employees. In 1910, with Interstate Commerce Commissioner E. E. Clark, he arbitrated the demands of the conductors and trainmen on the New York Central & Hudson River. In June, 1913, he was appointed assistant to the vice-president, in charge of operation, of the Chicago, Burlington & Quincy, which position he held at the time of his death.

Henry Monkhouse, until two years ago president of the Rome Locomotive & Machine Works, Rome, N. Y., died in St. Paul, Minn., on November 9, at the age of about 72 years. Mr. Monkhouse was in railway mechanical department service for many years. He was acting master mechanic of the Chicago, Kansas & Nebraska division of the Chicago, Rock Island & Pacific from October, 1887, to November, 1890, following which, from November, 1890, to June, 1891, he was assistant general master mechanic and assistant general master car builder of the Chicago, Rock Island & Pacific lines west of the Missouri River. From June, 1891, to February 1, 1897, he was assistant superintendent of motive power and equipment of the same road; from February 1, 1897, to April 1, 1900, superintendent of machinery of the Chicago & Alton; and from July, 1900, to September, 1901, superintendent of motive power of the Chicago, Indianapolis & Louisville. In September, 1901, he was appointed general manager of the Compressed Air Company, becoming, later, president of the Rome Locomotive & Machine Works, as noted above.

John M. Daly, who resigned as general superintendent of transportation of the Illinois Central in January, 1915, and who recently has been doing expert work on transportation matters before the Interstate and State Commissions, died at his home at Chicago, Ill., November 23, age 56 years. He was born in June, 1860, at Peoria, Ill., and entered railway service in 1874 as a clerk in the car accountant's office of the Toledo, Peoria & Western. From 1878 to 1883, inclusive, he held clerical positions on the Wabash, St. Louis & Pacific, the Atchison, Topeka & Santa Fe, and the Chicago & North Western. From 1884 to 1887 he was car accountant and then trainmaster on the Chicago, St. Paul & Kansas City, and from 1887 to September, 1892, he was employed as car accountant on the New York, Chicago & St. Louis and the Illinois Central. From September, 1892, to May, 1899, he was superintendent of transportation on this same road, and from May, 1899, to February, 1901, he held this same position with the Delaware, Lackawanna & Western. After a few months of special service with the Intercolonial Railway of Canada he was appointed general manager of the Cape Breton, and in April, 1902, he again returned to the Illinois Central as superintendent of transportation. From June, 1904, to May, 1910, he was car accountant on this same road, being then reappointed superintendent of transportation. In May, 1912, he was promoted to general superintendent of transportation, which position he resigned in January, 1915.



John M. Daly

Port Movement at Buenos Aires.—During the first nine months of the present year the movement of cars over the railways at the port of Buenos Aires totaled 259,392 goods vans, carrying 2,372,816 tons of cargo, and 1,584 cattle cars.

New Traffic Ruler in France.—Albert Claveille, formerly Under Secretary for Munitions, has assumed office as Director General of Transports and Importations, with supervisory powers over all matters connected with traffic by rail or water. M. Claveille is subordinate to three ministries—war, marine and public works. It will be his duty to carry out measures taken by these ministries to relieve congestion of land and water traffic and to enforce decrees restricting importations.

Equipment and Supplies

LOCOMOTIVES

Lightsey Brothers, Inc., Hampton, S. C., have orfdered one Prairie type locomotive from the Baldwin Locmotive Works.

The Bethlehem Steel Company, Sparrows Point, Md., has ordered 6 six-wheel switching locomotives from the Baldwin Locomotive Works.

The French Government is reported as having placed an order for 100 additional small locomotives with the Baldwin Locomotive Works.

The Mardez Lumber Company, Benford, Tex., has ordered one consolidation locomotive from the Birmingham Rail & Locomotive Company.

Albert N. Thompson & Co., Memphis, Tenn., have ordered one switching locomotive from the Birmingham Rail & Locomotive Company.

The J. M. Hemphill Lumber Company, Rhodes, Miss., has ordered one geared locomotive from the Birmingham Rail & Locomotive Company.

The Pennsylvania Equipment Company, Philadelphia, Pa., is in the market for one 50-ton and 2 60-ton second-hand, six-wheel switching locomotives.

The Norwegian State Railways and other Norwegian railways have placed an order with the Baldwin Locomotive Works for 22 locomotives of various types.

The Southern Railway, reported in the *Railway Age Gazette* of November 3 as being in the market for 12 Mallet, 8 Mountain and 25 Santa Fe type locomotives, has ordered these locomotives from the Baldwin Locomotive Works.

The Missouri, Kansas & Texas, reported in the *Railway Age Gazette* of November 10 as being in the market for 25 Mikado and 10 Pacific type locomotives, has ordered the 10 Pacific locomotives from the American Locomotive Company.

W. R. Grace & Co., New York, has ordered one four-wheel saddle tank locomotive from the American Locomotive Company. This locomotive will have 11 by 16 in. cylinders, 30½ in. driving wheels and a total weight in working order of 41,000 lb.

The Wabash, reported in the *Railway Age Gazette* of November 17 as having revived an inquiry for 25 Santa Fe type locomotives, has ordered these locomotives from the American Locomotive Company. These engines will have 29 by 32 in. cylinders, 64 in. driving wheels, a total weight in working order of 380,000 lb. and will be equipped with superheaters.

The Russian Government was reported in the *Railway Age Gazette* of November 17 as having ordered 40 Decapod locomotives from the American Locomotive Company, 40 from the Baldwin Locomotive Works and 20 from the Canadian Locomotive Company. These locomotives will have 25 by 28 in. cylinders, 52 in. driving wheels, a total weight in working order of 197,000 lb. and will be equipped with superheaters.

The Florida East Coast has ordered 10 Pacific and 2 six-wheel switching locomotives from the American Locomotive Company. The Pacific type locomotives will have 22 by 26 in. cylinders, 68 in. driving wheels and a total weight in working order of 204,000 lb. The six-wheel switching locomotives will have 20 by 26 in. cylinders, 51 in. driving wheels and a total weight in working order of 146,000 lb. All 12 locomotives will be equipped with superheaters.

The Norfolk & Western, reported in the *Railway Age Gazette* of September 29 as inquiring for a number of Mountain type locomotives, recently authorized the building of 8 of these locomotives in its own shops. These locomotives will be equipped with superheaters, brick arches and Baker valve gear. Four of them will have Hanna automatic stokers and four street stokers. The Norfolk & Western will also build one heavy Mallet (2-8-8-2) locomotive in its Roanoke shops.

FREIGHT CARS

The Virginian is inquiring for 50 gondola cars.

The Illinois Steel Company is in the market for 8 steel flat cars.

The Westmoreland Coal Company has issued inquiries for 100 50-ton hopper cars.

The Wabash is inquiring for specialties for repairing about 750 cars in its own shops.

The Jacob Dold Packing Company will soon place an order for 50 30-ton refrigerator cars.

The St. Louis Southwestern will purchase specialties for repairing about 1,000 cars in its own shops.

The Chesapeake & Ohio has issued inquiries for 51, 57½-ton flat bottom gondola cars and 26, 57½-ton hopper cars.

The New Jersey Zinc Company is inquiring for 15 hopper cars, 10 general service cars, 3 box cars and 10 gondola cars.

The Chicago, Rock Island & Pacific has issued inquiries for 2,000 40-ton steel underframe, steel superstructure box cars.

The Bethlehem Steel Company has ordered 30 20,000-lb. capacity special standard gage quarry cars from the Magor Car Company.

The Union Railroad has ordered 1,250 cars from the Pressed Steel Car Company, and 750 70-ton gondola cars from the Ralston Steel Car Company.

The New York Central has ordered 2,000 70-ton gondola cars from the Standard Steel Car Company, and is still inquiring for 1,000 to 2,000 42-ft. composite gondola cars.

The Delaware, Lackawanna & Western has ordered 500 hopper cars from the American Car & Foundry Company, in addition to the 500 box cars mentioned in last week's issue.

The Norfolk & Western, reported in the *Railway Age Gazette* of November 10 as in the market for 4,700 freight cars, will soon issue inquiries for 2,000 115,000-lb. hopper, and 1,000 ventilated box cars.

The Southern Railway, reported in the *Railway Age Gazette* of November 10 as having ordered among other cars, 1,265 box cars from the Lenoir Car Works, has since increased this to 1,350 steel center sill 30-ton box cars.

The Great Northern has ordered 500 Moore combination refrigerator, ventilator and heater cars from the Refrigerator, Heater & Ventilator Car Company, St. Paul, Minn. These are in addition to 500 refrigerator cars recently ordered from the Haskell & Barker Car Company.

The Oliver Iron Mining Company, Duluth, Minn., has ordered 25 to 50 20-yd., 140,000-lb. capacity, automatic air dump cars from the Magor Car Company. These cars will be of the Magor autopneumatic design, having rolled steel wheels and Andrews cast steel side frames. The same company has also ordered 25 70-ton automatic air dump cars from the Orenstein-Arthur Koppel Company.

Russian Government.—The *Railway Age Gazette* is in receipt of the following communication:

We notice in the November 17 issue of the *Railway Age Gazette*, under the heading of Freight Cars, there is quoted an abstract from the evening edition of the Wall Street Journal of November 14, which states that an order was placed by the Russian Government with The Bettendorf Company for 4,000 cars, etc.

This statement is erroneous. Mr. Newman Erb secured a contract from the Russian Government for 4,000 gondola cars and we have been negotiating with him during the past several months for the manufacture of these cars, but the terms of payment set forth in our proposition, calling for segregation of funds, could not be met, and we therefore finally found it necessary to withdraw our proposition.

We should like very much to have you publish the exact facts concerning this matter in your next issue, and we sincerely hope that you can comply with our request.

The Bettendorf Company, J. W. Bettendorf, President.

PASSENGER CARS

J. B. Duke has ordered a private car from the Pullman Company.

Mrs. H. N. Flagler has ordered a private car from the Pullman Company.

The Chicago, Burlington & Quincy is reported in the market for 5 postal cars.

The Florida East Coast is in the market for 5 coaches and 3 combination cars.

The Missouri, Kansas & Texas has ordered 10 baggage cars from the American Car & Foundry Company.

The Norfolk & Western, reported in the *Railway Age Gazette* of October 6 as being in the market for an officers' car, ordered this car from the Pullman Company.

The Wabash, reported in the *Railway Age Gazette* of October 27 as being in the market for 6 postal cars, has ordered these cars from the American Car & Foundry Company.

IRON AND STEEL

The New York Central is reported in the market for 150,000 tons of rails.

The Chicago & North Western has ordered 3,500 tons of steel from the American Bridge Company.

SIGNALING

El Paso & Northeastern.—This road plans, during the coming year, to install automatic block signals on its line near El Paso, 5½ miles.

El Paso & Southwestern.—This company proposes, during 1917, to install automatic block signals on its line between El Paso, Tex., and Lewis Springs, Ariz., 75 miles.

The Pennsylvania has given the contract to the General Railway Signal Company for the materials for the installation at Bellevue, Pa., of a 64-lever, model 2, unit lever type, electric-interlocking machine, having 52 working levers and 12 spare spaces; and a 64-lever, model 2, unit lever type, electric-interlocking machine, having 49 working levers and 15 spare spaces, at Baden, Pa. These machines will be installed by the railroad company's forces.

The Richmond, Fredericksburg & Potomac (operating also the Washington Southern) has awarded a contract to the General Railway Signal Company for the installation of 102 miles of double-track a. c. automatic block signaling from North Acca, Va., to AF Tower, on 20 miles of which, from North Acca to Doswell, the existing d. c. signaling will be replaced. The signals will be model 2-A base-of-mast type, three positions, with 110-volt induction motors, and wireless control circuits. Polyphase relays will be used throughout. The signal transmission line is 6,600-volt, single-phase, 60 cycle. This will finish the automatic signaling of the main line from Washington, D. C., southward to Richmond, Va., 116 miles. At present the manual block system is used.

The Nashville, Chattanooga & St. Louis recently awarded a contract for the replacement of seven Thomas pneumatic interlockings now in service in the Nashville terminal, with five electro-pneumatic plants, comprising about 275 working levers, the cost of which will be about $250,000. In these plants the use of color-light signals in lieu of semaphores is contemplated. The work will not be started before next spring, and probably will not be finished before January 1, 1918. Work will commence on or about January 1, 1917, on the installation of a 12-lever electro-mechanical interlocking plant at Bridgeport, Ala., to cost approximately $15,000. A contract has been awarded for the revision of the electro-mechanical interlocking at Chattanooga, Tenn., known as "NY," at a cost of about $8,000. Automatic signals, comprising two signals and six switch indicators, to cost about $5,500, will be installed to protect the Alton Park extension connection on double-track between the "NY" plant, and an electric-interlocking plant now being built at Lewis street at the crossing with the Chattanooga Belt. The last mentioned plant will comprise 35 working levers, and will cost approximately $25,000. The Union Switch & Signal Company has contracts for all of the aforementioned projects, both those under way and those contemplated.

Supply Trade News

Directors of the Haskell & Barker Car Company have declared an initial quarterly dividend of 75 cents a share.

The Standard Scale & Supply Company, Pittsburgh, Pa., has moved its Philadelphia branch to larger quarters at 523 Arch street.

The Northwest Steel Company, Portland, Ore., has under consideration the erection of a new $1,000,000 rolling mill, with a capacity of 20,000 tons of steel per month.

Arthur V. Farr, who for the last three years has been advertising manager of the S K F Ball Bearing Company, Hartford, Conn., has accepted the position of sales manager of the Hess Steel Corporation of Baltimore, Md.

The Burdett Oxygen Company, Chicago, Ill., will complete the erection of its Pittsburgh, Pa., plant, at Fortieth street and the Allegheny Valley tracks, on December 1. This will make the eleventh plant to be established by this company in the various industrial centers of the country.

J. Sterling Goddard, for the past 10 years chief engineer for the American Steel Foundries, Chicago, died at his home in Riverside, Ill., on November 23, at the age of 44. He was born on August 15, 1872, at Monroe, Mich. He graduated from the mechanical engineering department of Cornell University in 1894, and took employment at once with the Western Tube Company, Kewanee, Ill., as an assistant mechanical engineer. He held this position until April, 1898, when he entered the engineering department of the Frazer & Chalmers Company. In 1900 he was appointed chief draftsman in the motive power department of the Chicago, Burlington & Quincy at Chicago, and retained this position until 1906, when he was appointed chief engineer of the American Steel Foundries.



J. S. Goddard

R. C. Weller, formerly industrial agent of the Pittsburgh & Lake Erie, the Lake Shore & Western and the Lake Shore & Michigan Southern jointly, and for the past two years managing secretary of the Erie (Pa.) Board of Commerce, has been appointed traffic manager of the Erie Forge Company at Erie, Pa.

The Railway Steel Spring Company has declared a quarterly dividend of 1¼ per cent on the common stock, payable December 30, and also the regular quarterly dividend of 1¾ per cent on the preferred stock, payable December 20. This is the first disbursement on the common shares since March 22, 1913, when 2 per cent was declared.

The Lagonda Manufacturing Company, Springfield, Ohio, announces the opening of a new branch office in the McCormick building, Chicago. J. E. Chubb, formerly with the Griscom-Russell Company, is in charge as district sales manager. The company's business in this territory was formerly in charge of the Chicago Engineer Supply Company.

J. A. & W. Bird & Co., Boston, Mass., distributors of Ripolin Enamel paint, have arranged to have George Price, manager of the New York office, 120 Broadway, handling the metropolitan district for the past eight years, and who recently completed a trip through the south, engineer and handle the sales department covering the entire territory south of New York, as far west as the Mississippi, and also including Louisiana and Texas.

Westinghouse Electric Grants Employees a Bonus

Announcement has been made by the Westinghouse Electric & Manufacturing Company of an extension of its present bonus system to include salaried and office employees on hourly rates, by which they will receive a bonus of 8 per cent of their salary each month providing their total excusable time absent and late during the month does not exceed six hours incurred on not over three occasions.

An additional 4 per cent will be given each month to the employee who has not lost any time from work during the month through absence or tardiness, thus enabling those affected to obtain an increase in earnings of 12 per cent for a 100 per cent attendance. Several thousand employees in the Pittsburgh district are benefited by the granting of the bonus.

E. E. Hudson

E. E. Hudson, who has for years been prominently identified with the development and installation of the primary battery, will on January 1, 1917, become vice-president and general manager of the Waterbury Battery Company, with headquarters at Waterbury, Conn.



E. E. Hudson

Mr. Hudson, with the exception of a little over a year's time, has been for 18 years in the sales and managerial departments of concerns manufacturing primary batteries, and during this period has been responsible in a large way for the multiplication of the primary battery business in various industries, but particularly in the railway field. For the past eight years he has been closely associated with Thomas A. Edison.

"Ed," as he is known to a host of friends, began his experience in July, 1898, as chief clerk in the primary battery sales department of the Edison Manufacturing Company. He remained there until June, 1902, when he left to take a position as treasurer of the Peerless Fashion Company, in which his family was financially interested. A few months later that company changed hands, and he went as an accountant in the controller's department of the United States Steel Corporation. In December, 1903, he was made secretary and treasurer of the Battery Supplies Company, Newark, N. J., and in 1905 was made sales-manager of that company. When the Edison company absorbed the Battery Supplies Company in 1908 he was appointed assistant manager of sales in the primary battery department. He becames sales manager of that department in February, 1909, and in September, 1913, was also elected fourth vice-president. In October, 1914, in addition to these duties, he was also given charge of the manufacturing, as well as the sales, and in March, 1915, was made division manager in general charge of the entire primary battery business of Thomas A. Edison, Inc.

For the past several years Mr. Hudson has been closely identified in the work of several manufacturing associations that have to do with the annual meetings of railroad bodies. In 1914 he was chairman of the Railway Telephone & Telegraph Appliance Association, and still is a member of the executive committee, and on the arrangements committee for the 1917 meeting. During the present year he was chairman of the Signal Appliance Association, previously having been a director and at various times in charge of specific details in connection with the meetings of that association. He is also a director of the National Appliance Association, which is to the American Railway Engineering Association what the Signal Appliance Association is to the Railway Signal Association.

As vice-president and general manager of the Waterbury Battery Company he will have full charge of the company's business, and it is almost useless to add the prediction that success will be with him from the beginning.

Railway Construction

Baltimore & Ohio.—Bids have been received by this company for building a 3-mile line from Bosville, Pa., on the Somerset & Cambria branch, into the Jenners coal region.

Bowdon, Railway.—This company, which operates a line from Bowdon, Ga., northeast to Bowdon Junction, 12 miles, is said to be considering the question of building an extension from Bowdon southwest to Roanoke, Ala., about 30 miles.

Buffalo & Depew (Electric).—This company plans to build an extension, next year, from Depew, N. Y., southeast to Lancaster. The work is to be carried out by company forces. The The company now operates a double track line from Buffalo to Depew, 13.59 miles.

Cambria & Indiana.—This company, which let a contract to A. L. Anderson & Brothers, Altoona, Pa., early this year, to build an extension from Regan Junction, Pa., to Nant-y-Glo, eight miles, is making surveys for an extension from Nant-y-Glo to Revloc, six miles. (April 7, page 817.)

Canada & Gulf Terminal.—This company, which operates a line from Mont Joli, Quebec, to Matane, 36 miles, has projected an extension from Matane to Gaspe Basin, 250 miles.

Canadian Pacific.—This company now has grading work under way on the Western lines, from Vantage, Sask., southerly on seven miles.

Denver & Ephrata.—Incorporated in Pennsylvania, with $130,000 capital, to build a 4.7-mile line in Lancaster county, Pa. H. S. Dissler, Denver, Pa., is president.

Great Northern.—The line from Bynum, Mont., to Pendroy, 8.5 miles, was opened for business on November 20. The present end of track is at a point .40 of a mile beyond Pendroy.

Houston-Richmond Traction Company.—This company intends to construct an electric line from Houston, Tex., to San Antonio, a distance of 190 miles. Contracts for about 60 miles have already been let, and the work is being pushed forward rapidly. This new line will shorten the distance between these two points approximately 25 miles. Contracts for supplies and equipment will be let some time in February or March, 1917. W. A. Rinehart, president, Carter building, Houston, Tex.; Edward Kennedy, purchasing agent, Houston.

Minnesota Transfer.—This company, which operates a terminal switching road for the railroads entering St. Paul, Minn., and Minneapolis, during the year 1916, laid 5.18 miles of yard tracks.

Morgantown & Wheeling (Electric).—This company has given a contract to H. D. Eichelberger, Richmond, Va., it is said, to build an extension from Price station, W. Va., to Blacksville, 7.7 miles.

Northern Pacific.—This company has awarded a contract for the construction of about 35 miles of new line to Grant. Smith & Co., Spokane, Wash. The line will be built from a point 12 miles west of Billings, Mont., into the wheat growing area northwest of Laurel, Mont.

Northwestern Pennsylvania (Electric).—Construction work has been completed on the new line from Cambridge View, Pa., to Venango, Crawford county, 3.5 miles. The new line replaces about 3 miles of track between Cambridge Springs and Venango which will be abandoned. (June 2, p. 1205.)

Oakland, Antioch & Eastern (Electric).—This company has completed work on an extension from Stow, Cal., to Diablo, 1.36 miles.

Ohio Electric.—This company, which operates electric lines in Ohio and Indiana, completed work during 1916 on the reconstruction of about ten miles of main track.

Piedmont & Northern (Electric).—This company, which completed an extension from Belmont Junction, N. C., to Belmont 3.1 miles early this year, has survey made for an exten-

sion from Gastonia, N. C., to Kings Mountain. This is a section of the line to be built to complete the gap between Gastonia, N. C., and Spartanburg, S. C. (June 2, page 1205.)

Salt Lake, Garfield & Western.—This company, until recently the Salt Lake & Los Angeles, intends shortly to extend its line to Garfield, Utah, and then electrify its entire system. No engineering or construction work has as yet been done nor any contracts let. However, orders have been placed for rails, ties, poles and other equipment necessary to electrification. It is expected to effect the complete change from steam power to electrification about July, 1917. Joel Richards, secretary and traffic manager, Salt Lake City, Utah.

Salt Lake & Utah (Electric).—This company has completed work on the extension from Spanish Fork, Utah, to Payson, 7.4 miles. The company now operates a total of 66.6 miles. This company also laid 1.5 miles of second track during 1916 between Provo City, Utah, and Provo Junction.

Southwest Missouri (Electric).—This company will soon construct an extension from Galena, Kan., to Baxter Springs, a distance of 15 miles. No contracts have as yet been awarded. E. J. Pratt, Webb City, Mo., superintendent.

Tidewater Southern.—This company, operating 33 miles of steam road, intends shortly to construct 17 miles additional, and then electrify the entire line. The new construction will be done by the company's own forces. The actual work will commence about January 1. Byron A. Bearce, president and general manager, 25 Sutter street, Stockton, Cal.

Virginia Railway & Power Company.—According to press ports T. S. Wheelwright, president of this company, is interested in a project to build a line from Richmond, Va., west to Bon Air, seven miles.

RAILWAY STRUCTURES

Ardmore, Okla.—The Atchison, Topeka & Santa Fe and the Chicago, Rock Island & Pacific have awarded a contract to the H. D. McCoy Company, Cleburne, Tex., for the construction of a union passenger station. Work will begin at once. The building will cost $40,000. It will take the place of the one destroyed by fire in September, 1915, following a gasoline explosion.

Danbury, Conn.—The New York, New Haven & Hartford has given a contract to the T. J. Pardy Construction Company, Bridgeport, Conn., for building enginehouse facilities at Danbury. (Aug. 25, p. 350.)

Memphis, Tenn.—It is proposed to build a subway at Lamar avenue, Memphis, at a cost of $126,000. The cost of the work is to be paid by the city of Memphis and the following railroads: City of Memphis, $23,000; Nashville, Chattanooga & St. Louis, $48,000; Union Railway, $43,000; Memphis Street Railway, $12,000.

Spencer, N. C.—The Southern Railway is reported to have given a contract to J. P. Pettyjohn & Co., Lynchburg, Va., to build the new steel car shed and shop at Spencer. (Sept. 29, page 572.)

Utica, N. Y.—Contracts have been given to H. R. Beebe, Utica, for the substructure, and to the Lackawanna Bridge Company, New York, for the steel superstructure of a footbridge to the enginehouse of the New York Central to be built over Mohawk turnpike, Utica. The bridge will have concrete piers and abutments, steel columns and trusses and timber floor. It will have a clearance of 22 ft. to top of rail, and will be 6 ft. wide and 833 ft. long. The cost of the improvement is about $30,000.

Locomotive Production in Germany.—For the year 1916 the Prussian State Railway authorities have ordered 1,600 locomotives, 1,700 passenger vehicles, 400 luggage vans and 38,000 goods wagons, and with a view to executing these requirements every locomotive and railway rolling stock firm in the country has received orders according to their highest capacity for output, but operations are seriously curtailed on account of the shortage of workmen. In several factories prisoners of war, mostly French and Belgians, are working under military supervision. They are mostly skilled laborers who, before taking up arms, were employed in work of a similar kind. In normal times the German locomotive manufacturers can produce in the aggregate about 3,000 locomotives annually.

Railway Financial News

Baltimore & Ohio.—Hugh L. Bond, Jr., general counsel, has been elected a director, succeeding Charles S. Harkness, deceased.

Chicago Great Western.—Application has been made to the railroad commission of Illinois for authority to issue $2,505,000 first mortgage 50-year 4 per cent bonds.

Chicago, Rock Island & Pacific.—The following statement has been given out by the reorganization committee: An informal conference was held November 28 between Frederick W. Scott, Harry Bronner, James A. Patten and Charles G. Dawes and the representatives of the reorganization committee of the Chicago, Rock Island & Pacific. The conference resulted in a completed understanding between the interests represented, and as a result these gentlemen announced their intention of depositing the stock which they own and represent with the reorganization committee under the plan. The reorganization committee has agreed, pursuant to the request of these gentlemen, who represent important stock holdings in the Rock Island, to modify their plan so that the 7 per cent preferred stock given in exchange for new money be callable at 105, and that the 6 per cent preferred stock, payable to the present holders of debentures, be retirable at 102. The committee representing the debentures of the Chicago, Rock Island & Pacific has given notice to Receiver Dickinson, pursuant to agreement, advising that the committee will upon November 30 request the Bankers' Trust Company's trustees of the debentures to declare the principal due. This is another step in the direction of completing the plan of reorganization.

Cincinnati, New Orleans & Texas Pacific.—This company has declared an extra 3½ per cent dividend on the common stock, in addition to the regular semi-annual dividend of 3 per cent on the common and the regular quarterly 1¼ per cent on the preferred. In May, beside the regular dividends, an extra dividend of 2½ per cent was declared on the common.

Idaho Southern.—This road, which runs from Gooding, Idaho, to Jerome, 23 miles, and which has not been in operation since June, is to abandon its line with the permission of the Idaho railroad commission.

New York Central.—The Ohio Public Service Commission has been asked to authorize the sale of $25,000,000 common stock of the New York Central at not less than par.

Salt Lake & Los Angeles.—At a recent meeting of the stockholders of the Salt Lake & Los Angeles the name of the company was changed to Salt Lake, Garfield & Western.

Salt Lake, Garfield & Western.—See Salt Lake & Los Angeles.

Southern Railway.—Holders of the outstanding general mortgage 4 per cent bonds are asked to deposit their bonds immediately with the Bankers' Trust Company, New York, with October 1, 1917, and subsequent coupons attached, the coupon due April 1, 1917, to be retained by the owner for collection when due, in accordance with the plan described in these columns in the issue of November 3, 1916, page 783. New bonds will be issued in exchange bearing 4½ per cent interest, the first coupon on the new bonds being payable October 1, 1917.

Railway Subsidies in Colombia.—Colombian law provides for a subsidy of $16,000 for each mile of roadbed constructed, and grants up to 300 hectares (740 miles) of public land, to be located along the roadbed, for each mile of railway constructed. After 75 years the government reserves the right to purchase the road from the concessionaire.

Motor Women on Paris Railways.—Prefect of Police Laurent has issued an order authorizing motor women on the Paris street railways. They will be trained and placed on lines where traffic is lightest. Women are now also replacing baggagemen at some of the railroad stations, notably those of the Paris, Lyons & Mediterranean Railway.

ANNUAL REPORTS

NORTHERN PACIFIC RAILWAY COMPANY—TWENTIETH ANNUAL REPORT

OFFICE OF THE
NORTHERN PACIFIC RAILWAY COMPANY,
ST. PAUL, MINNESOTA.
September 15, 1916.

To the Stockholders of the
NORTHERN PACIFIC RAILWAY COMPANY.

The following, being the Twentieth Annual Report, shows the result of the operation of your property for the fiscal year ending June 30, 1916.

INCOME ACCOUNT.

I—OPERATING INCOME.	*1915*	*1916*	*Increase—I Decrease—D*	
Railway operating revenues	$63,171,652.60	$75,939,230.65	*I*	$12,767,578.05
Railway operating expenses	37,108,048.88	40,366,411.85	*I*	3,258,362.97
Net revenue	$26,063,603.72	$35,572,818.80	*I*	$9,509,215.08
Railway tax accruals	$4,470,958.70	$5,073,415.42	*I*	$602,456.72
Uncollectible railway revenues	4,151.33	6,213.55	*I*	2,062.22
Total operating income	$21,588,493.69	$30,493,189.83	*I*	$8,904,696.14
II—NON-OPERATING INCOME.				
Hire of freight cars—credit balance	$512,197.20	$301,152.76	*D*	*$211,044.44*
Rent from locomotives and cars	421,787.31	306,156.59	*D*	*115,630.72*
Joint facility rent income	1,839,275.32	2,019,951.04	*I*	180,675.72
Income from lease of road	273,352.51	287,660.54	*I*	14,308.03
Miscellaneous rent income	330,970.61	319,024.03	*D*	*11,946.58*
Miscellaneous non-operating physical property—rents	35,748.88	40,142.66	*I*	4,393.78
Separately operated properties —profit	39,194.81	21,283.15	*D*	*17,911.66*
Dividend income	*6,203,932.00	*4,345,152.00	*D*	*1,858,780.00*
Income from funded securities	235,004.75	235,305.50	I	300.75
Income from unfunded securities and accounts	440,713.01	473,235.83	*I*	32,522.82
Income from sinking and other reserve funds	108,245.99	124,982.77	*I*	16,736.78
Miscellaneous income	2,536.94	5,211.08	*I*	2,674.14
Total non-operating income	$10,442,959.33	$8,479,257.95	*D*	*$1,963,701.38*
Gross income	$32,031,453.02	$38,972,447.78	*I*	$6,940,994.76
III—DEDUCTIONS FROM GROSS INCOME.				
Rent for locomotives and cars	$118,532.38	$123,541.16	*I*	$5,008.78
Joint facility rents	493,150.80	540,555.58	*I*	47,404.78
Rent for lease of road	51,331.86	51,331.86		.....
Miscellaneous rents	5,752.89	5,338.68	*D*	*414.21*
Miscellaneous tax accruals	.....	144.88	*I*	144,88
Interest on funded debt	†12,294,400.16	†12,303,326.33	*I*	8,926.17
Interest on unfunded debt	54,380.43	25,925.49	*D*	*28,454.94*
Miscellaneous income charges	191,084.17	192,410.15	*I*	1,325.98
Total deductions from gross income	$13,208,632.69	$13,242,574.13	*I*	$33,941.44
Net income	$18.822,820.33	$25,729,873.65	*I*	$6,907,053.32
IV—DISPOSITION OF NET INCOME.				
Dividend appropriation of income	$17,360,000.00	$17,360,000.00		.....
Income balance for year—transferred to profit and loss	$1,462,820.33	$8,369,873.65	*I*	$6.907,053.32

*Includes dividends on stock of Chicago, Burlington & Quincy R. R. owned by this Company.

†Includes interest paid on this Company's proportion of joint bonds issued by this Company and the Great Northern Railway Company, secured by C. B. & Q. R. R. capital stock as collateral.

MILEAGE OPERATED.

Changes have taken place in the mileage operated during the year as follows:

There were added:

	Miles
July 1, 1915, Minneapolis, St. Paul & Sault Ste. Marie Ry. in Minnesota, leased	4.03
July 31, 1915, Fort Simcoe Branch in Washington, extended	1.34
Sept. 1, 1915, Great Northern Railway in Washington, leased	11.73
Oct. 1, 1915, Golden Valley Branch in North Dakota and Montana, constructed	25.90
June 30, 1916, Fairview Branch, North Dakota, transferred from spur tracks	1.04
June 30, 1916, Sundry minor changes and corrections	.73
Total additions	44.77
Deductions:	
June 30, 1916, Tumwater Branch in Washington, shortened	6.10
Net additions	38.67
Mileage operated June 30, 1915	6,466.17
Mileage operated June 30, 1916	6,504.84
Average mileage operated during the year	6,501.11

REVENUE TRAIN MILEAGE.

Revenue passenger train miles during the year were 9,874,845, a decrease of 481,860 miles compared with the previous year.

Revenue freight and mixed train miles during the year were 11,088,936, an increase of 2,076,701 miles.

Revenue special train miles during the year were 14,708, a decrease of 3,914 miles.

All revenue train miles during the year were 20,978,489, an increase of 1,590,927 train miles.

EARNINGS.

FREIGHT BUSINESS.

Freight revenue was $55,656,395.19, an increase of $11,822,758.29 or 26.97 per cent compared with the previous year.

7,017,609,074 tons of revenue freight were moved one mile, an increase of 1,853,037,642 tons one mile, or 35.88 per cent more than the previous year.

The average earnings per ton mile decreased from .00849 to .00793.

The revenue train load increased from 573.06 to 632.85 tons. The total train load, including company freight, increased from 668.45 to 717.02 tons.

The number of miles run by revenue freight trains was 10,200,544, an increase of 2,092,984, or 25.82 per cent.

PASSENGER BUSINESS.

Passenger revenue was $13,852,254.49, an increase of $233,140.69, or 1.71 per cent compared with the previous year.

Mail revenue was $1,161,943.23, an increase of $45,417.84, or 4.07 per cent.

Express revenue was $1,341,515.80, an increase of $116,322.92, or 9.49 per cent.

Sleeping car, parlor and chair car, excess baggage and miscellaneous passenger revenue was $847,116.94, an increase of $43,636.66, or 5.43 per cent.

Total revenue from persons and property carried on passenger trains was $17,202,830.46, an increase of $438,518.11, or 2.62 per cent compared with the previous year.

The number of passengers carried was 8,680,837, a decrease of 75,947 from the previous year, and the number of passengers carried one mile was 616,681,153, an increase of 16,408,000, or 2.73 per cent.

The number of miles run by revenue passenger trains was 9,874,845, a decrease of 481,860, or 4.65 per cent.

The average earnings per passenger per mile was .02246 against .02269 last year.

EARNINGS AND EXPENSES PER MILE OPERATED.

	1915	*1916*
Operating revenues per mile (average)	$9,777.88	$11,680.96
Operating expenses per mile (average)	5,743.68	6,209.16
Net operating revenue per mile (average)	4,034.20	5,471.80
Taxes per mile (average)	692.03	780.39

RATIOS.

	1915	*1916*
Operating expenses to operating revenue	58.74%	53.16%
Taxes to operating revenue	7.08%	6.68%

OPERATING EXPENSES.

CONDUCTING TRANSPORTATION.

The charges for transportation expenses were $20,900,054.72, an increase of $1,912,998.96 or 10.08 per cent, as against an increase in total operating revenue of 20.21 per cent.

MAINTENANCE OF EQUIPMENT.

The charges for maintenance of equipment were $7,846,259.43, an increase of $529,185.01 or 7.23 per cent.

LOCOMOTIVES.

Total number of locomotives on active list June 30th, 1915		1,361
Additions:		
Engine acquired with road purchased	1	
Engine restored to active list	1	
		2
		1,363
Deductions:		
Engines sold during the year, from active list	3	
Engines dismantled	4	
		7
Total locomotives on active list June 30, 1916		1,356

In addition to the engines on active list there were:

Withdrawn from service and on hand from previous year	122
Dismantled during year	82
Restored to active list	1
	83
Leaving on hand engines withdrawn from service which may be sold	39

HAULING CAPACITY.

Active List	Number.	Tractive Power. (Pounds.)	Total Weight on Drivers. (Pounds.)	Total Weight of Engines. (Pounds.)
Assignment June 30, 1915	1,361	45,396,440	204,283,688	259,848,168
Added during fiscal year, engines reinstated and acquired	2	32,700	141,350	177,950
Added during fiscal year*		56,340	130,812	183,982
Total	1,363	45,372,800	204,555,850	260,210,100
Engines sold and permanently retired	7	127,600	569,850	746,100
Assignment June 30, 1916.	1,356	45,245,200	203,986,000	259,464,000

*Account compound engines changed to simple and engines having superheaters applied.

The following statement shows the character and condition of the locomotives of the Company on June 30, 1916.

Wheel Arrangement	Owned June 30, 1915	Sold or Permanently Withdrawn from Service	Added.	Owned June 30, 1916.	Average weight of Locomotives without tender. Tons of 2000 lbs. Total.	Average weight of Locomotives without tender. Tons of 2000 lbs. On Drivers.	Average Tractive Force—Lbs.
0-0	1			1	28.50	28.50	8,300
0-0-0	1			1	20.25	17.00	7,900
0-0-0	169	1	1	169	66.92	66.92	28,373
0-0-0-0	14			14	66.71	66.71	26,264
0-0-0-0	106	2		104	54.47	45.23	18,397
0-0-0-0	118			118	88.02	78.72	37,412
0-0-0-0-0	2			2	72.51	65.27	34,800
0-0-0-0	63	2	1	62	46.58	29.76	14,313
0-0-0-0	278	2		276	80.29	60.28	26,461
0-0-0-0-0	4			4	93.00	75.00	38,500
0-0-0-0	6			6	84.39	43.85	21,483
0-0-0-0-0	142			142	113.47	71.42	30,891
0-0-0-0-0	150			150	102.25	76.75	33,300
0-0-0-0-0	270			270	136.03	105.75	48,411
0-0-0-0-0-0	22			22	170.70	150.72	64,936
0-0-0-0-0-0-0	15			15	225.80	200.73	89,500
Total	1,361	7	2	1,356	95.67	75.22	33,367

Condition.	1915. Number.	1915. Per Cent.	1916. Number.	1916. Per Cent.
Good	1,095	80.46	1,121	82.67
Fair	158	11.60	140	10.32
At Shops	108	7.94	95	7.01
	1,361	100.	1,356	100.
Number of oil burning locomotives	56	4.11	56	4.13
Number of locomotives equipped with superheaters	261	19.18	302	22.27

PASSENGER EQUIPMENT.

On June 30, 1916, the company owned 1,281 passenger train cars, including 128 sleeping cars owned jointly with the Pullman Company, a decrease of 6 cars. The number and kind of cars owned is shown in table on page 38.

Of the 1,281 cars owned 971 were not due in shops for two months or more.

FREIGHT EQUIPMENT.

Comparative number and capacity of freight cars.

	1915. Number.	1915. Capacity (Tons of 2000 lbs.)	1916. Number.	1916. Capacity (Tons of 2000 lbs.)	Decrease. Number.	Decrease. Capacity (Tons of 2000 lbs.)
Box	25,936	983,150	25,552	972,045	384	11,105
Furniture and Automobile	672	24,895	648	24,270	24	625
Refrigerator	4,052	129,855	4,035	129,420	17	435
Stock	2,473	57,435	2,399	55,825	74	1,610
Flat	8,507	301,085	8,348	296,735	159	4,350
Oil	62	2,555	62	2,555	...	....
Coal	5,206	252,065	5,097	249,115	109	2,950
Ballast and Ore	1,252	54,290	1,224	53,170	28	1,120
Total	48,160	1,805,330	47,365	1,783,135	795	22,195
Percentage	....	.....	....	.....	1.65	1.23
Average capacity per car	....	37.5	....	37.6	...	....

Of the total number of freight cars on the road on June 30, 1916, 1,251 or 2.64% were in need of repairs costing $5.00 or more per car.

No additional passenger equipment is under contract for construction or is building at company shops. 250 freight cars authorized for construction from second-hand material at company shops.

MAINTENANCE OF WAY AND STRUCTURES.

The charges for Maintenance of Way and Structures were $8,833,210.00, an increase of $309,552.55, or 3.63 per cent.

The table in the report of the Comptroller (page 28) shows the distribution of this increase under the respective accounts.

The following statements give particulars of some of the work done and show that the property has been well maintained.

PERMANENT WAY.

	1915	1916
New main line laid with 90 pound rail....miles	46.39	....
New second track laid with 90 pound rail.... "	61.56	....
New branch lines laid with 90 pound rail.... "	3.82	....
New branch lines laid with 85 pound rail.... "	36.87	25.90
New branch lines laid with 56, 60 and 70 pound rail .... "	1.33	1.34
Main line relaid with 90 pound rail.... "	119.88	88.05
Main line relaid with 85 pound rail.... "	9.01	0.91
Second track relaid with 90 pound rail.... "	22.85	83.16
Branch lines relaid with 90 pound rail.... "	1.39	.48
Branch lines relaid with 56, 66, 72 or 85 pound rail .... "	79.31	74.76
Sidings and spurs constructed.... "	33.69	37.80
Track ballasted .... "	382.97	173.70
Embankment widened .... "	64.73	27.51
Cross tie renewals—main line....ties	1,956,832	1,597,826
Cross tie renewals—branch lines.... "	1,060,667	1,002,622
Timber bridges replaced by permanent structures and embankments	57	25
Equal to ....miles	1.36	0.45
Timber bridges renewed	64	106
Timber culverts replaced	176	116
New stock fence constructed....miles	126.44	101.17
New snow fences constructed.... "	3.65	2.93

RAIL IN MAIN, SECOND AND THIRD TRACKS.

	Main Line Miles	Branches Miles	Second and Third Track Miles	Total Miles 1916	Total Miles 1915
100 pound steel.....	47.40	.....	.....	47.40	47.40
90 pound steel.....	1,784.87	75.99	403.67	2,264.53	2,092.72
85 pound steel.....	889.29	356.43	257.97	1,503.69	1,564.46
80 pound steel.....	1.12	.....	1.10	2.22	2.22
76 pound steel.....	.....	5.14	.....	5.14	5.14
72 pound steel.....	83.25	1,174.13	11.51	1,268.89	1,273.50
70 pound steel.....	.....	43.86	.....	43.86	43.86
66 and 67 pound steel	50.59	464.78	4.25	519.62	550.65
60 pound steel.....	2.60	80.82	.33	83.75	83.60
56 pound steel.....	2.59	1,207.40	.81	1,210.80	1,259.40
Other weights	.....	10.90	.....	10.90	15.71
TOTAL	2,861.71	3,419.45	679.64	6,960.80	6,938.66

BRIDGES.

During the year 132 bridges were replaced, 106 of which, 14,932 feet in length, were replaced by timber structures, and 1 permanent and 25 timber structures in permanent form as follows:

By embankment	19 bridges, 1,523 lineal feet.
By steel truss, girder, I-beam and reinforced concrete trestle	7 bridges, 884 lineal feet.
Total	26 bridges, 2,407 lineal feet.

In addition to changes referred to above 3 temporary bridges were abandoned and 23 temporary structures were added, 116 timber culverts were rebuilt, 14 in temporary and 102 in permanent form.

There are now under construction on operated lines 716 lineal feet of steel girder and I-beam spans for single track, 456 lineal feet of steel trusses for single track, one 140 foot double track steel truss, one 218 foot single track draw span, 394 lineal feet of double track, 126 lineal feet of 4 track and 54 lineal feet of 6 track and 54 lineal feet of 11 track solid floor steel construction of deck type; 128 lineal feet of single track, 66 lineal feet of double track, 157 lineal feet of 4 track, 867 lineal feet of 6 track, 71 lineal feet of 9 track, 71 lineal feet of 10 track and 92 lineal feet of 11 track reinforced concrete trestle and one 68 foot reinforced concrete arch carrying 9 tracks.

BRIDGES AS THEY EXISTED JUNE 30, 1916.

Description.	No.	Aggregate Length. Lineal Feet.	Aggregate Length. Miles.
Steel, iron, stone and concrete permanent bridges.	661	121,269	22.96
Timber and combination iron and timber structures	2,668	421,354	79.80
Total	3,329	542,623	102.76

Total length of timber structures replaced by steel bridges, embankment or other permanent form, from July 1st, 1885, when work was commenced, to June 30th, 1916, has been 132.52 miles.

BUILDINGS AT STATIONS.

New buildings and structures, or increased facilities have been provided at the following stations:

Minnesota: Morgan Park, Cromwell, Aitkin, Deerwood and Becker.
North Dakota: Jamestown, Arena, Solen, Burt and Sweet Briar.
Montana: Willow Creek.
Idaho: Sand Point.
Washington: Pullman.

WATER SUPPLY.

Additional or increased facilities have been provided at the following points:

Montana: Logan and Roberts.
Idaho: Wallace and Arrow.
Washington: Edgecomb.

DOCKS AND WHARVES.

Duluth, Minnesota, conveyor equipment at Docks Nos. 1 and 2.
Seattle, Washington, dredging southerly half of slip between Piers Nos. 5 and 6.
Additional fire protection installed on five piers.
Tacoma, Washington, new offices, London Dock.
Alterations to coal bunker No. 4 to accommodate larger vessels.

CHARGES TO CAPITAL ACCOUNT.

Upon requisition of the Executive Officers, approved by the Board of Directors, expenditures for additions to and betterments of the property have been made during the past fiscal year for:

REAL ESTATE, RIGHT OF WAY AND TERMINALS:		
Superior, Wisconsin, real estate	$780,919.91	
St. Paul, Minnesota, real estate	6,025.24	
Minneapolis, Minnesota, real estate	*Cr. 3,829.40*	
Seattle, Washington, real estate	*Cr. 7,432.88*	
		$775,682.87
BRANCHES, LINE CHANGES, GRADE REVISION AND SECOND MAIN TRACK:		
Grassy Point Line, Wisconsin-Minnesota (second main track)	$21.86	
Cuyuna Northern Branch, Minnesota (extension)	11,542.26	
Golden Valley Branch, North Dakota (construction)	325,096.11	
Flathead Valley Line, Montana (construction)	3,974.03	
Edgecomb to Kruse, Washington (construction)	23,027.45	
Fremont-Ballard Line and draw bridge, Washington (construction)	*Cr. 20,737.19*	
Gray's Harbor & Columbia River Railway, Washington (right of way)	948.43	
Gray's Harbor Branch connection at Nisqually and St. Clair, Washington	67,477.89	
Lake Union Line Franchise, Washington	36,995.46	
Simcoe Branch extension, Washington (construction)	19,808.94	
Spokane, Washington (grade separation)	994,393.27	
Sunnyside Branch extension, Washington (construction)	84,231.60	
Tenino to Vancouver, Washington (grade revision and double track)	*Cr. 14,398.75*	
Point Defiance Line, Tacoma to Tenino, Washington (construction)	56,268.68	
Sundry adjustments	*Cr. 6,061.92*	
		1,582,588.12
ADDITIONS AND BETTERMENTS:		
Right of way and station grounds (sale of property)	*Cr. $125,542.93*	
Widening cuts and fills	10,044.48	
Protection of banks and drainage	65,610.41	
Grade reduction and change of line (adjustments)	*Cr. 37,358.72*	
Tunnel improvements	15,439.01	
Bridges, trestles and culverts	70,480.68	
Increased weight of rail	215,782.67	
Improved frogs and switches	15,461.22	
Track fastenings and appurtenances	315,871.64	
Ballast	139,918.65	
Additional main tracks	774.35	
Sidings and spur tracks	59,310.64	
Terminal yards	81,642.43	
Fencing right of way	33,932.92	
Improvement of crossings—under and over grade	31,150.04	
Elimination of grade crossings	*Cr. 2,398.97*	
Interlocking apparatus	14,826.66	
Block and other signal apparatus	3,913.65	
Telegraph and telephone lines	38,943.96	
Station buildings and fixtures	722,890.24	
Shops, enginehouses and turntables	76,934.07	
Shop machinery and tools	*Cr. 3,424.95*	
Water and fuel stations	2,280.59	
Dock and wharf property	*Cr. 2,666.37*	
Snow and sand fences and snow sheds	3,196.82	
Assessments for public improvements	96,612.02	
Paving	9,503.45	
Roadway machinery and tools	*Cr. 191.22*	
Coal and ore wharves	*Cr. 62,776.14*	
Other additions and betterments	30,356.16	
Big Fork & International Falls Ry.—improvements	3,392.28	
		1,823,909.74
Total		$4,182,180.73

NEW EQUIPMENT:	*Total Expenditures*	*Less used from Reserves*	*Charged Capital*
Locomotives	$91,985.32	$28,599.18	$63,386.14
Passenger train cars	21,138.47	14,519.38	6,619.09
Freight train and work cars	180,423.65	270,842.33	*Cr. 90,418.68*
	$293,547.44	$313,960.89	
Balance being equipment abandoned in excess of replacements			20,413.45
Total			$4,161,767.28
Less			
Adjustment of original value of lines abandoned, etc., in previous years in connection with line changes			187,899.48
Net charges to capital account for the year			$3,973,867.80

In addition to the foregoing, added to the cost of the Northern Pacific Estate, advances have been made during the year to sundry companies, as follows:

Midland Railway Company of Manitoba	*Cr. $6,793.67*	
Olympic Peninsular Railway Company	30.50	
Kennewick Northern Railway Company	30.50	
Bear Creek and Western Railway Company	213.27	
Missoula & Hamilton Railway Company	453.09	
Northern Pacific Terminal Company	44,965.80	
Spokane, Portland & Seattle Railway Company	300,343.40	
	$339,242.89	

RESERVED FOR ACCRUED DEPRECIATION OF EQUIPMENT.

Credit balance, reserve for accrued depreciation July 1, 1915		$14,113,666.11
Credits during the year ending June 30th, 1916:		
From charges to operating expenses:		
Maintenance of equipment, depreciation	$685,276.97	
Locomotives	$194,876.49	
Freight cars	384,983.35	
Passenger cars	91,826.17	
Floating equipment	1,054.24	
Work equipment	12,536.72	
Maintenance of equipment, retirements	69,105.56	
From salvage	131,381.00	
From equipment sold	63,299.32	
		949,062.85
		$15,062,728.96
Less equipment retired:		
Locomotives	$28,599.18	
Passenger cars	14,519.38	
Freight cars	216,227.32	
Miscellaneous equipment	54,615.01	
		313,960.89
Credit balance June 30, 1916		$14,748,768.07

CAPITAL STOCK AND DEBT.

There has been no change in the amount of capital stock outstanding during the year, viz.:		$248,000,000.00
Changes in bonded debt were as follows:		
Prior Lien Bonds purchased and cancelled under Article eight, Section 2 of Mortgage	$530,000.00	
St. Paul & Northern Pacific Railway Company mortgage bonds purchased by trustee and cancelled	27,000.00	
Decrease in mortgage debt		$557,000.00

NEW LINES, GRADE REVISIONS, LINE CHANGES, ETC.

MINNESOTA.

Cuyuna Northern Railway:

To provide facilities for handling ore from the Hillcrest Mine a spur track about 4100 feet long and two sidings are under construction and will be completed this fall.

St. Paul:

The New General Office Building was completed, and the various departments moved into their new quarters in December, 1915, and January, 1916.

NORTH DAKOTA AND MONTANA.

Golden Valley Branch:

From Beach, North Dakota, southerly to Ollie, Montana, 25.90 miles were completed and turned over for operation October 1, 1915.

MONTANA.

Flathead Branch:

Contract has been awarded for grading the Flathead Branch between Dixon and Polson, Montana, a distance of approximately 32.76 miles. It is expected to complete the line next year.

WASHINGTON.

Spokane:

The grade separation work has been in progress during the entire year. It is expected that all the work will be completed before the end of the year, except the ballasting, which may have to be laid over until next season. Four bridges under construction east of Spokane under the yard, which are supplementary to the grade separation proper, will not be completed until 1917.

Grandview to Gibbon:

An extension of the Sunnyside Branch from Grandview to Gibbon, Washington, about 12.1 miles, has been authorized and work is in progress. It is expected to complete it this fall.

Harrah to White Swan:

An extension of the Fort Simcoe Branch from Harrah to White Swan, about 10.3 miles, has been authorized and work is in progress. It will be completed early in the fall.

Cowiche Branch:

An extension of the Cowiche Branch, a distance of 1.50 miles, was authorized, and contract was let for the grading. Owing, however, to some right of way complications work has been deferred for this season.

Snoqualmie Falls:

To serve a large saw mill being constructed by the Snoqualmie Falls Lumber Company, a bridge and track approximately 2500 feet long are being built and will be completed this autumn.

Valuation:

The Interstate Commerce Commission having given notice that the property of the Northern Pacific Railway Company would be valued in 1917, commencing in the State of Washington, pursuant to authority the additional force necessary is being employed and the preliminary work is in progress.

GENERAL.

The large increase in freight earnings ($11,822,758.29) was due to the general prosperity of the country tributary to our lines due to record crops and the consequent money return to the producers in practically all of such territory. The prices received by the growers were better than they have enjoyed for some time, and we handled during the crop year, July 31, 1915, to August 1, 1916, 87,371 cars of grain as compared with 64,039 cars for the previous year, an increase of 23,332 cars. There was also great activity in the mining interests in our country; copper, lead, zinc and iron mines being worked to their full capacity, and the metal selling at high prices created a demand for transportation of not only the products, but of supplies, material, machinery, etc., that swelled our receipts from merchandise to the maximum figures for years.

While the mining and lumber interests are still very active and prosperous, the grain crops for the coming season will not be as satisfactory as for the year just closed, and it is feared the effect on business of the current year will be quite pronounced.

Further details of the Company's transactions will be found in the attached report of the Comptroller.

The Directors desire to extend to the officers and employes of the Company their thanks for the loyalty to the interests in their care, and their appreciation of the results which have been brought about by the intelligent, conscientious and faithful performance of the duties entrusted to them.

By order of the Board of Directors,

JULE M. HANNAFORD,
President.

IN MEMORIAM.

On the 17th of August, 1916, the Company suffered a great loss in the death of its Chairman, Col. William P. Clough.

Your Executive Committee, at a meeting held on August 30, 1916, expressed its appreciation of Colonel Clough's character and ability, and of the excellence of his official services to the Company, by the unanimous adoption of the following minute, which has been spread upon the permanent records of the Company:

Col. William P. Clough, the Chairman of the Northern Pacific Railway Company, died August 17th, 1916, in New York City, terminating a service of four years as Vice-President and Chairman, and fifteen years as Director and member of the Executive Committee.

During all this period he applied himself unreservedly to the conservation, development and betterment of the Company's properties and interests; and to this task he dedicated with tireless energy the keenness of an analytical mind and the mature judgment resulting from long experience in corporate affairs. The use of his abilities was ever intelligent, loyal and courageous, and was unrestricted by either hours or environment. His devotion to this service was not merely the performance of a duty. It became the all-absorbing inspiration of his life.

His belief in the property's supremacy, in the efficiency and loyalty of its organization, and in the promise of its future, was inspiring; and this belief he at all times jealously defended and justified against all criticism.

His death has deprived the Company of the services of an able counsellor and a capable, conservative and conscientious guardian of its interests; and the Directors record their deep sense of the loss which is sustained by them and by the officers and stockholders of the Company.

To the family of Colonel Clough the Directors extend their heartfelt sympathy, and this testimonial of the high esteem in which he was held by them, both as a man and as an official.

NORTHERN PACIFIC RAILWAY COMPANY.

GENERAL BALANCE SHEET, JUNE 30, 1916.

ASSETS.

INVESTMENTS:		
ROAD AND EQUIPMENT (Northern Pacific Estate) June 30, 1915.		
Road, lands, etc.	$416,312,917.95	
Equipment	61,899,930.83	
	$478,212,848.78	
Charges since June 30, 1915 (see page 12)	3,973,867.18	
Land Department current assets	12,867,715.18	
Less—Land Department net receipts (see page 39)	6,069,636.91	
	$6,798,078.27	$488,984,794.85
Sinking Funds		1,207.07
Deposits in lieu of mortgaged property (net moneys in hands of Trustees from sale of land grant lands, etc.)		3,847,890.07
Miscellaneous physical property		2,444,973.95
INVESTMENTS IN AFFILIATED COMPANIES:		
Stocks	*$140,467,141.30	
Bonds	25,430,775.00	
Notes	6,530,182.12	
Advances	1,429,281.75	173,857,380.17
OTHER INVESTMENTS:		
Bonds		25,000.00
TOTAL CAPITAL ASSETS		$669,161,246.11
CURRENT ASSETS:		
Cash	$18,305,323.42	
Special deposits (for payment of interest and dividends)	1,831,005.52	
Loans and bills receivable	42,533.01	
Traffic and car service balances receivable	1,588,697.08	
Net balance receivable from agents and conductors	796,048.16	
Miscellaneous accounts receivable	3,689,878.69	
Material and supplies	6,588,836.45	
Interest, dividends and rents receivable	309,053.20	$33,151,375.53
DEFERRED ASSETS:		
Working fund advances	$31,036.63	
Cash and securities in insurance fund	5,803,205.98	5,834,242.61
UNADJUSTED DEBITS		258,125.15
		$708,404,989.40

*Includes this Company's one half of $107,613,500 stock of the Chicago, Burlington & Quincy Railroad Company to secure $215,227,000 joint bonds made and issued by this Company and the Great Northern Railway Company to pay for said stock, costing $109,114,809.76.

LIABILITIES.

STOCK:		
Capital Stock—Common		$248,000,000.00
LONG TERM DEBT:		
Funded Debt (see page 26)	$322,685,000.00	
Less—held in Treasury	9,149,500.00	
Actually outstanding		313,535,500.00
TOTAL CAPITAL LIABILITIES		$561,535,500.00
CURRENT LIABILITIES:		
Traffic and car service balances payable	$1,061,908.58	
Audited accounts and wages payable	9,675,620.52	
Miscellaneous accounts payable	520,028.40	
Interest matured unpaid	1,873,108.75	
Dividends matured unpaid	1,854.50	
Unmatured dividends declared	4,340,000.00	
Unmatured interest accrued	509,040.83	
Unmatured rents accrued	10,397.01	$17,991,958.59
DEFERRED LIABILITIES:		
Other deferred liabilities		180,300.93
UNADJUSTED CREDITS:		
Accrued depreciation of equipment	$14,748,768.07	
Other unadjusted credits	14,177,694.68	
Insurance and casualty reserves	5,803,205.98	
Taxes accrued—partly estimated	2,715,069.29	37,444,738.02
CORPORATE SURPLUS:		
Appropriated surplus not specifically invested	$353,754.71	
Profit and loss balance	90,898,737.15	91,252,491.86
		$708,404,989.40

PASSENGER AND FREIGHT STATISTICS.

	1914-1915 Miles, Tons, etc.	1914-1915 Amount, Rate, etc.	1915-1916 Miles, Tons, etc.	1915-1916 Amount, Rate, etc.	Increase	Per Cent.	Decrease
Average mileage for year	6,460.67		6,501.11		40.44		
Passenger Traffic.							
Number of passengers carried	8,756,784		8,680,837			.87	75,947
Number of passengers carried one mile	600,273,153		616,681,153		16,408,000	2.73	
Average miles traveled by each passenger	68.6		71.0		2.4	3.50	
Passenger revenue		$13,619,113.80		$13,852,254.49	$233,140.69	1.71	
Other passenger train revenue		3,145,198.55		3,350,575.97	205,377.42	6.53	
Total passenger train revenue		16,764,312.35		17,202,830.46	438,518.11	2.62	
Average amount paid by each passenger		1.56		1.60	.04	2.56	
Average rate per passenger per mile		.02269		.02246		1.01	.00023
Passenger train revenue per mile of road (average mileage)		2,594.83		2,646.13	51.30	1.98	
Freight Traffic.							
Number of tons revenue freight carried	17,625,225		20,995,693		3,370,468	19.12	
Number of tons revenue freight carried one mile	5,164,571,432		7,017,609,074		1,853,037,642	35.88	
Average distance haul of one ton	293.0		334.2		41.2	14.06	
Freight revenue		$43,833,636.90		$55,656,395.19	$11,822,758.29	26.97	
Other freight train revenue		784,147.78		1,075,909.04	291,761.26	37.21	
Total freight train revenue		44,617,784.68		56,732,304.23	12,114,519.55	27.15	
Average receipts from each ton of freight		2.49		2.65	.16	6.43	
Average receipts per ton per mile revenue freight		.00849		.00793		6.60	.00056
Freight train revenue per mile of road (average mileage)		6,906.06		8,726.56	1,820.50	26.36	
Total Train Traffic.							
Revenue from freight and passenger trains		$61,382,097.03		$73,935,134.69	$12,553,037.66	20.45	
Revenue per mile of road (average mileage)		9,500.89		11,372.69	1,871.80	19.70	
Revenue per train mile		3.17		3.52	.35	11.04	
Expenses per train mile		1.92		1.92			
Net traffic revenue per train mile		1.25		1.60	.35	28.00	

COLORADO & SOUTHERN RAILWAY COMPANY—SEVENTEENTH ANNUAL REPORT

CHICAGO, July 1, 1916.

To the Stockholders of The Colorado & Southern Railway Company:

Herewith is submitted the Seventeenth Annual Report of your Board of Directors for the year ended June 30, 1916, which report combines the operations and affairs of the lines operated by the companies named on the preceding page and which are herein designated as the

"COLORADO & SOUTHERN LINES."

Per Cent.	1916.	OPERATING REVENUES.	1915.	Per Cent.
72.40	$11,371,286.53	Freight	$ 9,960,043.59	70.28
21.51	3,378,625.65	Passenger	3,294,688.32	23.25
1.50	235,622.06	Mail	234,206.23	1.65
1.38	217,175.39	Express	230,757.01	1.63
1.95	306,016.07	Miscellaneous	269,503.51	1.90
1.16	182,815.80	Incidental	167,621.70	1.18
.10	15,769.48	Joint facility	16,157.47	.11
100.00	$15,707,310.98	Total operating revenues	$14,172,977.83	100.00
		OPERATING EXPENSES.		
		Maintenance		
12.75	$ 2,003,135.61	of way and structures	$ 1,741,313.17	12.29
17.67	2,775,182.55	Maintenance of equipment	2,723,291.50	19.22
1.30	204,167.66	Traffic	215,497.05	1.52
28.29	4,443,906.34	Transportation	4,908,457.99	34.63
.50	78,190.69	Miscellaneous	81,225.01	.57
3.02	474,025.81	General	441,090.61	3.11
63.53	$ 9,978,608.66	Total operating expenses	$10,110,875.33	71.34
36.47	$ 5,728,702.32	Net revenue from operations	$ 4,062,102.50	28.66
	$ 735,781.36	Railway tax accruals	$ 616,053.40	
	355.70	Uncollectible railway revenues	483.02	
	$ 736,137.06		$ 616,536.42	
	$ 4,992,565.26	Operating income	$ 3,445,566.08	
		NONOPERATING INCOME.		
	$ 521,521.11	Rents	$ 482,459.69	
	75,507.38	Miscellaneous interest	172,811.84	
	$ 597,028.49	Total nonoperating income	$ 655,271.53	
	$ 5,589,593.75	Gross income	$ 4,100,837.61	
		DEDUCTIONS FROM GROSS INCOME.		
	$ 352,873.34	Rents	$ 561,126.37	
	2,868,098.98	Interest on funded debt	2,842,249.47	
	1,104.00	Interest on unfunded debt	5,631.02	
		Amortization of discount		
	19,349.24	on funded debt	14,143.27	
	125,174.18	Miscellaneous income charges	62,538.37	
	$ 3,366,599.74	Total deductions	$ 3,485,688.50	
	$ 2,222,994.01	Net income	$ 615,149.11	

DISPOSITION OF NET INCOME.

		Appropriations for:	
	$ 70,298.32	Sinking funds	$ 61,382.56
	170,000.00	Dividends	
	280,220.33	Additions and betterments	
	500,000.00	Miscel. appropriations of income	
	$ 1,020,518.65	Total appropriations of income	$ 61,382.56
	$ 1,202,475.36	Income balance	$ 553,766.55

Compared with the preceding year, the total operating revenues show an increase of $1,534,333.15 or 10.82 per cent. The operating expenses show a decrease of $132,266.67 or 1.31 per cent. The net operating revenue shows an increase of $1,666,599.82 or 41.03 per cent.

Taxes increased $119,727.96 over the preceding year, due to increases in assessment by the Federal Government and in tax levies in Colorado, Wyoming, New Mexico and Texas.

Operating income shows an increase of $1,546,999.18 or 38.08 per cent.

The percentage of operating revenues required for operating expenses was 63.53 per cent. as compared with 71.34 per cent. in the previous year.

It required 53.22 per cent. of the gross income to meet interest on funded debt this year, as compared with 72.81 per cent. in the previous year.

During the year the following Long Term Debt obligations have been retired:

First mortgage bonds of the C. S. & C. C. D. Ry. Co. through sinking fund	$ 66,000.00
Deferred rentals under equipment leases	254,000.00
Making net decrease in Long Term Debt of	$320,000.00

There were charges to Capital Account aggregating $317,859.79 for additions and betterments to property. This amount was expended for:

Structures and machinery	$ 21,695.08
Bridges	111,944.94
Tracks	43,148.66
Land	37,131.68
Laying tie plates, main line	57,242.89
Various other additions and betterments	46,696.54

During the year trackage arrangements were made with the Chicago, Burlington and Quincy R. R. Co. between Wendover and Guernsey, Wyoming, thus making a direct connection with the Colorado and Wyoming Ry. at that point.

The main line between Wendover and Orin Junction, Wyoming, has been leased to the Chicago, Burlington and Quincy R. R. Co., and through joint train service inaugurated between Billings and Denver.

The Denver Union Terminal Railway, which is used by all railroads entering Denver, has been completely remodeled and is now in operation.

A viaduct crossing all tracks south of the Union Terminal, and connecting North and South Denver, is in process of construction and will be completed during the ensuing year.

The operating results of the receiver of The Trinity & Brazos Valley Railway Company show a deficit in the net operating revenue of $112,215.45, to which there was added for tax and miscellaneous items, $113,397.11, creating a net income deficit for the year of $225,612.56.

During the year a number of spur tracks and industry tracks were abandoned, as they were of no further service to the Company, and credits equal to the original cost of the property were passed to the various additions and betterments accounts.

The business of the Company has shown considerable increase during the last fiscal year, making necessary increased expenditures for additional

plant and facilities. In common with the experience of railroads generally throughout the country, there has been an increase in taxes and in some items of expense which may be expected to continue. The Company, by the use of larger power and other improvements in its facilities and the adoption of better methods of operation, has, during the past year, been able to conduct its operations with economy and increased efficiency, but further expenditures for better facilities and additional equipment will continue to be necessary to properly handle the business of the Company, and a considerable portion of these expenditures should be paid for out of surplus income in order to avoid unnecessary increase in fixed charges and thereby to strengthen the credit of the Company.

Following is the report of the General Auditor, with statements prepared by him.

By order of the Board of Directors.

HALE HOLDEN,
President.

GENERAL BALANCE SHEET.

June 30, 1916.

ASSETS.

Investments.

Investment in road and equipment		$111,272,557.68
Sinking funds		186.29
Deposits in lieu of mortgage property sold		21,493.65
Miscellaneous physical property		4,660.00
Investments in affiliated companies:		
Stocks	$ 448,909.94	
Bonds	8,257,121.29	
Notes	1,943,376.76	
Advances	30,281.77	10,679,689.76
Other investments:		
Stocks	$ 1,021,610.30	
Advances	417,377.42	1,438,987.72
Total investments		$123,417,575.10

Current Assets.

Cash		$ 3,641,771.79
Special deposits		116,981.96
Loans and bill receivable		7,950.00
Traffic and car service balances receivable		326,070.08
Net balance receivable from agents and conductors		197,959.37
Miscellaneous accounts receivable		454,013.69
Material and supplies		1,231,234.16
Rents receivable		15,075.46
Other current assets		7,063.47
Total current assets		$ 5,998,119.98

Deferred Assets.

Working fund advances		$ 1,468.59
Other deferred assets		8,637.49
Total deferred assets		$ 10,106.08

Unadjusted Debits.

Rents and insurance premiums paid in advance		$ 20,795.12
Discount on funded debt		280,386.70
Other unadjusted debits		71,527.87
Securities issued or assumed—Unpledged	$ 5,218,446.55	
Total unadjusted debits		$ 372,709.69
Grand Total		$129,798,510.85

LIABILITIES.

Stock.

Capital stock:		
Common stock		$ 31,021,484.00
Preferred stock		17,000,000.00
Total stock		$ 48,021,484.00

Long Term Debt.

Funded debt unmatured—		
Total book liability	$67,793,346.55	
Held by carrier	5,218,446.55	
Actually outstanding		$ 62,574,900.00

Current Liabilities.

Traffic and car service balances payable	$ 415,330.36
Audited accounts and wages payable	825,280.87
Miscellaneous accounts payable	1,170.63
Interest matured unpaid	109,769.75
Dividends matured unpaid	226.44
Unmatured dividends declared	170,000.00
Unmatured interest accrued	623,873.41
Unmatured rents accrued	9,866.61
Other current liabilities	68,488.50
Total current liabilities	$ 2,224,006.57

Deferred Liabilities.

Other deferred liabilities	$ 7,283.68

Unadjusted Credits.

Tax liability	$ 515,783.84
Accrued depreciation—Equipment	4,730,989.83
Other unadjusted credits	102,928.65
Total unadjusted credits	$ 5,349,702.32

Corporate Surplus.

Additions to property through income and surplus	$ 6,488,791.72	
Funded debt retired through income and surplus	468,000.00	
Sinking fund reserves	33,397.37	
Appropriated surplus not specifically invested	2,000,000.00	
Total appropriated surplus		$ 8,990,189.09
Profit and loss credit balance		2,630,945.19
Total corporate surplus		$ 11,621,134.28
Grand Total		$129,798,510.85

INCOME ACCOUNT.

Operating Income.

Railway operating revenues:		
Transportation:		
Freight	$11,371,286.53	
Passenger	3,378,625.65	
Excess baggage	28,311.07	
Mail	235,622.06	
Express	217,175.39	
Other passenger-train	1,392.56	
Switching	270,991.03	
Special service train	4,178.51	
Other freight-train	1,142.90	$15,508,725.70
Incidental:		
Dining and buffet	$ 80,814.90	
Hotel and restaurant	1,322.30	
Station and train privileges	22,113.89	
Parcel room	1,250.19	
Storage—Freight	3,066.51	
Storage—Baggage	3,859.66	
Demurrage	54,005.66	
Rents of buildings and other property	7,770.12	
Miscellaneous	8,612.57	182,815.80
Joint facility:		
Joint facility—Cr.	$ 15,799.55	
Joint facility—Dr.	30.07	15,769.48
Total railway operating revenues		$15,707,310.98
Railway operating expenses:		
Maintenance of way and structures	$ 2,003,135.61	
Maintenance of equipment	2,775,182.55	
Traffic	204,167.66	
Transportation	4,443,906.34	
Miscellaneous operations	78,190.69	
General	474,025.81	9,978,608.66
Net revenue from railway operations		$ 5,728,702.32
Railway tax accruals	$ 735,781.36	
Uncollectible railway revenues	355.70	736,137.06
Total operating income		$ 4,992,565.26

Nonoperating Income.

Hire of equipment	$ 200,832.68	
Joint facility rent income	31,295.60	
Income from lease of road	273,006.04	
Miscellaneous rent income	16,386.79	
Separately operated properties—Profit	1,943.47	
Income from unfunded securities and accounts	73,563.91	597,028.49
Gross income		$ 5,589,593.75

Deductions from Gross Income.

Hire of equipment	$ 292,051.05	
Joint facility rents	45,996.42	
Miscellaneous rents	14,825.87	
Separately operated properties—Loss	67,334.65	
Interest on funded debt	2,868,098.98	
Interest on unfunded debt	1,104.00	
Amortization of discount on funded debt	19,349.24	
Miscellaneous income charges	57,839.53	3,366,599.74
Net income		$ 2,222,994.01

Disposition of Net Income.

Appropriations of income to sinking funds	$ 70,298.32	
Dividend appropriations of income:		
First preferred stock, 2 per cent., payable Oct. 10, 1916	170,000.00	
Income appropriated for investment in physical property	280,220.33	
Miscellaneous appropriations of income	500,000.00	1,020,518.65
Income balance transferred to Profit and Loss		$ 1,202,475.36

PROFIT AND LOSS ACCOUNT.

Credit balance at beginning of year	$ 1,962,574.18	
Credit balance transferred from income	1,202,475.36	
Miscellaneous credits	32,214.05	$ 3,197,263.59
Dividend appropriations of surplus	$ 263.84	
Miscellaneous appropriations of surplus	500,000.00	
Loss on retired road and equipment	29,656.59	
Miscellaneous debits	36,397.97	566,318.40
Credit balance carried to balance sheet		$ 2,630,945.19

Railway Age Gazette

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A New Period of Comparisons

With the publication of railroad earnings for October there begins a new period of comparisons. The comparison of each current month since October, 1915, with the corresponding month of the previous year has been a contrast of good business with extraordinary depression. Now, however, for most roads the comparison will be between two months of heavy business. The eastern roads especially are beginning to show the effect of rising operating costs. After operating forces have been cut down to meet a falling off in business it is generally possible to hold them down for some little while after business begins to pick up and the gains that were made in net operating revenues in the last two months of 1915 and the first few months of 1916 reflect this fact. Western roads, with a greater margin between capacity and business, continue to show larger net with continued increasing gross than do eastern roads where the margin between capacity and business handled is smaller. The New Haven in October, 1916, earned $7,087,000 as against $6,533,000 in the corresponding month of the previous year, but operating income was $2,061,000 as against $2,197,000. The New York Central had $17,852,000 total operating revenues, an increase as compared with the corresponding month of the previous year of $1,632,000, but operating income was $5,677,000, a decrease of $134,000. The Erie had operating revenues of $6,664,000, an increase of $97,000, but operating income of $1,638,000, a decrease of $953,000. The Pennsylvania had operating revenues of $20,311,000, an increase of $1,213,000, but operating income of $4,950,000, a decrease of $364,000. On the other hand the Illinois Central in October had operating revenues of $6,819,000, an increase of $726,000, and operating income of $1,718,000, an increase of $509,000. The Southern Pacific had operating revenues of $15,692,000, an increase of $1,559,000, and operating income of $5,915,000, an increase of $632,000. The Atchison, Topeka & Santa Fe had $11,214,000 operating revenues, an increase of $1,878,000, and operating income of $4,516,000, an increase of $1,103,000. While it is true that the eastern roads began to feel the return of prosperity in 1915 before the western roads did, the most significant fact about the comparisons just cited is that on many eastern roads the expenses are beginning to eat up more than all the gain in gross.

Correct Whistling at Highway Crossings

There are some locomotive enginemen who, in signaling their approach to highway crossings, do not sound the whistle long enough or loud enough; this fact, as an element which may contribute to a smash-up on a crossing, was brought out at the recent safety-first convention at Detroit. Every trainmaster or inspector who has to do with this feature of operation should, of course, look out for this kind of carelessness. But the inspector who sets out to get really good practice in this matter will find a good deal more trouble in the opposite direction—runners who whistle too long and too loud, and very carelessly as to the length of the blasts. The fact is that only a very small proportion of the enginemen—on any road, if we may trust numerous well-informed observers—exercise their brains, in this matter, except in the crudest way. To the passenger it seems as though there must be a marked lack of brain exercise also on the part of the trainmaster or other supervising officer; for there is the widest possible variety in the style of the whistling. Any such thing as training the enginemen to observe the difference between one second and five seconds or between heavy and light sounds, seems never to have been thought of. On a few engines, here and there, the whistles are sounded as carefully and intelligently as if the man at the lever were a piano player; but it is quite evident that this is due, not to training by the officers of the road but to the native ability and taste of the engineman. One careful inspector—who, evidently, has not the energetic backing of his general manager—remarked recently that he had about given up, in despair, his efforts to induce or compel enginemen to use their whistles according to the rules. Strict compliance with the rules of a railroad company is important, simply as a matter of taste and smooth working; and with strict compliance "safety-first" will take care of itself, so far as whistles are concerned.

THE INTERSTATE COMMERCE COMMISSION—MANUFACTURER OF RUMORS

UNWITTINGLY, probably, the Interstate Commerce Commission is doing a serious injustice to the railways and the holders of their securities through the manner in which it is giving out the figures concerning the so-called "tentative valuations" of the different carriers which are now being made public. It is a fact that has been brought home at one time or another by bitter experience to every newspaper man that a false or misleading statement once given publicity cannot be recalled or adequately corrected. If a man's or a corporation's credit is sullied by a rumor, subsequent denial of the truth of the rumor may be quite powerless to undo the damage that has been done.

The Interstate Commerce Commission is making public the results of the work of the land, engineering and accounting sections of the Division of Valuation, and is serving on the roads what are called "tentative valuations" based on the reports of these sections. Great latitude has been left by the commission to its engineers as to the methods adopted in making their reports. The theory on which these tentative valuations are being made is that if an injustice is done to a road it will have an opportunity to present to the commission evidences of the injustice and corrections will be made.

The reports on the estimated cost of reproduction new of the Atlanta, Birmingham & Atlantic, the Texas Midland, the Kansas City Southern and the New Orleans, Texas & Mexico all put this cost at a fraction of the face value of the securities issued by these companies. This is the fact that will strike 999 men out of 1,000 who read these early statements from the commission. If on later investigation it is found that these tentative reports were absurdly low, a few of these men may become aware of this fact but it is a moral certainty that a large majority of them will not. The thing that will stick in their minds is that the Interstate Commerce Commission is finding the roads grossly overcapitalized. A rumor such as this, given the official character that attaches to it by reason of coming from the Interstate Commerce Commission, endangers the credit of the company about which the rumor is spread and may endanger railroad credit as a whole. That this is a real danger is indicated by the articles appearing in the newspapers such as the one headed "Find Kansas City Southern Is Capitalized for Twice What It Is Worth," which appeared in the Topeka (Kan.) State Journal a few days ago.

It is generally known that the Interstate Commerce Commission has been subjected to political pressure by the state commissions and certain other politicians who desire to show the roads highly overcapitalized in order that they may manufacture political capital. They, of course, realize the value of first impressions, and it would seem that the Interstate Commerce Commission is lending itself to their purposes both through the selection of the roads first to be valued and by the manner in which the reports have been made public. While representatives of the division of valuation have been prompt to state that it was necessary that they select short lines on which to develop their methods and to organize their forces, it was unfortunate that all the roads so selected were those which had passed through difficulties at one time or another in their history when other more prosperous lines of equal length were available. The fact that the roads whose earnings have been sufficient to enable them to put considerable sums back into their properties and that may have valuable terminals, etc., will be valued later will not remove the impression which is now being created in the mind of the public by reports on roads which have had a struggle to pay expenses without being able to return any earnings into the property in improvements, or, in many cases, even to spend adequate sums for maintenance.

Furthermore, although these reports are given to the public as "tentative valuations," they are not valuations in any true sense whatever. They are merely partial inventories. With this fact in mind the chairman of the President's Conference Committee wrote to the chairman of the Interstate Commerce Commission on July 21, requesting the commission not to serve the reports of the engineering and accounting divisions as "tentative valuations" on the Texas Midland, the Atlanta, Birmingham & Atlantic, the Norfolk Southern and the Kansas City Southern because these reports "neither separately nor collectively constitute the tentative valuation required by the act." The commission on October 11 replied to the President's Conference Committee that "it is not felt that the delay incident to a compliance with your request would be justified. . . . "

The law charges the Interstate Commerce Commission with the determination of the valuation of the carriers. Neither the engineering board nor the entire division of valuation has this power. Yet the reports of the division of valuation are heralded as "tentative valuations" without hearings before the commission and probably without its being cognizant of their details. This is evidenced by the lack of uniformity between the reports originating in different districts. As an instance, no depreciation is charged against organization expenses, general officers and clerks, law and stationery and printing in the Texas Midland report, while 20 per cent was deducted from these same items in the reports of the Atlanta, Birmingham & Atlantic.

To show how misleading the statements given out by the Interstate Commerce Commission in respect to these tentative valuations may be, take the case of the Kansas City Southern, an abstract of the "tentative valuation" of which, as given out by the Interstate Commerce Commission, is published elsewhere in this issue. The cost of reproduction new, exclusive of land, is placed at $46,274,363. The value of land is placed at $2,409,618, but with the qualifying statement that of this land valued at $248,136 was acquired by gift. Material and supplies are simply stated to have a book value of $2,715,135, but the commission makes no finding of their actual value. No mention is made of cash, which is a fairly necessary and fairly valuable part of the assets of a railroad company. No estimate is made of "other values and elements of value of the property of the carrier," which under the law will have to be included in the final valuation. The Department of Valuation refuses to accept the data presented by the Kansas City Southern as a basis for arriving at the original cost to date of the property, and then gratuitously adds that some of the land cost the Kansas City Southern nothing, but it does not think it worth while to add the further fact that to every item of the commission's estimate of the cost of reproduction new there might properly be appended some such sentence as this: "This, of course, is the least cost that the work could be done for. As a matter of fact, under the conditions which the company did the work, although materials and labor might have been cheaper, there is also the likelihood that some of this work cost very much more than our minimum shown there."

Allowing for engineering expenses, the commission's engineers went on the assumption that the line was already located and that no preliminary surveys were necessary. This is absurd on its face. Why not assume that no grading was necessary? That would be equally sane. Intuition which could locate the line without preliminary surveys might also provide the proper grades. Again, in estimating the cost of a line which runs through the heart of a town no allowance is made by the commission's engineers for the condemnation of buildings. It is presumed by the commission's engineers that intuition again playing providence had induced property holders to build houses on either side of a strip of land running through their town but had prevented them from putting up houses on this strip. No allowance is made for the appreciation of the roadbed but ties are depreciated 50 per cent, although there is no deterioration in the normal service value of the track. There is also much

dissatisfaction with unit prices which in many instances make no allowance for the overhead and general expenses directly chargeable thereto. This sort of thing, carried consistently through every detailed item of an estimate of cost of reproduction new, can make a difference of from 25 to 100 per cent or more.

The commission has no moral right to permit these matters to continue to be handled in the manner in which they are now being handled. All of these injustices may be corrected by the commission when the final valuation is made; but in the meantime the laymen may become firmly imbued with the idea that the railroads are grossly over-capitalized. Dame rumor will have done her work and it will be beyond the power of the commission to correct the wrong.

"INVOLUNTARY SERVITUDE" AND RAILROAD STRIKES

THE railroads have taken the Adamson law into court and the first court which has passed on it has held it unconstitutional. The leaders of the labor unions continue to protest violently against the attempt to get this measure nullified. Samuel Gompers, president of the American Federation of Labor, has announced that the "eight-hour day" will go into effect on railroads on January 1, "law or no law." W. G. Lee, president of the Brotherhood of Railroad Trainmen, has said substantially the same thing. This means in effect that the labor brotherhoods are still threatening to strike if on January 1 the Adamson law is not put into effect, as they interpret it.

This puts squarely up to the national government the question of whether it is going to do anything to end the chronic menace of the suspension of railroad transportation by strikes. It is reported that President Wilson in his annual message will again recommend the passage of a law providing for compulsory investigation of labor disputes on railways before strikes or lockouts can occur. The labor organizations are bitterly opposed to any such legislation. They say that it would be subjecting the employees in railway train service to "involuntary servitude." The labor leaders are apt and diligent coiners of counterfeit phrases. "Full crew" in their bright young lexicon means a train crew containing an employee who has nothing to do for his wages but draw his breath. "Eight-hour day" means a 25 per cent advance in wages. Likewise, "involuntary servitude" means any restriction which may be imposed upon the right of employees to strike before the public has informed itself as to what they propose to strike about.

In all dictionaries except that of the labor leaders "involuntary servitude" is merely a euphemism for slavery. Would railway train employees actually be slaves if there were reserved to them, first, the right to quit work individually whenever they please, and, second, the right to quit work collectively if they did not choose to accept the findings and recommendations of a body that had investigated a dispute between them and their employers? These rights would be absolutely reserved to them under the proposed legislation. If this would be slavery those subject to it would not notice that their chains clanked very loudly or find them very troublesome.

The real ground of the opposition of the labor leaders to legislation forbidding strikes on railways until after public investigation of the matters in dispute is that it would deprive the brotherhoods of a great advantage they now have in bargaining about wages and conditions of employment. In any ordinary concern, such as a factory, not only can the employees strike, but the employers can declare a lockout. Therefore, not only can the employees seize the opportune time to demand increases in wages, and to enforce their demands by striking or threatening to strike, but the employer also can seize the opportune time to demand reductions in wages and to enforce his demands by locking out the employees or threatening to do so. Under these conditions the advantage in bargaining power is sometimes on one side, sometimes on the other; wages are likely to vary with and maintain some fairly reasonable relationship to conditions.

In railway train service, the organized employees, like those in any other line of industry, can now seize upon every favorable opportunity to demand increases in wages and easier conditions of work, and can always strike or threaten to strike if their demands are not granted. The railway companies, on the other hand, can never close down their plants. The law and public opinion will not allow it. This is but another way of saying that the railways, in dealing with certain of their employees, cannot resort to the lockout, as other employers can. Indeed, they hardly dare let the demands of the employees go to the issue of a strike. Consequently, it is impossible for railways to take advantage, as most employers can, of conditions which in other lines of business would justify and render practicable reductions of wages.

Under a law requiring investigation of labor disputes before strikes in train service the present disproportionate bargaining power of the labor brotherhoods would be reduced. Instead of being able to threaten a strike at the particular time when the threat might be most effective, they would have first to explain and support their demands to a public tribunal. If the report of this tribunal was adverse, the labor leaders, after it was rendered, might be confronted not only with the fact that the public would be hostile to a strike, but also with the fact that, from the standpoint of bargaining strategy, the best time for striking or threatening to strike had passed.

The real question, then, is whether, in justice to the railways, and for the protection of the public, it is desirable to place restrictions on the right to strike which will not result in "involuntary servitude" for anybody, but which will reduce the bargaining power of the train service employees. The situation, from the standpoint of the railway companies, could be made perfectly equitable by the simple expedient of giving them exactly the same legal and moral power to declare a lockout that the employees have to declare a strike. There could then be a fair fight, and the railways might gladly exclaim, in the language of Macbeth:

"Lay on, Macduff!
And damned be him that first cries,
'Hold! Enough!' "

But the public will never and, of course, ought never to consent to this. Since it will not, in justice to the railways, as well as for its own protection, it should remove the determination of railway wages from the realm of strikes and threats of strikes to that of peaceful quasi-judicial proceedings.

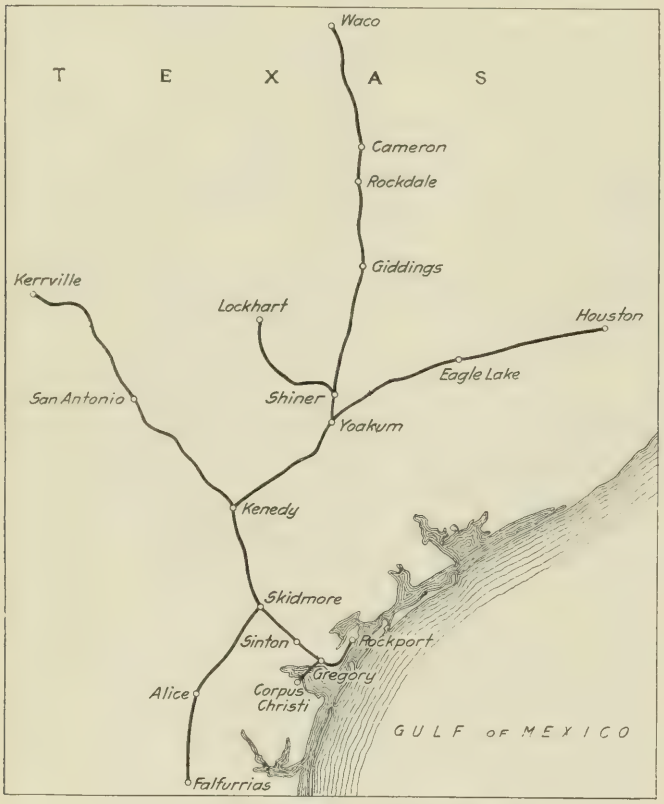
SAN ANTONIO & ARANSAS PASS

IT is rather odd to find a railroad operating 724 miles of road which carries less than 10,000 tons of coal a year and of the total tonnage of which coal forms less than one per cent. The San Antonio & Aransas Pass, familiarly known as the Sap, is such a road. The small amount of coal carried is made up for by the fact that 6.63 per cent of the total tonnage of the road in the fiscal year ended June 30, 1916, was furnished by fuel oil and 1.43 per cent by lignite. In place of coal as a heavy loading low grade tonnage the Sap carried 326,000 tons of stone and sand, which was 24.41 per cent of the total tonnage of all commodities. In 1916 the total tonnage of all commodities was 1,336,000, an increase over the previous year of 91,000. Of the total carried in 1916 678,000 tons originated on the line and 658,000 tons were received from connections. The increase in 1916 over 1915 was brought about by an increase of 61,000 tons of merchandise, the percentage of merchandise tonnage to total tonnage in 1916 being 12.55; an increase of 27,000 tons of stone and sand, and of 20,000 tons of lumber, the percentage of lumber tonnage to total tonnage in 1916 being 6.10 per cent. In part these increases were offset by a de-

crease of 19,000 tons in lignite, the total carried in 1916 being 38,000 tons; and a decrease of 13,000 tons in cotton and cotton seed and its products, the total tonnage in 1916 amounting to 175,000 tons.

The San Antonio & Aransas Pass is an independent local Texas railroad, with an operating ratio, even in 1916, of 88.14; with a debit balance to profit and loss of $4,492,000, of which $600,000 was the deficit for the fiscal year ended June 30, 1916; with total operating revenues per mile of road of $5,335 in 1916; and with an average ton-mile rate in 1916 of 1.491 cents and a passenger-mile rate of 2.468 cents, and with an average revenue trainload of 216 tons.

The year 1916 was prosperous compared with 1915. In 1916 there was gross income available for interest, rentals, etc., of $343,000, the interest, rentals, etc., totaling $944,000. In 1915 the operating ratio was 95.34, and there was available gross income for interest charges and rentals $38,000. The interest charges and rentals in 1915 were $900,000.



The San Antonio & Aransas Pass

The comparatively good showing made in 1916 was the result of an increase of 5.66 per cent in freight revenue, the total in 1916 amounting to $2,645,000, offset in part by a decrease of 6.27 per cent in passenger train revenue, the total in 1916 being $1,160,000, and the practice of economies in operating expenses. There was a decrease of $75,000, or slightly over 4 per cent, in transportation expenses, the total transportation expenses in 1916 being $1,768,000 and the ratio of transportation expenses to gross in 1916 being 45.77 as compared with 48.53, the ratio in 1915. There was a gain of nine tons in revenue trainloading, the average trainload, as previously mentioned, being 216 tons in 1916. The ton mileage of all freight amounted to 177,443,000 in 1916, an increase of 14.18 per cent, and the mileage run by freight trains totaled 923,000, an increase of 11.21 per cent. In the annual report President McIntyre says that train mileage decreased by 5,761 miles, or 0.29 per cent; but how this figure is derived is not plain, the tables included in the report of passenger and freight traffic statistics showing 1,072,000 passenger and mixed train-miles in 1916, a decrease of 23,000, or 2.07 per cent, and freight train-miles amounting to 923,000, an increase of 93,000, or 11.21 per cent, and switch train miles of 393,000, an increase of 17,000, or 4.55 per cent. There is, however, obviously a gain in economies in transportation expenses per train-mile, since transportation expenses decreased by 4.05 per cent. The price of fuel oil per barrel was the same in both years; but there was a decrease in consumption of 42,304 barrels, the gallons of fuel oil consumed per locomotive-mile being 8.92 in 1916 and 9.73 in 1915, a decrease of 8.32 per cent.

Rather heavy cuts were made in appropriations for maintenance. The amount spent for maintenance of way and structures in 1916 was $775,000, comparing with $827,000 in 1915 and being the lowest amount spent in any year since 1910. The amount expended for maintenance of equipment was $635,000, comparing with $732,000 spent in 1915; and in this connection mention should be made of the fact that 7 locomotives, 27 box cars, 67 flat cars and 34 coal cars, with some few other units of equipment, were retired, but no part of the additional cost of this equipment was charged to this year's operating expenses. The total cost of the equipment was $122,000. There was $30,422 salvage; $60,386 depreciation accrued prior to July 1, 1907, and all of this was charged, in accordance with the Interstate Commerce Commission's classification of expenses and capital expenditures, to profit and loss, and $32,692 depreciation accrued since July 1, 1907, and therefore already charged out to operating expenses in previous years.

At the end of the year there was $43,000 cash on hand, a decrease as compared with the beginning of the year of $47,000, and interest matured unpaid of $360,000.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	724	724
Freight revenue	$2,645,102	$2,503,321
Passenger revenue	946,814	1,017,034
Total operating revenues	3,862,745	3,797,055
Maintenance of way and structures	775,192	827,302
Maintenance of equipment	635,071	731,511
Traffic expenses	81,418	79,377
Transportation expenses	1,768,034	1,842,718
General expenses	147,022	139,593
Total operating expenses	3,404,594	3,920,005
Taxes	183,932	159,979
Operating income	273,392	16,207
Gross income	343,315	37,750
Deficit	600,471	861,871

NEW BOOKS

Bridge Engineering. By J. A. L. Waddell, C.E., LL.D., etc. Two volumes, Pp. LXXV + 2177. Cuts, diagrams, index. New York: John Wiley & Sons, Inc. London: Chapman & Hall, Limited. 1916. $10.00 net.

This book is the child of *De Pontibus,* published some 18 years ago, and the child has the essential qualities of the parent: courage, candor, enterprise, ability, all still further developed by the broad and successful experience of the intervening years. The book "is intended to be a record of the author's life work, prepared before age has begun to diminish his energy or to deteriorate his mental capacity." But the author had in mind also the duty of the engineer "to add his mite to the sum total of professional knowledge in order to repay in some slight measure the large obligation which the individual owes to his predecessors for the accumulated information handed down by them." So it has come about that Dr. Waddell has built for himself a handsome literary monument, and, at the same time, has made safe his legacy to the profession which he is glad to serve.

The author explains the scope of the book as an attempt "to cover essentially the entire field of bridge engineering excepting only the theory of stresses and similar matter, which can be found in all standard books on bridges." The result is a work of over 2200 pages divided into 80 chapters. A short chapter treats of the evolution of the art from the chain of monkeys down through the ages. Another short chapter considers the bridge specialist. Two chapters treat of the materials used. A group of five chapters takes up loads, impact, effects of curvature and vibration. Another

group of five chapters deals with stresses and deflections. Then follow chapters on designing, detailing, shopwork, classes of traffic, floors and floor systems and bracing. There are 11 chapters on the recognized types of bridges, such as plate-girders, simple trusses, cantilevers, arches, suspension bridges and movable bridges. Six chapters on various topics are followed by six chapters on foundations, piers and abutments. There is a chapter on shore protection and mattress work, one on expedients in design and construction and six chapters on the data required for designing. There are chapters on aesthetics, economy in design, weights and quantities, estimates, office practice, inspection, construction and erection, examination and repair of existing bridges, bridge failures, specifications and contracts and a group of seven chapters on the business side and the ethics of the profession, covering arbitration, promotion, fees, etc. There are two very complete chapters on specifications. Finally, there is a glossary of terms of 224 pages, covering 5,000 terms and 3,000 cross references.

The book is made convenient for use by a copious index and by complete lists of cuts, diagrams and tables. Dr. Waddell has been 40 years in practice. He mentions a time when he had in hand $15,000,000 of bridge work. For many years he has prepared studies, analyses and records of his work, using diagrams freely. The scope and value of the diagrams and tables which he now makes public may be imagined, but it is impracticable to give here any notion of the immense range and variety of the information made available. Dr. Waddell thinks that the chapter on First-Principles of Designing is "by far the most important one in the book." Here he has condensed the most important conclusions of his experience into 50 fundamental, general principles.

The chapter on Alloy Steels in Bridge Work has special interest, not only because of the importance of the subject, but because of the author's original work in a field in which he has been among the pioneers. He has experimented, written, studied and debated and in this chapter he gives very completely the present state of the art.

The chapter on reinforced concrete bridges, mostly written by Shortridge Hardesty, is a remarkably complete treatment of this form of construction. The chapter on shopwork will be of particular value to the designing engineer. The author was able to get important communications from Mr. Wolfel, of the McClintic Marshall Company, and Mr. Reichman, of the American Bridge Company, and he prints their communications with his comment on the points on which he differs from them. Thus this chapter will go far toward clearing up the ancient conflict between the engineer and the manufacturers.

The chapters on the weight of steel superstructures and on quantities for piers, abutments, etc., are of quite peculiar value because they are largely made up of diagrams accumulated in the author's experience and of the methods of using those diagrams evolved in his practice. There are two chapters on specifications, one for designing and one for manufacture and erection, occupying 260 pages, which must cover every item that could be the subject of specification.

The candid personal quality of Dr. Waddell's writing has been known to many readers for years. He does not look on engineering as an esoteric art, wrapped in sacred gloom. He knows no bridge pope who sits at the head of the profession and utters infallible dogma. Ever since he was 20 years old (more or less) he has spoken out in meeting. He has often shocked the hierarchy, but, oddly enough, he has generally been right, and when he has been wrong he has let in the light. So when he says that the Blackwell's Island bridge is a constructive lie, and gives his reasons he tempts people to think and to take sides and to debate. The book abounds in examples of this bracing plain-speaking and over it hangs the fine afterglow of many an ancient controversy. It is not only a mine of information and opinion, but it is full of lively human interest.

Letters to the Editor

OVER, SHORT AND DAMAGE CLAIMS

Mason City, Iowa.

To the Editor of the Railway Age Gazette:

In nearly every railway publication there appears one or more lengthy article dealing with the subject of over, short and damaged freight claims. It has been my experience that a large per cent of these claims are caused by the indifference and carelessness of the employees at the loading, unloading and transfer points of shipment: At the loading point, by improper loading, by loading without the proper billing, and by accepting shipments not properly packed, crated or stencilled; at the transfer point, through the carelessness of the checker and freight handlers in not seeing that all shipments are transferred according to billing and marks.

These causes can be eliminated through disciplinary measures only, the lack of which encourage many agents and freight handlers to fall into their lax way of doing business.

A great many mistakes are made because of unfamiliarity with the rules governing shipments. For example: An agent at a small station was about to accept a shipment of twenty bushels of potatoes in bulk. When instructed that he could not take it as an l. c. l. shipment, he admitted that he did not know this could not be done. I understand that this agent had been in service at this one station for almost fifteen years, I presume, consistently making mistakes at the expense of the company during that time.

Shipments of second-hand household goods are received for transportation, neither wrapped, crated nor stencilled. Some few articles may have a small card attached to them bearing the shipper's name and address only, shipped all charges collect. About seven times out of every ten when such a shipment arrives at its destination a claim for about twice what it is worth is presented to the company for loss and damage. In some cases where the shipment moves over two lines, the delivering line will refuse to accept it from the connecting line unless all charges are fully prepaid and all articles properly packed and marked, causing added expense to the line first accepting the shipment.

As I mentioned before, some of these mistakes are made because of ignorance, due to the fact that a great many agents, when they started in a small station alone, were handed a key and told to go to work, if they could handle their accounts and keep comparatively neat books, regardless of whether they were acquainted with the rulings regarding packing, marking and crating of shipments.

I could mention numerous other mistakes commonly made, which can all, or a greater part of them, be eliminated by a strict enforcement of the rules. Agents should occasionally be examined as to their knowledge and understanding of the rules. This would help to refresh their memories, besides being a benefit to the company, and I am sure a saving. Some roads issue small circulars from time to time dealing with this subject, but about 75 per cent of them are never read. The recipient glances at them just long enough to see what they are and then, in disgust, consigns them to the waste paper basket. Men of this kind need pressure brought to bear on them, and if they persist in violating the rules and in ignoring the instructions issued should be removed from the service, as they are more of a liability than an asset to the company.

The only way in which the freight claims can be eliminated to any great extent is to educate the employees and then see that they do business according to instructions.

J. F. O'Daniel.

Congressional Inquiry on Railroad Regulation

Alfred P. Thom, Counsel for Executives' Advisory Committee, Cross-Examined by Newlands Committee

CROSS-EXAMINATION of Alfred P. Thom, counsel for the Railway Executives' Advisory Committee, on his opening statement before the Newlands Joint Committee on Interstate Commerce which was presented on November 23, 24 and 25, occupied the hearings before the committee all of last week with the exception of Thanksgiving Day and was continued on Wednesday Mr. Thom had been questioned regarding the details of the railroad proposals by each member of the committee except Senator Underwood, who said the points about which he wished to ask had been covered by other members, but he was asked to return on Wednesday for some additional questions.

Mr. Thom's opening statement and the first part of the cross-examination was reported in last week's issue.

In reply to questions by Representative Sims, Mr. Thom said that, in his opinion, unless something is done to strengthen railroad credit and to cause the public to regard railroads as safe investments, government ownership is inevitable in a short time. For this reason, he said, the question of states' rights has no place in this investigation, "because, if something is not done to stabilize the present system and to bring the necessary amount of money into it, then government ownership will come and state control of all sorts will go."

Mr. Sims supplemented this discussion of government ownership by expressing a doubt whether the large sums of money needed for railroad development can be obtained from private sources free to invest money where the most attractive offer is made.

"The future of the country," said Mr. Sims, "should not be conditional upon the sweet will of men who are free to put their money where they wish. Some kind of government guarantee seems necessary. It seems almost as if the government must guarantee minimum dividends, or put its faith back of bonds, or, in some way, get behind the railroads."

Mr. Thom replied that he did not think public opinion was yet ready to sanction governmental guarantee of dividends or bonds and that the railroads, having accepted this as the present state of public opinion, had endeavored therefore to suggest plans for an improvement of existing conditions of private ownership.

"We don't think the country is ready to guarantee these things," said Mr. Thom. "Our minds therefore went naturally to the improvement of present conditions."

Representative Adamson asked Mr. Thom what legal reason existed for divesting states of control over rates and yet reserving to the states the right of taxation.

"Congress would have the power to control taxation," said Mr. Thom. "The preservation in the states of their power of taxation would be a matter of policy, not of law. The federal government could impose a tax on gross earnings."

Mr. Adamson asked what, in the event of federal incorporation of railroads, would be done with roads having capital stock in excess of the investment in the property.

"I believe you must recognize the things that have happened," said Mr. Thom. "You would not get rid of differences about capitalization unless under the federal system you issued stock without par value. Par value really means nothing."

Mr. Adamson said that the people of the country do not take kindly to the present system under which the Interstate Commerce Commission sends young men as examiners to hold hearings on rate disputes. He asked if an enlargement of the Interstate Commerce Commission and its division into groups would not solve this trouble.

Purpose of Regional Commissions

"That would not be enough," said Mr. Thom. "The Interstate Commerce Commission says that extra members are needed in any event. I think the people would prefer resident regional commissioners. So far as the selfish interests of the railroads are concerned they would be served equally well by a commission in Washington. My idea is that you must regard the needs, sensibilities and views of the people. The government must not be a stranger to them. This idea of regional commissions is to bring these commissions into touch with the people."

Mr. Adamson objected that this sugegstion was not consistent with Mr. Thom's statement that federal control of rates is necessary.

"If you will put the two ideas together you will find they look like brothers," said Mr. Thom. "It is necessary that commerce be handled without state limits. People do not do business along state lines. Yet it is essential that the needs of the people be understood and that these commissions come into close touch with them."

Mr. Adamson asked where, if regional commissions appointed by the President were named, communities would get redress for local wrongs.

"The regional commission would be a local body, but not like a state commission because a state commission is based on the idea that commerce should be bounded by state lines. Many railroad men take your view," said Mr. Thom. "They believe strangers would have a more independent view of local matters. I think we must take the risk of that. It is desirable from every standpoint to put the regional commission close to the people by making these commissioners live among them."

In response to another question, Mr. Thom made this statement:

"Not one cent of revenue is to come to the railroads from this investigation. This is not a rate hearing. This is a question of whether you are to allow a reorganization that will allow us to meet unprosperous years as well as the prosperous. We ought not to wait for a time of disaster to seek a method of relief from disaster."

Regulation Should Be Constructive

Senator Robinson asked if Mr. Thom, in accounting for the decline in railway credit, had given due prominence to the mistakes and mismanagement in the past on the part of the railway managers and financiers.

"I have no doubt it has had a marked cumulative effect," said Mr. Thom, "but the charges about that did not affect 10 per cent of the mileage of the country." He said that regulation was largely the result of former abuses on the part of the railroads but that "the time must come when the character of the men in charge of these properties must be recognized as being as high as in any other business or the system of private ownership and private management must go." "And when that time does come," he added, "and I say it has come now—we think that the time has come for you, while retaining all of your corrective powers and processes, to add the constructive and helpful features to this system of regulation, which will insure for the future the sufficiency of these facilities. Granting all that can be said about abuses existing in the past, detecting them and punish-

ing them will not provide what the public needs in the future. Our proposition is that the great mass of these abuses have been removed; that if they exist at all it is only in sporadic cases, but certainly as to those that are not removed the retention of your corrective powers will be sufficient to deal with them, and when they are all removed there still are conditions of incapacity created which will prevent the railroads from being able to do their real function for the public. We are asking you to see to it that when you get rid of them all you do not leave an anaemic and incapacitated system of transportation, but that you will deal in a comprehensive and helpful way with the needs of the future."

"Was the Sherman anti-trust act regarded as a railroad act when it was passed?" asked Senator Robinson.

"It was not," said Mr. Thom.

"The public interest would not be injured if the anti-trust act were made inapplicable to railroads?" asked Mr. Robinson.

"I do not think it would," said Mr. Thom, who recalled that the Interstate Commerce Commission has given its endorsement to a proposed law allowing traffic agreements which Congress has not passed.

Senator Robinson produced an advertisement of a Railway Investors' League indicating an impression that the interests of railroad security holders are not to be represented in the hearings. Chairman Newlands said that bankers were included in the original invitation to the hearings and that any organization of investors would be welcomed.

Proposed governmental supervision of security issues was touched upon briefly. "The government regulation of issues is in accord with public sentiment," said Senator Robinson, "and would do more than anything else to strengthen confidence in railroad securities."

The hearing on November 29 was devoted principally to a discussion between Representative Sims, of Tennessee, and Mr. Thom on the subject of government ownership of railroads.

Government Ownership

While Mr. Sims did not directly advocate government ownership, he argued that the plan of greater federal control proposed by the railways was "a political and practical impossibility" on the ground that the people would never consent to have the states deprived of their present powers of regulation, and that as present conditions demonstrated that something must be done the discussion might as well proceed to the inevitable question of government ownership.

Mr. Thom replied that government ownership would transfer power from the states to the federal government to an even greater degree than the plan proposed by the railways, but that he thought that when the people understand that the proposal of the railways is in the public interest they will approve it. "You propose to take more from the states than I do," he said. "In either event the authority of the states over these transportation facilities will disappear and be merged in the national government that acts on behalf of all the states."

Mr. Sims said he agreed that a situation exists that calls for relief and that without relief progress would be paralyzed, but that as a practical matter members of Congress are influenced by "a circumscribed local conception" rather than by a comprehensive and national view of the situation and that it would be impossible to get them to pass such legislation as the railroads propose.

"If we are going to have men in Congress who can never get outside of their local situation," said Mr. Thom, "we are in a bad way."

"Do you know of any way of getting them here in opposition to a local situation?" asked Mr. Sims. "If they do not have men that represent them they turn him down and get one who does."

Peanuts and Politics

As an example Mr. Sims said that a delegation of members of Congress from Virginia went before the ways and means committee and demanded a high protective duty on peanuts "to comply with the requests of the peanut growers who sent them to Congress, in spite of the Democratic position on that subject."

"The only answer I can make to you is that this proposition is a great deal bigger than a peanut," replied Mr. Thom. "I hope that the gentlemen from the peanut district will rise to the national and universal aspects of this great problem."

Mr. Sims said that it was time the railroad owners and executives gave some consideration to "the inevitable question," and asked whether they would be willing to sell. Mr. Thom replied that he was not advised on that point but that "if the present system is persisted in it may not be long before the principal advocates of government ownership are the railroad owners themselves."

The discussion was devoted chiefly to an analysis of conditions which, in Mr. Sims' opinion, are tending toward government ownership of railroads. He insisted that the system of private ownership is "breaking down."

"I think it will break down unless you improve conditions," said Mr. Thom. He said that the majority of railroad people are hopeful and expect proper results from improved regulation, that they believe the time has come for their hands to be upheld by sympathetic and helpful regulation.

Mr. Sims began his questioning by agreeing with Mr. Thom that the present condition of the railroad business is serious and that something ought to be done to improve it. He said that the statement that less than 1,000 miles of new railroad was built last year was one of the "saddest examples of arrested development" he had ever heard of. He again suggested the possibility of a government guarantee of a minimum dividend of 4 per cent, giving the investor the opportunity of receiving more if the property could earn more under government regulation. He said that any loss sustained by the government under such a guarantee should be secured by a first lien on the property. Mr. Thom said that the railroads had not considered government guarantee as within the range of possibility and had merely asked that the government perfect the system of regulation to give them the help and encouragement necessary to give the system of private ownership a fair test. If private ownership then fails, he said, it will be time to consider government ownership.

National Defense

Mr. Sims then asked if a vital element of national defense should be dependent upon private capital. Mr. Thom replied that the national government should establish such a standard of efficiency for the railroads in time of peace that they will be in a position to serve as part of the national defense in time of war. He added that the government does not place its fortifications within the jurisdiction of the states in which they are located.

Mr. Sims brought up what he termed the "economic waste" resulting from competition between railroads and asked why, if it was in the public interest for large numbers of small lines to be consolidated and operated in large systems, it would not be a good thing if all the railroads in the country were operated as one system. He referred to the "waste" in maintaining two competing lines of railroads between two cities. Mr. Thom said that the railroads propose that the Interstate Commerce Commission be given power to pass on proposed competitive railway construction and to issue a certificate of necessity before a federal charter can be issued for a new railroad.

"Do you seriously think the American people will ever vest in the hands of a single board the question of whether

they shall or shall not have a single railroad or two railroads?" asked Mr. Sims. "Would the great state of Texas ever agree to depend on a board sitting in Washington as to whether a railroad should or should not be built there?"

"Why not? Does not that board represent Texas?" Mr. Thom replied.

At the opening of the hearing on December 1 Mr. Thom stated that he desired to clear up an apparent misunderstanding as to the proposal of the railroads. He said that they had not suggested eliminating all authority of the states over railroads but that although they had not undertaken to draw any exact line of separation between state and federal authority they advocated the principle that in matters where the exercise of authority by a state extends beyond the borders of the state and affects the affairs of other states or substantially affects interstate commerce the national authority should be paramount. He said that the fixing of a rate for purely intrastate traffic not only affects interstate commerce by measuring the contribution of the intrastate traffic toward the upkeep of the railroad but that it also had a direct effect on interstate rates.

Litigation in State Courts

In reply to a question by Representative Cullop, Mr. Thom said that the railroads do not propose that litigation against railroads shall be removed from state to federal courts in case a plan of federal incorporation is adopted. He said that the statute could provide for that. He also thought that the states should reserve their police powers over such matters as the construction of depots, grade crossings, etc. "My conception of the constitutional limitation is one thing, my belief as to the proper policy is another," he said. "My belief is that the federal government could take entire charge of the instrumentality of interstate commerce in all its relationships. I do not think it is wise that that full authority should be exercised at the present time."

Mr. Cullop asked if railroad credit had not been affected by the public distrust caused by "manipulation" of railroad securities. Mr. Thom replied that there was no doubt that there had been such an effect, but that the same thing applied to other kinds of business, and that there was much less fluctuation in railroad securities than in others. He said he had not lost sight of the fact that there had been objectionable practices in railroad finance as in other businesses but that the abuses constitute but one of many reasons for the lack of confidence in railroad investments and that the principal difficulties in the present situation of the railroads would exist without them.

Reasons for Lack of Confidence

"I do not in any way take the position," he said, "that some of the objectionable things which have been done in respect to financing railroads have not had an effect on the public estimate of railroad management, but I do not think that that alone explains. There are other causes and other difficulties that have created insuperable difficulties. If you cannot control either your income or your expenses you find that your chance of success is very much limited, and when you find also that those matters are controlled by a willingness to publicly agitate the question, to determine it by political exigencies in any particular case, you find such a very serious situation created that the investor shrinks from entering that field of investment, when he considers the attractions that may be open to him in other fields."

Mr. Cullop asked if the confidence of investors would not be increased by giving the Interstate Commerce Commission authority to pass upon railroad security issues.

"That is but one of the things that we think ought to be done," said Mr. Thom. "You have also got to convince the investor that there is going to be a proper return on the security."

In reply to a question whether higher rates would not reduce the volume of traffic, Mr. Thom said that the increase of rates up to a reasonable point would not do so and that the farmer's interest is not in low rates alone but that he is vastly more interested in having adequate service and facilities.

Mr. Cullop asked if the two-cent fare laws in a number of states had not materially increased the revenues of the railroads. Mr. Thom replied that while the general consensus of opinion is that they induced some additional travel they reduced passenger rates to so low a point that the passenger business was not contributing its part to the upkeep of the railroad facilities and that a burden was placed on the shippers of freight to such an extent that the Interstate Commerce Commission has allowed passenger fares to be increased.

When Mr. Thom referred to increases in operating expenses Mr. Cullop said: "Now we are getting to where I wanted to get. Have not the increases come in high-salaried officers? Do you think any railroad president in this country is worth $100,000 a year? Could he get that at anything else that he would be employed in, and does he not get his position through favoritism?"

Salaries of Presidents

"I do not suppose you have at all investigated that matter, if you ask such a question," replied Mr. Thom. "If every one of those officers worked for nothing it would not affect this problem at all because the percentage of all the expenses of a railroad is so small. As to whether there is any railroad president in the United States getting $100,000 a year, I do not know; perhaps you do. I have never heard of any."

"I do not know," said Mr. Cullop, "I have understood so."

Mr. Thom said that the railroad presidents have been selected because of the belief on the part of the people that selected them that they were the best men for the job and that "you cannot get a man that is too big for the responsibilities of trying to make a success of the facilities which he is using in the public service."

In response to questions Mr. Thom said that the European war had induced an abnormal traffic for the railroads but that the economic situation after the war is a matter of uncertainty. He said that any disposition to take a war basis of business as a basis for policies of railroad control would be shortsighted.

Mr. Cullop suggested that the states would oppose federal incorporation because it would take from many of them large incorporation tax revenues.

"Is that a proper charge for one state to impose upon the general public or other states?" asked Mr. Thom. "Such charges are paid by the public either in increased rates or impaired facilities."

Cummins for Greater Federal Control

Senator Cummins prefaced his examination of Mr. Thom with the statement that he has for a long time favored and now favors, "a substantial enlargement of the scope of federal control." He said that the only evidence Mr. Thom had presented bearing upon the disinclination of men of money to invest in railway securities is that during the past year only about a thousand miles of railway has been constructed. Mr. Thom said that a great many witnesses will appear who will show the fact that the public is unwilling to invest in railway securities.

"Do you know of any company desiring to build additional railways that has endeavored and failed to secure the capital?" asked Senator Cummins.

Mr. Thom said that the companies have come to the conclusion that the field is not attractive enough to attempt to do it. Senator Cummins insisted that there may be many

reasons for the failure to enlarge railway facilities other than the inability to secure the capital and that within two years the present railway facilities were more than sufficient to take care of the traffic. "There always will be," he said, "some years in which a part of the facilities will be inadequate."

Not Criticizing I. C. C.

When Mr. Thom replied to a question that the fears of railroad investors arise both from past regulation and from apprehension with respect to future regulation, Senator Cummins insisted that Mr. Thom was simply criticizing the Interstate Commerce Commission for not taking the future welfare of the railroads into consideration. Mr. Thom objected to being put in the position of criticizing the commission, saying that the difficulty lies with the spirit of the present system of regulation.

Senator Cummins said that Congress can only direct the commission to fix "reasonable rates" and that rate-making is a judicial function, but Mr. Thom asserted that Congress could instruct the commission as to the elements to be considered in determining the reasonableness of rates. "For example," he said, "here is a section of the Interstate Commerce Commission that has held distinctly that they cannot consider general considerations in fixing a rate: that they must have regard only to the particular little transactions that are before them. Now you can say to them that they must take into consideration the whole outlook; that they must regard the credit of the carriers to the extent that such credit is necessary for them to be able to furnish the facilities. That is one of the principal things we want you to say."

Capitalization

Senator Cummins asked Mr. Thom a number of questions regarding railway earnings and capitalization, in the effort to show that a large part of railroad stocks represent "water" and that "the situation is not as bad as we have been led to believe." Mr. Thom said that a great deal of stock has been issued at par but that witnesses would appear before the committee on statistical matters.

Return on Capitalization

At the opening of the session on December 2, Mr. Thom read into the record statistics of the percentage earned on railway capitalization in recent years in reply to questions asked by Senator Cummins on the day before. For the five years from 1911 to 1915 the net income was 4.56 per cent of the net capitalization, and for the five years from 1905 to 1910 it was 5.25 per cent. The total earnings on the stock, computed by adding to the net operating income the income from securities owned and deducting bond interest, were for 1910, 7.09 per cent; 1911, 6.17 per cent; 1912, 4.97 per cent; 1913, 5.94 per cent; 1914, 4.06 per cent; 1915, 3.44 per cent. Mr. Thom said that Halford Erickson, formerly chairman of the Wisconsin Railroad Commission, would take the stand later to give statistical testimony.

Senator Cummins asked if there was anything hostile to the carriers in the action of Congress committing to the Interstate Commerce Commission the authority to determine reasonable rates. Mr. Thom said that was a very proper regulation but that the question of a reasonable return to the railways has been influenced by other conditions. For example, he had been informed that in one state the state commission, if it increased a rate, would be met with a bill in the legislature to abolish the commission, and the Interstate Commerce Commission had been attacked in Congress for its decision in the five per cent rate case.

In discussing the powers of Congress to direct the Interstate Commerce Commission what elements to consider in fixing rates Senator Cummins asked if Congress could say that the commission must not take into consideration the advance in the value of railway right of way.

"No," replied Mr. Thom, "because that is property, and it would be forbidden by the constitution."

"We have the right, then, to prescribe any element that will tend to increase the rates but we cannot withdraw any element that will tend to decrease the rates?"

"Yes, you can," replied Mr. Thom, "the very elements that I refer to might tend to decrease the rate."

Senator Cummins asked if there was not an inconsistency in saying that railways ought to be allowed to earn enough to pay 6 per cent on the stock and 3 per cent for a surplus, for lean years, and also to say that rates should be adjusted to the value of the service. Mr. Thom said it was undoubtedly inconsistent, but that he had said that the percentages he had named represented what was necessary to make stock salable at par to attract the investor and that while he thought the value of service was the proper measure of rates the courts had given more weight to the idea of a fair return in the value of the property.

He said that the percentages mentioned should apply to average conditions and that the surplus would be used in part to pay dividends in "lean years," and in part to build up the property. Senator Cummins expressed the opinion that it would not be fair to expect the public to pay rates that would give a return on invested surplus.

"I do not expect that the rates that will be permitted will allow an undue accumulation," said Mr. Thom.

Senator Cummins asked what should be done in a situation where one railroad earns 25 per cent on its stock and another earns nothing for its stock on the same rates. Mr. Thom said that if no wrong is done to the public in the rates which make the large earnings for one road, the fact that its earnings are great ought not to be objected to.

Senator Cummins asked questions indicating the opinion that in case a plan of federal incorporation should be adopted, the new federal corporations would take over the property of the present companies by condemnation at a fair value and "establish a capitalization that represented the real value."

Mr. Thom said he thought that would create too great an upheaval and that the wisest plan would be not to disturb the present capitalization, unless a plan of issuing stock without a par value, to be exchanged share for share for the present stock, were adopted.

"Such a plan," Senator Cummins said, "simply deludes the country," and "avoids realization of the fact that the value of the property is less than the capitalization." To this Mr. Thom replied that the criterion of rate-fixing is value, not capitalization, but that to attempt to make capitalization correspond exactly with value "would disturb the financial confidence of the world."

"I believe that it would be a very healthful, but a somewhat painful surgical operation and the sooner it is performed the sooner the patient will recover," said the Senator. "I have a great deal of sympathy with your general plan but when you base it upon the perpetuation of all the securities that are now outstanding, I think you have raised an obstacle which you will never be able to overcome."

Regional Commissions Would Expedite Rate Cases

In reply to questions by Representative Esch of Wisconsin, Mr. Thom said that the proposed plan of regional commissions subordinate to the Interstate Commerce Commission, would greatly expedite the handling of rate cases, because the Interstate Commerce Commission would not be bothered with the preparation of the record or the conduct of hearings, and it would only be necessary for it to consider and pass upon the controverted points in a case, as to which exception had been taken by one or more of the parties. Mr. Esch asked Mr. Thom what he thought of the plan sug-

gested by Chairman Meyer of the Interstate Commerce Commission for co-operation between the state and federal commissions in cases of a conflict of jurisdiction. Mr. Thom said he thought the plan was impractical.

Mr. Esch asked if giving the commission the power to fix a minimum rate would not give the commission power to revive transportation on the inland waterways of the country.

"Undoubtedly," replied Mr. Thom. "I am a disciple of the philosophy that whatever goes to make up the prosperity of the country, in improvement of water transportation facilities and any other facility, is not contrary to the broad and proper interests of existing railroad companies."

In reply to Senator Brandegee, Mr. Thom said that the Railway Executives' Advisory Committee represents railroads having about 90 per cent of the gross earnings of the railroads of the country. Mr. Thom is chairman of the law committee, which also includes E. G. Buckland, vice-president and general counsel of the New York, New Haven and Hartford; A. H. Harris, general counsel, New York Central; W. C. Noyes, general counsel, Delaware & Hudson; Francis I. Gowen, general counsel, Pennsylvania Railroad; Gardiner Lathrop, general solicitor, Atchison, Topeka & Santa Fe; Burton Hanson, general counsel, Chicago, Milwaukee & St. Paul; N. H. Loomis, general solicitor, Union Pacific; Joseph M. Bryson, general counsel, Missouri, Kansas & Texas; C. W. Bunn, general counsel, Northern Pacific; and Chester M. Dawes, general counsel, Chicago, Burlington & Quincy.

Representative Hamilton also questioned Mr. Thom very briefly. Chairman Newlands said he had some further questions to ask at the next session regarding a national incorporation act and Vice-Chairman Adamson said he had a few more questions. It was announced that hearings would be held on Wednesday, Thursday and Saturday, December 6, 7, and 9.

VALUATION OF THE KANSAS CITY SOUTHERN

The Interstate Commerce Commission on Monday made public the tentative valuation, made by the division of valuation, of the property of the Kansas City Southern system, operating a total of 877.9 miles of main line. The total cost of reproduction new of common carrier property owned, exclusive of land, assessments for public improvements, and materials and supplies, is placed at $46,274,363 and the cost of reproduction less depreciation as $38,258,909. The present value of land used for common carrier purposes, a total of 6,413 acres, is placed at $2,409,619, of which 785 acres, with a present value of $248,136, were acquired by gift. The original cost of the 5,745 acres of land purchased and owned is placed at $2,283,899 and the present value as $2,267,926. Materials and supplies, etc., were found having a book value of $2,715,135, as to which the commission makes no finding of the actual value. The original cost of the units of equipment now in existence is placed at $9,109,281. The commission makes no finding of the original cost to date of road. The total capitalization of the property to June 30, 1914, was $99,052,000.

The report states that the roadbed and accompanying structures which have been abandoned because of a change in location of line and grade were not inventoried. There is a considerable amount of this class of property. The report includes lengthy history of the construction of the road and of its finances. It is stated that at the time of the completion of 778 miles of line, the Kansas City, Pittsburg & Gulf had a total capitalization of $45,279,000 as against an actual money outlay of $15,288,771. In describing some of the methods used in obtaining the valuation, it is stated that in preparing the cost of reproduction the Kansas City Southern will be considered as one entity, the work being prosecuted over the whole line and in sections varying in length, governed by the feasibility of securing construction material and the difficulty of work on each section. A program for carrying out the work in the different stages of construction is set forth. The inventory work was begun on January 27, 1914, and completed on December 15, 1914. It is stated that the unit prices applied are representative prices of railway property constructed or purchased by the usual methods of railroad construction. Where property was first purchased from the manufacturer and installed by day labor the unit prices are representative of unit costs. In all instances as specified by the classification of accounts of the Interstate Commerce Commission the unit prices represent the total cost of the property in place, including all expenses incident thereto, including such profits as the representative unit price costs may contain.

It is stated that the records of the carrier did not show sufficient information from which to draw any conclusion as to the amount of engineering expense associated with the road. From general inspection and study it is the opinion of the district engineers that 4 per cent of road accounts 3 to 47 is commensurate with the engineering which actually exists.

Quantities of clearing and grubbing are estimated according to the extent of timber contiguous to the right of way as of the date of valuation. The unit prices are representative contract prices for work of this kind in the vicinity of the Kansas City Southern. Clearing, grading, excavation and embankment are given a service condition of 100 per cent. The service condition of ties was determined from the statistical records of the company and the conclusion was reached that renewals have been normal, thus giving ties a service condition of 50 per cent, except treated ties.

Based on the progress of construction, a study was made of the amount of money needed each month and interest was calculated therefrom which led to the conclusion that the total amount of interest during construction would equal the interest rate on the total expenditure for one-half the total period of construction. The interest rate on safe investments in the territory was applied.

As to original cost, it is stated that the books of the construction companies appeared to show with considerable completeness and accuracy the total expenditures made by those companies, but did not give the location of the expenditure nor do they in all cases distinguish between different accounts.

INDIAN RAILWAY EXTENSION.—The Burma Railway Company has in hand schemes for building eight new railways of a total length of 322 miles.

THE INTERNATIONAL RAILWAYS OF CENTRAL AMERICA.—The International Railways of Central America was incorporated in 1912 and represents a consolidation of the Guatemala Railway (195 miles), the Guatemala Central Railway (139 miles), the Occidental Railway (51 miles), and the Ocos Railway (22 miles). The company's main lines at present extend from Puerto Barrios to Guatemala City, a distance of 194.5 miles, thence to San José de Guatemala, on the Pacific Ocean, a distance of 74 miles. The company is capitalized for $40,000,000 and has issued bonds in the sum of $10,850,000. It receives subsidies from the Governments of Guatemala and Salvador, ranging from $5,150 to $11,780 per mile. The Salvador division of 40 miles is operated separately. The Government of Guatemala may purchase the lines after the year 2002 at a price to be decided by arbitration. The lines located in Salvador may be purchased after June, 1978, by the Government of that country at an arbitrated price. After the year 2005 Salvador will receive the lines without indemnity.

Louisville & Nashville Timber Treating Plant

This Layout Has Been Entirely Rebuilt Because of a Disastrous Fire. A Number of Interesting Features

THE Louisville & Nashville has recently completed the rebuilding of its creosoting plant at Gautier, Miss., which was burned on August 13, 1915. This plant was one of the first built in this country and is the oldest in the United States in point of continuous operation.

The main line of the Louisville & Nashville from Mobile to New Orleans includes several long trestles across indentations of the Gulf of Mexico, the timbers in some of which are subjected to severe attacks of marine borers. These borers soon showed the necessity for the treatment of all piling and an open tank plant was at once installed. In 1876, this open tank plant was changed over into a one cylinder pressure plant. On May 1, 1880, the Louisville & Nashville acquired active control of the New Orleans & Mobile, as the line west of Mobile was known. Two cylinders were added to this plant by the L. & N. at different dates previous to 1902, when all three cylinders and the remainder of the layout were destroyed by fire. The plant was at once rebuilt with the buildings of timber construction covered with galvanized iron, housing three cylinders, each 6 ft. in diameter and 115 ft. long. It was this plant which was destroyed by a second fire last year, caused by an explosion of gas which had collected in the top of the cylinder room. In this later fire one cylinder was entirely destroyed, parts of another were reclaimed, while a third was in such condition that it could be used with only slight repairs. This cylinder was turned end for end, moved to new foundations and placed in service with a delay of only one week.

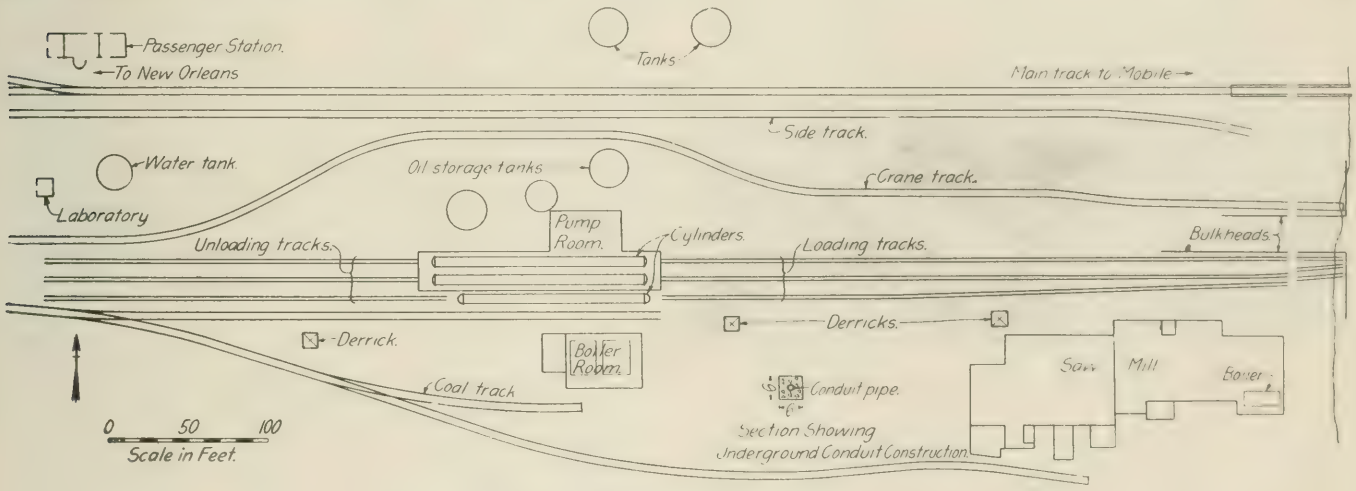
The Gautier plant treats bridge timbers and piling exclusively, employing the full cell treatment and supplying the bridge material for the entire system. The Louisville & Nashville operates a second timber treating plant at Guthrie, Ky., at which only ties are treated, which are used on the lines north of Birmingham, Ala., untreated cypress ties being used south of that point. In addition to the large amount of timber bridging on the Gulf division, ballasted deck construction is now standard for trestles on all parts of the system except this division, where open deck construction is used. Only creosoted timber is used in wooden bridges. About 10,000 piles and about 6,000,000 ft. B. M. of timber are treated annually at Gautier. Because of the depth of water encountered at a number of the bridges on the Gulf division a large amount of the piling treated is of long dimensions. All of the dimension timber except the bracing is framed before treatment.

With the exception of the bracing all of the material treated is long leaf yellow pine, which is secured from points south of Montgomery, Ala. The Gautier plant is located on the shore of an inlet of the Gulf into which three streams enter at the upper end. This makes it possible to deliver 65 per cent of the piling to the plant by water. About 25 per cent of the timber also comes to the plant by water in the form of logs and is sawed to the required dimensions at this point. The remainder of the piling and dimension timber is received by rail.

All timber is treated green as it comes from the water, although, as much of it has been in the water for periods ranging from 6 weeks to 3 months, it is fairly well seasoned in this way. Good penetration is secured in the treatment although a longer time is required, from 21 to 30 hours being necessary to treat this timber, depending upon the condition of the material.

As far as practicable the material recovered from the old plant was used in the reconstruction. This accounts for the difference in the size of the two working tanks and the use of three small oil storage tanks instead of one larger one. The boilers and a considerable portion of the original power plant have also been used in the revised layout. The use of this older material has also influenced the arrangement of the plant since it was necessary to locate the new buildings and other facilities to fit the location of that part of the equipment of the old plant which was utilized. Thus the arrangement of the present plant is entirely different from that which would probably have been provided had the designers been free to adopt the most desirable arrangements.

In so far as the plant has been designed new, it is similar in general details to that built at Guthrie, Ky., in 1913. In both of these plants particular attention was paid to the detailed design of pipe fittings and connections in order to reduce fuel consumption and to prevent the leakage of water into the oil. Before completing the plans for each of these plants a visit was made to most of the larger and more

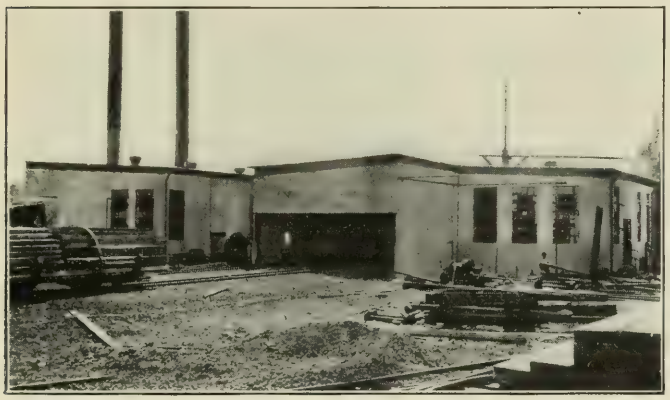


Plan of the Plant and Track Layout

modern installations in this country in order to secure the best ideas of each.

It was necessary to construct all the new buildings and install the equipment without interfering with the operation of the cylinder recovered intact from the fire. The new buildings are of fireproof construction, with steel frames and 6 in. concrete curtain walls 8 ft. high with 2½ in. stucco on metal lath above. Concrete floors are used throughout.

The retort house is 153 ft. long and 24 ft. wide. It opens directly into an engine room 45 ft. long and 25 ft. wide in which are located the pumps and operating equipment. In the retort room are two cylinders, one of which is 7 ft. in diameter and 133 ft. long and the other is 6 ft. in diameter and the same length. The larger cylinder is new throughout. The larger diameter was determined on as a desirable size for tie plant operation. If the amount of bridge timber to be treated decreases in the near future it is proposed to transfer this larger cylinder to a new tie plant, the construction of which is now under consideration. The 6 ft. cylinder is composed in part of material recovered from the old plant, 68 ft. of the shell being cut from a cylinder which was installed in this plant four years ago and was still in serviceable condition after the fire. A third cylinder which was recovered from the fire and quickly placed in operation is located outside the retort house, where



Cylinder House and Boiler Room

it will be operated for 3 or 4 years, or as long as it is serviceable.

Two 50,000 gal. measuring tanks were uninjured by the fire and were returned to service without alterations. The oil in these tanks is heated by live steam which passes through six ½ in. pipes enclosed in 2 in. pipes, the steam entering the coils through the smaller pipes and returning with the condensation to the feed water heater through the larger one. In this way it is possible to raise the oil to a high temperature in two hours. The oil passes from these tanks to the cylinders by gravity through a 10 in. pipe line and it is pumped back through the same line. The pressure pump operates through a 4 in. pipe line. Gage boards in the operating room indicate the amount of oil in the measuring tanks at any time.

In emptying the cylinders, the oil can either be pumped back directly into the measuring tanks or drained into an underground tank from which it can be pumped into the storage tanks by means of a 12 in. by 12 in. by 12 in. Worthington pump, set in a depressed pit in the engine room. In filling the cylinders, an electric contact rings a bell and turns on a light when the oil touches the top of the cylinder. The oil pressure pumps are equipped with regulating valves to maintain the pressure at 125 lb. In a similar way the steam header is equipped with a regulating valve to limit the steam pressure in the oil storage tanks or in the cylinders to 45 lb., preventing too high pressure in the heating pipes.

The vacuum is secured and maintained by means of two vacuum pumps recovered from the fire. The vacuum is drawn from the top, enabling all water accumulating during the steaming process to be drained out to a sap drum under the cylinder.

All valves are located under a false steel floor at one side of the engine room, adjacent to the cylinders. The valves are arranged to enable oil to be pumped to any tank



Cylinder House and Oil Storage Tanks

or cylinder in the plant. The high pressure valves are equipped with by-passes to permit the pressure to be released before these valves are opened. A complete drainage system has been built underground, carrying the water to an outlet at one end and the oil escaping from the ends of the cylinders to an underground storage tank at the other end.

All 10-in. oil pipes under floors are laid in 24-in. by 24-in. concrete tunnels to enable them to be withdrawn readily for alterations or repairs. As a protection against



The Yard and Derricks

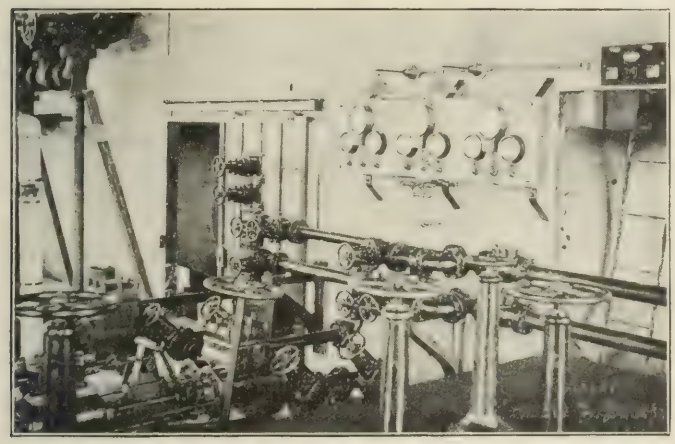
fires a 50,000-gal. water tank on a 50-ft. tower is provided, also a 12-in. by 8½-in. by 10-in. Laidlaw-Dunn-Gordon fire pump, both connected to 6-in. and 4-in. underground pipe lines about the yard. Electric lights are used throughout the plant and yard, current being provided from a small generator in the engine room.

A boiler house and a small shop are located in a separate building a short distance from the cylinder house. Two sets of boilers which were recovered from the old plant burn either wood or coal and are equipped with a Cookson feed water heater. Coal is delivered into a pit at the door of the boiler house from a track extending along-

side. The machine shop is equipped with an air compressor, a 14-in. lathe and a few other tools sufficient to handle the ordinary repair work around the plant.

One of the interesting features of this installation is a saw mill located at the water's edge. This mill was installed primarily to frame all bridge timber except braces, before treatment, but its activities have been extended to include the sawing direct from the logs of about 25 per cent of the dimension timbers required. A planing mill is operated in connection with it. The saw mill employs 25 men and has a capacity of about 15,000 ft. B. M. of timber daily. All waste slabs and refuse from this mill are carried to the boiler room by a continuous belt conveyor and are dumped opposite the fire doors where they are used as fuel.

Practically all material in this yard is handled mechanically. A stiff leg derrick on a fixed support loads the material from the saw mill onto trams for the cylinders. After treatment the material is transferred from the trams into cars by a guyed stationary American derrick at the other end of the yard. In addition a Brownhoist locomotive crane with a 50-ft. boom loads the piling directly from the water onto cars and performs such other work about the yard as may be necessary. All material is loaded for shipment as fast as it is treated, to the extent that cars are available and none is stored permanently at the treating plant.



Interior of the Operating Room

This plant has been built and is being operated under the direction of W. H. Courtenay, chief engineer of the Louisville & Nashville, with John B. Lindsay, superintendent of timber treating plants, and P. T. Vaughan, assistant superintendent, directly in charge. The buildings were erected by the Mecham Contracting Company, Hopkinsville, Ky., while the piping was installed by J. M. Foley, Birmingham, Ala. The Power and Mining Machinery Co., Cudahy, Wis., furnished the new 133-ft. cylinder and the new section of the 6-ft. cylinder, while the tram cars were manufactured by the Allis-Chalmers Mfg. Co. of Milwaukee, Wis.

FRENCH RAILWAYS.—There has been a satisfactory recovery in French railway traffic—that is, a satisfactory recovery in the earnings of the lines still in French hands. Two important companies—the Northern of France and the Eastern of France—are still practically, however, in German hands. Subject to this remark, it may be noted that the earnings of the French State lines, the Western of France, the Paris, Lyons & Mediterranean, the Paris & Orleans, and the Southern of France, amounted in August to $26,037,732, as compared with $23,397,353 in August, 1915, and $15,086,539 in August, 1914.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., December 6, 1916.

PRESIDENT WILSON URGES LAW TO PREVENT STRIKES

A recommendation that Congress pass a law to prohibit railroad strikes pending a full public investigation is made the outstanding feature of President Wilson's message to Congress delivered at a joint session of the Senate and House on Tuesday, December 5.

Referring to the six recommendations which the President made to Congress on August 29, he says that two have been complied with by the passage of the Adamson eight-hour law. The other recommendations are now renewed, with the exception of that for "explicit approval by the Congress of the consideration by the Interstate Commerce Commission of an increase of freight rates to meet such additional expenditures by the railroads as may have been rendered necessary by the adoption of the eight-hour day and which have not been offset by administrative readjustments and economies, should the facts disclosed justify the increase." This he does not deem it necessary to renew, saying that the power of the commission to increase rates on this ground "is indisputably clear." The renewed recommendations are as follows:

"Immediate provision for the enlargement and administrative reorganization of the Interstate Commerce Commission along the lines embodied in the bill recently passed by the House of Representatives and now awaiting action by the Senate; in order that the commission may be enabled to deal with the many and various duties now devolving upon it with a promptness and thoroughness which are, with its present constitution and means of action, practically impossible.

"An amendment of the existing federal statute which provides for the mediation, conciliation, and arbitration of such controversies as the present by adding to it a provision that, in case the methods of accommodation now provided for should fail, a full public investigation of the merits of every such dispute shall be instituted and completed before a strike or lockout may lawfully be attempted.

"The lodgment in the hands of the Executive of the power, in case of military necessity, to take control of such portions and such rolling stock of the railways of the country as may be required for military use and to operate them for military purposes, with authority to draft into the military service of the United States such train crews and administrative officials as circumstances require for their safe and efficient use."

"In the first place," the President says, "it seems to me imperatively necessary that the earliest possible consideration and action should be accorded the remaining measures of the program, of settlement and regulation which I had occasion to recommend to you at the close of your last session in view of the public dangers disclosed by the unaccommodated difficulties which then existed, and which still unhappily continue to exist, between the railroads of the country and their locomotive engineers, conductors and trainmen."

The address then repeats the six recommendations made in the previous message, and continues as follows:

"The second and third of these recommendations the Congress immediately acted on; it established the eight-hour day as the legal basis of work and wages in train service and it authorized the appointment of a commission to observe and report upon the practical results, deeming these the measures most immediately needed; but it postponed action upon the other suggestions until an opportunity should be offered for a more deliberate consideration of them. The fourth recommendation I do not deem it necessary to renew. The power of the Interstate Commerce Commission to grant an increase of rates on the ground referred to is indisputably clear and a recommendation by the Congress with regard to such a matter might seem to draw in question the scope of the commission's authority or its inclination to do justice when there is no reason to doubt either.

"The other suggestions,—the increase in the Interstate Commerce Commission's membership and in its facilities for performing the manifold duties, the provision for full public investigation and assessment of industrial disputes, and the grant to the Executive of the power to control and operate the railways when necessary in time of war or other like public necessity,—I now very earnestly renew.

"The necessity for such legislation is manifest and pressing. Those who have entrusted us with the responsibility and duty of serving and safeguarding them in such matters would find it hard, I believe, to excuse a failure to act upon these grave matters or any unnecessary postponement of action upon them.

"Not only does the Interstate Commerce Commission now find it practically impossible, with its present membership and organization, to perform its great functions promptly and thoroughly but it is not unlikely that it may presently be found advisable to add to its duties still others equally heavy and exacting. It must first be perfected as an administrative instrument.

"The country cannot and should not consent to remain any longer exposed to profound industrial disturbances for lack of additional means or arbitration and conciliation which the Congress can easily and promptly supply. And all will agree that there must be no doubt as to the power of the Executive to make immediate and uninterrupted use of the railroads for the concentration of the military forces of the nation wherever and whenever they are needed.

This is a program of regulation, prevention and administrative efficiency which argues its own case in the mere statement of it. With regard to one of its items, the increase in the efficiency of the Interstate Commerce Commission, the House of Representatives has already acted; its action needs only the concurrence of the Senate.

"I would hesitate to recommend, and I dare say the Congress would hesitate to act upon the suggestion should I make it, that any man in any occupation should be obliged by law to continue in an employment which he desired to leave. To pass a law which forbade or prevented the individual workman to leave his work before receiving the approval of society in doing so would be to adopt a new principle into our jurisprudence which I take it for granted we are not prepared to introduce. But the proposal that the operation of the railways of the country shall not be stopped or interrupted by the concerted action of organized bodies of men until a public investigation shall have been instituted which shall make the whole question at issue plain, for the judgment of the opinion of the nation is not to propose any such principle. It is based upon the very different principle that the concerted action of powerful bodies of men shall not be permitted to stop the industrial processes of the nation, at any rate before the nation shall have had an opportunity to acquaint itself with the merits of the case as between employee and employer, time to form its opinion upon an impartial statement of the merits, and opportunity to consider all practicable means of conciliation or arbitration. I can see nothing in that proposition but the justifiable safeguarding by society of the necessary processes of its very life. There is nothing arbitrary or unjust in it unless it be arbitrarily and unjustly done. It can and should be done with a full and scrupulous regard for the interests and liberties of all concerned as well as for the permanent interest of society itself."

These suggestions the President refers to as "things left undone at the last session which there will now be time to complete and which it seems necessary in the interest of the public to do at once," and it is understood to be the intention of Congress to make the proposed legislation one of its principal orders of business at this session. The President held a conference at the White House on Sunday afternoon with Speaker Clark and Representative Kitchin, majority leader of the House, at which they promised their co-operation to expedite the consideration of the President's proposals. The President is to confer with Senate leaders on the subject later in the week. It is believed that inasmuch as the Interstate Commerce Commission has, on several occasions, protested against the idea of its being expected to advance rates to enable the railroads to pay extravagant wages for which it felt no responsibility, the President may have felt it not only not necessary but inexpedient to renew his suggestion that the commission take wage increases into account. It is certain that his proposal for compulsory investigation of labor disputes before a strike may lawfully be called will arouse most strenuous opposition in labor circles, whereas the recommendation which he has decided to withdraw would undoubtedly arouse opposition among shippers and among the members of Congress who make a specialty of taking the side of the shippers on every possible occasion. The American Federation of Labor and the brotherhoods of train service employees are unalterably opposed to what they choose to call compulsory arbitration and their representatives in Congress are expected to do everything possible to prevent the President's recommendations from being carried out. Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers, issued a statement a few days ago saying that the railroad men are opposed to compulsory arbitration because it is unconstitutional. "You cannot compel a man to work if he does not wish to while his wage troubles are being arbitrated," he said. "In the first place, I do not believe such a law will be passed. In the second place, if it is passed I cannot see how it could be held constitutional."

President Gompers of the American Federation of Labor and a number of other labor leaders called on President Wilson on Monday afternoon at the White House, but it was reported that their purpose was to urge an investigation of the high cost of living.

What the prospects are for the passage of such a law seems to be a matter of considerable uncertainty. It is safe to say, however, that the legislative machinery will work much less smoothly than it did in grinding out the Adamson law. The House Committee on Interstate and Foreign Commerce is to meet on Friday to arrange its program for the session.

The Senate Committee on interstate commerce will also consider proposed railroad regulation on Friday. Bills in accordance with the President's recommendations are already before the committee and Chairman Adamson of the House Committee has prepared a bill to be introduced in the House.

Adamson Law to Supreme Court

The test case on which the constitutionality of the Adamson law is to be determined is now in the hands of the Supreme Court on a motion filed in the court on Monday by Solicitor General Davis of the department of justice that the appeal from Judge Hook's decision in the Missouri, Oklahoma & Gulf case be set for hearing upon a date as early as may suit the convenience of the court. The motion was concurred in by the counsel for the railroads who were in court, including Walker D. Hines, chairman of the railroads' committee of counsel, and Arthur Miller, counsel for the Missouri, Oklahoma & Gulf. The transcript of the record in the Kansas City court was filed with the Supreme Court last week and the motion was received on Monday in the usual formal way. It is expected that the date for the hearing of arguments will be announced by the court next Monday. John G. Johnson of Philadelphia and Walker D. Hines will present oral argument on behalf of the railroads.

A Warning to Railroads and Courts

The situation created by the Adamson law has inspired another of the examples of unconscious humor which occasionally find their way into the archives of Congress.

Representative Benjamin C. Hilliard, of Colorado, has introduced a joint resolution, which was referred to a committee and ordered to be printed on six pages of expensive white paper, directing that unless all suits relative to the Adamson law shall be wholly discontinued before December 20 the department of justice shall summarily take over the railroads of the United States, pay for them at their actual value and operate them, and that unless the suits are discontinued before the date mentioned Congress shall not entertain any kind of railroad legislation other than such as shall contemplate government ownership and operation of all transportation facilities. After the department of justice shall have taken over the railroads it shall at once fix an eight-hour day in all branches of railroad service, reduce passenger fares to two cents a mile and adjust freight rates "so that patrons in every part of the country shall enjoy the benefit which would follow the operation of all the railroads with the single purpose of public service." The department is authorized to employ help in the operation of the properties and to provide means and methods of payment for such service. It is not stated whether or not the department is expected to be able to do this from two-cent fares and the kind of freight rates which railroad patrons would enjoy.

The resolution also provides that if any court created by Congress shall fail to dismiss any such suit in the time reasonably required to convene the court and enter an order, all courts so created shall be abolished, but if the court which was created by the Constitution shall entertain any such suit Congress is to proceed with somewhat more deliberation. It is to "exercise its every constitutional power to secure early and favorable determination of any issue involved." Congress is also asked to solemnly covenant "that never again will it permit any public statute of the United States to be questioned, ignored or avoided."

Various reasons for this expenditure of good paper and ink are stated in a series of whereases, from which it appears that "in many instances, . . . evincing no care for their country or its welfare, wealthy and influential men . . . have appealed to courts of congressional creation to undo the acts of Congress." that "with customary effrontery and assumed superiority, the typical, old and well-known selfish interests of the country, in culmination of a slanderous campaign against the Congress and the President, happily of no avail, are once more appealing to the congressionally created courts to have made inoperative and void an act of Congress which, in the interest of all the people, the President recommended and the Congress passed," that "while those in control of such actions entertain no honest belief that the so-called Adamson or eight-hour law is unconstitutional, they nevertheless purpose to create so much confusion and uncertainty in relation thereto that in placation the Congress will legislate more power into channels through which the railroad companies may exact greater toll from the masses of the people," and that, "the country's forward steps toward the perfect in government have been woefully retarded by the arrogated power of the courts, invoked by men more widely known for their financial influence and power than by their devotion to justice."

Another whereas assumes to leave an impression that the resolution is "in keeping with the dignity, purpose and responsibilities of the Congress" and "that the occasion is timely for courageous and definite action."

DELIVERIES OF FREIGHT CARS ABROAD.—According to a despatch from Paris, manufacturers in the United States and Spain were criticised in the Chamber of Deputies for failing to deliver freight cars ordered by France. It was charged that out of 35,000 cars contracted for only 3,000 or 4,000 had been delivered, and that the terms of the agreements had not been carried out.

STEPS TO RELIEVE CAR SHORTAGE

The Interstate Commerce Commission on November 29, after conferences with representatives of the railroads and of the shippers, authorized a progressive increase in demurrage charges to become effective on not less than three days' notice and to expire by limitation on May 1, 1917. The commission's order authorizes the carriers to cancel at once all the increased demurrage tariffs which they had filed with the commission and which were suspended on November 15, and to file new tariffs, making no change in the present form of the weather rule or average agreement, providing for two days' free time, Sundays and holidays not to be counted, and the following demurrage charges per car after the expiration of free time: $1 for the first day, $2 for the second day, $3 for the third day and $5 for the fourth and each succeeding day. Track storage charges are to remain in effect as at present except where the demurrage rate is $3 per day or more.

The commission's order represents a compromise between the proposals submitted by the railways, as represented by the Conference Committee on Car Efficiency of the American Railway Association, and by the shippers, as represented by the demurrage committee of the National Industrial Traffic League, in conference with Commissioner McChord and Examiner-Attorney F. B. Dow on November 27. The railroad committee had expressed a view that the charges named in the suspended tariffs (two dollars a day for the first day, etc.) were necessary to correct the immediate situation; but for the purpose of a compromise proposed the rule which the commission later accepted, with the exception that it asked that these rates be embodied in a permanent tariff. The National Industrial Traffic League committee had proposed a rate of $1 for the first two days after the expiration of the free time and $2 for the next two days and $5 for each succeeding day, and that the present track storage charge remain except where the demurrage rate is $5. The league committee also insisted that the new rates should expire on May 1 and that there be a concurrent increase in the per diem rate for cars interchanged. After the railroad committee had been advised by Commissioner McChord that the commission was holding the demurrage question under advisement pending advice as to what the carriers proposed to do about the per diem rates, the committee adopted a resolution recommending to the executive committee of the American Railway Association that the per diem rate be increased from December 1, from 45 cents to 75 cents.

The Conference Committee on Car Efficiency of the American Railway Association, created by the Car Service Commission to co-operate with Commissioner McChord in dealing with the freight car situation, has established headquarters in Washington in the Kellogg Building and has been holding almost daily conferences with representatives of the shippers and of individual railways to discuss methods for dealing with the situation. The commission has been represented at these conferences either by Commissioner McChord or by Examiner-Attorney Dow. The general secretary of the American Railway Association has issued a circular to members stating that this committee is authorized to take whatever action may be deemed advisable in connection with the matter of car interchange, etc., and requesting members of the association promptly, earnestly and sincerely to enforce its recommendations. The committee held its first meeting at Washington on November 22 with the Car Service Commission. Commissioner McChord was notified of the presence and organization of the committee and requested to designate a representative to attend its meetings.

At the first meeting of Commissioner McChord with the committee it was arranged that the commission should request the attendance of the demurrage committee of the National Industrial Traffic League for a conference on the

demurrage question, with the understanding that if an agreement could be reached the commission would authorize putting new demurrage tariffs into effect on less than statutory notice.

At the first meeting of the conference committee the chairman was authorized to employ inspectors on all railroads having an excess of coal cars. The committee also sent to the railroads a form of blank for information to be furnished weekly regarding car balances. A circular was addressed to the railroads requesting that all foreign open top cars be at once returned to their owners either loaded or empty. Another circular requested all roads to take immediate steps to facilitate the prompt return of fruit refrigerator cars and heater cars to home territory. On November 25, the roads were asked to supply data regarding the number of cars of company material on hand, and also complete information regarding all embargoes in effect, embargoes cancelled or modified, and new embargoes laid.

At a meeting on November 28, the committee issued a notice cancelling the penalty for car diversion until January 1. It was also announced that, at the request of the conference committee, the executive officers of roads in the Northwest had agreed to put into the coal car service about 16,500 ore cars to be used on the Chicago & North Western, the Minneapolis, St. Paul & Sault Ste Marie and their immediate connections, for the purpose of releasing a large number of regular coal cars which were being used for general commercial shipments. Instructions were also issued to all roads which had on their lines more box cars than they owned, regardless of their local requirements, to move such excess of cars immediately, whether loaded or empty, toward roads which had less than their ownership of cars. These instructions provide that cars should be routed homeward to the greatest extent consistent with the quick accomplishment of the desired result. The circular also stated that roads which had on their lines less box cars than they owned were expected to assist in relieving the situation by giving full information to connecting lines in the direction in which the burden of traffic has been moving.

On December 1 instructions were issued to all railroads to turn over to their southern and western connections a percentage of box cars, loaded or empty, in excess of the number received from those lines. Railroads in New England which have on their lines more box cars than they themselves own were directed to turn over to their southern and western connections 30 per cent more box cars than they receive from such lines. Railroads in Trunk Line and Central Freight Association territory were instructed to turn over 20 per cent more box cars than they receive, and the southern and western lines were directed to deliver 10 per cent more box cars than they receive.

Western railroads were also instructed to use every effort to discourage sending to Atlantic seaboard and New England freight, which apparently cannot be unloaded and disposed of upon its arrival. Eastern roads have been asked to refuse to accept from other lines or from shippers on their own lines freight which cannot be unloaded upon arrival at destination. All railroads have been requested to forward promptly to the committee a report showing the number of box cars received from and the number delivered to other roads, divided as between northern, southern, eastern and western connections. This report is to be forwarded weekly. A statement as of November 1, showing the railroads having more or less cars than they own has been sent to all lines for their information.

Representatives of various roads have been requested to appear before the committee to discuss the situation on their lines. On November 29, representatives of the Philadelphia & Reading, the Delaware & Hudson, the New York Central and the Wheeling & Lake Erie conferred with the committee. On December 4, a similar conference was held with representatives of the Grand Rapids & Indiana, the Michigan Central, the Vandalia, the Baltimore & Ohio and the Pere Marquette; and on December 5, a similar conference was held with representatives of the Wabash, the International & Great Northern and the Texas & Pacific.

Later developments will be found in the News Section.

PROPOSED LEGISLATION AFFECTING RAILROADS

The following is a summary of bills and resolutions affecting railroads introduced in Congress at its opening session on December 4. There were also a number of bills introduced to regulate the distribution of food supplies, which would indirectly affect transportation.

H. J. Res. 305. Mr. Hilliard, authorizing the government ownership of all interstate railroads under certain conditions. Committee on Interstate and Foreign Commerce.

Unless all suits or actions relative to the Adamson eight-hour law shall be wholly discontinued and dismissed on or before the twentieth day of December, 1916, the Department of Justice, in the name of the government, is authorized to seize, take, and hold all interstate railroads, tracks, roadbeds, rights of way, rolling stock, etc., of said railroads to be owned and operated by the government forever.

Congress shall abolish all courts created by it that permit motions that cause delay or question authority of this act.

H. J. Res. 307. Mr. Emerson. Embargo on wheat, etc. Committee on Agriculture.

1. To place an embargo on wheat.

2. As to advisability of enacting legislation to make possible transportation of food products under government regulation, at low cost, from sections of United States where food is plentiful to sections where it is scarce.

H. R. 17815. Mr. Fitzgerald. To fix the rates of postage on farm products and manufactured foodstuffs. To Committee on Post Offices and Post Roads.

All farm products, articles of food, and manufactured foodstuffs now mailable and embraced within the classification of fourth-class mail matter not exceeding 150 pounds in weight shall, subject to existing restrictions, be subject to rates of postage of 3 cents for the first pound or fraction thereof and 1 cent for each additional pound or fraction of a pound.

H. R. 17819. Mr. Fitzgerald. To regulate the transportation in interstate commerce of cold-storage food. To Committee on Interstate and Foreign Commerce.

Cold storage products not to be transported in interstate commerce unless same shall be branded or stamped in conspicuous place on package, with the day, month and year when such products were placed in cold storage.

Shall be unlawful to transport in interstate commerce any kind of food, or article used as food, which has been in cold storage, or refrigeration for more than 10 calendar months, except butter, which shall not be transported if it has been in cold storage for more than 12 calendar months.

H. R. 17823. Mr. McKellar. To regulate shipment of cold storage products. To Committee on Interstate and Foreign Commerce.

H. R. 17849. Mr. McLemore. To prevent the transportation in interstate commerce of any food products, except meats and fruits, that have been kept in cold storage for a period of more than 90 days. To Committee on Interstate and Foreign Commerce.

H. R. 17850. Mr. Howard. To prohibit commerce in intoximating liquors between the states. To Committee on the Judiciary.

H. R. 17854. Mr. Oliver. Authorizing Interstate Commerce Commission to prescribe rules for the exchange, and moving of cars on railroads engaged in interstate business. Committee on Interstate and Foreign Commerce.

Annual Report of Interstate Commerce Commission

Commission Asks Absolute Authority Over Railway Rates for the Future and Other Extensions of Its Powers

IMPORTANT changes in the act to regulate commerce are recommended by the Interstate Commerce Commission in its annual report to Congress for the period from November 1, 1915, to October 31, 1916. The recommendations are summarized in the report as follows:

That by statute the Congress fix the interstate rates, fares, charges, classifications, rules, and regulations existing at a specific date, prior to that of enactment, as just and reasonable for the past, and provide that no change therein after that specified date may be made except upon order of the commission; with provision that such statute shall not affect proceedings pending at the time of enactment.

That, unless this recommendation be followed, section 15 of the act to regulate commerce be so amended as to provide one period, limited to one year, for suspension of a schedule stating a new rate, fare, charge, classification, regulation, or practice; and, if so amended, that section 6 be amended so as to provide for 60 days' notice of proposed increased charges.

That appropriate provision be made for punishment of any attempt, by intimidation, threats, inducements, or otherwise, to influence the testimony of any witness before the commission or to deter him from testifying; as also for punishment of misbehavior, disorderly conduct, or contumacy, in or about any proceeding before the commission.

That the commission be given definite and specific authority to prescribe for all carriers by rail subject to the act rules and regulations governing interchange of cars, return of cars to the owning road, the conditions and circumstances under which such cars may be loaded on foreign roads, and the compensation which carriers shall pay to each other for the use of each other's cars. The carriers should be required to publish, post, and file with the commission, under the provisions of section 6 of the act, such rules and regulations prescribed by the commission, and should be held to an observance of those rules and regulations just as they are held to an observance of their lawfully published, posted and filed rates.

That, if jurisdiction to award reparation remains with the commission, in lieu of the uniform three-year period recommended in the last annual report for the beginning of all actions relating to transportation charges subject to the act, the Congress fix a limit of three years within which a carrier subject to the act to regulate commerce may bring action for recovery of any part of its charges, and amend section 16 of the act so as to provide that if the carrier begins such action after expiration of the two-year limit now prescribed in that section, or within 90 days after such expiration, complaint against the carrier for recovery of damages may be filed with the commission within 90 days after such action shall have been begun by the carrier, and not after.

That, without abdication of any federal authority to finally control questions affecting interstate and foreign commerce, the commission be authorized to co-operate with state commissions in efforts to reconcile upon a single record the conflicts between the state and the interstate rates.

The commission's reasons for these recommendations are discussed under the various headings in the report. The commission also renews several recommendations stated in its previous reports, suggests that consideration be given to the advisability of a federal statute to prohibit trespassing and suggests to Congress the question whether authority should be conferred on the commission to permit a continuance of railroad ownership and control of water lines under circumstances which it believes require it under the present law to withhold its permission. It is also stated that there are other questions which the commission will probably desire to discuss before the Joint Committee on Interstate Commerce and still others which it may desire to bring to the attention of the appropriate committees of Congress.

The following is a very much condensed abstract of some of the principal parts of the report. A total of 854 formal complaints was filed during the year, a decrease of 110 as compared with the previous year. During the same period 671 cases have been decided and 135 have been dismissed, making a total of 806 cases disposed of as against 1,107 in the preceding year. The commission has conducted 1,485 hearings and taken approximately 154,488 pages of testimony as compared with 1,543 hearings and 200,438 pages during the preceding year. There were 223 proceedings instituted under the investigation and suspension docket, an increase of 24, and 206 such proceedings have been disposed of, a decrease of 4. The commission declined to exercise the authority to suspend in 312 cases, a decrease of 56 as compared with the previous year. Forty-four conferences consuming from one to eight days each have been held at the request of interested parties for the purpose of laying before the commission their reasons for and against suspension of protested schedules. The division of correspondence and claims has received and answered approximately 50,000 general inquiries. During the year 4,939 informal complaints were received, a decrease of 1,561, as compared with the previous year, due in part to the adoption of a somewhat different method of handling informal complaints. A total of 6,040 special docket applications were filed by carriers, a decrease of 650, and orders were entered in 5,370 cases, a decrease of 372. Reparation has been awarded amounting to $432,493. There were 1,833 cases disposed of without an order.

Fourth Section

The matter of greatest interest and importance coming under the fourth section of the act, the commission says, has been the question of the proper adjustment of transcontinental rates, which is discussed at length. The situation has so radically changed by reason of the virtual cessation of compelling water competition via the Panama Canal as to put in issue rate relationships fully justified when established but now alleged to be unduly preferential to coast cities and unduly prejudicial to interior points. It is the commission's design to attain, if possible, a permanent basis for the adjustment of this perplexing problem, which has been so provocative of complaint, and reach such a solution, without any discouragement to the just relative utilization by all the people of established transcontinental avenues of transportation by rail as well as by canal. In addition to the 5,030 original applications, 5,855 special applications have since been filed requesting fourth section relief in order that carriers might make changes in rates to meet changed commercial and transportation conditions.

Rate Schedules

There were 106,442 tariff publications filed during the year. This is less by several thousand than the numbers filed during recent years. The policy of consolidating numerous schedules of individual roads into joint tariffs

effects economies, reduces the number of publications and simplifies the task of ascertaining a rate. More than 100,000 such documents as division sheets, car reports and embargo notices have been filed.

Classification of Freight

The Western Classification Committee has continued the plan of reorganization noted in last year's report. The Official Classification Committee has been reorganized under a different plan. There is reason to expect that the Southern Classification Committee will in the near future be reorganized along lines similar to those adopted in the western and official territories.

Check of the current classifications shows that in the western 76 per cent represents recommendations of the Committe on Uniform Classification, and that 89 per cent of the recommendations submitted by the uniform committee have been accepted; that in the official 70 per cent represents recommendations of the uniform committee, which it is expected will be increased to 75 per cent in an early issue; and that in the southern 84 per cent represents recommendations of the uniform committee, and that 86 per cent of the uniform committee's recommendations have been adopted

The current issue of the western classification effected 170 increases, 365 reductions, 266 additions, and 351 changes which did not effect either increases or reductions; that of the official effected 237 reductions and 403 increases; that of the southern effected 191 increases, 156 reductions, 204 additions, and 497 changes which did not effect increases or reductions.

The western classification has been adopted to govern intrastate traffic by nearly all of the western states, the exceptions being Illinois, Nebraska, Iowa and Texas. The official classification is applicable on intrastate traffic in all of the states in official classification territory, excepting Illinois and Virginia, which lie, respectively, on the borders between official and western and between official and southern classification territories. The southern classification has, with minor exceptions, been adopted for intrastate traffic by the states of North Carolina, South Carolina, Tennessee and Louisiana east of the Mississippi River. The Railroad Commission of Georgia is considering the question of adopting it in that state. The southern classification, which became effective April 20, 1914, was adopted and is still in force in Alabama.

The commission remarks that the progress made in the direction of uniform classification has been rather disappointingly slow. The work, however, has been done in a thorough manner, and it is urged in some quarters that the further consideration of the uniform committee's recommendations by the several classification committees and by the individual carriers parties thereto has been a refining process which will contribute to permanency. It not infrequently happens that in such consideration of the recommendations of the uniform committee questions are raised which necessitate further exhaustive investigation and which finally result in a modification of the proposed uniform regulation. No effort has been made to establish uniformity in ratings in the several classifications.

Division of Inquiry

Fifty-four indictments were returned for violations of the act to regulate commerce and the acts supplementary thereto. Twenty-two were against carriers or carriers' agents and 32 against shippers, passengers, or interested parties other than carriers. During the year 53 cases were concluded. Pleas of guilty were offered by 23 defendants and pleas of *nolo contendere* by 4 defendants; in 11 cases verdicts of guilty were rendered; in 7 cases verdicts of not guilty were rendered. In 4 cases demurrers to the indictment were sustained; and in 4 cases demurrers were overruled. Three indictments were dismissed upon motion of the government, but in each instance pleas of guilty were offered to other indictments returned in the same case. Experience has shown that the indictment of a corporation does not have the same preventive influence as the indictment of responsible individuals, the commission says. Where personal responsibility is clear, it seems not only fairer to the corporate shareholders interested but more effective in the administration of the act to secure personal indictment. During the year 23 individuals were indicted. In the cases concluded 10 individuals pleaded guilty, of whom 9 were fined and 1 sentenced to 12 months' imprisonment; 1 individual was convicted by a jury; 3 were found not guilty; and the indictments against 6 were dismissed.

Division of Law

On March 1, 1914, 25 cases involving orders or requirements of the commission were pending in the courts, all but 1 of which have been concluded. That case has since been decided by the Supreme Court of the United States, remanded, decided anew by a district court, and again appealed to the Supreme Court, where it is now pending argument and submission. Since that date 50 cases involving orders or requirements of the commission have been instituted in the courts, of which 19 have been concluded. Of the remaining 31 cases, 4 have been argued, submitted, and taken under advisement by the Supreme Court and 7 are pending argument and submission to that court. There are pending in district courts 17 cases, of which 1 is held under advisement on a motion to dismiss, 1 is pending dismissal or reargument after decision by the commission on rehearing, and 15 are pending hearing or final hearing and submission. Three cases, decided by the Supreme Court of the District of Columbia in favor of the commission, are to be appealed.

During the period covered by this report 14 cases involving orders or requirements of the commission have been instituted in the courts. Of these 3 were brought to compel railroad officials to answer certain questions relative to expenditures by carriers for political and other purposes; another to enjoin the issuance by a carrier to non-excepted persons of passes stipulated for in deeds to rights of way; while still another was an action at law to recover the penalty provided by section 6 of the act for failure of a carrier to comply with an order requiring the filing of indexes to freight and passenger tariffs. The purpose of the other 9 cases was the annulment of certain orders.

Seven cases to which the commission was a party have been decided by United States district courts, and 3 by the Supreme Court of the District of Columbia. Of these 10 cases, 7 were decided in favor of the commission. The remaining 3 cases, in which the decisions were adverse to the commission, have been appealed, argued and submitted to the Supreme Court of the United States, and are now pending decision. Motions for interlocutory injunctions against orders of the commission were denied by district courts in 2 cases, and 5 cases were dismissed in district courts on motion of petitioners or by stipulation at their instance. In the Supreme Court 2 cases were dismissed by the United States.

Division of Carriers' Accounts

Much valuable information not expedient to require in annual reports has been gathered by the division and much good has been accomplished in the past few years by sending out circulars to carriers requiring from them special reports touching particular features of their accounts. Varying practices are thus disclosed, and steps are taken to have erroneous methods corrected, thus subserving the principle of uniform accounting. As illustrative of this class of work are mentioned two circulars sent out at different

times requiring the steam roads to report their current methods relating to the depreciation of equipment.

The great majority of erroneous practices disclosed by the examinations conducted by the division are said to be not the result of willful intent and it has usually been possible to effect adjustments without resorting to extreme measures. In fact, it may be said that most accounting officers of carriers are now in full accord with the accounting regulations and are inclined to welcome examinations as assisting them in keeping their accounts properly.

Division of Statistics

The general character of the work of this division has been stated in previous reports. The volume of its work, like that of other divisions of the commission, is constantly increasing.

Under date of October 2, 1916, orders were entered requiring common carriers by steam railway whose revenues exceed $1,000,000 per annum to render semi-monthly reports of freight car requirements and supply, beginning as of October 15, 1916, and quarterly reports of condition of freight cars, beginning as of January 1, 1917. Besides such work, the division has made various studies of the statistical aspects of particular cases coming before the commission for determination and its work of this character is continually increasing. One line of study in this connection that has received attention is that regarding the comparative density of traffic and the cost of operation in various geo graphical regions and the relation which these matters bear to the level of freight rates. The subject of freight traffic statistics is also receiving further attention.

Division of Safety

The work of the division of safety during the past year has been substantially similar to its work in previous years. A detailed report of this work is published separately.

During the fiscal year 267 cases, involving an aggregate of 703 violations of the safety appliance laws were transmitted to the several United States district attorneys for prosecution. Cases comprising 86 counts were tried, of which 54 counts were decided in favor of and 5 counts against the government; 27 counts are still pending decision, and confession of judgment was had as to 473 counts. Cases involving 47 counts which were pending decision at the beginning of the last fiscal year have been decided, 35 in favor of and 12 against the government, which 12 counts were argued in the circuit court of appeals and decision rendered in favor of the government. The decision of the circuit court of appeals in *Spokane & Inland Empire R. R. Co. Case,* involving 15 counts, and taken to the Supreme Court on writ of error, was affirmed in a decision rendered in favor of the government.

Attention is called to the fact that there was a marked increase in the number of violations of the safety appliance acts reported for prosecution as compared with the preceding year. This condition is said to indicate the necessity for a more rigid inspection on the part of the carriers at terminal and repair points, as well as the maintenance of an adequate force at such places properly to keep equipment in a safe condition.

During the past fiscal year there were transmitted to the several United States district attorneys for prosecution 159 cases, involving 1,129 counts, of violations of the hours of service act. Cases involving 628 counts were confessed and 390 counts were brought to trial, resulting in verdicts in favor of the government as to 224 counts and against it as to 112 counts, while the remaining 54 counts are still undecided.

During the fiscal year 55 collisions and 30 derailments, a total of 85 train accidents, were investigated. These resulted in the death of 209 persons and the injury of 1,441 persons. Collisions caused the death of 153 persons and the injury of 1,121 persons; derailments caused 56 deaths and 320 injuries. Twenty-six of the collisions occurred on lines operated by the block system, 11 in automatic block signal territory, and 15 in manual block signal territory; 29 of the collisions occurred where no block system was in effect, 22 on lines operated by the train order system, and 7 in yard and similar locations. It is stated that the investigation of collisions in automatic signal territory has demonstrated the need of a revision of the rules and a change in the practices pertaining to the observance of caution signal indications. It is declared to be extremely desirable from the standpoint of safety that the caution indication of a distant signal should require an engineman to reduce speed at once and approach the next signal with caution prepared to stop. The suggestion in previous reports as to the necessity for some form of automatic train control device is referred to and it is stated that it is encouraging to note that railroad managements are apparently giving serious consideration to the necessity for developing devices of this character. The report says there is need of legislation requiring the standardization of operating rules. Experimental tests have been conducted during the past year of three automatic train control devices and one air-brake system.

Locomotive Boiler Inspection.

The work of this division has been materially changed by the act making the provisions of the boiler inspection law apply to and include the entire locomotive and tender and all their parts, which has presented additional problems for consideration. In connection with a review of the work of the division a summary of the tabulated data contained in the report of the chief inspector for the fiscal year, which is published separately, and which includes inspections of all parts of locomotives or tenders and accidents resulting from failure thereof since the amendment became effective, is given as follows:

Number of locomotives inspected	52,650
Number found defective	24,685
Percentage found defective	47
Number ordered out of service for repairs	1,943
Number of accidents	537
Number killed	38
Number injured	599

It is stated that a large majority of the carriers are diligent in their efforts to comply with the law and are sincerely co-operating with the division with that end in view, and in such cases the beneficial results are particularly noticeable. A few carriers have attempted to place the burden of inspecting their locomotives on the government by continuing to use defective equipment until it was found and ordered out of service by federal inspectors.

Division of Valuation

It was stated in the last annual report that the engineering forces of the commission engaged in valuation work had been expanded as far as was thought advisable and that those forces if maintained as then existing should cover from 45,000 to 50,000 miles of road per annum. For the last year field engineering forces have been maintained at that point and from October 1, 1915, to September 30, 1916, covered 50,840.38 miles of road. There are in the United States about 1½ miles of tracks of all kinds for each mile of road. The track mileage covered during this year was 77,348.51, thus indicating that the properties under survey were of at least average difficulty. If the same rate of progress should be maintained in the field for the future as during the past year, the road and track surveys should be completed by January 1, 1920. There will still be a certain amount of field work to be done in connection with mechanical and structural work, but this probably will not require much time nor a considerable force.

The computing forces have during the same year

assembled, ready for pricing, about the same number of miles. Taking the country as a whole, there is probably a lag of six months between the field and the office work.

The commission's forces have inventoried and computed for pricing approximately 50,000 miles of road during the last year, and at this rate of progress the field work should be completed in slightly over three years and the office work in from six months to a year afterwards. The application of prices and the writing out of the final assembly sheets is a comparatively short and inexpensive task when the prices have been determined. The ascertainment of the prices themselves has proved to be a more extensive work than was anticipated.

There are many fundamental questions common to the valuation of all railroad properties which will be raised by objection to the tentative valuations and which must be decided before the commission can make up and transmit to Congress a final valuation. Since the act gives to all interested parties the right to be heard, it has not felt justified in reaching or announcing a conclusion upon these matters in advance of hearings upon these tentative reports.

Certain tentative valuations have been served and the questions raised by the protests to them will be heard and decided in due course. Since many of these questions are common to all properties, their decision in these first cases may be controlling in other cases.

As soon as these fundamental questions have been passed upon, the commission says, there is no reason why tentative valuations can not be completed and served at substantially the same rate that the field work proceeds. The rapidity with which valuations can be made final and reported to Congress must depend upon the number and character of the objections which are made to the tentative valuations.

The Panama Canal Act

On this subject the commission says in part:

The amendments to the act to regulate commerce which were effected by the passage of the Panama canal act prohibit a railroad company or other common carrier subject to the act from owning, leasing, operating, controlling, or having any interest, directly or indirectly, in any common carrier by water or any vessel carrying freight or passengers with which said railroad or other carrier does or may compete for traffic. It is provided that if the commission shall be of opinion that such service by water, other than through the Panama canal, is operated in the interest of the public and is of advantage to the convenience and commerce of the people, and that a continuance thereof will neither exclude, prevent, nor reduce competition on the route by water, it may by order extend the time during which such service by water may continue to be operated.

In interpreting these provisions the commission has held that the competition or possibility of competition referred to is not a vague, indefinite, or remotely possible competition, but something real and substantial. We have felt that where the competition or possible competition was remote, improbable, or negligible, and where the service was being operated in the interest of the public, and was of advantage to the convenience and commerce of the people, and a continuance thereof would neither exclude, prevent, nor reduce competition on the route by water, we should permit such continuance. But where the competition is real and substantial and it is not clearly shown that a continuance of the service will neither exclude, prevent, nor reduce competition on the route by water we have no power to abate the prohibition against such continued common ownership, control, or operation.

Cases of this kind have come forward and are now pending in which the competition is real, substantial, and not denied, but in which there is abundant testimony on behalf of shippers and shipping interests generally in the territory served, frequently not contradicted in any degree, to the effect that the service is in the interest of the public and of advantage to the convenience and commerce of the people, and that a discontinuance thereof would be substantially injurious to them and to their localities instead of working any public benefit.

We think that these facts should be brought to the attention of the Congress, so that in the light of those facts it may determine whether or not authority shall be conferred upon the commission to permit, in such cases and under such circumstances, a continuance of the railroad ownership, control, or operation of the water lines, subject to such further and different orders as the commission may subsequently enter upon a further hearing and a showing of substantially changed circumstances and conditions.

Suspension of Schedules

Under this head the report says in part:

We call attention to the advisability of changing the periods for which the commission can suspend the operation of a proposed new schedule, suggesting that in lieu of the two periods now provided, the first being too short within which to dispose of any important case, thus necessitating in most cases the preparation and service of supplemental suspension orders, there be provided one period of one year.

If the above-mentioned change is made it should, we think, be supplemented by a provision requiring the carriers to give not less than 60 days' notice of increased rates or charges. Under such a notice those who are affected by the charges would have more opportunity to ascertain accurately the effect of the proposed new schedule and to determine whether or not they ought to protest it; they would have more opportunity within which to properly prepare their protests and the reasons therefor; the carriers would have more time within which to present their reasons in support of the proposed schedules; and the commission would have more time within which to determine whether or not it would suspend the schedules. It not infrequently happens now that schedules are suspended on the strength of protests filed a short time before the schedule is to become effective, and later protestant learns that he was not fully informed or advised and withdraws his protest. It has been our practice, in important cases and where the time before the effective date of the schedule permitted, to hear the parties informally on the question of whether or not the schedules should be suspended, but in the great majority of cases there is not time for such proceeding.

Intimidation of Witnesses

There is no provision of existing law making it an offense for a person to intimidate or threaten a witness who is about to give testimony before the commission. Recent occurrences suggest that section 12 of the act should be so amended as to make punishable any efforts, by intimidation, threats, or inducements of any kind, to influence the testimony of any witness or to prevent any person from testifying before the commission. Although the commission is exercising a function that is quasi-judicial, it has no means or power for enforcing order or securing the punishment of persons who may interfere with the orderly conduct of its proceedings.

Trespassing

The commission desires to call the attention of Congress to the matter of trespass. Figures compiled from the monthly reports of accidents resulting from the operation of steam railways in the United States are shown in a table in the report from which it appears that 5,006 trespassers were killed during the year ended June 30, 1916. This number is more than 56 per cent of the total number of persons killed in railway accidents of all classes resulting from the opera-

tion of trains, locomotives, and cars during the year, and it represents a loss of life for which laxity in the enforcement of the law seems to be largely responsible. Of the trespassers killed only 23 per cent were on trains. Of the 77 per cent not on trains a large proportion were trespassing on the right of way, 989 being struck or run over by locomotives or cars at stations or in yards, 88 at highway grade crossings, and 2,581 at other places along the tracks. The commission's investigations of accidents disclose instances in which it is morally certain that serious accidents to trains have been caused by malicious acts of trespassers. While 13 states have legislated upon the subject of trespassing, it appears to be difficult to secure the enforcement of such laws, and carriers thus fail to obtain the protection in this regard which the public welfare demands. The commission believes that the matter is of sufficient importance to warrant a consideration of the advisability of enacting a Federal statute prohibiting, under appropriate penalty, trespassers on the trains of interstate carriers, and on the tracks of such carriers at places where there are two or more tracks, or within the limits of incorporated towns, or at places where the carrier by appropriate sign or warning gives notice that trespassing on its tracks is prohibited. Any such statute should, however, provide that nothing therein is intended to make lawful any trespass which would be unlawful under state laws. It might be that Congress could confer concurrent jurisdiction upon Federal and state courts for the enforcement of any statute which might be enacted upon this subject.

Car Shortage

The report includes a long discussion on the subject of car shortage, as to which the commission says, in part:

Whenever business generally is good and times are prosperous there is widespread difficulty and complaint due to inability to secure satisfactory transportation services from the railroads. This difficulty recurs during the fall and winter months practically every year with regard to transportation of coal, and usually in connection with the movement of grain when the crops are good. These situations are generally spoken of as "car shortage" periods. This expression by no means indicates the whole trouble. While it is true that the shippers can not get the cars they would like to have for loading, it is equally true in many instances, if not generally, that if the number of cars available for loading were doubled or trebled the situation would thereby be made worse, due to the fact that the additional number of cars loaded could not be promptly transported, and to inadequacy and congestion of terminals, which congestion, in turn, is due in part to failure of consignees to promptly receive and remove their freight.

The original custom of transferring freight from car to car at junction points of railroads was long ago abandoned in the interests of economy and good service. Rules were adopted by the carriers which had for their purpose insuring prompt return of cars to the owning road. Fines were provided as penalties for misuse of another carrier's equipment or for loading it except in the direction of home.

When business is comparatively light and there is an abundance or surplus of equipment and the transportation facilities and terminals of the carriers are not overtaxed, these rules are quite generally observed, but when business is heavy and shippers are clamoring for cars they seem to be entirely ignored, and, so far as we are advised, no effort is or has been made to assess the penalties provided in the rules for misuse of equipment. As a result, the railroad that originates a large volume of outbound tonnage, such as grain or coal, finds its cars going rapidly off its line and it and its shippers faced with a "car shortage," which continues to the inconvenience and substantial loss of that railroad and the shippers served by it until the season comes to a close or the period of "car shortage" has passed. It is undoubtedly true that under these practices the railroad that has liberally provided itself with cars, tracks, and motive power with which to serve the shippers on its line is unable properly to serve those shippers or to get the benefit of its investment in equipment and the use of its facilities, while another railroad, that has neglected to reasonably provide itself with equipment, is using the cars of the roads that have so provided themselves and that are suffering through the absence and misuse of their cars.

Cars move regardless of ownership far beyond the lines of the owning carrier and its immediate connections. A car goes out into the sea of movement of traffic under conditions analogous to those under which a bank note goes over the counter of the bank into the hands of the public. It seems obvious, therefore, that rules regarding the use and return of carriers' cars and the compensation to be paid by one carrier for the use of another carrier's cars must be uniform for the entire country. It is quite probable that it would be reasonable, desirable, and proper to make those rules more drastic and the compensation higher during periods of so-called "car shortage" than during other periods when there is an abundance of equipment and transportation facilities.

Section 1 of the act requires the carriers to furnish transportation as defined in that section "upon reasonable request therefor," and defines the term "transportation" as including among other facilities, cars. Manifestly if the carriers were to equip themselves with cars, motive power, tracks, and terminals so as to meet at any moment the maximum demand for transportation, a substantial part of those facilities would be idle during a part of each year and sometimes during all of consecutive years. Interest on the investment and depreciation of the facilities would, however, go on. It would be an extremely difficult thing to determine exactly when a carrier had reasonably provided itself with facilities, and the undertaking would be much more difficult under existing conditions where the carrier that has signally failed in this regard is able to keep itself on a substantial parity with other carriers by using their equipment under a per diem charge which is moderate, if not nominal, during the period of "car shortage," and by disregarding entirely the rules adopted by the carriers relative to the use and return of such cars. The Supreme Court of the United States seems to have recognized the fact that it would be unreasonable to undertake to require a carrier to provide facilities which would meet every condition that might arise; and it was held that a railroad's car supply may be legally sufficient and yet not sufficient to meet the demands of shippers in unforeseen contingencies, fluctuations in the demand for transportation, or unavoidable absence of equipment off the line.

This situation had grown so bad and become so acute in the early spring of 1916 as to lead the commission to suggest to the executives of the eastern railroads some united and co-operative effort to improve it. The cars of the western railroads had been loaded with eastbound traffic and sent through to such an extent that their supply was alarmingly diminished.

A road that has fairly well provided itself with cars, and that is the originator of the greater portion of the tonnage which it moves, presumably would favor an increased per diem charge for the use of one carrier's cars by another, but the road that is a delivering carrier of a much larger volume of traffic than it originates presumably would take the opposite view. The carrier that is disposed to depend upon its ability to confiscate to its own uses the cars provided by other carriers naturally desires to do so at the lowest possible cost to itself. It is therefore difficult to get any new agreement between all of the carriers with their varying individual interests. Experience seems to show that every carrier shrinks from seeking the penalties provided in the rules

voluntarily agreed to by the carriers among themselves for misuse or improper diversion of its cars. It naturally fears retaliation, which might take the form of diverting substantial quantities of traffic, and as to which it would have no adequate recourse.

It seems to us beyond question that largely increased railroad facilities are necessary to adequately handle the commerce of the country, and that in some way those facilities must be provided. It seems, also, that it would be sound public policy to exhaust all reasonable efforts to secure the highest possible degree of efficiency from the facilities already possessed. Obviously this can not be done by leaving these matters for determination by unanimous vote of all the carriers in the country. Within certain limits the force of competition between carriers can not be denied. The carrier that desires to participate in the movement of traffic must carry it as cheaply as its competitor. It must accord as liberal rules and regulations as are accorded by its competitor, and these competitive influences make unanimity of opinion as to what are proper rules and regulations more difficult of attainment than it would otherwise be.

From these facts and experiences and a study of these considerations over a substantial period we are led to the conclusion that a reasonable degree of the desired and necessary improvement can be reached within any reasonable time only by vesting power to regulate these questions for all railroads in the appropriate Federal body, and also providing means by which rules and regulations promulgated can be enforced. We recommend that the commission be given definite and specific authority to prescribe for all carriers by rail subject to the act rules and regulations governing interchange of cars, return of cars to the owning road, the conditions and circumstances under which such cars may be loaded on foreign roads, and the compensation which carriers shall pay to each other for the use of each other's cars. The carriers should be required to publish, post, and file with the commission, under the provisions of section 6 of the act, such rules and regulations prescribed by the commission, and should be held to an observance of those rules and regulations just as they are held to an observance of their lawfully published, posted, and filed rates.

Authority Over Changes in Rates

The commission's recommendation that Congress fix the existing rates at a specific date as reasonable for the past is discussed under the subject of "Reparation." On this the report says in part:

During somewhat recent years numerous agencies have been established in different parts of the country whose principal or sole business is to secure from shippers or consignees their paid freight bills and power of attorney to bring complaints in the name of the one from whom such bills are secured. Usually an agreement is entered into that whatever reparation is recovered will be divided on a percentage basis, but in some instances expense bills are purchased outright for insignificant sums. Wherever it is thought that there is any prospect of securing an award of reparation, complaint is brought before the commission, which necessitates hearing, decision, and preparation and printing of a report. The number of such cases is very large, and it is undoubtedly true that if it were not for the hope of securing reparation a majority of the complaints filed would not be presented.

In connection with the question of reparation on account of an unreasonable rate charged it should be borne in mind that the standard of reasonableness under our act is not a definite fixed standard. That is to say, whether a certain rate is reasonble or not often can not be known by the carrier until the commission has passed upon it. Now, in seeking reparation on account of an unreasonable rate, complainants frequently invoke the common law in support of their claims, but we have been referred to no common-law case where the standard exceeded by the carrier was not a fixed definite standard which the carrier knew and was bound to observe. The act contemplates that we shall find rates reasonable or unreasonable according to whether, in our opinion, the rate bears a proper relation to the service rendered. But this is pre-eminently a question upon which opinions of the commission and of the carriers may differ, and the act contemplates an original exercise of the carriers' judgment.

The act authorizes us to prescribe for the future only the maximum reasonable rate, fare, or charge. The carriers are at liberty to adopt the maximum so fixed or anything lower. It may easily transpire that an adjustment contemplated by the fixing of maximum rates, fares, or charges will be distorted or set at naught by the action of some individual carrier. The orders of the commission are binding for a maximum period of two years. It frequently results that discriminatory or unreasonable rate situations considered in an investigation extending over a substantial period of time and involving a large amount of work and expense, and which are corrected for a period of two years by an order, are re-established immediately upon the expiration of the two years, thus necessitating another equally or more exhaustive investigation.

These and other contributing causes lead to the result that in this respect and to this extent the present system or plan of regulation resolves itself largely into a sort of continuous moving around in a circle. The necessity for flexibility in order to fairly meet rapidly changing industrial and commercial conditions is fully recognized, but the soundness of the theory of leaving each carrier free to initiate its own rates and thus investing each of them with the power to overthrow or seriously disturb an adjustment that is recognized as reasonable and fair by the overwhelming majority of the carriers and shippers interested therein may well be doubted.

There are many instances in which a rate that has been in effect for 8 or 10 or more years and against which no real objection has been made is attacked as unreasonable, both at the time of filing the complaint and for the statutory period of two years prior thereto, and reparation on past shipments moving within the period of limitation is demanded. It seems clearly desirable that the highest possible degree of uniformity and stability of rates and rate relationships should obtain, and that the time at which the carriers' final accounts for the past years may be considered closed should be much more definite than it is.

All rates, fares, and charges have been open to complaint for a period of more than 10 years, within which the commission had power to fix the future maximum rates. For a period of more than six years all proposed increased rates have been subject to protest and suspension before becoming effective. Obviously there should come a time when as to the past the general level of the rates and the relationship of rates should be fixed as reasonable. We are convinced that the best interests of the entire public, of the system of governmental regulation of rates, and of the railroads will be served by the enactment of a statute which as of a specified date fixes the existing interstate rates, fares, classifications, rules, regulations, and charges as just and reasonable for the past, and which provides that after that date no change therein may be made except upon order of the commission. Of course, causes pending at the time of the enactment of such a statute should be preserved. The time as of which the existing rates, fares, charges, classifications, rules, and regulations are declared to be reasonable for the past should antedate somewhat the date of the enactment in order to prevent the filing of numberless complaints and new rate schedules in anticipation of a date fixed at some time in the future.

The adoption of such a plan as this would make it pos-

sible to apply the energies expended upon rate controversies in the direction of constructive work for the future instead of expending them upon controversies as to reparation for the past, with every probability that in a majority of the cases the one who ultimately bore the charge will never be reached by the reparation.

Shreveport Case

The report includes a review of the history of the Shreveport rate case, involving a conflict of jurisdiction over rates between the Texas Railroad Commission and the Interstate Commerce Commission, as to which the commission says in conclusion:

We call to mind once more the fact previously noted, that this commission has not reached out in a spirit of aggression to lay its hand on situations involving the principles of the *Shreveport Case.* While we have decided over 50 of such cases, and more are being presented to us from time to time, we have dealt with them in the regular line of official duty. In all instances the complaints were filed by sovereign states, municipalities, public administrative authorities, private associations of business men, corporations, and individuals, parties who had a legal right to do so. Were we to look about for opportunities to apply the principles of the *Shreveport Case,* we could find them in every part of the United States, and we have been requested in several instances to institute investigations upon our own initiative with a view to removing unjust discriminations in such cases just as we have proceeded in scores of other instances on our own initiative to apply remedies which the law provides.

Generally speaking, such situations represent rate questions and economic problems rather than legal controversies and constitutional issues. While we are fully sensible of the vital principles of constitutional and statutory law which are inherent in certain aspects of such situations, we believe that every such case can, as a practical matter, be disposed of without challenge of these principles of government.

The question is therefore presented how most effectively to bring into relief the mountains and the valleys of these interstate rate problems, so that they may be dealt with in a just and lawful manner. The situations requiring adjustment present two rates, one state and the other interstate, the one higher or lower than the other, applicable on the same commodity for transportation by the same carrier under substantially similar circumstances and conditions. Assuming both of these rates which give rise to the controversy to lie within the zone of reasonableness, an assumption which is not always warranted by the facts, the difference between them creates the unjust discrimination and the undue preference or advantage which we are called upon to remove. The single point within a zone of reasonableness which represents the reasonable rate is, therefore, the point to be sought. In the *Shreveport Case* proper, the history of which has been recited above, we had the assistance of the authorities of only one of the states concerned in addition to counsel for interested parties. In other cases, involving the same principles, we have had the active co-operation of the respective state commissions. This co-operation was entirely voluntary and without status under the act to regulate commerce, except in so far as the respective state commissions acted in the capacity of interested parties of record.

Viewing the entire situation, we believe that without abdicating any of the Federal authority to finally control questions affecting interstate and foreign commerce we should be authorized to co-operate with state commissions in efforts to reconcile upon a single record the conflict between the state and the interstate rates. We believe that procedure like this, the legislative details of which we deem it unnecessary at this time to attempt to define, together with the other amendments recommended by us, or still to be brought to the attention of Congress through the joint congressional investigating committee, will go far to meet the requirements of the rate situation as it is presented in this country to-day.

In a great and growing country like this economic changes follow one another in rapid succession. The act to regulate commerce has been, and doubtless must continue to be, amended from time to time to meet these changes. Future needs, the indications of some of which are now discernible, can be met by future amendments when the times so require. We make these latter observations simply to guard against the possible impression that what we are proposing is thought by us to be more permanent than the character of the industrial and social life in which it is to be initiated.

For the reasons stated in previous annual reports the commission renews its recommendations:

For enlargement of its membership and express statutory power to act through subdivisions designated by the commission to perform its duties with regard to specified subjects or features of its work, subject, of course, to retention by the commission of its control, as a commission, of all duties and powers delegated to the commission.

That the act be amended to accord right of access to the carriers' correspondence files.

That there should be appropriate and adequate legislation upon the subject of control over railway capitalization.

That the use of steel cars in passenger train service be required, and that the use in passenger trains of wooden cars between or in front of steel cars be prohibited.

That trains composed of cars exclusively used for the transportation of sugar cane on common-carrier railroads in Porto Rico should be excepted from the provisions of the safety appliance acts relating to power brakes.

From appropriations amounting to $4,865,000 the commission has expended the following amounts for the fiscal year ended June 30, 1916:

As salaries to commissioners and secretary	$ 75,000.00	
All other authorized expenditures	1,023,257.81	
Examination of accounts, act approved June 29, 1906	299,748.61	
Locomotive boiler inspection, act approved Feb. 17, 1911	211,520.08	
Safety appliance, block signal, and hours of service	240,239.14	
Valuation	2,984,332.83	
		$4,834,098.47

The report also includes a review of the work of its division of indices, the library and a report on the explosion at Black Tom, N. J.

FIRE PREVENTION AND THE PROTECTION OF WHARVES AND PIERS*

Covered freight and passenger piers and wharves are, as a rule, built over water on wooden pile supports and usually separated by slips of good width. The direct fire exposure externally is therefore as a rule moderate except such as unavoidably arises from the presence of shipping in the slips or from burning floating material drifting under the houses. The fire hazard is primarily *internal,* arising from the large volume of combustible freight and often excessive height of sheds and large unbroken areas and from the comparative inaccessibility to fire apparatus.

Wooden creosoted (below high water mark) piling is practicable (except in the South where concrete may have to be used) and as a rule is under water for ⅝ or more of its length. Concrete piling is costly and not always practicable, and for some other reasons hardly to be urged except as a last resort where, because of the ravages of teredo or similar causes, wooden piling is unsatisfactory.

Cutting off piles a few feet below low water mark, and capping them, superimposing concrete sills and stone or concrete supporting piers, or continuous foundations, would appear to be the best method. Owing to some uncertainties

*Abstract of a committee report presented at the annual meeting of the Railway Fire Protection Association held in New York, October 3-5, 1916, by W. F. Hickey (N. Y. N. H. & H.), chairman.

regarding light concrete work continuously exposed to salt water (reinforced work) the use of stone in hydraulic cement would seem preferable where it can be used.

Beyond question the entire floor and platforms should be constructed of reinforced concrete, and probably this is the most economical in the long run. The entire structure, from floor inclusive to a point a safe distance below low water mark should be of fireproof (not merely non-combustible) construction. Above the floor line the conditions are reversed to a considerable extent, since a "fireproof" structure, viz. one that will withstand combustion of all of its contents without suffering material structural injury, manifestly imposes conditions of weight, and possibly expense, that render it impracticable under many conditions. It is, however, usually practicable to frame the superstructure in units of well-protected steel but unless all of the steel work can be thoroughly covered and insulated, heavy timber framing is preferable as being more completely fire resistant. By "heavy timber" is meant 12 in. by 12 in. or 8 in. by 12 in. minimum cross section, *dressed smooth.*

The wall covering should of course be completely non-combustible, but nevertheless of a material which under continued high temperatures sufficient to bring about a more or less general collapse of the framing, will become friable enough to break up, which bars sheet metal, plain or corrugated. Some form of cement and asbestos is by far the best and, being non-corrosive and requiring no paint, is economical in the end. The roof should be wholly non-combustible on thoroughly protected steel or carried on "heavy timber" (barring light purlins) or of 2-in. or 3-in. matched or splined plank on heavy timbering (mill construction) the latter probably being preferable as the better fire resisting method.

The very worst possible construction is of sheet metal on an unprotected steel frame, as such framing buckles and collapses under comparatively moderate heat in a startlingly brief period (in some instances ten minutes or less) permitting the sheathing to fall and cover the burning contents in such a manner as to permit of intense combustion beneath it and to materially interfere with, if not entirely prevent, the effective application of water. Even the very flimsiest of wooden construction is likely to give better result.

These principles of construction, i.e. strictly fireproof floors, heavy framing and non-combustible siding, are applicable to pier structures of all heights.

Where roof monitors in one-story buildings are used fire-resisting construction is of course desirable (the weight of "fireproof" being here ordinarily prohibitive). The ends of the monitors should be solid (no windows) sash and frames metal, but for the side windows glazing of the thinnest obtainable glass with wire screens on the outside, unless in the very unlikely event of a heavy and intimate exposure, in in which case wired glass might be necessary. The monitor is essentially a ventilator and its first importance is in affording an outlet for smoke (it is smoke rather than fire that hampers firemen). So far from being an objection, especially in a one-story structure, such a vent is advantageous; such draft as is created tending to draw the fire to a single central point rather than diffuse it, while the smoke vent is extremely valuable. This has no application to openings through floors but entirely to monitors in roofs. Such monitors should never extend over or across fire walls, and are better discontinued at 10 feet or more from such walls.

Fire Walls and Doors

Single areas would better be restricted to a maximum of 10,000 sq ft., preferably less, and to the least height possible. Where subdividing walls are of necessity of wood, solid splined plank should be used, never less than 3 in. thick and preferably 4 in., using hard wood splines as far as possible. Such walls (more properly "retardant partitions") should be sheathed with lock jointed metal laid as flat as possible and with all nail heads covered and protected. "Lap jointed" metal and exposed nail heads are nowhere admissible and are apt to increase rather than diminish hazard. Flashing at roof line should be broad and heavy. On such partitions standard three-ply fire doors on one side suffice, being equally resistant with the partition. Free use of cold water "fire retarding" paint is to be urged on all woodwork.

Brick or concrete parapet fire walls are to be desired in all cases with double standard fire doors on all openings. All fire doors should be National Standard labelled doors and such as well as labelled hardware should be clearly and distinctly specified in all contracts. The practice of calling for "fire doors" and permitting contractors to put in any sort of a contraption they choose to so designate is to be very strongly condemned. Where bulkhead, shed or offices connect piers the connecting structure should be separated from the piers by means of a fire wall at each end. The need of subdividing the space under the apex of wooden awnings protecting platforms is urged—at least opposite each fire wall or partition. Such divisions should be of metal or plank 2 in. or more, and extend solidly downward to the level of the lowest point of the awning and entirely across. There is no easier path for a fire to go around a fire wall than via this apex, which in its nature concentrates the draft. If the awning is flat or nearly so a drop of two feet or more should be carried entirely across from the wall to the outer edge of the awning at each fire division. In considerable areas, especially if the height of the roof or ceiling is greater than the average similar drops are very useful in trapping hot air to hasten sprinkler operation and preventing formation of air currents and whirlpools in the air.

Where tracks run down the center of piers, necessitating large openings in the fire walls, these openings should be protected by standard fire doors with folding automatic drops to fill the track pits and care should be exercised not to allow cars to stand in the openings. These folding drops act as soon as a door is completely closed.

Standpipes and Extinguishers

Piers should be equipped with standpipes located about 100 ft. apart, each equipped with 50 ft. of fire hose, and a monitor of revolving nozzles, an automatic sprinkler system, portable chemical engines, hand fire extinguishers and galvanized metal casks and pails staggered throughout. As monitor nozzles are capable of instant and complete operation by one person, they are especially desirable where conditions are suited for their installation. At each point of hose connection on standpipes a double hose connection should be provided, one for the inside "first aid" hose, and the other for the use of the fire department.

The "first aid" or private hose except under special conditions should be 1½ in. unlined linen hose and nozzle with ½-in. tips. The other outlet should be 2½ in., capped and kept for use of the fire department. All pier sheds should be equipped with a sufficient number of stationary ladders, extending from string piece to roof in order to allow free access to and from roof in event of fire, and having available a few small boats from which lines of hose can be directed.

The construction of new piers on approved lines, of fireproof or fire retarding material will naturally reduce the hazard which piers of wooden construction present, but there are many old piers of timber construction that will probably be in existence for some time to come, and it will be a long time in the future before a standard fireproof construction will be generally realized. It is not, however, needful to await the period of complete reconstruction for if a settled policy is determined on and all considerable repairs and partial reconstructions conform to it, the new work, being permanent in its nature, will reduce the cost of final reconstruction, and frequently will in time practically effect reconstruction without any material expense.

Sleeping Cars for the Canadian Government

Construction Is All-Steel Except Part of Interior Finish; The Cars Have 10 Sections and Weigh 168,500 lb.

THE Canadian Government Railways have recently placed in service twelve all-steel sleeping cars, eight of which were built by the National Steel Car Company, Hamilton, Ontario, and four by the Preston Car & Coach Company, Preston, Ontario. Each car has ten sections and two drawing rooms and conforms to the following principal dimensions:

Length over end sills	75 ft. 6 in.
Length between truck centers	57 ft. 6 in.
Length over buffers	82 ft. 6½ in.



Interior of Canadian Government Sleeping Cars

Width over side sills	9 ft. 10 in.
Height, rail to top at center	14 ft. 2 in.
Trucks	Simplex, six-wheel
Journals	5 in. by 9 in.
Total weight, complete	168,500 lb.

Underframe

The underframe is of the through center sill type. The sills are 15-in., 40-lb. channels, spaced 16 in. apart, with the flanges turned outward and extending from buffer to buffer. A single ⅜-in. cover plate is riveted to the bottom flanges, extending to a point 3 ft. 10 11-16 in. beyond the center line of the transom at each end of the car. The top flanges of the sills are reinforced with two cover plates, the first a 5-16-in. plate extending the entire length of the sills and the second, a ¼-in. plate 24 ft. 9 in. long.

The transoms are built up of two 5-16 in. pressed steel web members on each side of the center sills. These are spaced 9 in. apart, and have full length top and cover plates tapering from a width of 24 in. at the center to 15 in. at the ends. The top cover plate is ⅝ in. thick and the bottom plate ⅞ in. thick. A steel filler casting is placed between the center sills above the center plate. In addition to the transoms there are four single-diaphragm cross ties, the webs and fillers of which are 5-16 in. pressed steel, the top and bottom flanges being reinforced with ⅜-in. and ½-in. cover plates, respectively, each 6 in. wide and extending across the car to the 6-in. by 4-in. by ½-in. angle side sills.



Upper Berth Safety Straps and Coat Hangers

The body and end sills are ⅜-in. pressed steel, reinforced at the top by a ½-in. plate, 10 in. wide where it crosses the center sills, and tapering to a width of about 3 in. at the end. The platform end sills are made in three sections, the center section being an 8-in. by 8-in., 34-lb. H-beam and the ends built up of structural and pressed steel sections.



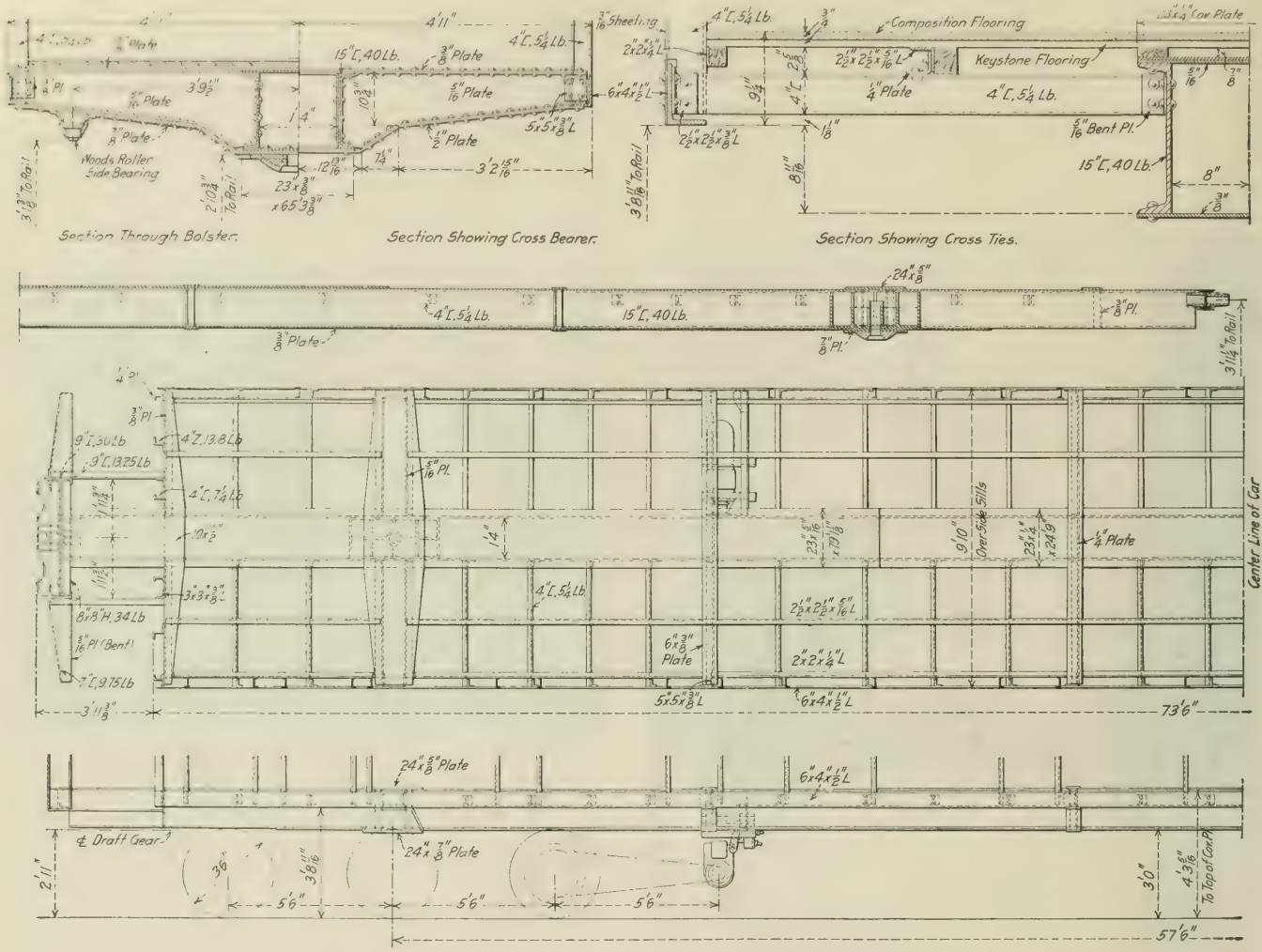
Canadian Government Railways 10-Section Steel Sleeper

Platform end posts of 9-in., 30-lb. I-beams are framed between the sections of the end sills, the attachment to the H-beam being made by means of corner plates of 5-in. by 3-in. by ⅜-in. angles. The intermediate platform sills are 9-in., 13.25-lb. channels, and are attached to the body and

platform end sills with 3-in. by 3-in. by ⅜-in. angle corner plates.

The floor supporting system consists of transverse 4-in., 5¼-lb. channels, spaced from 2 ft. to 3 ft. 6 in. apart, These channels are attached to the side and center sills by means of angle corner plates and carry the intermediate

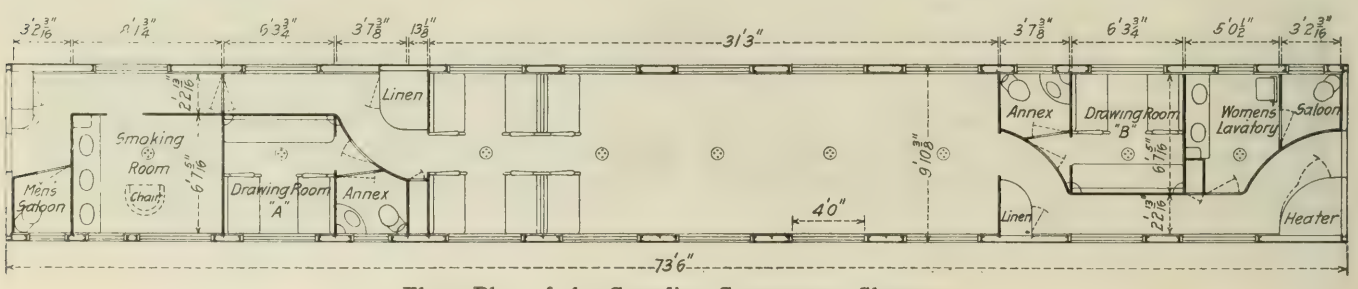
the spacing being arranged to suit the window openings. The belt rail is a ½-in. by 4-in. bar, riveted to the outside sheets. The top of this bar is 2 ft. 11 in. above the bottom of the side sills and to it is riveted a light 2-in. by 4-in. angle with the long leg horizontal, the wood window sills being attached to this with round headed wood screws.



Underframe Arrangement and Details of Construction

longitudinal floor supports. These are wood strips reinforced at the top with 2½-in. by 2½-in. by 5-16-in. angles. The side supports are a 2-in. by 2-in. by ¼-in. angle, riveted to the inside flange of the vertical side frame members. Both longitudinal angles are fitted with wood nailing

The sides of the car are covered with 5-16-in. plate, applied in panels, those below the windows being applied first. The plates between the windows extend under the bottom of the letter board which is a ¼-in. plate, 13 in. wide, the top being flush with the top of the side plates.



Floor Plan of the Canadian Government Sleepers

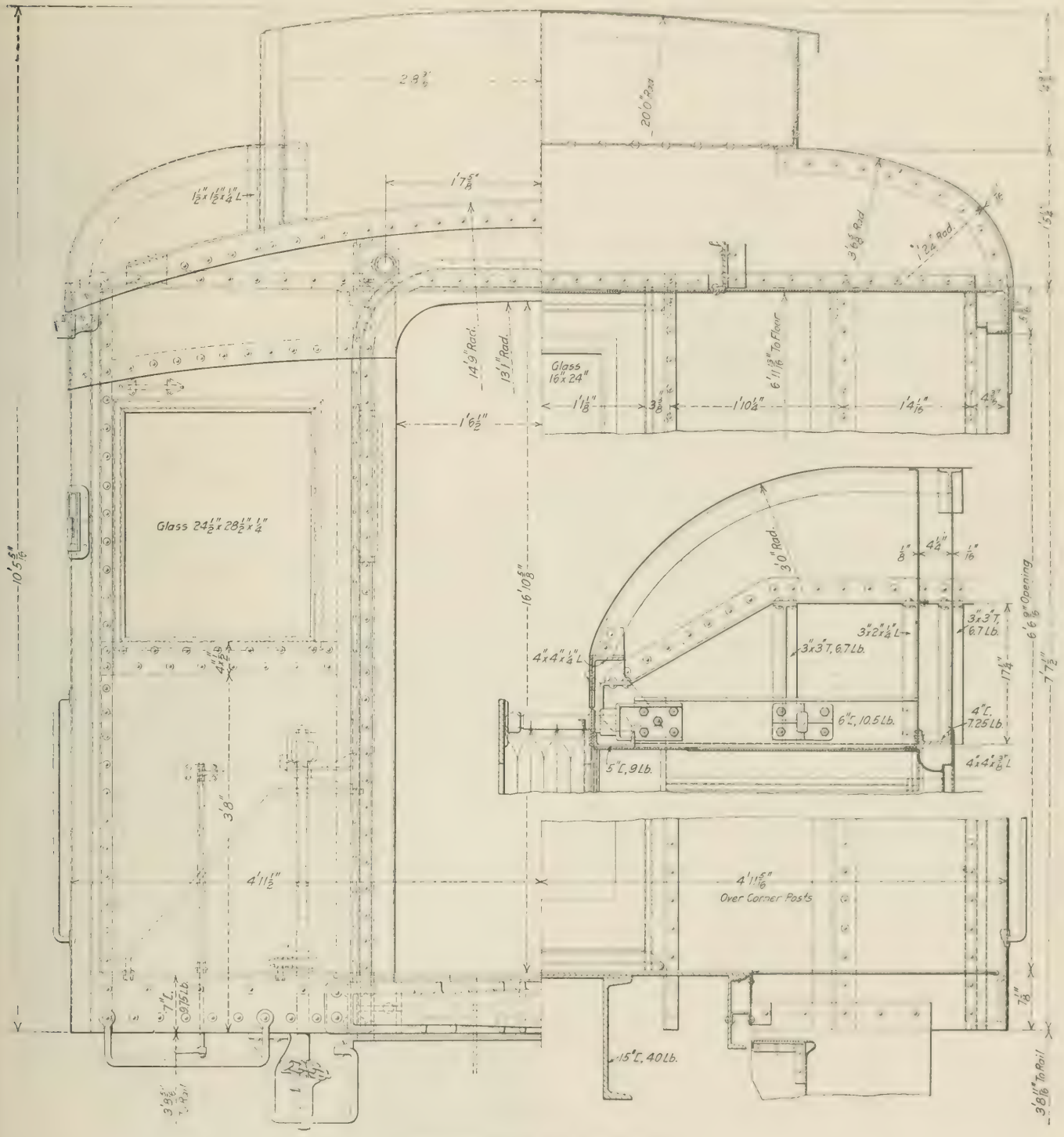
strips and the floor is supported at the center on nailing strips placed directly over the flanges of the center sills.

Body Construction

The principal members of the side frame are the 4-in., 5.25-lb. channel posts, extending from side sill to the plate,

The roof is of unusually light construction. The lower deck carlines are 3-in. by 3-in. by 6.7-lb. T-iron, to the flanges of which the roof sheets are riveted. The deck sheets are flanged at the top to form an inverted U-section 2⅞-in. wide and are secured at the bottom to the vertical leg of a 3-in. by 3-in. by ¼-in. longitudinal angle, which is

riveted to the ends of the lower deck carlines. The deck sheets are stiffened vertically by T-irons, which are applied on the outside of the deck plates. There are 15 of these on each side of the car, the intervals between them being considerably greater than those between the carlines. The upper deck carlines are 3-in. by 3-in. by 6.7-lb. T-sections, the flanges of which are bent down at the end and riveted to the bers are the 4-in., 7.25-lb. channel door posts, the corner posts built up on 5-in. by 3-in. by ⅜-in. angles, and the 4-in., 13.8-lb. Z-bar intermediate posts. The short leg of the corner post angle is flush with the outside face of the side sill and to it is riveted the side sheet. The face of the long leg is even with the inside faces of the intermediate and door posts and to it is attached the ⅛-in. steel interior end finish. The

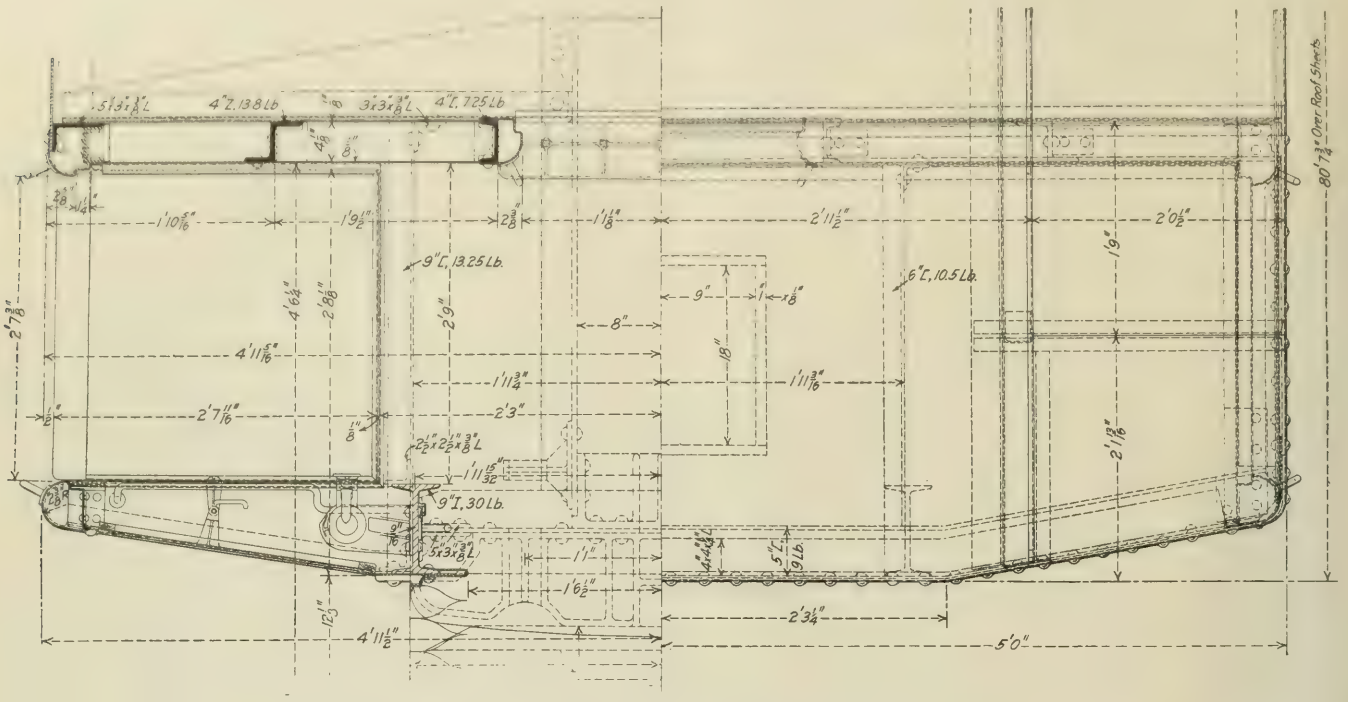


Construction of the Vestibule

inside faces of the deck sheets. The roof sheets, which are 1-16-in. thick, are riveted to the carlines; they extend over and are also riveted to the inverted U-section at the top of the deck sheets.

The details of the vestibule and body end construction are clearly shown in the drawings. The body end-frame members are the 4-in., 7.25-lb. channel door posts, the corner posts built up on 5-in. by 3-in. by ⅜-in. angles, and the 4-in., 13.8-lb. Z-bar intermediate posts. The short leg of the corner post angle is flush with the outside face of the side sill and to it is riveted the side sheet. The face of the long leg is even with the inside faces of the intermediate and door posts and to it is attached the ⅛-in. steel interior end finish. The corner post is completed by a special ¼-in. pressed steel channel, to which the exterior end sheet is riveted and is finished with a pressed steel vestibule door post, applied outside of the side and end sheets. The hood construction is designed for longitudinal rigidity and is simple in its detail. The end stresses are carried across to the sides of the car

by channel-section vestibule and body end plates. A 5-in., 9-lb. channel is placed across the top of the vertical 9-in. I-beam anti-telescoping members, flanges upward. This is bent to conform to the contour of the end of the vestibule



Horizontal Section Through End Frame and Half Plan of Hood

outside sheets below the windows are lined with Corkboard, 2 in. thick, and 1-in. Corkboard is applied between the windows and inside the letter board. The roof sheets are lined with ⅛-in. tar paper, which is cemented on, and they are and is secured at the ends to the angle side plates, which are continuous to the ends of the vestibules. Inside this channel, a portion of the webs of the I-beams are continued upward and to them are attached longitudinal 6-in., 10.5-lb. channels extending to the bulkhead at the end of the car body, where they are secured with angle corner plates. These channels carry the top diaphragm buffer-spring brackets. Longitudinal stiffness at the bulkhead is secured by the use of a 4-in., 7.25-lb. channel, placed with flanges up, the ends of which are attached to the side plates. To the inside of this channel is riveted the 1-16-in. steel interior finish, and to the outside is riveted the ⅛-in. plate reaching from the top of the door to the roof. The latter is applied in two pieces, which are flanged and riveted together on a horizontal line even with the top of the lower deck. The vestibule and roof sheets are riveted to a 4-in. by 4-in. by ¼-in. angle, which is shaped to conform to the curve of the end of the roof and is secured at the ends to the horizontal channel member by the use of pressed steel fillers.

Interior Finish

The floor is laid with ¾-in. Keystone flooring, above which is applied ¾ in. of composition. The sides, below the table plate over the steam pipes, are ⅛-in. steel plates, which are lined on the exposed side with ¼-in. asbestos board extending from the top of the Keystone flooring to the table plate rivets. The wainscoting, the window sills, window stops and wall plate moulding are wood, while the sides above the windows and the lower deck ceiling, which are enclosed by the upper berths, are of 3-16-in. Agasote. This material is also used for the upper deck ceiling, but in the latter case is ¼-in. thick.

The cars are well insulated, Corkboard and Resisto being the principal materials used. An air space below the floor is enclosed with sheet metal covers flanged and screwed to wood strips and lined with three-ply Resisto; the tops of the center sills are also covered with the same material. The further insulated by the application of two-ply Resisto. For winter use, the window openings are fitted with storm sash, which is hinged to open outward for convenience in cleaning.



Interior Finish of Women's Lavatory

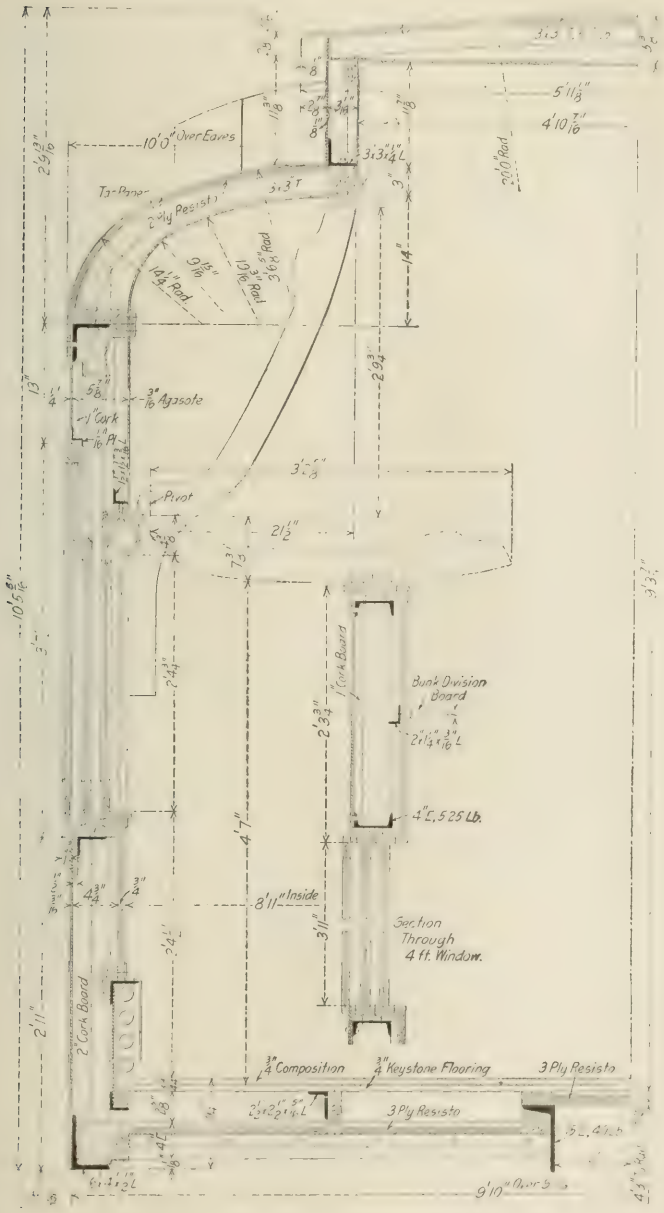
The interior finish of the body is in vermilion, the steel work being grained in imitation wood. The drawing rooms are finished, one in Cuban mahogany, and the other in Eng-

lish oak, while the smoking rooms and passageways are finished in Koko. The women's lavatory is finished in white enamel and vermilion and the walls of all saloons are covered with 3/8-in. glazed tile, imbedded in cement applied to expanded metal lath.

The cars are fitted with the Stone electric light system. The lighting fixtures are of the semi-indirect type placed on the center line of the upper deck ceiling. Both the upper and lower berths of each section are fitted with reading lights.

Trucks

The cars are carried on Simplex six-wheel trucks, with a wheel base of 11 ft. The frame of this truck is of the built-up type, in which both structural and pressed steel sections are used. The side frames are of box sections, formed by the use of two 8-in. channels, placed with the flanges adjoining and covered on top for the greater part of their length by the gusset plates which form the top flange of the transom members. The center plate and longitudinal bolster is an integral steel casting, which is bolted to the built-up the trucks secured to the car body by Coleman locking center pins. The trucks are fitted with clasp brakes.



Cross Section of the Car Body and Horizontal Section Through the Windows

Among the special appliances with which the cars are fitted may be mentioned the Miner friction draft gear and buffing device, the Chaffee drawbar centering device, the National steel trap doors and McCord 5-in. by 9-in. journal boxes. The windows are fitted with Edwards sash fixtures and weather stripping and the curtains are of silk finish Pantasote. Garland ventilators are applied to the deck sash. The Gold car heating system is used, and the equipment includes the Frumveller double duplex coil heater.

PARIS AS A MILITARY RAILWAY CENTER

By Our Special European Correspondent

The city of Paris today without question furnishes the best example in the world of railroads centering in a big city properly organized for harmonious coöperation in war time. It has taken the war to prove this fact, as well as the value of such railway organization. It is not too much to say, in the light of recent information, that without the co-ordination of the systems about Paris, Verdun certainly could not have been kept supplied with artillery, munitions and troops, and, in short, could not have been held. It has long been patent that but for the railways making possible quick movements of troops early in the war, Paris would herself have fallen. Like all efficient bodies, there is nothing complicated about the French railway arrangement of lines. A glance at a railway map of France tells her railroad story. The six systems radiate, like the spokes about the hub of a wheel, from Paris, which is the heart of France's business activity.

A glance at the map also shows how well the railways about Paris are connected and provided with terminals to prevent the congestion of troops or of freight, and also how admirably each terminal fits into the general scheme. Each of the big lines has a central passenger station near the center of Paris, with freight and engine yards a little further removed from the passenger station, and finally car yards and shops just beyond the city suburbs.

The six lines, 25,000 miles in length, that handle the transportation of a nation of 40,000,000 people are able to work together as a single unit by means of a little bit of double track, 75 miles long, that circles Paris at an average distance of ten miles. This strategic railway, today so important, in peace times was all but unknown to the traveler. It was used by the few people who owned homes along its route and was mostly used by them only when they were not able to go to or from Paris at seasonable hours. Its name is the Grande Ceinture, as opposed to the 19-mile Petite Ceinture which circles Paris just within the old and today useless line of fortifications. From a railway operating point of view la Grande Ceinture can hardly be classed as a success. On an original capital of $12,000,000, $3,000,000 of which was advanced as a subsidy by the government and with yearly expenses roughly $1,500,000, it earns $100,000.

In peace times this road received from its bigger brothers the consideration due a no-account jerkwater line in the United States. Sometimes engineers on the larger lines forgot to stop at its crossings and stations, or at least this was the explanation handed to wrathful passengers carried beyond their stations. The line gave rise to many disputes between trainmen and agents. Those of the larger lines played all kinds of mean tricks on the representatives of la Grande Ceinture, refused to accept or deliver freights, and otherwise harassed them.

It took the war to prove the right of the la Grande Ceinture to exist, and that right it has proven a thousand fold. If the little road hadn't been laid with the heaviest of steel rails on the best of road beds, it would months ago have been in need of rebuilding, and perhaps thereby wrought

disaster to French arms on the wide battle front 80, 100 or 150 miles away.

For instance, as illustrative of its strategic value, and its worth in lessening the burden on the centers in Paris, a single division of the Moroccan troops has passed no less than ten times over a few miles of the Grand Ceinture to the south of Paris. These troops were not passed this way just to give them a joy ride; they were so routed because the general staff at one end of the front willed that they go to another part of the same front 40 to 50 miles away and knew that this was the best way to route them to get them to the second point on time. This division, it may be said in passing, has had the major portion of its men killed three times over, hence has been three times made over; it is always called on to do desperate work, and has been sent to Arras, to Champagne, to Verdun, and to the Somme. Therefore, when moved, its moving is done in a hurry, by the most expedient route. One member of the division, whose old country home, it so happens, is located along la Grande Ceinture, has related to me that, thanks to the use of this route, he has been able to get a view of his home on many rides from one part of the front to the other—in fact the only time he has been able to see his home since the war began.

The people living along this Ceinture line to the east of Versailles, have perhaps got the best possible idea of the war from a transportation point of view. Practically every military train arriving from the south of France, via the Paris-Lyons-Mediterranean Railway, has been directed to the tracks of the Northern Railway and thence to the front via the Ceinture. Countless thousands of troops and tons of military freight have passed this way. Before the Verdun counter-offensive of the French, trains passed on this way day and night, and passed in opposite directions, each track of the Ceinture being used. Between the 10th and 13th of June, for instance, 142 trains of 40 to 50 cars each passed this way.

The Creusot output of 420 millimetre giants, each piece weighing down a container truck composed of three freight cars, passed here. The trains were so heavy, at times, that the people living along the Ceinture often confused the noise of their approach with that of the sound of the guns along the Somme, sixty miles away. Again, these heavy trains, moving at a ten-mile rate, pulled by two and three engines, made the houses miles distant, tremble and quiver like an Italian earthquake.

No circus could have had the attraction of these trains that moved along this line for so many months. The English troop trains, always moving in distinct groups of 55 cars each, were filled inside and out. The English Johnnies danced on the car roofs, they swung about the ladders, the steps, and all but straddled the locomotive's back. The children who live along the Ceinture obtained more real war transportation experience than could have been gotten in any other spot in Europe. They saw pass English, Russian, Hindoo, Australian and Annimite troops from the French colony of Indo China. They had a chance to see on one track soldiers riding away to the front while on another the hospital trains came *from* the front laden with the wounded. They saw German prisoners, cannon mouths decorated with roses, kitchen stovepipes smoking from the fires of the company cooks, freight trains, double-headed, made up of 60, 65, 70 or 75 cars, and long processions of engines hooked one to the other going back for more trains to haul.

Possibly the most interesting statement to be made about the little, once despised Ceinture is that it hasn't broken down under the strain that no other railroad has been called on to bear. Not a single one of its rails has so far had to be replaced. However, under the head of accidents, it did help kill two little children at Jouy this summer, one a little girl who was running to give a bouquet of forget-me-nots to a brawny soldier and receive a button from his sleeve in return. The other child, a boy, was leaning over the iron road barrier to better see the pictures painted on the freight cars, the pictures representing field and roads and flowers and trees and ruined churches and houses, in order to deceive German aeroplane bomb throwers. The child leaned too far, fell over the barrier and under the wheels of the cars.

The building of the Grande Ceinture came as a result of the Franco-Prussian war of 1870-71 when both the French and German nations realized in some measure how much better that war might have been conducted, either as a defensive or offensive instrument, had railroad facilities been more complete. While Bismarck was working to this end in Germany, the French were not idle. Indeed, the Petite Ceinture about the fortifications had been built before that war during the reign of Emperor Napoleon III.

The possession by all the railroads of France of an ample passenger and freight terminal within the city, thereby making possible their use as a single unit for national defense by the connecting link of the Grande Ceinture, must, however, be attributed in some measure to the ambition to make Paris the foremost capital of Europe. City planning is an old art in Paris. Every government of France within the past hundred years has occupied itself with building bridges, wide streets and big public monuments within and about Paris. The future was always taken into account by the rulers of Paris. It so happened that the railroad era was beginning under Napoleon III (1852-70), the man who did more than any other to make Paris a roomy city, and in his time the railroad approaches into Paris were laid.

The best proof of the foresight exercised lies in the fact that with an ever increasing passenger traffic but two of the stations have been rebuilt. The Northern Railway station, facing on the rue de Dunkerque for a distance of 230 yards, is today much as when built in 1863-64. It was built with an eye to architectural beauty, its 170-yd. facade being crowned with a statue of Paris, the pediment holding statues representing eight foreign cities of the north connected to Paris by the railroad. A half mile to the rear of this station lie immense plots of ground which serve as the freight delivery station, as the engine and car yards for passenger trains, and further out of the city at St. Denis are located the repair and building shops of the company. The two passenger terminals that have been completely rebuilt in recent years are those of the Orleans Railroad and of the Paris-Lyons-Mediterranean. While the Orleans Railroad has always had sufficient space, it eight years ago removed its principal passenger station from the head of the Austerlitz bridge to the Quai d'Orsay, opposite the Palace of the Louvre. The P. L. M. railway rebuilt the Gare de Lyon 12 years ago, and today such is the increase in its traffic it is preparing to enlarge this station further.

Concession for Railway in State of Matto Grosso.—The President of Brazil has granted a concession to Alberto Alvares de Azevedo de Castro for the construction and operation of a railway from Cuyabá, the capital of the State of Matto Grosso, through the town of Sant' Anna, on the Paranahyba River, to connect with the Araraquara Railway at a place called Jangada, or at São José do Rio Preto. This total extension will be about 620 miles in length, and will furnish direct railway communication between the city of Cuyabá and the ports of Rio and Santos. Plans for the first section, 62 miles, must be submitted to the Government before June 30, 1919, and construction work must be begun within one year from the date of approval of these plans by the Government. Construction must be carried on at the rate of 31 miles per year. The concession calls for a single line of 3.28-ft. gage.

General News Department

A street railway at Windsor, Ont., is advertising for women to act as conductors.

The coaling station of the New York Central at North White Plains, N. Y., was destroyed by fire November 28; estimated loss, $35,000.

Congress is receiving a large number of petitions from railway employees, not members of the brotherhoods, asking that they be included in the provisions of the Eight-hour law.

At Thomasville, Ga., one day last week a reporter noticed that 300 bales of cotton were being carted in wagons from the freight house of the Atlanta, Birmingham & Atlantic to that of the Atlantic Coast Line—a sure means of keeping freight cars at home.

The Interstate Commerce Commission's partial summary of revenues and expenses for the month of October, 1916, for 109 roads, operating 148,000 miles, shows revenues per mile of $5,766, as compared with $5,010 for October, 1915; expenses per mile, $3,620, as against $3,175; net revenue per mile, $2,146, as against $1,835.

Buildings containing the car repairing and painting departments of the Chesapeake & Ohio at Peru, Ind., were destroyed by fire on November 27. Other structures used as shops, offices, and as division headquarters for supplies of all kinds, were also consumed. The origin of the fire has not yet been determined, but it is thought to have been the work of incendiaries. Estimated loss, $75,000.

More than 100 railroad men narrowly escaped death at Columbus, Ohio, on the night of November 25, when a fire of unknown origin broke out in the Railway Young Men's Christian Association building. The fire spread so rapidly that for a time it was feared all the sleeping occupants of the building would be trapped. However, all escaped injury except a few who were slightly burned. The loss is estimated at about $50,000.

The Canadian Pacific has renamed its operating territories on the eastern lines by which the divisions previously consisting of a group of districts each under the jurisdiction of a superintendent, will hereafter be known as districts, and the districts will be known as divisions. The Lake Superior division is renamed the Algoma district; the Eastern division is renamed the Quebec district, and the Atlantic and Ontario divisions become the Atlantic and Ontario districts.

The Bangor & Aroostook has given a bonus of 4 per cent. on the wages of the last six months to all employees receiving less than $2,000 a year. About 1,700 employees will benefit. The Western Union Telegraph Company has decided to distribute a bonus of approximately 6 per cent of a year's salary to all employees earning $2,000 a year or less. In a general way messengers will receive $25 each; employees receiving less than $1,200 per annum 7 per cent of their annual wages, and employees receiving from $1,200 to $2,000 per annum, both, inclusive, 6 per cent.

In addition to the bills noted elsewhere as having been introduced in Congress at its opening session, the following were introduced on Tuesday: S. 7,031, by Senator Underwood, to give the Interstate Commerce Commission the power to fix the hours of labor, and determine the wages of employees of carriers engaged in interstate and foreign commerce; S. 7,066, by Senator Townsend, to provide for the investigation of controversies affecting interstate commerce, and for other purposes. Both were referred to the Committee on Interstate Commerce.

A special committee of the National Civic Federation, appointed to consider amendments to the Newlands arbitration law for the handling of disputes between railroads and labor organizations, held a meeting at Washington on December 4. It is proposed to submit some recommendation to Congress in connection with the inquiry being made by the Newlands committee. James Murdock, vice-president of the trainmen's organization in Canada, and other officers of the train service brotherhoods, addressed the committee to explain the opposition of organized labor to the Canadian industrial disputes act.

In response to the request of J. H. Peyton, president of the Nashville, Chattanooga & St. Louis, G. W. W. Hanger, assistant commissioner of the United States Board of Mediation and Conciliation, has undertaken to mediate the differences between the N. C. & St. L. and its employees belonging to the four brotherhoods. The employees had threatened to strike because the company refused to meet representatives of all four organizations in conference, when grievances affecting only one were to be considered. The contracts with the men require only that the management meet representatives of two organizations in such a case.

David Krinsky, a resident of Union Hill, N. J., riding on Long Island one night last August, drove his automobile through the gates at the Long Island Railroad crossing at Lynbrook; and when he was called to account he gave a fictitious name; but, after some difficulty, the police department of the road secured a summons calling on him to appear in court. He repeatedly failed to appear; and, being a resident of another state, he was comparatively immune to disturbance; but the railroad company laid the facts before the Commissioner of Motor Vehicles of the state of New Jersey, and this officer, after calling Krinsky before him and investigating the matter, revoked the man's license.

In order to get the maximum use of cars the Southern Pacific has passed into service open cars, both flat and gondolas, protecting the load with tarpaulins, to carry freight ordinarily shipped in box cars. The tarpaulins are made of No. 6 hard cotton duck, are stenciled "Property of Southern Pacific Company," and are numbered consecutively. The auditor of freight accounts has instructed agents at forwarding stations to bill each tarpaulin with $40 advance charges, and the agent at destination gets relief by securing the tarpaulin and billing it back to the station from which it started. The St. Louis-San Francisco has papered some stock cars for the purpose of shipping merchandise to western points.

Thomas W. Gregory, attorney general, in his annual report to Congress, recommends a change in the commodities clause of the interstate commerce law. He says that, despite the government's victory in the Supreme Court in the Lackawanna Coal Company case, the railroads are still able to claim that the commodities clause does not prohibit them from engaging in production along their lines, provided only that they sell the articles produced before transporting them. He would prohibit a railroad from transporting articles manufactured or produced by it or by any corporation it controls, or it is affiliated with by having the same controlling stockholders, irrespective of interest in the articles at the time of transportation. He says it is also necessary that Congress prohibit any railroad owned or controlled by a producing or trading corporation, and not merely a plant, from transporting the articles produced or owned.

"Sand Tracks" Tried at Boston

The Boston Elevated Railway, with a view to providing more complete safeguards at the approach to drawbridges, made experiments, last week, in the yard at Forest Hill, with a sand track, for stopping trains—though instead of sand the troughs were filled with broken stone. A train of four cars of the elevated line, running at 25 miles an hour, was brought to a stop in 230 feet. When the leading car runs off the rails into the stone-filled troughs, the power is automatically cut off. It is proposed to build one of these "decelerators" on the elevated structure at the north end of the Charlestown bridge over Charles river. The track at this point is already equipped with automatic train stops, from which it would appear that the introduction of the sand track will provide duplicate safeguards.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF OCTOBER, 1916

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Alabama & Vicksburg	143	$123,336	$42,569	$184,708	$24,379	$27,220	$4,004	$56,689	$2,560	$5,463	$120,315	$64,393	$20,500	$43,893	$24,819
Atchison, Topeka & Santa Fe	8,648	8,182,276	2,154,877	11,213,757	1,300,729	1,627,721	184,018	2,851,070	2,516	198,298	6,149,061	5,064,696	548,200	4,515,494	1,167,253
Alabama Great Southern	312	379,868	109,651	525,132	36,774	92,641	13,593	137,526	3,433	12,235	296,202	228,930	31,164	197,766	62,126
Arizona Eastern	378	242,809	48,230	315,655	58,841	33,492	2,408	65,815	2,789	12,773	177,099	138,556	9,603	128,953	13,112
Atlanta & West Point	93	73,697	47,295	140,545	15,247	20,506	7,156	37,232	2,189	4,874	87,189	53,356	6,709	46,647	11,823
Atlantic & St. Lawrence	167	115,009	24,086	150,697	53,920	33,195	4,466	78,500	.....	5,343	175,424	—24,727	9,895	—34,622	15,617
Atlantic Coast Line	4,748	2,090,009	738,136	3,088,725	386,663	542,761	55,432	973,899	9,023	75,809	2,041,157	1,047,568	165,000	881,665	293,511
Baltimore & Ohio	4,539	8,449,520	1,465,401	10,657,534	1,284,170	2,080,580	186,498	3,703,268	73,708	275,015	7,596,612	3,060,922	339,421	2,720,963	—457,114
Baltimore, Chesapeake & Atlantic	88	84,564	28,718	118,892	2,207	31,446	990	60,750	.....	2,274	97,651	21,241	2,700	18,541	26,338
Bangor & Aroostook	632	310,869	70,681	399,883	43,424	57,049	4,210	92,776	4,286	13,193	214,937	184,946	13,669	171,277	29,098
Belt Ry. of Chicago	31	.....	.....	300,733	21,015	33,582	1,435	113,117	.....	7,548	176,698	124,035	13,265	110,770	22,461
Bessemer & Lake Erie	205	1,046,791	26,882	1,092,752	94,902	205,593	16,724	252,469	.....	14,470	573,012	519,740	40,694	479,046	—479,875
Buffalo & Susquehanna R. R. Corp.	253	134,653	5,933	142,807	22,330	39,373	1,393	41,312	.....	6,451	110,839	31,967	2,600	29,367	—4,335
Buffalo, Rochester & Pittsburgh	586	1,005,141	98,565	1,157,011	160,128	288,837	12,598	401,159	1,256	23,605	887,583	269,429	22,000	247,424	96,867
Canadian Pacific Lines in Maine	234	94,113	20,221	122,733	17,864	20,504	6,075	46,576	.....	4,773	95,792	26,940	9,100	17,840	24,543
Central of New Jersey	684	2,267,390	518,435	2,995,088	247,449	548,372	43,383	1,007,720	18,965	58,848	1,924,141	1,070,947	144,085	926,862	—147,906
Central New England	301	400,029	42,375	460,474	58,934	59,896	1,575	141,769	.....	6,083	268,211	192,263	15,500	176,763	30,120
Charleston & Western Carolina	343	176,547	33,482	218,874	29,126	20,901	4,436	56,776	.....	4,280	115,519	103,355	6,500	96,855	32,544
Chesapeake & Ohio Lines	2,378	3,420,852	603,934	4,315,500	587,179	803,319	53,571	1,222,564	29,427	85,975	2,780,502	1,534,997	141,170	1,393,748	117,588
Chicago & Alton	1,053	1,223,870	378,440	1,717,163	193,504	367,441	40,238	560,326	12,117	32,462	1,199,461	517,702	46,105	471,223	65,000
Chicago & Eastern Illinois	1,136	1,168,950	247,522	1,533,760	190,173	393,139	25,170	510,484	8,023	35,506	1,157,337	376,422	63,750	312,490	—109,585
Chicago & North Western	8,108	6,804,324	1,928,209	9,668,214	1,087,430	1,411,273	114,471	3,133,098	58,220	166,329	5,957,868	3,710,346	485,000	3,274,865	604,994
Chicago, Burlington & Quincy	9,373	7,779,989	1,964,469	10,586,316	1,007,953	1,488,949	135,449	2,968,211	79,172	260,960	5,880,695	4,705,621	397,733	4,307,888	578,582
Chicago, Detroit & Can. Gd. Trunk Jctn.	60	72,457	18,572	112,564	20,815	16,034	1,538	51,949	.....	1,445	91,781	20,783	3,487	17,292	4,238
Chicago Great Western	1,496	1,132,793	312,339	1,566,079	248,796	211,405	46,740	478,534	11,747	37,646	1,032,691	533,387	53,430	479,459	155,857
Chicago, Indianapolis & Louisville	622	502,030	176,412	731,945	77,024	127,375	21,506	226,829	341	18,622	470,313	261,632	30,619	230,977	35,427
Chicago Junction	13	.....	.....	228,436	29,428	23,569	1,171	129,149	.....	5,377	188,694	39,742	2,863	36,879	—11,350
Chicago, Milwaukee & St. Paul	10,208	7,923,524	1,673,277	10,575,240	1,144,367	1,600,467	180,215	3,553,483	61,003	159,215	6,506,184	4,069,055	497,288	3,570,668	142,921
Chicago, Peoria & St. Louis	255	137,877	24,025	171,169	24,757	35,044	5,474	65,878	.....	5,642	136,795	34,374	6,000	28,370	—1,957
Chicago, Rock Island & Gulf	477	241,780	65,558	328,438	34,524	46,675	9,710	95,010	1,178	9,292	196,379	132,059	7,152	124,771	24,802
Chicago, Rock Island & Pacific	7,653	5,289,295	1,738,824	7,526,793	1,007,076	1,207,534	133,846	2,340,715	43,798	165,373	4,878,356	2,648,437	295,405	2,351,740	1,054,505
Chicago, St. Paul, Minn. & Omaha	1,753	1,467,658	465,298	2,080,290	227,800	220,272	24,940	694,796	18,443	41,446	1,226,034	854,256	98,195	755,889	153,932
Chicago, Terre Haute & Southeastern	373	244,476	15,815	268,493	32,861	85,800	4,501	74,627	1,238	9,659	208,687	59,806	10,883	48,899	—19,461
Cincinnati, Hamilton & Dayton	622	724,511	109,013	940,347	127,479	142,430	16,912	335,393	3,377	18,682	636,264	304,083	32,201	271,781	—65,677
Cincinnati, Indianapolis & Western	322	151,792	47,843	219,089	31,723	26,261	6,404	78,882	445	6,407	149,961	69,128	8,941	60,187	.....
Cincinnati, New Orleans & Texas Pacific	337	837,588	179,068	1,068,899	76,181	200,979	30,786	270,128	3,908	24,484	606,467	462,432	48,300	414,132	201,473
Cincinnati Northern	246	161,339	14,013	181,839	25,063	28,448	4,095	53,067	.....	3,366	114,040	67,799	6,000	61,533	12,729
Cleveland, Cincinnati, Chic. & St. Louis	2,384	3,038,779	887,762	4,312,712	374,007	719,947	94,667	1,416,678	28,466	78,315	2,700,444	1,612,268	149,000	1,461,353	322,437
Coal & Coke	197	82,653	18,404	105,132	23,947	27,527	899	29,064	.....	3,289	84,726	20,406	5,000	15,406	3,596
Colorado Midland	338	153,549	15,834	179,178	23,945	31,196	6,456	75,155	1,105	5,437	143,293	35,885	9,000	26,885	23,866
Cripple Creek & Colorado Springs	87	92,140	11,920	105,462	13,501	11,272	3,789	26,289	.....	3,589	58,439	47,022	3,956	42,981	—699
Cumberland Valley	164	282,097	67,277	366,882	29,079	35,014	4,511	104,068	651	8,072	180,001	186,881	5,960	180,921	—43,957
Detroit, Grand Haven & Milwaukee	191	178,000	55,000	274,984	45,878	38,719	5,597	161,788	931	5,552	258,466	16,518	3,963	12,545	—96,673
Detroit, Toledo & Ironton	441	186,678	15,540	216,090	24,605	31,458	4,639	96,127	.....	6,357	163,186	52,904	6,000	46,903	—25,164
Duluth & Iron Range	277	837,680	21,414	881,681	57,514	65,804	1,415	191,351	2,112	10,432	327,817	553,864	50,979	502,885	112,682
Duluth, Missabe & Northern	411	1,872,149	30,969	1,985,542	130,012	127,948	2,738	335,283	1,198	11,584	608,763	1,376,780	126,024	1,250,755	403,634
Duluth, South Shore & Atlantic	601	235,925	91,252	358,238	67,934	48,078	6,716	118,660	4,167	8,485	254,041	104,198	19,000	85,193	13,244
Duluth, Winnipeg & Pacific	191	115,574	22,940	147,268	24,200	28,516	2,154	49,201	33	4,778	108,881	38,387	7,363	31,024	—8,881
El Paso & Southwestern Co.	1,028	933,018	213,594	1,208,655	141,154	121,612	18,211	275,613	6,857	25,901	589,348	619,307	39,529	579,778	284,848
Elgin, Joliet & Eastern	809	1,206,176	17	1,282,414	107,416	310,594	7,241	355,462	.....	21,127	801,059	481,355	40,254	441,101	—84,895
Florida East Coast	745	569,046	116,305	759,794	57,172	78,372	10,329	192,836	3,003	22,533	360,226	399,568	25,983	373,567	276,313
Fort Worth & Denver City	454	408,515	160,566	596,869	51,336	86,396	6,758	170,958	2,586	16,585	334,619	262,250	18,000	244,250	38,870
Galveston, Harrisburg & San Antonio	1,361	1,145,775	408,728	1,623,206	139,795	229,110	31,209	447,406	10,787	36,346	892,815	730,391	41,928	688,286	241,066
Grand Rapids & Indiana	575	341,530	123,990	516,825	60,703	83,220	10,148	207,971	2,642	18,373	383,058	133,767	25,328	108,439	4,055
Grand Trunk Western	347	540,000	156,000	767,337	87,264	134,209	16,667	301,228	7,929	14,110	561,407	205,930	36,637	168,841	73,783
Gulf & Ship Island	308	131,276	30,276	171,463	17,130	28,630	4,421	49,296	359	7,501	107,338	64,125	7,989	56,156	39,733
Gulf, Colorado & Santa Fe	1,938	1,352,069	332,972	1,783,764	241,028	184,579	26,766	496,820	.....	47,902	989 524	794,240	59,591	734,081	587,869
Hocking Valley	350	654,853	82,216	791,070	73,268	171,532	9,659	218,377	.....	15,308	488,144	302,925	46,000	256,819	8,002
Houston, East & West Texas	191	111,065	28,804	149,825	16,652	9,964	2,271	43,009	795	3,092	75,561	74,265	4,190	70,031	35,778
Houston & Texas Central	895	666,500	180,468	897,678	71,954	58,873	17,014	217,173	5,493	17,822	387,886	509,792	21,567	487,630	207,577
Illinois Central	4,767	5,072,498	1,273,672	6,819,182	1,058,035	1,417,784	115,921	1,983,756	39,033	172,515	4,766,710	2,052,472	334,000	1,717,504	508,874
Indiana Harbor Belt	109	.....	.....	426,763	53,655	44,529	2,761	169,520	.....	8,101	278,566	148,197	8,608	139,517	—212
International & Great Northern	1,159	876,885	258,513	1,208,901	128,139	157,008	21,877	375,092	5,040	28,163	697,908	510,993	35,000	475,770	225,248
Kanawha & Michigan	177	225,353	31,858	266,804	46,484	78,725	3,503	72,097	4	6,984	207,798	59,006	13,850	45,149	—70,218
Kansas City, Mexico & Orient	466	82,823	22,218	111,536	17,797	23,152	4,129	50,470	.....	5,753	101,300	10,235	5,000	5,234	—13,233
Kansas City Southern	837	861,368	138,325	1,096,040	117,148	130,253	30,930	305,850	.....	36,002	619,563	476,477	48,447	427,871	46,635
Lake Erie & Western	900	596,256	58,345	687,711	70,305	113,563	12,161	203,590	.....	12,229	411,848	275,863	28,500	247,362	71,257
Lehigh & Hudson River	97	183,306	4,706	194,425	28,386	20,295	1,435	57,359	.....	4,597	112,073	82,353	5,200	77,099	25,078
Lehigh & New England	296	272,132	1,443	286,143	41,572	31,709	1,989	73,559	.....	7,294	156,112	130,031	9,720	120,311	39,468
Lehigh Valley	1,444	3,766,901	390,318	4,434,852	535,369	710,733	84,936	1,634,385	17,605	87,150	3,065.357	1,369,495	158,000	1,211,398	—159,005
Long Island	397	401,996	688,638	1,269,953	131,782	135,058	15,044	539,708	8,467	33,975	862,848	407,106	74,545	332,400	46,152
Los Angeles & Salt Lake	1,154	626,739	230,523	949,187	101,961	161,327	31,235	265,024	18,466	18,825	589,174	360,013	54,005	305,989	65,456

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF OCTOBER, 1916—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Louisiana & Arkansas	279	$99,098	$20,932	$124,464	$27,504	$17,272	$3,665	$34,731	.....	$4,293	$87,464	$36,999	$42	$28,762	—$29,412
Louisiana Ry. & Nav. Co.	350	160,067	28,799	199,981	29,826	23,387	7,036	62,989	.....	6,544	129,782	70,199	10,985	58,993	—6,141
Louisiana Western	208	185,665	74,375	274,658	20,476	40,177	7,023	60,281	$1,928	6,645	136,476	138,182	13,699	123,987	53,780
Louisville & Nashville	5,071	4,339,746	1,114,458	5,841,790	760,464	1,014,368	131,415	1,626,738	19,433	125,670	3,647,952	2,193,838	226,555	1,966,412	432,086
Louisville, Henderson & St. Louis	200	106,228	37,140	151,754	35,187	23,559	4,722	44,410	.....	3,903	111,781	39,973	3,800	36,164	—2,230
Maine Central	1,211	788,307	329,012	1,204,694	144,848	149,145	10,902	412,505	3,368	26,132	746,670	458,024	51,586	406,433	93,469
Michigan Central	1,893	2,801,362	949,219	4,261,189	420,814	618,943	78,903	1,483,536	63,687	74,226	2,740,109	1,521,079	140,000	1,380,825	278,629
Midland Valley	385	163,554	49,423	222,022	34,743	31,230	2,526	63,241	.....	7,018	138,723	83,299	5,933	76,974	22,080
Mineral Range	120	98,010	2,577	103,337	24,269	15,252	327	39,327	.....	1,676	80,845	22,491	3,300	19,191	—6,602
Minn., St. Paul & Sault Ste. Marie	4,227	2,464,020	556,198	3,249,859	315,562	381,245	48,524	895,133	15,780	64,235	1,714,018	1,535,842	144,558	1,391,283	—357,909
Missouri & North Arkansas	365	85,257	34,203	126,947	19,138	15,724	4,135	38,640	.....	4,932	82,569	44,377	4,800	39,577	31,761
Missouri, Kansas & Texas System	3,865	2,728,904	926,345	3,898,918	709,645	657,934	58,584	1,137,518	17,284	95,286	2,676,128	1,222,789	127,129	1,094,988	191,010
Missouri Pacific	3,931	2,486,598	445,712	3,161,932	541,056	638,155	71,986	1,070,723	8,013	67,407	2,395,527	766,405	114,000	651,018	38,070
Mobile & Ohio	1,166	871,001	135,891	1,068,072	130,155	287,646	41,616	341,140	2,474	32,624	835,656	232,415	39,424	192,872	—59,978
Monongahela	108	160,052	10,396	173,228	30,303	8,298	888	38,185	.....	4,361	82,034	91,193	11,000	80,193	—12,917
Monongahela Connecting	6	.....	.....	108,689	17,520	16,572	300	60,194	.....	3,120	97,707	10,982	1,635	9,347	—9,291
Morgan's La. & Tex. R. R. & S. S. Co.	401	350,324	113,097	491,062	52,168	52,393	11,084	162,477	2,343	11,956	292,193	198,869	24,790	173,661	102,409
Nashville, Chattanooga & St. Louis	1,237	925,592	251,334	1,269,904	120,069	200,370	57,485	374,669	10,275	37,149	799,542	470,362	29,500	440,552	137,728
Nevada Northern	165	177,232	12,313	195,214	26,901	15,701	738	30,919	116	4,686	79,062	116,152	2,051	114,101	43,749
New Orleans & North Eastern	204	268,694	49,149	352,684	40,697	63,017	11,590	96,709	8,406	12,632	233,051	119,633	18,000	101,633	—20,240
New Orleans, Mobile & Chicago	402	126,333	28,201	164,149	22,802	26,276	3,965	51,763	8	6,740	111,554	52,594	6,564	45,970	17,445
New Orleans Great Northern	285	97,282	30,862	136,284	15,816	22,651	3,166	39,503	256	6,422	87,815	48,469	7,166	41,245	—4,150
New Orleans, Texas & Mexico	191	103,270	29,137	136,466	25,743	18,963	5,848	35,561	.....	7,145	93,261	43,204	1,346	41,846	4,515
New York, Chicago & St. Louis	571	1,253,973	123,367	1,425,861	107,414	380,785	52,101	571,364	4,718	27,096	1,143,167	282,693	42,000	240,693	—128,427
New York, New Haven & Hartford	2,005	3,421,820	2,775,029	7,087,456	894,225	890,887	38,644	2,672,891	98,069	172,413	4,764,727	2,322,729	260,000	2,061,176	—135,677
New York, Ontario & Western	568	446,861	97,271	634,209	96,261	132,271	8,508	272,360	.....	19,517	527,919	106,290	25,000	81,290	116,471
New York, Philadelphia & Norfolk	112	387,648	44,877	463,076	40,677	85,031	4,919	152,083	5,175	11,852	299,733	163,343	22,000	141,326	52,028
Norfolk & Western	2,086	4,542,270	529,999	5,266,244	598,722	899,772	64,186	1,243,754	9,391	86,987	2,885,166	2,381,078	255,000	2,125,964	80,087
Norfolk Southern	908	313,319	116,788	456,369	60,286	63,741	8,883	144,211	69	18,952	296,142	160,228	15,015	145,171	24,716
Northern Pacific	6,505	5,816,548	1,252,725	7,683,068	906,087	773,086	109,095	1,991,153	89,539	119,140	3,905,210	3,777,858	505,046	3,272,164	—106,555
Oregon Short Line	2,254	2,169,218	439,730	2,843,932	197,156	228,486	33,403	583,346	31,173	60,865	1,129,705	1,714,228	136,100	1,578,067	291,819
Oregon-Washington R. R. & Nav. Co.	2,054	1,395,158	392,155	1,959,640	216,533	174,730	44,116	573,075	25,159	70,015	1,100,285	859,356	94,050	765,097	137,141
Panhandle & Santa Fe	670	438,995	94,055	557,581	62,482	77,585	3,805	130,364	.....	12,042	286,200	271,380	17,079	254,302	65,971
Pennsylvania Company	1,755	5,073,864	1,051,360	6,826,131	717,504	1,160,475	93,372	2,344,544	42,874	143,058	4,498,841	2,327,291	415,496	1,911,732	—182,188
Pennsylvania Railroad	4,534	14,596,601	3,834,588	20,311,486	2,572,479	4,139,848	205,076	6,975,536	277,619	449,446	14,609,321	5,702,165	751,007	4,950,214	365,913
Pere Marquette	2,249	1,607,032	334,527	2,121,109	175,961	360,155	34,756	698,157	4,414	44,680	1,317,483	803,626	50,682	752,006	155,366
Philadelphia, Baltimore & Washington	717	1,205,614	841,074	2,247,790	305,671	448,561	27,336	869,854	170	52,115	1,702,049	545,741	65,620	480,062	—21,064
Pittsburgh & Lake Erie	225	1,855,676	180,447	2,185,343	159,263	352,666	14,554	485,505	4,210	34,518	1,050,717	1,134,626	84,400	1,050,226	—57,774
Pittsburgh, Cincinnati, Chic. & St. Louis	1,489	3,172,078	868,682	4,550,899	627,706	839,122	74,456	1,494,694	29,856	101,767	3,167,340	1,383,560	216,011	1,167,433	—47,843
Richmond, Fredericksburg & Potomac	88	165,632	97,528	295,675	28,782	42,530	3,657	100,145	2,260	7,645	185,019	110,655	7,186	103,434	26,011
Rutland	468	188,132	112,938	352,235	38,395	53,831	10,492	111,470	1,337	7,077	222,602	129,633	17,201	112,433	177
St. Joseph & Grand Island	258	182,033	27,930	222,131	24,661	25,398	4,094	62,526	590	4,719	121,989	100,142	7,956	92,181	47,204
St. Louis & San Francisco	4,752	3,383,184	1,223,955	4,910,579	625,503	755,681	66,646	1,426,834	.....	104,732	2,956,245	1,954,334	172,960	1,779,984	471,358
St. Louis, Brownsville & Mexico	548	272,166	162,935	452,383	45,547	35,923	8,596	103,566	.....	9,102	201,430	250,953	8,000	242,910	168,218
St. Louis, Iron Mountain & Southern	3,555	2,731,556	684,485	3,670,149	615,335	444,534	70,068	887,914	9,768	63,290	2,082,684	1,587,465	136,600	1,449,202	707,071
St. Louis Merchants' Bridge Terminal	9	.....	413	256,708	37,662	16,748	809	99,088	.....	6,710	161,016	95,692	10,576	85,073	13,730
San Antonio & Aransas Pass	726	403,187	109,455	539,617	74,631	53,017	7,308	181,611	.....	13,320	329,475	210,141	20,000	190,113	52,338
Seaboard	3,455	1,637,334	428,070	2,292,797	278,612	349,995	89,179	741,788	10,751	60,981	1,507,243	785,553	102,500	681,861	.....
Southern	6,983	5,040,493	1,563,583	7,248,070	1,145,690	949,883	191,858	2,086,448	39,175	184,628	4,548,285	2,699,784	264,332	2,433,287	553,599
Southern in Mississippi	281	68,051	41,302	119,049	23,006	9,054	2,913	39,771	.....	3,719	78,464	40,586	8,350	32,156	4,926
Spokane, Portland & Seattle	555	356,561	111,910	512,449	52,325	43,088	7,906	110,872	4,197	15,099	233,114	279,338	57,445	221,877	16,625
Tennessee Central	295	114,320	33,341	158,135	23,761	19,496	6,453	52,151	.....	6,635	108,495	49,640	4,566	45,016	25,586
Terminal R. R. Ass'n of St. Louis	37	.....	292	271,181	37,327	20,951	877	74,602	.....	3,632	137,391	133,791	41,369	92,422	—35,120
Texas & New Orleans	468	329,112	120,624	491,005	45,769	51,867	8,446	143,124	9,491	12,063	270,630	220,375	13,935	206,430	114,462
Toledo & Ohio Central	436	478,094	52,350	581,334	68,589	104,458	8,199	184,307	1,919	9,285	376,747	204,588	23,501	181,087	25,758
Toledo, Peoria & Western	248	68,390	41,746	126,288	16,764	27,734	2,423	37,841	.....	4,063	88,826	37,462	6,500	30,962	6,256
Toledo, St. Louis & Western	451	498,172	41,976	563,581	106,428	71,832	15,901	172,697	.....	10,410	375,537	188,054	19,000	169,054	27,496
Union Pacific	3,622	5,510,426	972,825	7,181,296	740,119	789,312	101,489	1,646,651	95,020	139,948	3,483,550	3,698,746	245,400	3,453,012	698,731
Union Railroad of Baltimore	8	158,027	25,524	185,371	15,255	.....	.....	6,629	.....	2,116	23,999	161,372	9,176	152,196	31,885
Union Railroad of Pennsylvania	32	.....	.....	559,794	50,038	116,364	108	222,365	.....	4,537	393,402	166,392	10,000	156,392	25,698
Vandalia	917	866,774	241,750	1,239,117	136,229	217,130	25,441	390,981	11,678	26,879	807,107	432,010	43,070	389,001	126,422
Vicksburg, Shreveport & Pacific	171	118,050	49,416	191,040	21,960	26,847	4,146	44,628	2,171	4,963	104,715	86,325	9,500	76,825	44,844
Virginian	510	749,913	44,121	839,026	65,415	101,747	5,547	175,612	20,147	17,530	384,091	454,934	33,500	421,433	203,392
Wabash	2,519	2,644,211	632,583	3,557,409	401,387	476,450	89,847	1,151,597	18,936	80,768	2,308,680	1,248,729	112,288	1,236,063	316,629
Wabash-Pittsburgh Terminal	63	105,873	9,612	123,583	18,042	20,939	1,717	32,688	1,731	7,732	83,849	40,734	7,500	33,234	7,785
Washington Southern	36	56,812	55,245	142,364	14,730	14,235	1,424	46,903	891	3,219	81,402	60,962	3,768	57,192	17,314
West Jersey & Seashore	359	231,174	291,873	570,224	120,719	117,218	11,095	256,981	2,664	16,187	524,837	45,387	39,340	6,126	3,388
Western Maryland	689	1,003,755	91,930	1,174,098	115,756	155,793	21,848	368,891	12,909	23,709	698,281	475,817	33,500	442,317	124,818
Western Railway of Alabama	133	80,232	41,116	135,875	15,884	22,885	6,922	33,297	1,998	4,787	85,773	50,102	6,331	43,770	10,890
Wheeling & Lake Erie	512	774,706	56,901	913,509	111,112	113,828	8,655	304,580	1,621	16,706	556,503	357,005	41,352	315,654	—16,196
Wichita Valley	257	72,876	28,540	105,941	16,471	8,316	115	52,283	.....	1,488	58,673	47,268	3,925	43,343	—1,120
Yazoo & Mississippi Valley	1,382	1,200,913	334,245	1,603,146	205,294	182,573	22,444	424,703	2,369	33,005	867,848	735,298	57,000	678,125	170,852

REVENUES AND EXPENSES OF RAILWAYS

FOUR MONTHS OF FISCAL YEAR 1917

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Alabama & Vicksburg	143	$389,830	$159,049	$609,364	$77,961	$121,228	$14,706	$203,820	$9,845	$23,861	$451,420	$157,944	$36,300	$121,645	$42,945
Alabama Great Southern	312	1,335,312	471,654	1,964,056	189,680	393,986	55,731	527,950	12,862	46,323	1,226,531	737,525	78,502	658,909	187,684
Arizona Eastern	378	1,072,243	182,797	1,342,285	211,794	129,606	9,433	259,153	10,035	51,400	671,014	671,271	59,604	611,559	182,081
Atchison, Topeka & Santa Fe	8,048	30,577,972	9,369,739	43,137,967	5,464,700	6,410,240	727,811	11,011,731	11,522	782,586	24,354,292	18,783,676	2,001,442	16,777,096	3,603,696
Atlanta & West Point	93	248,618	178,258	492,040	54,553	79,670	26,463	136,879	7,964	19,389	324,557	167,484	26,982	140,718	3,489
Atlantic & St. Lawrence	167	482,011	121,970	648,970	151,401	123,587	17,197	325,808	.....	19,083	637,076	11,894	39,580	—27,714	—31,215
Atlantic Coast Line	4,748	7,445,153	2,712,801	11,045,229	1,541,483	2,060,532	225,870	3,761,462	32,568	302,630	7,914,269	3,130,960	647,000	2,479,765	1,117,880
Baltimore & Ohio	4,539	32,269,823	6,348,176	41,877,521	5,159,440	8,062,027	762,143	13,935,477	320,523	916,087	29,148,601	12,728,919	1,386,587	11,334,641	—353,628
Baltimore, Chesapeake & Atlantic	88	366,850	197,041	588,940	33,302	121,940	7,453	266,600	.....	10,403	439,631	149,310	8,760	140,601	75,457
Bangor & Aroostook	632	892,065	259,910	1,224,991	176,908	211,297	16,033	322,486	15,016	51,308	792,485	432,506	53,480	378,972	101,185
Belt Ry. of Chicago	31	.....	.....	1,088,757	84,130	136,293	5,931	422,655	.....	25,720	674,729	414,028	54,572	359,457	36,564
Bessemer & Lake Erie	205	4,766,467	161,548	4,999,044	359,986	794,414	47,752	1,081,243	.....	57,870	2,280,239	2,718,805	154,402	2,564,391	—77,761
Buffalo & Susquehanna R. R. Corp.	253	542,606	24,989	578,029	89,381	140,589	5,802	157,936	.....	23,854	417,562	160,467	10,400	150,066	33,401
Buffalo, Rochester & Pittsburgh	586	4,008,668	456,314	4,665,094	642,149	1,088,308	52,459	1,496,018	6,099	89,965	3,374,999	1,290,095	88,000	1,202,654	112,698
Canadian Pacific Lines in Maine	234	279,013	77,299	390,693	93,357	63,632	23,364	153,640	.....	15,808	349,801	40,892	36,400	4,492	63,226
Central of New Jersey	684	8,413,077	2,649,032	11,952,737	985,858	1,983,887	139,880	4,063,351	64,431	281,063	7,515,656	4,437,081	576,513	3,860,560	129,763
Central New England	301	1,067,894	173,891	1,928,890	204,668	183,679	4,909	527,047	.....	23,676	943,890	984,999	61,500	923,487	167,875
Charleston & Western Carolina	342	491,841	126,252	652,119	113,524	99,601	17,578	194,481	.....	16,339	441,323	210,796	23,000	187,796	48,604
Chesapeake & Ohio Lines	2,378	13,139,278	2,525,306	16,792,016	2,198,509	3,073,444	225,112	4,606,147	133,855	353,591	10,584,278	6,207,738	524,430	5,684,015	499,154
Chicago & Alton	1,053	4,421,370	1,601,563	6,471,016	746,774	1,279,359	158,095	2,031,183	44,814	129,301	4,365,189	2,105,828	184,431	1,919,275	514,489
Chicago & Eastern Illinois	1,136	4,208,315	1,087,493	5,731,936	881,261	1,406,493	97,624	1,944,505	31,458	154,441	4,497,324	1,234,612	252,300	981,700	—82,607
Chicago & North Western	8,108	23,785,778	8,510,625	36,001,832	4,591,599	5,202,698	484,188	11,672,013	238,602	665,105	22,710,336	13,291,495	1,715,000	11,575,208	2,881,368
Chicago, Burlington & Quincy	9,373	27,605,636	8,508,964	39,455,112	4,332,351	5,855,766	554,308	10,740,860	323,201	770,958	22,577,444	16,877,668	1,590,842	15,286,826	3,201,701
Chicago, Detroit & Can. Gd. Trunk Jctn.	60	253,965	81,975	411,307	57,702	50,105	6,266	188,506	.....	5,967	308,547	102,760	13,948	88,807	—6,431
Chicago Great Western	1,496	3,933,683	1,337,546	5,756,132	900,635	867,462	194,306	1,780,965	42,706	145,485	3,924,999	1,831,132	198,348	1,629,387	492,929
Chicago, Indianapolis & Louisville	622	2,004,317	700,311	2,915,281	309,166	492,445	83,296	900,877	1,755	67,704	1,850,073	1,065,207	119,711	945,320	189,203
Chicago Junction	13	.....	.....	858,279	96,798	83,450	4,840	471,959	.....	20,004	677,051	181,228	13,166	168,062	—6,077
Chicago, Milwaukee & St. Paul	10,208	28,499,021	7,563,868	39,980,101	4,443,599	5,919,320	704,315	13,496,963	269,242	655,977	24,819,699	15,160,402	1,969,917	13,179,384	1,068,608
Chicago, Peoria & St. Louis	255	490,546	109,747	635,744	88,119	139,661	22,471	245,281	.....	22,797	518,328	117,417	24,000	93,413	3,673
Chicago, Rock Island & Gulf	477	886,015	273,312	1,240,400	179,789	165,555	39,611	359,502	4,503	35,225	784,119	456,280	31,456	424,453	194,360
Chicago, Rock Island & Pacific	7,653	18,903,999	7,443,446	28,342,203	3,898,891	4,578,765	541,073	8,955,204	185,566	626,893	18,723,094	9,619,110	1,191,653	8,422,232	3,926,698
Chicago, St. Paul, Minn. & Omaha	1,753	4,864,455	2,058,563	7,483,587	989,966	900,780	117,115	2,502,103	69,197	167,387	4,739,008	2,744,579	363,975	2,378,213	669,401
Chicago, Terre Haute & Southeastern	373	876,685	67,819	971,464	128,663	324,914	16,525	266,127	4,713	32,634	773,284	198,180	43,533	154,615	—30,315
Cincinnati, Hamilton & Dayton	622	2,948,766	472,151	3,866,162	534,562	526,976	62,766	1,329,342	13,875	74,415	2,526,653	1,339,508	122,928	1,215,214	—257,488
Cincinnati, Indianapolis & Western	322	590,773	201,478	869,155	125,494	109,830	27,546	310,179	1,741	25,557	599,737	269,418	37,264	232,154	.....
Cincinnati, New Orleans & Texas Pacific	337	2,967,648	739,716	3,934,633	308,797	879,501	107,556	1,024,483	23,637	83,571	2,427,545	1,507,088	158,800	1,348,169	539,414
Cincinnati Northern	246	607,765	78,080	712,085	104,152	116,053	14,610	206,325	.....	12,490	453,630	258,454	24,000	234,185	69,287
Cleveland, Cincinnati, Chic. & St. Louis	2,384	11,223,896	3,887,764	16,541,083	1,764,917	2,926,566	370,567	5,250,263	109,726	313,542	10,701,177	5,839,907	596,000	5,240,317	1,103,633
Coal & Coke	197	307,208	75,721	398,118	86,727	103,026	3,923	112,270	.....	11,961	317,906	80,212	20,000	60,212	—9,888
Colorado Midland	338	525,162	101,391	674,298	123,218	123,556	28,117	271,048	6,898	21,569	574,406	98,892	36,000	63,892	64,098
Cripple Creek & Colorado Springs	87	378,703	82,134	469,039	46,137	56,427	11,654	111,598	.....	13,098	238,913	230,126	26,764	203,278	3,350
Cumberland Valley	164	953,339	252,355	1,271,964	121,771	127,252	18,412	359,562	2,786	35,249	660,462	611,502	23,839	587,442	—104,210
Detroit, Grand Haven & Milwaukee	191	689,000	258,090	1,129,760	202,627	143,908	22,777	562,634	4,171	20,624	956,740	173,020	15,852	156,796	—227,669
Detroit, Toledo & Ironton	441	696,320	68,980	821,923	91,579	122,445	17,143	347,447	.....	24,259	602,873	219,050	24,000	194,958	—742
Duluth & Iron Range	277	3,607,277	86,053	3,792,914	308,011	309,573	5,714	765,673	8,759	44,959	1,434,324	2,358,590	230,101	2,128,489	181,921
Duluth, Missabe & Northern	411	7,652,804	127,991	8,126,772	542,068	477,376	11,750	1,225,328	4,736	49,881	2,311,139	5,815,632	527,444	5,288,188	1,430,836
Duluth, South Shore & Atlantic	601	862,909	406,415	1,401,830	257,099	168,351	29,185	442,398	17,711	38,505	953,249	448,580	76,000	372,565	44,564
Duluth, Winnipeg & Pacific	191	458,421	83,216	562,591	74,023	88,672	7,896	183,939	1,874	19,628	376,033	186,557	28,056	158,501	7,000
El Paso & Southwestern Co	1,028	3,526,159	858,374	4,614,621	460,598	475,621	72,660	1,029,138	26,713	101,552	2,166,281	2,448,339	158,116	2,290,152	1,218,974
Elgin, Joliet & Eastern	800	4,482,051	129	4,768,133	409,900	1,151,447	26,371	1,318,543	.....	81,150	2,985,537	1,782,596	159,585	1,623,011	—185,015
Florida East Coast	745	1,766,650	429,997	2,438,737	222,913	319,833	31,591	685,324	12,081	71,845	1,332,702	1,106,036	103,980	1,001,931	820,509
Fort Worth & Denver City	454	1,390,887	591,581	2,087,282	229,444	341,887	30,996	566,946	11,327	65,255	1,245,854	841,428	68,400	773,005	172,602
Galveston, Harrisburg & San Antonio	1,361	4,189,672	1,369,408	5,843,180	594,535	742,721	121,897	1,719,637	40,840	146,642	3,352,002	2,491,177	187,433	2,303,413	1,090,043
Grand Rapids & Indiana	575	1,224,823	729,367	2,152,780	253,636	321,681	42,923	824,945	14,145	70,532	1,527,862	624,917	99,258	525,601	15,033
Grand Trunk Western	347	2,299,000	660,000	3,181,973	323,172	543,806	68,968	1,091,137	31,754	58,835	2,117,673	1,064,300	146,548	916,525	66,445
Gulf & Ship Island	308	514,739	126,268	678,279	64,951	115,030	14,565	202,774	1,279	31,405	430,008	248,271	30,480	217,758	—36,450
Gulf, Colorado & Santa Fe	1,938	4,469,059	1,225,992	6,004,042	1,021,937	752,931	110,013	1,853,773	.....	189,629	3,918,633	2,085,408	238,061	1,845,086	1,206,210
Hocking Valley	350	2,601,924	360,194	3,199,057	303,176	719,096	34,794	849,268	.....	66,654	1,972,989	1,226,068	174,700	1,051,254	81,454
Houston, East & West Texas	191	386,513	120,373	542,373	84,454	60,554	8,729	164,488	3,181	12,445	333,318	209,054	22,581	186,233	98,438
Houston & Texas Central	895	2,121,382	636,463	2,929,206	301,669	309,517	65,516	777,700	19,186	70,443	1,540,944	1,388,261	120,020	1,267,240	584,787
Illinois Central	4,767	18,390,482	5,138,385	25,616,786	3,914,635	5,984,822	440,054	7,401,388	142,455	640,848	1,845,512	7,157,274	1,327,000	5,825,233	1,634,413
Indiana Harbor Belt	109	.....	.....	1,601,869	196,973	173,369	11,004	605,559	.....	32,027	1,018,931	582,937	32,457	550,336	129,533
International & Great Northern	1,159	2,763,833	970,715	4,003,418	491,579	638,552	87,377	1,321,630	20,051	114,296	2,607,064	1,396,354	130,000	1,265,911	712,310
Kanawha & Michigan	177	1,003,159	141,747	1,179,483	181,088	315,516	12,369	292,276	32	27,858	829,139	350,344	56,350	293,986	—109,843
Kansas City, Mexico & Orient of Texas	466	354,204	79,359	458,986	74,639	85,871	15,026	193,679	.....	18,586	387,794	71,192	20,000	51,169	86,130
Kansas City Southern	837	2,985,257	596,024	3,956,415	407,923	506,080	114,031	1,148,025	.....	140,075	2,312,157	1,644,258	193,425	1,449,135	141,551
Lake Erie & Western	900	2,252,392	279,333	2,671,379	274,896	422,038	53,881	803,613	.....	48,688	1,603,116	1,068,263	109,500	958,456	348,544
Lehigh & Hudson River	97	699,076	35,422	794,416	111,227	121,623	5,987	264,815	.....	17,604	521,255	273,161	20,200	252,862	—18,422
Lehigh & New England	296	946,887	5,342	1,012,122	162,028	137,829	8,112	270,695	.....	25,901	604,392	407,731	37,080	370,629	—216,436
Lehigh Valley	1,444	14,453,749	1,852,497	17,486,957	2,174,819	3,024,125	335,193	6,209,618	70,174	335,286	12,137,331	5,349,625	622,500	4,725,712	85,935
Los Angeles & Salt Lake	1,154	2,514,408	1,074,844	3,934,107	352,168	568,524	124,156	1,041,074	77,676	76,922	2,218,977	1,715,130	204,522	1,510,185	216,170
Long Island	397	1,501,380	3,710,572	6,016,021	564,115	541,796	62,085	2,112,071	27,186	137,549	3,439,540	2,576,481	292,589	2,277,776	274,076

REVENUES AND EXPENSES OF RAILWAYS

FOUR MONTHS OF FISCAL YEAR 1917—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of—										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Louisiana & Arkansas	279	$401,304	$76,410	$494,977	$102,244	$71,155	$14,566	$139,438	.....	$170,657	$344,469	$150,508	$32,506	$117,894	—$50,034
Louisiana Ry. & Nav. Co.	351	589,572	107,349	736,539	112,641	91,749	26,951	230,335	.....	26,755	488,432	248,107	43,985	203,877	— 5,940
Louisiana Western	208	586,368	262,680	901,536	87,333	133,470	28,416	201,379	$7,074	27,022	484,607	416,929	46,999	369,085	177,047
Louisville & Nashville	7,071	15,958,691	4,579,710	21,985,039	2,992,507	4,132,737	486,785	6,256,231	76,800	461,856	14,351,825	7,633,214	878,432	6,752,168	1,218,386
Louisville, Henderson & St. Louis	200	391,287	162,051	588,213	119,916	94,209	19,542	168,566	.....	12,951	415,186	173,027	15,200	157,763	48,764
Maine Central	1,211	2,756,812	1,543,265	4,661,506	590,782	572,956	55,866	1,635,960	31,794	110,955	2,997,639	1,663,867	200,362	1,463,392	293,861
Michigan Central	1,803	10,079,747	4,318,531	16,288,721	1,904,099	2,346,999	275,562	5,409,251	233,696	288,817	10,458,423	5,830,299	560,000	5,267,249	1,163,186
Midland Valley	385	565,063	180,023	772,254	141,858	123,426	10,660	217,762	.....	27,016	520,401	251,853	23,735	227,360	53,623
Mineral Range	120	363,976	13,456	388,860	73,219	63,903	1,554	155,456	.....	6,458	300,590	88,270	13,200	75,070	—25,907
Minn., St. Paul & Sault Ste. Marie	4,227	9,109,058	2,570,588	12,627,024	1,219,531	1,450,633	192,885	3,364,109	69,672	250,329	6,530,631	6,096,394	567,740	5,528,654	764,982
Missouri & North Arkansas	365	301,768	155,503	487,892	69,685	52,042	15,802	146,319	.....	20,911	304,759	183,132	19,200	163,902	145,789
Missouri, Kansas & Texas System	3,865	9,291,322	3,506,441	13,673,932	2,597,101	2,505,417	239,176	4,179,222	80,716	388,372	9,985,623	3,688,309	511,559	3,168,843	533,384
Missouri Pacific	3,931	9,189,624	1,958,470	12,080,771	2,138,059	2,432,782	304,272	3,993,298	36,676	277,984	9,158,333	2,922,437	446,442	2,469,355	405,228
Mobile & Ohio	1,160	3,265,800	512,611	4,009,097	512,500	996,458	149,756	1,332,472	9,908	125,758	3,126,852	882,245	154,616	727,015	62,936
Monongahela	108	621,772	41,795	675,213	111,446	40,525	3,080	149,524	.....	16,818	321,394	352,818	30,000	323,819	7,385
Monongahela Connecting	6	.....	.....	442,168	65,806	60,818	1,200	227,879	.....	11,885	367,587	74,581	7,887	—32,183	107,999
Morgan's La. & Tex. R. R. & S. S. Co.	491	1,150,488	399,251	1,660,722	227,753	270,990	44,329	558,805	8,721	47,012	1,156,311	504,411	93,840	408,683	218,280
Nashville, Chattanooga & St. Louis	1,257	3,368,854	1,068,816	4,682,751	524,080	839,678	214,173	1,494,431	40,699	145,764	3,255,506	1,427,245	116,000	1,309,565	375,155
Nevada Northern	165	671,079	49,975	741,693	93,554	55,925	2,972	113,459	366	19,066	285,343	456,351	20,725	435,626	143,774
New Orleans & North Eastern	204	968,898	214,152	1,322,887	153,703	237,318	41,499	371,272	31,049	49,882	884,721	436,166	64,900	373,266	48,364
New Orleans, Mobile & Chicago	402	522,831	112,973	668,115	99,029	105,160	16,369	207,540	323	26,615	455,035	213,081	26,936	186,823	23,650
New Orleans Great Northern	285	450,246	119,892	600,545	61,464	87,465	11,522	164,403	899	26,228	351,981	248,564	21,501	226,926	35,976
New Orleans, Texas & Mexico	191	326,406	98,382	439,243	81,502	75,785	21,664	119,600	.....	26,716	325,268	113,976	5,420	108,543	23,863
New York, Chicago & St. Louis	571	4,471,186	620,350	5,304,146	478,711	1,244,904	202,076	2,028,499	20,956	109,480	4,083,276	1,220,870	168,000	1,052,764	—157,083
New York, New Haven & Hartford	2,005	13,422,002	11,269,625	28,310,169	3,327,459	3,522,129	172,206	10,205,754	375,012	678,747	18,277,049	10,033,120	1,039,000	8,991,879	324,337
New York, Ontario & Western	568	1,834,029	1,028,364	3,362,613	453,358	498,100	32,747	1,154,869	.....	75,307	2,210,872	1,151,740	100,000	1,051,715	62,033
New York, Philadelphia & Norfolk	112	1,548,120	202,495	1,886,870	161,947	368,417	19,038	619,030	20,709	45,664	1,234,208	652,662	64,000	588,466	165,121
Norfolk & Western	2,086	17,498,011	2,215,457	20,057,561	2,699,183	3,456,336	250,413	4,870,012	40,624	338,493	11,581,161	8,995,309	920,000	8,074,995	632,685
Norfolk Southern	908	1,089,717	488,588	1,688,206	245,144	252,138	34,037	542,998	449	74,282	1,149,047	539,159	55,059	483,605	89,850
Northern Pacific	6,505	21,051,899	5,470,327	29,032,834	3,873,398	2,979,224	417,619	7,530,027	377,152	429,300	15,525,800	13,707,034	1,924,610	11,777,466	1,522,686
Oregon Short Line	2,254	7,414,421	1,844,130	10,007,211	997,367	875,997	131,588	2,069,253	131,968	237,159	4,438,942	5,578,269	621,400	4,956,484	1,127,257
Oregon-Washington R. R. & Nav. Co.	2,054	4,855,391	1,724,617	7,194,279	1,045,889	685,058	180,169	2,122,139	98,639	281,234	4,399,906	2,794,373	377,700	2,416,021	142,294
Panhandle & Santa Fe	670	1,577,514	366,186	2,031,052	287,817	302,234	16,218	477,067	.....	45,949	1,128,635	902,417	53,818	848,362	326,350
Pennsylvania Company	1,755	20,670,698	4,518,379	27,974,105	3,170,238	4,510,770	367,645	8,883,988	157,711	576,944	17,645,247	10,328,858	1,400,552	8,922,184	483,384
Pennsylvania Railroad	4,534	57,035,832	16,304,491	80,585,772	10,086,611	15,546,936	849,062	26,882,086	1,092,761	1,902,138	56,329,907	24,255,865	2,980,616	21,275,661	265,767
Pere Marquette	2,249	5,436,848	1,728,330	7,919,648	735,146	1,400,600	141,351	2,585,773	21,732	171,562	5,054,073	2,865,574	206,412	2,658,801	587,550
Philadelphia, Baltimore & Washington	717	4,744,463	3,429,406	8,966,062	1,165,476	1,722,799	113,980	3,360,869	478	316,066	6,574,340	2,391,721	260,236	2,131,102	188,243
Pittsburgh & Lake Erie	225	7,275,360	772,087	8,602,847	727,516	1,303,913	55,007	1,876,151	16,702	131,883	4,111,172	4,491,675	304,600	4,187,074	172,634
Pittsburgh, Cincinnati, Chic. & St. L.	1,489	12,292,654	3,540,333	17,796,440	2,469,680	3,301,807	295,472	5,652,529	115,647	410,813	12,241,004	5,555,436	781,186	4,774,706	586,559
Richmond, Fredericksburg & Potomac	88	672,024	371,950	1,177,402	94,554	155,688	15,216	370,650	8,542	31,768	676,418	500,984	34,726	466,195	153,301
Rutland	468	696,717	502,920	1,403,553	169,808	220,232	42,781	445,427	5,079	28,131	911,458	492,095	69,662	423,027	22,468
St. Joseph & Grand Island	258	638,994	115,388	801,749	114,921	95,683	17,161	221,042	2,140	19,253	470,201	331,549	31,852	295,566	211,519
St. Louis & San Francisco	4,752	13,416,846	4,760,267	18,295,532	2,446,177	3,435,328	270,762	5,489,990	.....	427,348	11,995,281	6,870,350	695,352	5,672,036	1,377,996
St. Louis, Brownsville & Mexico	548	1,038,706	733,630	1,872,404	203,145	158,463	35,136	454,515	.....	38,807	887,361	985,043	31,000	952,470	634,840
St. Louis, Iron Mountain & Southern	3,555	9,351,496	2,606,283	12,844,963	2,481,537	1,963,692	278,551	3,307,804	38,005	365,842	8,279,386	4,565,577	539,144	4,025,374	1,425,005
St. Louis Merchants' Bridge Terminal	9	.....	1,507	902,246	139,907	53,469	3,247	363,473	.....	27,642	587,738	314,509	33,376	281,069	69,984
San Antonio & Aransas Pass	726	1,196,849	425,940	1,718,460	240,850	198,914	29,018	627,470	.....	50,981	1,145,896	572,564	80,000	492,509	161,880
Seaboard	3,455	5,499,683	1,721,557	7,992,949	1,065,781	1,300,411	317,223	2,720,391	40,203	244,683	5,666,699	2,326,250	415,641	1,910,609	.....
Southern	6,993	17,130,149	6,310,874	25,754,159	3,934,625	3,819,267	686,465	7,985,625	154,694	710,230	17,139,018	8,615,141	1,037,899	7,595,814	1,160,283
Southern in Mississippi	281	225,146	129,132	386,140	91,644	34,898	9,708	142,964	.....	14,201	293,416	92,724	33,400	59,075	30,483
Spokane, Portland & Seattle	555	1,234,395	585,674	2,003,354	224,981	164,827	33,593	419,198	18,947	60,873	920,004	1,083,360	229,780	853,681	14,664
Tennessee Central	295	417,958	153,108	605,482	94,162	77,507	23,440	203,114	.....	26,398	424,620	180,862	18,468	162,464	58,974
Terminal R. R. Ass'n of St. Louis	37	.....	1,045	990,584	119,717	69,942	3,523	284,513	.....	11,913	489,608	500,976	124,538	376,410	—11,045
Texas & New Orleans	468	1,166,673	416,022	1,726,910	200,449	289,814	31,698	510,568	43,146	43,537	1,118,534	608,376	73,518	534,366	240,738
Toledo & Ohio Central	436	1,926,801	245,855	2,343,544	290,834	455,630	30,031	748,475	7,489	41,938	1,574,356	769,187	94,005	675,047	210,216
Toledo, Peoria & Western	248	240,756	153,224	434,422	68,704	115,252	9,939	146,558	.....	16,029	356,482	77,940	26,460	51,480	578
Toledo, St. Louis & Western	451	1,768,984	210,278	2,082,222	339,552	283,567	65,095	636,546	.....	36,792	1,355,698	726,524	74,500	651,847	144,712
Union Pacific	3,892	19,324,241	4,137,822	25,789,777	3,482,069	2,798,342	403,043	5,720,939	387,717	542,794	13,731,867	12,057,909	1,217,600	11,329,017	2,587,983
Union Railroad of Baltimore	8	578,435	103,788	689,467	52,094	.....	.....	24,569	.....	9,333	85,995	603,472	31,845	571,627	148,240
Union Railroad of Pennsylvania	32	.....	.....	2,235,633	136,856	396,789	455	845,772	.....	17,962	1,396,795	838,838	47,703	791,136	—48,127
Vandalia	917	3,146,677	965,570	4,627,973	687,841	854,408	102,563	1,497,009	45,534	106,899	3,294,817	1,338,157	164,388	1,173,974	174,128
Vicksburg, Shreveport & Pacific	171	363,603	179,080	611,716	82,701	105,879	15,503	172,294	8,127	20,775	405,275	66,441	37,940	169,301	85,034
Virginian	510	2,615,898	185,562	2,978,181	293,764	438,376	22,899	603,082	66,893	63,470	1,481,418	1,496,764	157,000	1,369,731	337,604
Wabash	2,519	9,290,357	2,779,058	13,141,973	1,412,469	1,958,389	362,124	4,366,926	78,266	381,790	8,873,333	4,718,640	408,821	4,308,485	1,290,876
Wabash-Pittsburgh Terminal	63	428,546	37,322	499,885	77,955	66,147	7,354	126,522	7,553	20,978	306,357	193,528	30,000	163,528	105,668
Washington Southern	36	224,435	214,663	565,150	55,925	58,116	5,542	117,409	3,686	14,211	254,981	310,169	15,735	294,433	82,306
West Jersey & Seashore	359	854,293	2,354,436	3,642,861	514,062	439,190	57,509	1,135,939	12,369	70,619	2,229,533	1,413,327	153,469	1,079,703	6,415
Western Maryland	689	3,627,090	437,328	4,366,352	467,574	595,439	92,641	1,315,310	50,979	88,803	2,608,588	1,757,764	131,000	1,675,764	459,312
Western Railway of Alabama	133	358,249	146,724	454,697	61,464	88,133	25,984	119,870	7,247	17,411	320,081	134,616	24,384	110,128	35,959
Wheeling & Lake Erie	512	3,402,949	255,478	3,764,176	557,205	514,264	38,471	1,123,589	6,336	62,293	2,301,157	1,462,019	162,358	1,299,584	343,551
Wichita Valley	57	122,050	93,817	331,308	54,926	30,697	385	93,288	.....	5,405	184,712	146,597	15,835	131,060	.....
Yazoo & Mississippi Valley	1,382	3,946,151	1,035,511	5,238,827	828,115	739,633	83,992	1,481,703	7,747	130,737	3,256,910	1,918,917	278,000	1,753,359	538,520

Disastrous Collision in Japan

Press despatches from Tokio, November 30, report a collision, on the line between that city and the north coast, in which 130 soldiers were killed.

Disastrous Collision in Hungary

Press despatches of December 1 report a collision of passenger trains on the line between Vienna and Budapest, in which 66 persons were killed and over 100 injured. Among the killed were two high officers of the government.

Revenues and Expenses of Express Companies for July

The Interstate Commerce Commission has issued the following statement, which is subject to revision, compiled from the monthly reports of operating revenues and operating expenses of the principal express companies for July, 1916. (The express companies have three months in which to make reports).

Item	Adams Express Co.		American Express Co.		Canadian Express Co.	
	1916	1915	1916	1915	1916	1915
Mileage of all lines covered (miles)	45,153.38	44,930.22	74,364.85	74,466.64	12,049.93	10,264.13
Charges for transportation	$3,700,651	$3,099,118	$5,131,671	$4,346,539	$382,814	$307,674
Express privileges—Dr.	1,772,847	1,532,653	2,565,497	2,186,999	190,101	157,121
Operations other than transportation	53,380	47,916	237,840	211,761	5,652	5,262
Total operating revenues	1,981,184	1,614,381	2,804,015	2,371,301	198,365	155,716
Operating expenses	1,864,631	1,449,592	2,601,884	2,081,972	158,413	136,820
Net operating revenue	116,553	164,789	202,130	289,329	39,952	18,895
Uncollectible revenue from transportation	259	280	894	637	45	...
Express taxes	19,704	15,600	39,335	35,422	4,700	4,200
Operating income	96,499	148,907	161,900	253,268	35,206	14,695

Item	Great Northern Express Co.		Northern Express Co.		Southern Express Co.	
	1916	1915	1916	1915	1916	1915
Mileage of all lines covered (miles)	9,837.99	9,582.80	8,274.70	8,233.03	34,864.60	34,707.60
Charges for transportation	$346,418	$313,848	$339,297	$328,908	$1,199,169	$1,053,495
Express privileges—Dr.	209,957	189,775	183,666	175,004	603,725	537,623
Operations other than transportation	6,352	4,960	4,104	3,727	20,594	22,104
Total operating revenues	142,813	129,033	159,734	157,631	616,038	537,976
Operating expenses	96,926	91,221	102,633	94,299	544,247	498,609
Net operating revenue	45,887	37,812	57,101	63,332	71,790	39,367
Uncollectible revenue from transportation	2	19	14	32	53	71
Express taxes	14,253	4,284	5,000	5,000	14,322	13,792
Operating income	31,631	33,509	52,086	58,299	57,414	25,503

Item	Wells Fargo & Co.		Western Express Co.		Total for companies named	
	1916	1915	1916	1915	1916	1915
Mileage of all lines covered (miles)	107,483.54	114,589.52	5,248.89	5,232.87	297,277.88	302,006.81
Charges for transportation	$4,239,219	$3,477,462	$149,776	$122,266	$15,489,020	$13,049,215
Express privileges—Dr.	2,171,210	1,806,294	72,360	56,191	7,769,368	6,641,664
Operations other than transportation	94,612	92,633	3,728	3,426	426,266	391,793
Total operating revenues	2,162,621	1,763,801	81,144	69,501	8,145,918	6,799,344
Operating expenses	1,808,650	1,576,265	61,784	55,968	7,239,173	5,984,750
Net operating revenue	353,971	187,536	19,359	13,532	906,745	814,594
Uncollectible revenue from transportation	1,592	881	9	12	2,872	1,936
Express taxes	37,969	34,711	1,066	925	136,441	113,937
Operating income	314,409	151,943	18,283	12,594	767,432	698,721

The Eighty Per Cent Movement

Senator Newlands presented in the United States Senate on Wednesday a petition signed by Robert T. Frazier, as chairman of the committee, and 300,000 railway employees in the eighty per cent movement, started on the part of those not members of the brotherhoods, asking the appointment of a commission to investigate and fix hours and wages of all railway employees and for compulsory arbitration of disputes over wages and hours.

Opposition to Centralized Government

William Jennings Bryan, at a dinner given in his honor in Washington on Wednesday evening, formally advocated the adoption of prohibition as a national issue by the Democratic party; and expressed opposition to exclusive Federal control of railroads, and to an increase in the military and naval forces of the country. On the railroad issue he said:

"An effort is now being made by the railroads to secure legislation, and if necessary, a constitutional amendment depriving the States of all regulative power over them, and giving to Congress exclusive control over railroad regulation. This is the most far-reaching change that has been proposed since the organization of our government—and which, if made, would involve incalculable harm. It would practically obliterate State lines and lead to a centralization which would threaten the very existence of our dual form of government."

Tentative Valuations Protested

The Atlanta, Birmingham & Atlantic and the Texas Midland have filed protests against the tentative valuations of their properties recently made public by the Interstate Commerce Commissions. The governor of Texas and the Texas Railroad Commission have also protested against some features of the Texas Midland valuation and the Western Union has also objected to the valuation of the Atlanta, Birmingham & Atlantic property leased to it.

Bibliography on Valuation

Bulletin 190 of the American Railway Engineering Association, which has just been issued, contains a detailed list of references to discussions of the valuation of steam railways, which has been compiled by the Bureau of Railway Economics, Washington, D. C. This bibliography fills 150 pages, and is arranged under the following heads: General discussion; uses and purposes; methods and bases; items to be valued; land valuation; concessions, donations, grants of rights, etc.; treatment of property constructed by investing surplus earnings; treatment of adaptation and solidification of roadbed; depreciation; the Federal valuation; state valuation; and valuations of individual companies. The complete index contains over 1,400 references to articles, papers and discussions of this important subject.

Illinois Manufacturers' Association

At a meeting of the directors of the Illinois Manufacturers' Association at Chicago a committee was appointed to appear before the Newlands commmittee and present the views of the association. These are contained in a bulletin recently issued under the caption, "Regulation, Incorporation or Damnation," which states that the association is in favor of broadening the powers of the Interstate Commerce Commission to give it control over intrastate, as well as interstate, rates, and over the wages and hours of railroad employees. It recommends that strikes and lockouts be declared illegal, pending investigation and mediation, and endorses the federal incorporation of public carriers. The association declares itself opposed to any increase in the membership of the Interstate Commerce Commission, and to government ownership. The committee, which will go to Washington, is composed of Charles T. Piez, president of the Link-Belt Company, chairman; D. E. Felt, president of the Felt & Tarrant Manufacturing Company; A. H. Mulliken, presi-

dent of Pettibone, Mulliken & Co.; E. Tyner, vice-president of E. V. Price & Co., and O. F. Bell, traffic manager of the Crane Company.

Chicago Praises Boston

Henry D. Capitain, chairman of the Chicago Board of Aldermen's Transportation Committee, which recently visited Boston to inspect the transportation system of that city, is quoted as follows:

"No city in the world has as much rapid transit in proportion to its size or so enormous an investment in proportion to population as Greater Boston. No city furnishes more rapid transportation from point to point. The Cambridge subway is conceded to be the finest high-grade system in the world. Washington street tunnel at an expense of $8,500,000 for one mile of double track tunnel, built under the direction of the transit commission with the money of the citizens of Boston, under most difficult circumstances due to the nature of the street and buildings, with most trying conditions to be met by the engineers, is the most expensive mile of transportation facility in the world, not exceeding the Jungfrau tunnel, which was built through solid granite.

"No other system in the world furnishes absolutely a universal transfer from rapid transit lines operating under ground, on the surface, and overhead, to surface lines operating underground, on the surface and overhead, and vice versa; carrying passengers throughout an area of 85 square miles and giving a ride of 17 miles for five cents.

"No other system in the world issues or permits of as many transfers per capita as does the Elevated road, with its 100,000,000 paper transfers and approximately the same number of bodily transfers per year. No other transportation system in the world has such an enormous investment per capita on which a return must be earned. . . . No other system in the world has a universal five-cent fare through the limits of 13 cities and towns."

Canadian Pacific Provides Farms for Soldiers

The Canadian Pacific, through its department of natural resources, has formulated a plan for the colonization of veterans of the war on its western lands. The areas which will be available for colonization are of two kinds, improved farms and "assisted colonization" farms. The former comprise those in selected colonies with distinctive military names, which have been improved by the erection of a house, a barn and fences, the cultivation of a certain area of land, and the provision of a water supply, before the colonist goes into occupation. Each colony will contain a central control farm in charge of a superintendent, who will supervise the work of all the colonists. Central control farms will be used for purposes of demonstration and as supply depots for male livestock, and for implements to be used by the colonists in common, as follows: One drill, one mower, one binder, and one rake for each three farms.

There will be only a limited number of improved farms available, but land to an almost unlimited extent can be provided under the assisted colonization plan. Under this scheme farms are first selected by the intending colonist and then improved by him with assistance from the company in the way of advances of building and fencing material, live stock, implements and seed grain. Both plans provide easy terms of payment for the land over long periods, as well as direct financial aid at fair rates of interest if desired in the first year of occupation. Applicants for these lands must be married men of good moral character, who can produce proof of having been in active service in the Canadian army or the British army or navy, who are physically fit and have had experience either as a farmer or farm laborer. All mineral rights on the lands purchased (including rights to gas and petroleum) are reserved by the company.

Illinois Central Crossing-Accident Campaign

Twenty-two persons killed and 51 persons injured in automobile accidents is the record of the Illinois Central system, in four months, according to the Illinois Central Magazine of November. This issue is devoted largely to the automobile peril at railway grade crossings and includes a large number of letters and newspaper editorials commending the warning circulars which were distributed in the towns throughout the Illinois Central's lines in September by T. J. Foley, general manager. This circular called attention to the appalling number of accidents at grade crossings resulting from careless motoring and made a special appeal to automobilists to stop, look and listen before crossing tracks. Some of the letters received by Mr. Foley advocate making approaches to grade crossings as rough as possible so that motorists will be forced to slacken speed or be dumped out. Others advocate legislation requiring automobilists to stop at crossings, declaring that no real results will be accomplished until this is done.

A careful check, by division officers, of one hundred grade crossings on all parts of the Illinois Central system, between the hours of 8 a. m. and 6 p. m., disclosed the fact that in approaching crossings automobilists exercise much less precaution than drivers of horse-drawn vehicles. It was found that 72 per cent of the motorists looked in neither direction, but ran over the tracks at a reckless rate of speed, while but 27 per cent of the occupants of horse-drawn vehicles thus disregarded the danger. During this period of four months there was not a single serious case of injury to an occupant of a horse-drawn vehicle, and there were no serious automobile accidents on the Illinois Central lines in Indiana or in Louisiana, where motorists are required by law to stop before passing over a railroad crossing at grade.

Where automobilists fail to stop and make sure that the way is clear before driving upon a railway track, higher courts in most states have held that there can be no recovery against the railroad; but despite this fact, these accidents increase, and promise to become more numerous with the great increase in automobiles, unless some measure of relief shall be found. There is today one automobile for every 44 people in the United States. The production of automobiles in this country in 1915 was 892,618, and at the present rate the production for this year promises to be over 1,500,000.

In addition to sending out 100,000 circulars, as aforementioned, the Illinois Central management has caused its division officers to inspect carefully every grade crossing on the system, with instructions, wherever practicable to do so, to clear the view at crossings by the cutting down of trees, removal of small embankments, unimportant structures and other obstructions.

Suit by An Expelled Brakeman

H. F. Spayd, of Pottstown, Pa., an employee of the Pennsylvania Railroad and a member of the Brotherhood of Railroad Trainmen, has begun suit in court at Norristown, Pa., against the officers of that brotherhood to compel them to revoke his dismissal from his lodge. He had been a member of the brotherhood since 1901. In February, 1915, he signed a petition asking the Pennsylvania legislature to repeal the "full crew" law of that state; and when he refused a request from the officers of the lodge to withdraw his name he was expelled. He appealed to W. G. Lee, president, and then to the grand lodge, but his dismissal was everywhere approved. Mr. Spayd tells the court that the law in question forces the Pennsylvania railroad needlessly to spend more than $1,000,000 annually, which money could have been applied to the betterment of the conditions of all classes of employees of the road. By his expulsion he is deprived of $1,500 life insurance and other rights.

He contends that, as a citizen of Pennsylvania, he has a right under the state constitution to petition the legislature for redress; that this right is one of the essential principles of liberty and free government, and paramount to constitution, general rules or laws of the Brotherhood of Railroad Trainmen which are in conflict therewith. Therefore, the actions of lodge or high officers are ineffectual and void. He also avers that the federal constitution forbids states and organizations within states, including the Brotherhood of Railroad Trainmen, from enforcing rules, "which in the least impair the right of the citizen to petition the government for a redress of grievance."

Bonuses to Santa Fe Employees

The Atchison, Topeka & Santa Fe announced on December 5 that bonuses aggregating $2,750,000 would be distributed to employees. President E. P. Ripley, in a circular, said:

"In the last two years, especially since the influence of the European war has been fully felt, our railway has enjoyed what appears to be an abnormal prosperity. The same factors which have produced this prosperity have made substantial increases—which it is hoped will be temporary—in the cost of living.

"In recognition of these conditions our board of directors

to-day authorized us to make in a lump sum a distribution of additional compensation equal to 10 per cent of a year's pay to all employees who have been in the service for at least two years and whose annual compensation does not exceed $2,500, and whose compensation is not paid according to present or former contract schedules.

"The payments of the amounts thus authorized will be made as soon as the necessary computations can be completed. It is estimated that the amount thus to be distributed will be approximately $2,750,000."

It is understood that 25,000 employees will receive bonuses. The classes who work under contract schedules and who thus are excluded from the bonus order are the conductors, enginemen, brakemen and firemen.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Demurrage Officers.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., New York. Next convention, December 5-8, 1916, Engineering Societies' Bldg., New York.

American Wood Preservers' Association.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

Association of Transportation and Car Accounting Officers.—G. P. Conard, 75 Church St., New York. Next meeting, December 12-13, 1916, Ansley Hotel, Atlanta, Ga.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 30 Church St., New York. Next annual meeting, January 16, 1917, Waldorf-Astoria Hotel, New York.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August. Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The Chamber of Commerce of Birmingham, Ala., has raised $15,000 to start a Traffic and Transportation Bureau.

The New York City subways, operated by the Interborough Rapid Transit Company, on November 20, carried 1,400,747 passengers, a larger number than ever before recorded in one day.

South Dakota Supreme Court issued a permanent injunction on Tuesday restraining express companies from increasing intrastate tariffs in obedience to an order of the Interstate Commerce Commission, equalizing intrastate and interstate rates.

The Boston & Albany has this week placed an embargo at its western termini on all of the less important commodities. The Baltimore & Ohio, on account of the irregular arrival of vessels from Europe, has placed an embargo on all grain for export, except corn.

The St. Joseph (Mo.) Railroad Club held its monthly banquet on November 13, and was addressed by B. H. Harris, vice-president and general manager of the Chicago, Milwaukee & Gary, Chicago, Ill., on the "Passing of the Demagogue as a Factor in Railway Regulation and Legislation."

W. J. Dockstader, general traveling agent, foreign department of the American Express Company, addressed the monthly meeting of the Traffic Club of Dayton, Ohio, on November 14, on the difficulties experienced by exporters in selling their goods in foreign markets. C. N. Hunt, of the Northern Pacific, delivered an illustrated lecture on Yellowstone Park.

Officers of the Baltimore & Ohio have announced in Baltimore that financial arrangements have been made for establishing a line of large steamships between Baltimore and South American ports; but, owing to the fact that ship yards everywhere are at present very busy, it is not known how soon the ships for the new line can be built. The reports indicate that Argentine capitalists are heavily interested in the new project.

Work has been begun at 138th street, New York City, on extensive docks for the use of the barges which are to navigate the enlarged Erie Canal. The estimated cost of this New York terminal is $700,000, and the city has made the necessary appropriations. The opening of the canal, from the Hudson river to Buffalo is still far in the future but it is expected that it will be opened to Oswego, on Lake Ontario, in the spring of 1917.

Central States Conference Rail and Water Transportation will meet at Evansville, Ind., on December 14 and 15 to discuss important transportation questions. Among the prominent speakers will be Frank Trumbull, chairman of the board of the Chesapeake & Ohio; Alfred P. Thom, counsel of the Railway Executives' Advisory Committee; G. M. Freer, president of the National Industrial Traffic League, and W. G. Lee, of the Brotherhood of Railway Trainmen.

The St. Marys Falls Canal at Sault Ste. Marie, Mich., was used for the transportation of 14,031,262 short tons of cargo in the month of August, 1916, setting a new record. The September record was 12,906,524 short tons. The tonnage for August is nearly four times the quantity carried through the Panama canal during the fiscal year ending June 30, 1916. During that year, however, the Panama canal was closed approximately six months.

A freight car loaded with automobiles remained in the railroad yards at Denver for 89 days without being unloaded, according to the Denver Commercial. Other carloads of automobiles stood at Denver for 27 days, 12 days and 13 days, respectively. It was facts like these that led the Public Utilities Commission of Colorado to order demurrage rates increased from the old rate of $1 to $3 a day, as announced in a recent issue of the *Railway Age Gazette.*

It is reported from Detroit that some automobile factories may have to suspend operations because of lack of transportation. Motor cars valued at nearly $10,000,000 are now stored in factories there awaiting shipment. The National Automobile

Chamber of Commerce has appointed committees to visit railroads throughout the Central Freight Association territory, and in the East, to urge compliance with the Interstate Commerce Commission's recommendation that automobile cars be returned promptly to their home lines.

As a result of the inability of the National Railways to provide cars, many of the large private concerns of Mexico are buying engines and cars, and are running private trains of coal, ore, etc., over some divisions of the system. More than 500 privately purchased freight cars entered Mexico through the Laredo and Eagle Pass gateways during the last half of November. In southern Mexico several large plantation owners have bought cars and engines to handle their products. Most of the coal mining companies in the State of Coahuila are hauling their output to Monterey and other industrial centers.

The New York, New Haven & Hartford announces that, beginning December 26, it will unload and place in storage all goods which are not unloaded by the consignees within 10 days after cars are placed for delivery on public team tracks. If there is no storage space available at the station where the car is placed for delivery, the freight will be sent to a station at which storage accommodations can be obtained, and all expenses incidental to the storage of the freight, including demurrage, trackage and transportation charges to and from the station at which the freight is stored, will constitute a lien on the property. When such cars remain loaded five days, the railroad agent must notify the consignee in writing that unless delivery of the goods is taken before the expiration of the ten days, the car will be unloaded by the road; also that, if during these 10 days the weather is such as to damage the freight if taken from the car, allowance for this weather interference will be made. The consignee is to have 10 days free from weather interference in which to unload the car before any action is to be taken by the railroad.

A Chain of Links

The Southern Railway in its latest passenger department folders shows a list of 114 golf links at places on or reached by its lines. There is a directory, giving the links in the different Southern States according to each state, the number of holes and length in yards of each.

New York Traffic Club

The New York Traffic Club, at its meeting November 28, elected officers for the ensuing year as follows: President, T. N. Jarvis, vice-president of the Lehigh Valley; secretary, C. A. Swope; treasurer, Frank C. Earle.

Half-Million Tons of Shipping

Business is booming in the shipyards along the Delaware river on a scale quite unprecedented in this or any other district. Seven large yards and a number of smaller ones are working to capacity, and new contracts are constantly coming in. One hundred and two vessels of various types, aggregating almost 500,000 tons, and valued at almost $150,000,000, have been contracted for, and 90 of them are already reported on the ways. This is undoubtedly more than war-time prosperity. In fact, a greater rush of business is looked for on the Delaware after the war is over.—*Philadelphia Press.*

Master Ticket Thief Caught

After a search of two years the Railway Ticket Protective Bureau, Chicago, has secured the arrest and conviction of Cleve E. Williams, telegraph operator and ticket thief. In September, 1914, the bureau was advised by the Southern Pacific that its station at Madera, Cal., had been robbed of a considerable portion of its ticket stock apparently by the telegraph operator and night ticket agent, J. E. Bridges, who disappeared concurrently with the theft. A prompt investigation by the bureau disclosed that sales of these tickets had been made in Kansas City, Omaha, St. Paul and Minneapolis through ticket scalpers, hotel clerks and porters. By persistent efforts the bureau identified the culprit as one Cleve E. Williams, and learned that he had been employed on 14 different railways of the country as a telegraph operator, in each instance disappearing with tickets or express money orders. His most profitable venture was realized by his theft of 39 Southern Express Company money orders, a number of which he adroitly forged and cashed for considerable sums of money. Williams was finally arrested at Grand Junction, Colo., through the investigation of the use of two trip passes stolen from the offices of the Denver & Rio Grande by his brother, who was employed by that company as a stenographer under the alias of J. E. Jones. Under the direction of the bureau Williams was taken to Denver, where he was arraigned before the district federal court for the violation of Interstate Commerce Act, and found guilty and fined $100. The bureau promptly notified the Southern Express Company, which arranged for his extradition to Atlanta, Ga., where he was convicted of the theft of the money orders, and sentenced to a four-year term in the state prison.

Remedy for Congested Coal Traffic

[*From Coal Age.*]

How would it be if the next time the miner asks for an increase to suggest to him a differential between winter and summer? By paying the miner higher wages in the winter the price of coal would automatically favor summer purchasing. And why, when freight rates are raised, which is sure to happen soon, could not the railroads arrange to put all that increase on the winter service? The railroads would gain immensely by regularity of operation, which would enable them to keep their equipment in continued profitable operation and their employees steadily at work. It would also increase their traffic at the one period of the year when it is conducted at least cost and with least loss. The coal operator is the only factor that is making concessions to correct the seasonal demands of the industry, and he will continue to contribute liberally toward regularity of production.

Steps to Relieve Car Shortage; Per Diem Raised to 75 Cents

On page 1039 of this issue reference is made to the order of the Interstate Commerce Commission allowing increased demurrage charges, and to the American Railway Association's Conference Committee on Car Efficiency. On Tuesday the general secretary of the American Railway Association issued a circular saying that, in order that the special committee of railroad transportation officers, previously known as the Conference Committee on Car Efficiency, might have all the authority of the Commission on Car Service, in co-operating with the Interstate Commerce Commission in relieving the freight car situation, the executive committee at a session held today (1) accepted, at their requests, the resignations of the members of the Commission on Car Service; (2) dissolved the Conference Committee on Car Efficiency, and (3) appointed, as provided for in Rule 19, the following as members of the reconstructed Commission on Car Service, with temporary headquarters in Washington: Fairfax Harrison, chairman, president, Southern; W. L. Park, vice-president, Illinois Central; C. M. Sheaffer, general superintendent transportation, Pennsylvania; E. J. Pearson, assistant to president and vice-president, New York, New Haven & Hartford; W. A. Worthington, vice-president and assistant to chairman, Southern Pacific, and George Hodges, secretary.

In another circular issued on Wednesday announcement was made that the Commission on Car Service had increased the rate for the use of freight cars to 75 cents a day, effective December 15, 1916, until May 1, 1916.

Transcontinental Rate Hearing at Salt Lake

At the Salt Lake hearing of the Interstate Commerce Commission on transcontinental rates before H. A. Thurtell, attorney-examiner, testimony was introduced by representatives of Utah industries for the purpose of showing that business in that state is hampered by discriminations in rates favorable to coast points. F. A. Sweet, president of the Standard Coal Company, stated that discriminatory tariffs kept the production of the Utah coal fields down to 3,500,000 tons a year, while equitable freight rates would result in a production of not less than 15,000,000 tons a year. He explained that the Wyoming coal fields, which have an advantage in rates to eastern points, have an annual output of 11,000,000 tons. N. T. Porter, representing marble quarries, testified that the supply of marble in Utah was

almost unlimited and of a finer quality than found almost anywhere else in the country, but that, owing to excessive freight rates, it was impossible to operate the quarries except to a limited extent. He stated that while the railroads had declined to grant a rate on marble of 60 cents per 100 lb. from Utah points to New York City, they had published a rate of 52½ cents on bullion between the same points. Various jobbers and manufacturers complained that territory naturally belonging to Utah was not accessible to them because of the high freight rate adjustment. J. F. Shaughnessy, associate commissioner of the Nevada Railroad Commission, declared that the people of Nevada were dissatisfied with the prevailing rates into Utah territory, which, he said, placed a handicap on Nevada jobbers in attempting to compete with jobbers and wholesalers at coast points. H. W. Prickett, traffic manager of the Traffic Service Bureau of Utah, introduced 20 exhibits of freight rates as evidence. These contain an analysis of 25,800 rates, which Mr. Prickett tried to show not only unduly favor coast points, but in many instances bring a return to the carriers of 150 per cent on the haul. He showed that in some instances it costs $160 more a car to ship goods to Salt Lake from eastern points than from the same points to San Francisco, 800 miles farther. The hearing at Salt Lake was adjourned last week, to be continued at San Francisco this week.

Increased Demurrage Rates in Illinois

In accordance with an agreement between the railroads of Illinois and the coal shippers and dealers, reached at the conclusion of a hearing on proposed rules governing reconsignment and demurrage at Chicago last week, the State Public Utilities Commission issued an order providing for a revised demurrage schedule applicable to coal cars only, effective December 6, and to expire on May 1, 1917. Its main provisions are as follows: 48 hours free time at loading and unloading points, and 24 hours free time for reconsigning, following which $1 will be charged for the first day, $2 for the second day, $3 for the third and $5 for the fourth and all succeeding days.

In view of the pronounced opposition of the coal shippers and dealers to the reconsigning rules proposed by the carriers (published in the *Railway Age Gazette* last week), the railroads did not press for immediate action on those rules, but asked for an early hearing and a full investigation of the whole matter by the commission. Michael F. Gallagher, attorney for the Coal Dealers' Association of Chicago, and H. C. Barlow, of the Chicago Association of Commerce, both protested strongly against any curtailment of reconsignment privileges. They argued that the rules proposed by the railroads would have the effect of impeding the free movement of coal cars rather than accelerating it, and would reduce the coal supply of Chicago and other large Illinois cities, rather than increase it. They alleged that the railroads were inefficient, and that freight service was so irregular that consumers of coal could not keep up their supply by direct shipments from the mines, but that upon the arrival of coal cars at the yards it was necessary to reconsign them to points where storage space was at that time available. They also introduced evidence to show the delay of cars in the Chicago yards was due partially to the fact that the carriers did not act promptly on orders for reconsignment. They held further that reconsignment was a right, the compensation for which was included in the freight tariff. This position was assailed by A. P. Humburg, of the Illinois Central, representing the railroads, who argued that reconsignment was a privilege which could be withdrawn by the carriers at any time. Mr. Humburg disputed the charge that the railroads were inefficient, pointing out that in October, 1916, the Illinois Central moved cars in Illinois an average of 46.9 miles per day, and that the Chicago, Milwaukee & St. Paul showed an average movement of 33.33 miles per can per day, this year, as compared with 25.9 miles in 1913.

Mortimer Flynn, of the Bottinger & Flynn Coal Company, large coal dealers in Chicago, disconcerted the attorneys of the coal men when he testified that coal operators were shamefully violating contracts with him, and that as a result he was in danger of losing his trade, despite the fact that private investigation on his part showed that the operators were receiving plenty of empty cars at their mines, and were shipping coal to other points.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended until May 29 the operation of items in tariffs filed by various western carriers providing increased carload minimum weights on grain and wheat flour in carloads.

The attorney general of Texas, on behalf of the Texas Railroad Commission and of shippers of that state, appeared before the commission at Washington on Wednesday, and argued for a reopening of the Shreveport case. During the five years of litigation on this case, the Texas commission, hitherto, has refused to take any part.

The Interstate Commerce Commission has suspended until April 6, 1917, the clause, in a tariff of the Chicago, Rock Island & Pacific, which withdraws joint through rates on lumber from points in Arkansas to Pensacola, Fla.

Lumber from North Pacific Coast Points to Texas

William Cameron & Company, Inc., et al. v. Abilene & Southern, et al. Opinion by Commissioner Clark.

A rate of 72 cents per 100 lbs. on lumber products in carloads from North Pacific coast points to Austin and Waco, Tex., is found to be unreasonable and prejudical. A rate of 63½ cents is prescribed as a just and reasonable maximum rate for the future. Reparation awarded. No fourth section violation is shown to exist. (41 I. C. C., 521.)

Rates on Corn from Sioux City, Ia.

Traffic Bureau of the Sioux City Commercial Club et al v. Chicago, Burlington & Quincy et al. Opinion by Commissioner Daniels:

Rates from Sioux City, Ia., to points in Kansas, Oklahoma and Missouri, on corn and corn products originating at specified points on the Great Northern in Minnesota, are held not shown of record to be unreasonable, discriminatory, or unduly preferential as alleged. (41 I. C. C., 518.)

Storage for Imported Wood Pulp

Mechanical & Chemical Pulp Division of the American Paper & Pulp Association v. Baltimore & Ohio et al. Opinion by Commissioner Hall:

Upon complaint that the rules and practices of defendants providing storage for imported wood pulp at the ports of Baltimore, Md., Philadelphia, Pa., and Newport News, Va., for unlimited periods, and without compensation in addition to the freight rates from the ports, are discriminatory and subject complainant's members, to unlawful prejudice and disadvantage; the commission holds that the rules and practices in question should be replaced by others allowing only such free time as may reasonably be required for unloading or removal, with reasonable charges for storage thereafter. The case is held open for further proceedings, and defendants are called upon to submit to the commission proposed measures for removing objectionable features of the present rules and practices. (41 I. C. C., 506.)

Rates on Grain from South Dakota to Des Moines

Beaver Valley Milling Company et al. v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner Daniels.

Rates on wheat and coarse grain from points in South Dakota to Des Moines, Iowa, are found unjust and unreasonable, and defendants are given until February 1, 1917, to propose tariffs to remedy the situation.

The proportional rate of 8 cents on wheat and 7 cents on coarse grain from Des Moines to Kansas City, Mo., on shipments destined beyond to points in Kansas, Oklahoma and Texas, are not found unreasonable or discriminatory, except as regards territory intermediate to Omaha and Des Moines, as to which a readjustment is required.

Rates on grain from Des Moines to points in Northeastern Missouri and near-by points in Illinois on the Wabash, the Missouri, Kansas & Texas, and the Chicago & Alton, are found prejudical to Des Moines and to accord undue preference to Omaha, Neb. Defendants are required to remove this discrimination. (41 I. C. C., 533.)

Rates on Sugar from California to Texas

American Beet Sugar Company et al. v. Southern Pacific et al. Opinion by Commissioner Clements.

The commission holds that a rate of 85 cents per 100 lbs., minimum 36,000 lbs., on sugar from producing points in California to Texas common points, is not found unreasonable in itself.

This rate, compared with a rate of 44 cents per 100 lbs., minimum 24,000 lbs., on sugar from producing points in Louisiana to Texas common points, is, however, found prejudicial, for the reason and to the extent that the carload minimum is higher from California than from Louisiana, and because the Louisiana rate applies on mixed carloads of sugar and molasses, while the California rate does not.

The case is held open for the purpose of enabling defendants to readjust the carload minimum and mixed carload provisions of their tariffs in conformity with the views expressed in the report. (41 I. C. C., 631.)

STATE COMMISSIONS

The Railway Commission of Canada will hold a hearing at Toronto, December 11, on the application of the principal roads of the Dominion for authority to increase the rate of demurrage on freight cars from $1 a day to $4 a day. Demurrage collections in Canada now average about $90,000 a month.

The railroads of Illinois have filed tariffs with the State Public Utilities Commission of Illinois providing for a fare of 2.4 cents a mile between all points in Illinois, effective January 1, in accordance with the decision of the Interstate Commerce Commission in the case of the Business Men's League of St. Louis vs. the Atchison, Topeka & Santa Fe et al. The railroads' application for an injunction against interference with the filing of these tariffs by the utilities commission was to be heard by the United States District Court at Chicago on December 7.

The South Dakota Board of Railroad Commissioners will hold a hearing on December 19 on the new demurrage tariffs showing advanced rates. The Public Service Commission of Wyoming, which was to hold a hearing on proposed demurrage rules on December 4, postponed consideration of the matter, the date for the new hearing not being given. The railroad commissioners of Iowa, who were to hold a hearing on demurrage rules on December 5, postponed the hearing until December 19. The Public Service Commission of West Virginia has suspended all proposed demurrage tariffs.

The thousands of Mexican refugees of the poorer class who have entered Texas during the last few months have brought a new problem upon the railroads which the railroad commission has been requested to solve. In Mexico it is a general practice of families when traveling to carry their bedding and other worldly possessions with them in the passenger cars; and this practice has been introduced into Texas to such an extent that the railroads have petitioned the commission to promulgate a prohibitory rule, and to require that all such belongings be enclosed in trunks or similar containers when shipped as baggage. The matter will be considered by the commission at a hearing on December 12.

The Pennsylvania Public Service Commission has approved new passenger tariffs issued by the Pennsylvania and the Philadelphia & Reading for commutation tickets between Philadelphia and points within 30 miles thereof, showing a general reduction in rates, though there are a few increases. The fares which are now changed are not those of the regular daily "commuters," but those riding occasionally and who buy fifty-ride or one-hundred-ride tickets. On these tickets the average basis of fare is to be one and one-sixth cents a mile. The roads had proposed an average rate of one and one-half cents a mile, but after repeated conferences and to meet strenuous opposition on the part of associations of passengers, a compromise was made; and this compromise has now been approved by the Public Service Commission. The fifty-ride tickets are good to be used any time within six months from the date of purchase. These reductions are to meet persistent complaints which have been kept up since the advances which were made in suburban fares about two years ago.

PERSONNEL OF COMMISSIONS

David H. Crowley, assistant attorney general of Michigan, has been appointed by Governor Ferris to membership in the Railroad Commission, succeeding Lawton T. Hemans, deceased.

E. D. Chassell, formerly state senator, and more recently state binder of Iowa, has been appointed a member of the Board of Railroad Commissioners of Iowa, succeeding the late James H. Wilson.

William H. Connolly, chief clerk of the Division of Valuation of the Interstate Commerce Commission, and also secretary of the National Association of Railway Commissioners since 1907, died suddenly at his home at Bethesda, Md., on December 4. Mr. Connolly was formerly for several years chief clerk of the Interstate Commerce Commission.

James H. Wilson, a member of the Iowa State Railroad Commission, the announcement of whose death was made in these columns in a recent issue, was born in Kings county, N. Y., in 1846. Enlisting in the 127th New York Volunteers in 1862, at the age of 17, he served throughout the Civil War, being mustered out at Charleston, S. C., in 1865. He settled in Adair county, Ia., in the late sixties. He died on November 22 at the age of 70 years. He was appointed to the Iowa State Board of Railway Commissioners in 1914.

COURT NEWS

Delay in Transporting Live Stock

The New Hampshire Supreme Court holds that the fact that a railroad had for a long time always delivered Monday shipments of cattle at a market destination before a certain hour on Tuesday, and that it knew that these shipments, if delivered later than that time, could not be sold on the day of receipt, has no tendency to prove an agreement to deliver such shipments at such a time. Proof that a shipment of cattle was delayed considerably longer than a reasonable time, does not, it was held, raise any presumption of fault of the railroad causing delay, where, from all that appears, it is as probable that the delay was not, as that it was, caused by the railroad's fault. In an action for loss caused by delay in transporting live stock, the railroad was held not in fault for unloading cattle for feeding, unless it was not warranted in thinking that it would be impossible for the shipment to be delivered within the 28-hour period prescribed by the federal act.—Wood v. Boston & Maine (N. H.), 98 Atl., 480.

Insufficient Evidence of Unseen Accident

The evidence in an action for death showed that the deceased was last seen walking in broad daylight along the company's platform beside its four-track railroad, where a side track crossed the platform; that a train approached him from the rear, of which he had notice, and that his mangled body was afterwards found about 25 feet from the platform. There was no other evidence as to how the accident occurred. The Pennsylvania Supreme Court held that there could be no recovery.—Biddle v. P. B. & W. (Pa.), 98 Atl., 566.

Accident to Switchman

A night switchman, who had worked only 24 days, was injured by being squeezed between a car which was slightly wider than those he had previously handled and the door of a shed; and he sued the company for negligence in not informing him of the extra width of the car. The Michigan Supreme Court held there was no negligence on the part of the company, in the absence of any excuse for the plaintiff's failure to observe that the cars were of unequal width.—Sage v. Wyandotte Terminal (Mich.), 159 N. W., 139.

Stop, Look and Listen Rule

Because of the fact that a collision betweeen a railroad train and an automobile endangers, not only those in the automobile, but also those on board the train, and also because the car is more readily controlled than a horse vehicle and can be left by the driver, if necessary, the law exacts from him a strict performance of the duty to stop, look and listen before driving on a crossing, where the view is obstructed, and to do so at a time and place where stopping, looking and listening will be effective. This doctrine, which is that of the Federal Circuit Court of Appeals (168 Fed., 21) is approved and applied by the Louisiana Supreme Court in a case where the automobile driver did not stop, look and listen, or even check his speed before he collided with a passing locomotive.—Callery v. Morgan's Louisiana & Texas (La)., 72 So., 222.

Contributory Negligence of Passenger

An employee of locomotive works, an old railroad employee, was directed to accompany two dead engines moving on their own wheels as freight. His fare as a passenger was paid, but he signed a paper advising him that, in riding on and getting on and off freight trains, he was liable to be exposed to unusual risks and dangers. The two dead engines formed part of a long freight train. In running down a grade their bearings began to get hot. He signaled the conductor and got off to examine the engines. He was warned of the danger of alighting on the side he did, because of passenger trains, both by the engineman and a brakeman. The train went on for several miles, when it was stopped again and the care-taker got off, without looking or listening for approaching trains, and stood in the space between the parallel tracks, reduced by the overhang of 2 feet to a train, to 3 feet 5½ inches. He was struck by a train; and he sued for his injuries. The Virginia Supreme Court of Appeals holds that he was guilty of contributory negligence, barring recovery. The fact that the engineman may have promised to stop the train in a place safe for him to inspect the dead engines did not relieve him from the obligation to use ordinary care for his own safety.—Pennsylvania v. Jenkins (Va.), 89 S. E., 96.

Provocation for Profanity

In an action against a railroad company for an alleged assault by its section foreman on the plaintiff, a laborer, who was staying in the foreman's house while recovering from injuries, the evidence was held by the Kentucky Court of Appeals to show that the plaintiff was the aggressor, and that if the foreman cursed him and demanded that he leave the house, as alleged, it was the result of his own prior profanity. Even admitting that the foreman cursed the plaintiff, and told him to leave when he declined to sign a release, these acts were not an "assault" for which the railroad would be liable, an assault being an unlawful offer of corporal injury to another by force, or force unlawfully directed against the person of another, under such circumstances as to create a well-founded fear of immediate peril. Nor could the plaintiff recover for mortification of feeling caused by such acts of another servant unaccompanied by physical injury. L. & N. v. Simpson (Ky.), 188 S. W., 297.

Maximum Rate Statutes

Injunction was applied for by the state of Nebraska against certain railroads, forbidding them from violating the mileage book statute and the two-cent rate statute. Before the petition was filed the Rock Island and the Missouri Pacific, two of the defendants, had sought in the federal courts injunction restraining the enforcement of the statutes. The attorney general, learning of this, no doubt thought it his duty to enjoin all the railroads in the state from violating the statute. The petition alleged that the Chicago & North Western, the Chicago, St. Paul, Minneapolis & Omaha, and the Burlington were conspiring and confederating with the other defendants to violate the statutes. On the hearing, however, it was shown that these roads had obeyed the provisions of the statutes since their passage in 1907, and affidavits of their managing officers showed their intention to continue to do so. There was a total lack of proof of intention on their part to depart from the policy they had theretofore pursued. The application was therefore denied.—State v. Rock Island (Neb.), 159 N. W., 410.

Proof of Negligent Killing of Animals

The West Virginia Supreme Court of Appeals holds that negligence justifying recovery against a railroad for killing dumb animals on the track must be established either by positive proof of the fact, or by facts proved from which negligence may reasonably be inferred; and the burden is on the plaintiff to show negligence. The mere finding of dead animals, such as cows, near the track is not enough.—Underwood v. Chesapeake & Ohio (W. Va.), 89 S. E., 2.

In another action, for the killing of horses at night, the same court held the railroad not liable where the only testimony was that of the engineman and fireman, who saw nothing but the bushes moving beside the track at the curve where the horses were struck, the killing being unavoidable.—Christian v. C. & O. (W. Va.), 89 S. E., 17.

UNITED STATES SUPREME COURT

The United States Supreme Court on Monday, December 4, handed down several decisions in railroad cases. The court denied the authority of the Interstate Commerce Commission to require the Louisville & Nashville, and the Nashville, Chattanooga & St. Louis to switch cars of competitive freight for the Tennessee Central, at Nashville, and authorized the issuance of an injunction to restrain the enforcement of the commission's order. Justices Day, Brandeis, Clarke and Pitney, in a dissenting opinion, declared that the decision of the majority of the court would open wide the door to discriminatory practices. The decree of the district court for the middle district of Tennessee was reversed and the case remanded, with directions that the injunction issue without prejudice to the further orders of the commission.

The court also sustained a decision by the Alabama supreme court upholding as constitutional an Alabama law imposing a franchise tax on the capital stock of domestic corporations. The decision, by Justice Day, was in a suit filed by the Kansas City, Memphis & Birmingham, a consolidation of railroads incorporated in Alabama, Tennessee and Mississippi, but itself incorporated in Alabama, which contended that the tax on its capitalization was a burden on interstate commerce, because approximately half of the capitalization was issued against property outside of the state. The court finds nothing in the amount or character of the tax which makes it a burden upon interstate commerce, and says that the fact that a wholly intrastate corporation may own no property outside of the state, while the consolidated company does thus own, presents no case of arbitrary classification.

The Union Tank Line Company filed a brief in the case involving the authority of the Interstate Commerce Commission to require railroads to furnish tank cars, on which arguments had been submitted to the court some weeks ago. The motion to file the brief was opposed by Solicitor General Davis.

In an opinion by Justice Clarke the court affirmed dismissal of a suit against the Northern Pacific in which the government sought to punish the road for neglecting to report cases in which trainmen had been kept on duty more than 16 hours. It is held that such a violation, if not in bad faith, does not make the road liable to the penalty of $100 a day.

The Supreme Court decided in favor of the Great Northern in the case of William B. Ward. Ward was a switchman in Minneapolis, and was injured in an accident, and died a few minutes later without regaining consciousness. The road averred that he did not legally "live" after the accident so as to give his administrator the right to sue for damages under the employers' liability act; and that view is sustained.

In an opinion by Justice Brandeis the court reversed the decision of the district court for the northern district of California, which had enjoined the enforcement of an order of the Interstate Commerce Commission in connection with the transcontinental rate cases. The commission, in its order, denied the application of terminal rates to certain cities in California, which are not ports of call, including Sacramento, Santa Clara and San Jose. The inland cities of the Pacific slope have thus failed in their suit to be put on an equality with the seaports. Associate Justice Brandeis announced the unanimous decision of the court dissolving the injunction. The cities and towns affected number 182.

Railway Officers

Executive, Financial, Legal and Accounting

C. F. Coleman has been appointed auditor of passenger accounts of the Southern Pacific, Texas Lines, at Houston, Tex., a newly created position.

T. F. Darden, assistant to president of the Atlantic Coast Line at Wilmington, N. C., has been elected assistant secretary, with headquarters at Wilmington.

J. D. McCraney, chief clerk to the president of the Southern Pacific, Texas Lines, at Houston, Tex., has been appointed freight claim agent, with the same headquarters.

A. E. Sweet, vice-president of the Denver & Rio Grande, with office at Denver, Colo., will take over the duties also of general manager, vacated by James Russell, resigned to go with another company.

Frederick W. Green was appointed assistant to the first vice-president of the St. Louis Southwestern, with office at St. Louis, Mo., effective November 1, 1916. He was born April 30, 1871, at Rock Island, Ill. He studied civil engineering under private tutors for five years. In 1889 he entered the service of the Chicago, Rock Island & Pacific as a laborer in a roundhouse at Rock Island, Ill. From August, 1893, to June, 1894, he was yard clerk at the World's Columbian Exposition, Chicago, Ill. In September, 1894, he took employment with the Chicago & Alton as a trucker and checker in the freight house at Chicago, and from August, 1895, to January, 1898, he was yard clerk and assistant yardmaster on the same road at Chicago. In January, 1898, he was made agent and operator, leaving this company in February, 1899, to take a position with the Kansas City Suburban Belt at Kansas City, Mo., as chief clerk to the superintendent. From December, 1899, to April, 1900, he held a similar position on the Fitchburg Road, Boston, Mass., and from April, 1900, to March, 1901, he was general yardmaster with the same company, leaving in March, 1901, to become trainmaster of the Union Terminals at Sioux City, Ia. On June 20, 1903, he went to the St. Louis, Iron Mountain & Southern as superintendent of terminals at Little Rock, Ark. From January, 1905, to July, 1906, he was division superintendent. On the latter date he was appointed general superintendent of the Louisiana & Arkansas, with office at Stamps, Ark., and was advanced to general manager in June, 1911, which position he held at the time of his recent appointment.



F. W. Green

C. M. Kittle, assistant to the president of the Illinois Central, with office at Chicago, Ill., has been elected vice-president of the Illinois Central and the Yazoo & Mississippi Valley, with the same headquarters.

Daniel Uthegrove, formerly district attorney for the St. Louis-Southwestern at Dallas, Tex., has been appointed general solicitor, with headquarters at St. Louis, Mo. This office was abolished some time ago, but is now reëstablishsd.

Clarence W. Huntington, vice-president and general manager of the Minneapolis & St. Louis, at Minneapolis, Minn., has resigned to become chairman of the board and executive committee of the Virginia Railway, with headquarters at New York, succeeding C. W. Hotchkiss, deceased.

G. B. Herbert, freight claim agent of the Southern Pacific, Texas Lines, at Houston, Tex., has been promoted to assistant auditor, with the same headquarters. J. D. McCraney has been appointed to succeed Mr. Herbert and C. G. Webb has been appointed assistant freight claim agent, with headquarters also at Houston.

J. S. Dennis, assistant to the president of the Canadian Pacific who for many years has been located at Calgary, Alta., as head of the company's department of natural resources has been transferred to Montreal, Que. The administration of the department will be turned over to P. L. Naismith, who has been manager for some years. Mr. Dennis, at Montreal, will be assistant to Lord Shaughnessy, in charge of important questions of colonization and the development of natural resources.

Operating

C. C. Porter has been appointed manager of the Sugarland Railway at Sugarland, Tex., effective December 1.

E. A. Campbell has been appointed assistant superintendent of the Smiths Falls division of the Canadian Pacific, with office at Smiths Falls, Ont.

J. W. Riley, general superintendent of the Pittsburgh & Lake Erie, at Pittsburgh, Pa., has tendered his resignation to become effective on January 1.

J. A. Combs has been appointed superintendent of terminals of the Fort Dodge, Des Moines & Southern, with office at Fort Dodge, vice O. E. Slater, deceased.

W. J. Deneen has been appointed chief despatcher for the St. Louis, Brownsville & Mexico, with headquarters at Kingsville, Tex., succeeding O. O. Hollingsworth, assigned to other duties.

James Russell, general manager of the Denver & Rio Grande, with office at Denver, Colo., has resigned to become vice-president and general manager of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn.

James P. Carey, superintendent of the St. Joseph & Grand Island at St. Joseph, Mo., has been appointed superintendent of the Kansas division of the Union Pacific, with headquarters at Kansas City, Mo., succeeding R. L. Davis, resigned.

James Alvis Jones, whose appointment as superintendent of telegraph of the Southern Railway, with headquarters at Washington, D. C., has already been announced in these columns, was born in March, 1873, at Leaksville, N. C., and was educated in the public schools, and later took a course in Danville, Va., Business College. He began railway work in January, 1890, with the Richmond & Danville, serving as telegrapher and agent at several different places on this road, and with its successor, the Southern Railway. He was later engaged in installing multiplex telegraph apparatus at different important points, and subsequently was appointed chief clerk to the superintendent of telegraph of the same road. Mr. Jones remained in this position until December 1, when he was promoted to superintendent of telegraph, as above noted. During his 25 years' service Mr. Jones was engaged in several different departments of the business, thus becoming familiar with railroad management in its numerous branches.



J. A. Jones

J. A. Power, superintendent of shops of the Southern Pacific, Texas Lines, at Houston, Tex., has been appointed assistant general manager, succeeding George McCormick, with the same headquarters. J. W. Surles, general foreman, succeeds J. A. Power as superintendent of shops.

J. H. Dodds, assistant division superintendent of the Southern Pacific at Bakersfield, Cal., has been appointed superintendent of freight terminals of the Oregon Short Line, with headquarters at Ogden, Utah, succeeding H. L. Bell, promoted.

Traffic

Stephen T. Stackpole, Canadian freight agent of the Pennsylvania Railroad at Toronto, Ont., has been appointed assistant foreign freight agent, with headquarters at New York.

James C. Hayes, commercial agent of the New York, Chicago & St. Louis at Kansas City, Mo., has been appointed commercial agent at Los Angeles, Cal.; the former office is discontinued.

Sheldon A. Volkman, traveling freight agent for the Great Northern, with headquarters at Portland, Ore., has been promoted to general agent at St. Paul, Minn., succeeding H. F. Sanborn, resigned.

Henry F. Sanborn, general agent of the Great Northern at St. Paul, Minn., has been appointed general agent for the St. Louis-San Francisco, with headquarters at Minneapolis, Minn., succeeding E. F. Lefaivre, promoted.

C. E. Hilliker, division freight and passenger agent of the Chicago, Milwaukee & St. Paul at Des Moines, Ia., has been appointed division freight and passenger agent at Toronto, Canada, succeeding W. H. D. Snazel.

J. T. Bate has been appointed Pacific Coast agent of the Missouri, Kansas & Texas, with headquarters at Los Angeles, Cal., in charge of all freight and passenger traffic in this territory, the office of general agent having been abolished.

F. E. Godfrey, assistant general freight agent of the Tennessee Central at Nashville, Tenn., has resigned to accept service with the Alabama Great Southern at Birmingham, Ala., and the office of assistant general freight agent has been abolished.

J. L. McDonald has been appointed assistant general freight agent of the San Antonio, Uvalde & Gulf, with headquarters at San Antonio, Tex. H. W. Rieck, division freight and passenger agent, has resigned to accept service with another company, and his office has been abolished. Charles D. Wynne, Jr., has been appointed general agent at San Antonio, Tex.

Golden Shumate, division freight agent of the Baltimore & Ohio, at Youngstown, Ohio, has been transferred as division freight agent to Baltimore, Md., succeeding W. R. Askew, promoted to general freight agent. Charles S. Roberts, chief clerk to the general freight agent at Pittsburgh, Pa., has been promoted to division freight agent at Youngstown, Ohio.

N. B. Wright, general freight agent of the Central of Georgia at Savannah, Ga., has been appointed assistant freight traffic manager, with office at Savannah; J. G. Carlisle, assistant general freight agent, has been appointed general freight agent at Savannah, in charge of solicitation, and F. D. McConnell, assistant general freight agent, has been appointed general freight agent at Savannah, in charge of rates, divisions and classification.

A. F. Winn has been appointed general freight and passenger agent of the Wichita Falls & Northwestern, with office at Wichita Falls, Tex., succeeding C. L. Fontaine. He was born on November 3, 1880, at Louisville, Ky., and entered railway service with the Missouri, Kansas & Texas, as a stenographer to the assistant general freight agent, but resigned this connection in February, 1909, to enter the employ of the St. Louis-Southwestern as secretary to the freight traffic manager. Shortly thereafter he was appointed traveling freight agent for this company, with headquarters in New York City. From February 1, 1909, to November 1, 1910, he was secretary to the chairman of the National Railways of Mexico, and from November 1, 1910, to January 1, 1914, he was chief clerk to the assistant freight traffic manager of the Missouri, Kansas & Texas, with headquarters at Chicago, Ill. On January 1, 1914, he was appointed chief clerk in the general freight office of this road at St. Louis, Mo., resigning on December 1, 1916, to assume the duties of his present position.

Engineering and Rolling Stock

A. C. Everham, engineer of construction for the Kansas City Bridge Company, has been appointed terminal engineer of the Union Pacific at Kansas City, Mo.

C. E. Weaver has been appointed engineer maintenance of way of the Central of Georgia, with headquarters at Savannah, Ga., vice C. P. Hammond, assigned to other service.

J. H. Reeder, resident engineer of the Canadian Pacific at Schreiber, Ont., has been transferred to Smiths Falls, Ont., succeeding T. B. Ballantyne, who replaces Mr. Reeder at Schreiber.

M. Kelly, resident engineer in charge of the Toronto terminals of the Canadian Pacific, has been appointed resident engineer at Farnham, Que., succeeding D. A. Wallace, resigned, to accept a position with the Canadian government at Ottawa.

George McCormick, assistant general manager of the Southern Pacific, Texas and Louisiana Lines, with office at Houston, Tex., has been appointed general superintendent of motive power of all the lines of this system west of El Paso, Tex., with headquarters at San Francisco, Cal.

W. L. Kellogg, superintendent of motive power of the Missouri, Kansas & Texas, with office at Denison, Tex., has resigned, to accept service with another company, effective February 1. He will be succeeded by C. W. Taylor, now superintendent of motive power on the International & Great Northern, with headquarters at Palestine, Tex.

Purchasing

H. D. Ponton has been appointed assistant general storekeeper of the Southern Pacific, Texas and Louisiana Lines, with headquarters at Houston, Tex.

H. L. Morgan has been appointed general storekeeper of the St. Louis, Brownsville & Mexico, with office at Kingsville, Tex., succeeding L. C. McRoberts, assigned to other duties.

OBITUARY

J. R. Pool, formerly an engineer on the Chicago, Rock Island & Pacific in charge of bridge construction throughout the Southwest, died at his home in Oklahoma City, Okla., on November 28, aged 64.

O. E. Slater, for the past three years superintendent of terminals at Fort Dodge, Iowa, of the Fort Dodge, Des Moines & Southern, died on November 6 at his home at Ottumwa, Iowa, after a short illness, aged 40 years.

M. C. Coyle, superintendent of the Bay City, Saginaw & Mackinaw divisions of the Michigan Central, at Bay City, Mich., died on November 3, at the age of 62, following an operation for appendicitis. He began railway work in 1867 as a messenger on the New York & Erie at Angelica, N. Y., and since December, 1898, he served as division superintendent of the Michigan Central.

George Lincoln Sands, formerly general superintendent of the Atchison, Topeka & Santa Fe, and more recently receiver for the Missouri & North Arkansas, the announcement of whose death has been made in these columns, was born on April 18, 1845, at Brunswick, Maine, and entered railway service with the Chicago & North Western as a brakeman in 1865. He held the same position on the Union Pacific, and later was a conductor on the North Western. From September, 1869, to May, 1872, he was consecutively laborer, brakeman, conductor, assistant division superintendent and division superintendent on the Missouri, Kansas & Texas, and later became master of transportation, and then division superintendent of the Texas & Pacific. After several years on construction work in Argentina and Brazil he returned to the Texas & Pacific, which he served as division superintendent, assistant general superintendent and general superintendent in turn. Following a period of employment in various positions on several lines, he was general superintendent of the Atchison, Topeka & Santa Fe Lines west of the Missouri river, from January, 1877, to March, 1891. He then became superintendent of transportation on the San Antonio & Aransas Pass at San Antonio, Tex., and in October, 1891, was appointed general superintendent. After five or six years spent in reorganizing and rehabilitating several minor companies he was elected vice-president and general manager of the St. Louis, Kansas City & Colorado in July, 1900. From July, 1906, to April, 1912, he was vice-president of the Missouri & North Arkansas, following which he was appointed receiver. He resigned in March, 1914, retiring from active railway service.

Equipment and Supplies

LOCOMOTIVES

THE TOLEDO TERMINAL is reported in the market for 2 locomotives.

THE GREAT NORTHERN is expected to issue inquiries shortly for 40 locomotives.

THE MAINE CENTRAL is reported in the market for a number of locomotives.

THE ST. LOUIS & SAN FRANCISCO is reported in the market for 30 locomotives.

THE ERIE has ordered 10 Pacific type locomotives from the American Locomotive Company.

THE YOSEMITE VALLEY has ordered one Mogul type locomotive from the Baldwin Locomotive Works.

THE DULUTH, MISSABE & NORTHERN is reported as having placed an order for 2 Mallet type locomotives.

THE ATCHISON, TOPEKA & SANTA FE has ordered 28 Mikado locomotives from the Baldwin Locomotive Works.

THE BINGHAM & GARFIELD has ordered four six-wheel switching locomotives from the Baldwin Locomotive Works.

THE LYON PINE LUMBER COMPANY, Odessa, Fla., has ordered one Prairie type locomotive from the Baldwin Locomotive Works.

THE COMMERCIAL ACID COMPANY, St. Louis, Mo., has ordered one switching locomotive from the Birmingham Rail & Locomotive Company.

THE RUSSIAN GOVERNMENT is reported as having closed for 66 additional locomotives with the American Locomotive Company, 66 with the Baldwin Locomotive Works, and 21 with the Canadian Locomotive Company.

FREIGHT CARS

THE BESSEMER & LAKE ERIE is in the market for 500 hopper cars.

THE H. C. FRICK COKE COMPANY is inquiring for 1,525 mine cars.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS is reported in the market for 200 coal cars.

THE LOS ANGELES & SALT LAKE is understood to have placed an order for 1,000 50-ton general service cars.

THE PITTSBURG & SHAWMUT has ordered 100 50-ton steel underframe gondola cars from the American Car & Foundry Company.

THE NEW YORK CENTRAL has ordered the construction of 750 stock cars in the shops of the Merchants Despatch Transportation Company.

THE MAINE CENTRAL is reported as having ordered 100 underframes from the Standard Steel Car Company. The item has not been confirmed.

THE UNION PACIFIC, which recently placed orders for 1,000 box and 1,500 automobile cars, is in the market for 2,500 refrigerator cars for the Pacific Fruit Express, and for 100 ore cars.

THE MINNEAPOLIS & ST. LOUIS, reported in the *Railway Age Gazette* as being in the market for 1,000 box, 200 flat and 300 gondola cars, has ordered the box cars from the American Car & Foundry Company.

THE CHICAGO, ROCK ISLAND & PACIFIC, reported in last week's issue as inquiring for 2,000 box cars, has been refused permission to buy these cars by the Federal Court because of high prices.

THE DELAWARE, LACKAWANNA & WESTERN was incorrectly reported in last week's issue as having ordered 500 hopper cars from the American Car & Foundry Company. These cars were ordered from the Pressed Steel Car Company.

THE ATLANTIC COAST LINE, reported in the *Railway Age Gazette* of November 17 as being in the market for 100 stock cars, has ordered these cars from the Standard Steel Car Company. This company is also reported in the market for 200 hopper cars.

THE MILWAUKEE COAL & GAS COMPANY, reported in the *Railway Age Gazette* of November 24, as having ordered 200 hopper cars from the Pressed Steel Car Company, also placed orders a few weeks ago with the American Car & Foundry Company for 300 hopper cars.

THE GREAT NORTHERN was incorrectly reported in last week's issue as having ordered 500 refrigerator cars from the Refrigerator, Heater & Ventilator Car Company, in addition to 500 refrigerator cars ordered from the Haskell & Barker Car Company. The item should have stated instead that the Moore combination system of refrigeration, heating and ventilation has been specified for the 500 cars ordered from the Haskell & Barker Car Company. The Great Northern was reported in the *Railway Age Gazette* of November 24 as inquiring for 500 stock cars. These stock cars will be built in the company's own shops.

PASSENGER CARS

THE ATLANTIC COAST LINE has ordered one dining car from the Pullman Company.

THE CHICAGO GREAT WESTERN has ordered 5 passenger cars from the Pullman Company.

THE EL PASO & SOUTHWESTERN has ordered one business car from the Pullman Company.

THE ERIE is reported as having ordered 50 express cars from the Osgood-Bradley Car Company.

THE ATCHISON, TOPEKA & SANTA FE has ordered 10 second-class coaches and 25 baggage cars from the Pullman Company.

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, Pa., is in the market for a combination passenger car 60 ft. long, with a 10-ft. baggage compartment and a partition for 6 colored people.

THE NEW YORK CENTRAL.—The orders for passenger cars recently placed by the New York Central have been assigned to the various members of the New York Central Lines as follows: Of the 25 coaches ordered from the Barney & Smith Car Company, 5 are for the New York Central and 20 for the Cleveland, Cincinnati, Chicago & St. Louis; of the 50 coaches ordered from the Pressed Steel Car Company, all are for the New York Central; of the 55 coaches ordered from the Standard Steel Car Company, 35 are for the New York Central and 20 for the Michigan Central; of the 20 combination passenger and baggage cars ordered from the Standard Steel Car Company, 5 are for the Cleveland, Cincinnati, Chicago & St. Louis, 5 for the Michigan Central and 10 for the New York Central. Of the 125 cars ordered from the American Car & Foundry Company, 30 are baggage and mail cars and 95 baggage cars. Of the former 10 are for the Cleveland, Cincinnati, Chicago & St. Louis and 20 for the New York Central. Of the latter, 15 are for the Michigan Central and 80 for the New York Central. An order for one private car for the New York Central has been given to the Pullman Company.

IRON AND STEEL

THE ERIE has placed orders for 40,000 tons of rails.

THE PENNSYLVANIA RAILROAD is expected to place orders shortly for 205,000 tons of rails.

THE LEHIGH VALLEY has ordered 6,500 tons of steel from the Bethlehem Steel Bridge Corporation.

THE SOUTHERN RAILWAY has ordered 2,500 tons of structural steel from the American Bridge Company.

The St. Louis-San Francisco has ordered 42,000 tons of rails for 1917, and 56,000 for 1918, delivery.

The Chicago & North Western has ordered 40,000 tons of rails from the Illinois Steel Company for 1918 delivery.

The Illinois Central has ordered 1,600 tons of steel from the American Bridge Company for the St. Charles Air Line lift bridge over the Chicago river.

The Pacific Great Eastern, through its agents, Evans, Coleman & Evans, Ltd., Vancouver, B. C., has ordered 20,000 tons of rails and necessary accessories for 1917 requirements from the United States Steel Corporation.

The New York Central has divided orders for 175,000 tons of rails among the Illinois Steel Company, the Lackawanna Steel and the Bethlehem Steel Corporation. It is understood that the Bethlehem Steel Company was given 10,000 tons, and that the remainder of the order was divided equally between the Illinois and the Lackawanna companies.

SIGNALING

Los Angeles & Salt Lake.—This road has begun work on the installation of automatic signals on its line from Rox, Nev., to Modena, Utah, 112 miles. It is expected that the work will be completed by June, 1917.

The Union Pacific has under construction, to be completed in 1917, automatic block signals throughout its line, from Salina, Kan., westward to Ellis, 117 miles, single track. This is on the line from Kansas City to Denver.

The Mahoning & Shenango Railway and Light Company is contemplating the installation of color light automatic block signals on 12 miles of single-track and three miles of double-track between Youngstown, Ohio, and Sharon, Pa.

The New York Central will install an addition to the present model 2, unit lever type electric interlocking machine at Buffalo Creek drawbridge, East Buffalo, N. Y., including lever locks, clock contactors, and model 2 dwarf signals. The contract for this material has been recently awarded to the General Railway Signal Company.

The Southern Railway has awarded a contract to the General Railway Signal Company for the installation of an electric interlocking machine of the model 2, unit-lever type, comprising 12 spare spaces, and 60 working levers to operate 12 model 2-A high signal arms, 15 model 3 dwarf signals, 17 model 2 switch layouts, and 16 model 2 derail layouts.

The New York State Public Service Commission, First district, has let to the H. C. Stowe Construction Company, New York City, the contract for building 13 signal towers on the new elevated structures which are being built to extend the Manhattan subways into Bronx and Queens boroughs. Two of these towers will be three-story, and the rest will be two-story. The frames of the buildings are to be of steel and the floors of concrete; and the outside of the walls will be covered with copper. The roofs will be of tin, and the inside walls will be covered with crimped galvanized iron. The average area of the rooms to be occupied by the signalman will be 300 sq. ft. The work is to be finished within four months, and the price for the whole is to be $110,651.

New Zealand Railways.—According to the railways statement made to parliament by the minister of railways there were on March 31, 1916, 2,970 miles of railway in New Zealand, against 2,955 miles at the end of the fiscal year ended with March 31, 1915. The construction costs of these lines at the close of the past fiscal year was $181,691,167, with gross earnings for the year of $22,134,574, against $19,979,206 for the previous fiscal year. The net profits during the fiscal year ended March 31, 1916, were $7,768,762, against $5,766,812 for the year ended March 31, 1915. It is estimated that the revenue of the current fiscal year will be $21,607,260, with an estimated expenditure of $14,818,492. During the fiscal year ended March 31, 1916, there was expended on improvements on the New Zealand government railways the sum of $4,750,843, against an estimated expenditure for the current fiscal year of $3,918,506.

Supply Trade News

Horace N. Trumbull has been appointed advertising manager of the S K F Ball Bearing Company, Hartford, Conn.

Franklin Morey, president of the Commonwealth Steel Company, St. Louis, Mo., died at his home in that city on November 22, at the age of 85.

Charles Wiley, vice-president of John Wiley & Sons, New York, publishers of scientific books, died at his home in East Orange, N. J., December 3, at the age of 83 years.

W. J. Leighty, mechanical engineer of the St. Louis & San Francisco, with headquarters at Springfield, Mo., has resigned to accept a position as chief engineer of the Oxweld Railroad Service Company, Chicago.

The American Car & Foundry Company has declared an extra dividend of 1 per cent and a quarterly dividend of 1 per cent on the common stock, in addition to the regular quarterly preferred dividend of 1¾ per cent, all dividends payable January 1 to stockholders of record December 13. This is the first extra disbursement declared by the company since its incorporation. The common dividend is an increase of ½ of 1 per cent over that ordered three months ago.

F. J. Lepreau, western sales manager of Thomas A. Edison, Inc., primary battery division, has been appointed general sales manager, with headquarters at Orange, N. J. Mr. Lepreau was born in Lyons, France, in 1873, and came to America in 1892. After having been in this country a short time he secured a position with the Stromberg-Carlson Telephone Manufacturing Company, serving in various capacities until 1902. In 1903, he entered the employ of the Western Electric Company as salesman, and held that position until 1905, when he went with the Batteries Supplies Company, Newark, N. J., as traveling representative. Since the Batteries Supplies Company was absorbed by the Edison Manufacturing Company in 1909, Mr. Lepreau has served the Edison company, with headquarters in Chicago.



F. J. Lepreau

The following have been elected directors of the Baldwin Locomotive Works: Guy E. Tripp, chairman of the Westinghouse Electric & Manufacturing Company; Sydney F. Tyler, chairman of the Fourth Street National Bank; William E. Corey, president Midvale Steel & Ordnance Company, and Sydney E. Hutchinson, Hutchinson & Rivinus. They succeed John G. Shedd, E. T. Stotesbury, T. De Witt Cuyler and Otis H. Cutler, who resigned on account of the Clayton act.

The directors of the Rail Joint Company, New York, have elected E. Y. Weber president, to succeed the late C. W. Hotchkiss. Other officers were re-elected as follows: Percy Holbrook, B. Wolhaupter and W. P. Thomson, vice-presidents; B. Wolhaupter, secretary, and F. C. Runyon, treasurer. Mr. Weber was associated with the Weber Railway Joint Manufacturing Company before that company and others were consolidated to form the Rail Joint Company in 1905. Since that time he has been a member of the board of directors and of the executive committee of the Rail Joint Company.

G. H. Peabody, vice-president, and W. A. Austin, consulting engineer, of the Railway & Mine Supply Company, 332 South

Michigan avenue, Chicago, have been appointed western representatives of the Southern Locomotive Valve Gear Company, Knoxville, Tenn., and will handle matters pertaining to the Southern valve gear and the Brown power reverse gear in Chicago territory. Mr. Peabody was formerly western sales manager for the Lima Locomotive Works, and Mr. Austin was formerly connected with the Baldwin Locomotive Works, and later chief mechanical engineer of the Lima Locomotive Works.

The Utah Iron & Steel Company, Midvale, Utah, 11 miles south of Salt Lake City, is beginning the construction of a new 40-ton open hearth furnace, with continuous ingot heating furnaces and a 24-in. ingot breakdown mill. It expects to have this in operation not later than next spring. Round, square and flat bars, angles, channels and T-rails will be produced up to 30 lb. per yd. This plant has been in operation since September, 1915. The present capacity is about 1,000 tons per month, but, with the installation of the open hearth, it will be over 3,000 tons per month, on single turn. The capitalization of the company is $300,000. The officers are C. W. Whitley, president; N. Rosenblatt, vice-president; S. A. Whitney, treasurer; S. Rosenblatt, secretary; H. G. Purcell, manager of sales; Salt Lake City, Utah.

George H. Groce has left the Electric Storage Battery Company, where he has been a sales agent of the railway department, to become a sales representative in the railroad department of the U. S. Light & Heat Corporation of Niagara Falls, N. Y., with headquarters at 1402 Railway Exchange building, Chicago. Mr. Groce has had considerable railroad experience. Starting as a telegraph operator on the Pittsburgh & Lake Erie in 1880, he has since been with a number of roads in such positions as train despatcher, signal engineer, division superintendent and assistant to vice-president and to general manager. Mr. Groce has also represented the General Railway Signal Company, and was assistant to the president of that company. From 1912 to 1915 he was vice-president of the Wright Telegraphic Typewriter Company.

Draft Gear Patent Decision

A decision has been rendered by Hon. John R. Hazel, judge of the United States district court for the Western district of New York, holding that, in the manufacture of draft gears, The T. H. Symington Company has infringed the following claims of patents controlled by William H. Miner: claims 4 and 5 of Miner patent No. 668,655; claim 8 of Miner patent No. 668,656, and claims 5, 6 and 7 of O'Connor patent No. 829,728, and, further, that these claims are valid. It was also held that claim 2 of Miner patent No. 668,656 was invalid for want of novelty. The T. H. Symington Company has appealed the case.

TRADE PUBLICATIONS

Power Hammers.—A booklet recently issued by Beaudry & Co., Inc., illustrates and describes in considerable detail the Beaudry champion and Beaudry Peerless power hammers made by the Company.

Corkboard Insulation.—A booklet and folder recently issued by the Armstrong Cork Company, Pittsburgh, Pa., are entitled respectively "Nonpareil Corkboard Insulation for Cold Storage Rooms" and "Fifteen Years on Brine Lines."

Concrete Through the Ages.—It is not a matter of general information that the first extensive use of concrete construction came during the early Roman period, and that the Roman people carried it to an extraordinary development as early as in the first century B. C. "Concrete Through the Ages" is a 28-page book, 11 by 14 in. in size, which has been recently issued by the Pennsylvania Cement Company, New York. It bears the subtitle, "Looking Backward Twenty Centuries on Concrete Construction," and in its pages the reader is told how successfully the Romans made use of concrete in their important buildings, aqueducts and roads. The book is printed on high-grade paper and its most distinguishing feature is a series of six-color drawings, "Master Builders of Ancient Rome," by Birch Burdette Long. The pictures show the Pantheon at Rome, the Pont du Gard at Nimes, the Pons Fabricius, the Via Appia or Appian Way, the Amphitheatre at Pompeii and an unnamed view of Roman ruins. In the first five structures mentioned concrete played an important part.

Railway Construction

Arkansas Roads.—Banking interests in Dallas, Tex., are contemplating the construction of a 50-mile line from Rogers, Ark., through Madison and Newton counties. The primary object of the line, surveys for which are now being made, is to tap a timber district. R. J. Henderson, secretary, Slaughter building, Dallas, Tex.

Cheyenne Railroad.—This company has been incorporated for the purpose of taking over and reconstructing the Cheyenne Short Line, which runs from Strong City, Okla., to Cheyenne, about seven miles. When this line has been fully rehabilitated it will be operated by the Clinton & Oklahoma Western, by which arrangement through trains will run from Clinton, Okla., to Strong City. J. C. Mytinger, Wichita Falls, Tex.

Cleveland, Cincinnati, Chicago & St. Louis.—The Saline Valley Railway is building an extension of 8.34 miles from a point 1.75 miles west of Harrisburg, Ill., to a point 10.09 miles west of the same place. Contract let to Head, Jones & Co., St. Louis, Mo.

Columbia & Nehalem River.—Work is now under way on a four-mile extension of this road in Oregon from mile 26 to mile 30. The work is being carried out by station gangs and day labor.

Columbia Railway & Navigation Company.—Surveys will be made at once, it is said, for a line to be built from Columbia, S. C., west via Lexington and Saluda to Greenwood, about 70 miles. Electricity will probably be used as the motive power. G. A. Guignard, president; T. C. Williams, vice-president and general manager, and F. H. Haskell, engineer, Columbia.

Cumberland & Manchester.—Work on the line building from Barboursville, Ky., north to Manchester, 24 miles, is nearing completion. The company has projected a branch from Garrard to Big Double creek, 20 miles. (August 4, p. 213.)

East Broad Top Railroad & Coal Company.—Surveys for an extension are now being made from Alvin, Pa., to a new mine near Wells Tannery, 5 miles. (August 25, p. 345.)

Electric Short Line.—This company is building an extension from Hutchinson, Minn., west to Clara City, 51 miles; grading work on 3 miles was carried out during 1916. H. F. Balch & Co., Minneapolis, have the contract for this work. The company now operates a line from Minneapolis west of Hutchinson, 58 miles.

Fernwood & Gulf.—This company contemplates building an extension, it is said, from the present eastern terminus at Kokomo, Miss., northeast to Columbia, about 12 miles.

Ft. Smith, Subiaco & Eastern.—This company is building an extension from Dardanelle, Ark., to Scranton, about 26 miles. Construction work from the Dardanelle end is proceeding rapidly, and grading at the Scranton end is expected to be started within the next few days. W. L. Ruhle, chief engineer, Dardanelle, Ark.

Great Northern.—The Montana Eastern has projected an extension from Richey, Mont., south to Circle, 30 miles.

Kansas & Oklahoma Southern.—This company has given a contract for the completion of its line between Caney, Kan., and Fort Smith, Ark., which are about 165 miles apart, to Samuel Stephenson Sons & Co., New Haven, Conn., who have sub-let the work to the Railroad Construction Company, New York City.

Kentucky Roads.—Surveys are being made, it is said, for building a line from a point on the Lexington & Easton, in Perry county, Ky., along the middle fork of the Kentucky river, about 25 miles. The line is to be built to develop coal and timber lands. The Mobray-Robinson Lumber Company, Cincinnati, is said to be interested.

Montana Eastern.—See Great Northern.

Omaha, Lincoln & Beatrice (Electric).—This line is to be constructed from Lincoln, Neb., through University Place,

Havelock, Waverly, Greenwood, Ashland, Springfield, Papillion, South Omaha to Omaha, about 51 miles. The company's own forces are doing some preliminary work, but no contracts will be let until next spring. J. M. Bramlette, chief engineer, Lincoln, Neb.

Pennsylvania Lines West.—A contract has been awarded to John C. Herndon & Co., Akron, Ohio, for the construction of a third track from Leetonia, Ohio, to Salem, five miles. The project will include track laying and bridging, about 140,000 cu. yd. of steam shovel work, and about 40,000 cu. yd. of team work.

Rapid Railroad.—This company, which operates a line for freight service connecting Chesterfield, Mich., with New Baltimore, Anchorville, Fairhaven, Algonac and Marine City, 28 miles, plans to build a double track extension to connect with Mt. Clemens and Detroit. Work is now under way on three miles between these places, and on 0.45 miles in Mt. Clemens.

Ringling & Oil Field.—This is the name of a railway being built from a point on the Oklahoma, New Mexico & Pacific, near the town of Ringling, Okla., through Jefferson, Carter, Stephens, Garvin, McClain, Cleveland and Oklahoma counties in Oklahoma to Oklahoma City, 120 miles. Grading work is expected to begin at once. Jake L. Hamon and C. L. Anderson, Ardmore, Okla.

Saline Valley.—See Cleveland, Cincinnati, Chicago & St. Louis.

Smith Powers Logging Line.—This company contemplates building a steam road from Myrtle Point, Ore., through Marshfield, to Powers, 44 miles. It is not known when contracts will be let. C. A. Smith, president, Berkeley, Cal.

Tennessee Roads.—Construction work will be started this month, it is said, on a four-mile logging line, to be built for the Ferguson Hardwood Company. The line is to be built to develop timber lands in Stewart county, Tenn. J. K. Ferguson, president, Paducah, Ky. (September 1, page 391.)

Texas Railroads.—Plans are under way for the construction of a road from Ft. Worth, Tex., to connect with the Gulf & Western in Palo Pinto county, a distance of about 45 miles. While some preliminary surveys have been made, no definite time has been set to commence construction, nor have contracts been let. B. B. Paddock, Ft. Worth, Tex.

RAILWAY STRUCTURES

Bloomington, Ind.—The Illinois Central has received bids for the reinforced concrete substructure for a four-pier bridge at College avenue.

Muskogee, Okla.—The Missouri, Kansas & Texas has awarded contracts and work is in progress on a 15-stall brick roundhouse with concrete foundation, a machine shop, coaling station, 90-ft. turntable, cinder pits, engine inspection pits and incidental tracks, to cost about $195,000. Leon F. Lonnbladh, chief engineer, Dallas, Tex.

Orangeburg, S. C.—Plans are being made by the Atlantic Coast Line for a one-story brick passenger station to be built at Orangeburg.

Port Huron, Mich.—The Grand Trunk car repair and general shops, which were destroyed by fire last year, are soon to be replaced by an entirely new plant, to occupy about 60 acres of ground. The buildings will consist of a power house, passenger car shop of two units, 135 ft. by 545 ft., accommodating 27 cars at one time; between the two units will be a transfer table 80 ft. in length; a freight car shop 160 ft. by 360 ft., accommodating 70 freight cars at a time; a cabinet shop of two floors, 73 ft. by 250 ft.; a combination blacksmith and machine shop 150 ft. by 300 ft.; a wood mill 47 ft. by 147 ft.; a storehouse 61 ft. by 154 ft., and an office building 61 ft. by 64 ft. The approximate cost of this undertaking will be about $1,000,000.

Trenton, N. J.—The Pennsylvania Railroad has given a contract to Eugene F. Verg & Co., Camden, N. J., to build a concrete bridge over the Delaware and Raritan canal at the crossing of the New Brunswick turnpike, midway between Trenton and Princeton.

Railway Financial News

Buffalo & Susquehanna.—A dividend of 3 per cent has been declared on the common stock. This makes 5 per cent in all declared during the calendar year 1916. The road was taken over by the new company after foreclosure sale on January 1, 1914. Dividends have been paid on the $4,000,000 4 per cent preferred at the regular rate of 4 per cent since July, 1915.

Missouri Pacific.—Kuhn, Loeb & Co., reorganization managers of the Missouri Pacific and the St. Louis, Iron Mountain & Southern, have announced that the plan for reorganization has been declared operative, and that further deposits of bonds, stocks and claims may be made up to and including January 5, 1917.

The United States District Court has ordered the sale under foreclosure of the collateral securities, which are deposited under an issue of $9,636,000 Missouri Pacific bonds on which $426,020 interest is in default. The date of the sale of the collateral has not been set, but an upset price of $6,750,000 has been fixed. Anything received over and above this price is to be turned over to the Guaranty Trust Company as trustee for the first refunding mortgage bonds.

New Orleans, Ft. Jackson & Grand Isle.—This road, which was recently sold under foreclosure, has been reorganized and taken over by a new company—the New Orleans & Lower Coast. The road runs from New Orleans, La., to Buras, 60 miles.

New Orleans & Lower Coast.—See New Orleans, Ft. Jackson & Grand Isle.

St. Louis & San Francisco.—Judge Sanborn, in the United States District Court at St. Louis, has rendered a judgment against the St. Louis & San Francisco for $1,077,000, covering that road's guarantee of Cape Girardeau Northern bonds. The reorganization plan of the St. Louis & San Francisco provided for the payment of these bonds if judgment was finally rendered against the Frisco.

Bagdad Railway Tunnel.—The last tunnel on the Bagdad Railway in the Taurus mountains has been blasted through, according to press despatches.

New Line in Mexico Opened.—The first section of the Cuzco-Santa Ana Railway, extending 20 miles to the village of Poroy, was opened on October 22.

Norway's Metal-Trades Imports.—The values of Norway's metal imports for 1913 and 1914, the latest years for which import statistics can be obtained, are shown in the table below. Of (a) Great Britain and Germany together furnished in 1913 more than one-half, but in 1914 nearly all was furnished by the United States. Of (b) and (c) Great Britain and Germany together supplied far the larger part in both years, the former country supplying more than one-half of (d) in both 1913 and 1914. About three-fourths of the raw zinc (e) was imported from Germany, as was more than half of the manufactured zinc (f), in both the years mentioned. Germany was the source of supply of nearly half of the copper nails, spikes, etc., and of more than half of the copper wire in 1913 and 1914, Great Britain ranking second as to the copper nails, spikes, etc., in 1913. In 1914 Sweden stood second to Germany as an exporter to Norway of copper wire, France ranking third. The imports of lead pipes, etc., from Great Britain and Germany together exceeded the imports from all other countries combined in both 1913 and 1914.

Articles	1913	1914
(a) Copper, brass, German silver, etc., raw	$120,252	$768,088
(b) Aluminum, copper, brass, German silver, etc., in plates, bolts and rods	515,257	430,000
(c) Lead, raw	40,012	47,034
(d) Lead in rolls, rods and plates	59,684	60,728
(e) Zinc, raw	1,384,086	2,042,347
(f) Zinc in plates, bolts and rods	169,269	128,908
(g) Copper nails, spikes, screws, pipes, etc	196,724	182,079
(h) Copper wire, etc	453,315	534,606
(i) Lead pipes, spikes, etc	57,540	39,181

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* Illustrated.

We have been honored by Clifford Thorne, chairman of the Railroad Commission of Iowa, with a communication which we publish in another column in this issue. We are greatly pained by the cruelly sarcastic manner in which Mr. Thorne refers to our "wise understanding" and to the "profound learning and wisdom with which your (our) brain is burdened." If our "wise understanding" and our "profound learning and wisdom" do not find favor in the sight of this greatest of railway inexperts, we are undone, indeed. Fearful as we are, however, of the complete loss of his good opinion, we humbly suggest that his own reasoning may not be flawless. Mr. Thorne implies, as we understand him, that when the Interstate Commerce Commission passes upon the relationship between state rates and interstate rates the "parties to the difference" are the Interstate Commerce Commission and one or more state commissions. But may not the real "parties to the difference" be the railways, on the one hand, and the state commission, or the shippers of a particular state, on the other? In the Shreveport case the Railroad Commission of Louisiana and the shippers of that state were lined up with the railways on one side and the Railroad Commission of Texas and the shippers of that state were lined up on the other side. The Interstate Commerce Commission seems, to our poor understanding, to have played a part analogous to that of an umpire. Suppose, however, that the Interstate Commerce Commission really is one of the "parties to the difference," and therefore should not be allowed to be umpire. Who, in that case, would Mr. Thorne have to umpire the game?

Concerning Batting Averages, Umpires, etc.

The Interstate Commerce Commission has issued an order changing the fiscal year for which railroads are required to report to the Interstate Commerce Commission from the year ending June 30 to the year ending December 31, thus making it coincide with the calendar year. The Association of American Railway Accounting officers had voted by a large majority to favor this change and it was largely through the efforts of this association that the change was brought about. The *Railway Age Gazette* has for a long time strongly advocated the change. It is logical; it makes all the season's maintenance work fall within one reporting year for all roads except a few in the extreme southern part of the United States; and it brings the hardest work of the accounting department in the winter instead of in the hot months of summer. Some roads already have the calendar year as the period covered by their reports to their stockholders. The more important of these are the roads composing the Pennsylvania system, the New York Central lines, the Delaware & Hudson, the Erie and the Delaware, Lackawanna & Western. The change will relieve these companies of the additional labor involved in preparing reports as of June 30 for the Interstate Commerce Commission. The change from the year ending on June 30 to the calendar year will involve increased work temporarily for the accounting departments of most roads, but if they change their period for reporting to their stockholders as well as to the commission to the calendar year, the burden of keeping two sets of accounts will extend over a period of only six months or a year. This order of the Interstate Commerce Commission is in the nature of constructive regulation, and is to be much commended.

Change in the Fiscal Year Adopted

While the cost of reproduction new of a railroad is only one of the elements which is to be taken into consideration by the Interstate Commerce Commission in the determination of value of the property, it is likely to be the most important single element. Were the courts to pass on the value of a property to be taken over by the government, the estimated cost of reproduction new would be an important factor in determining the price which the government would have to pay. One of the costs in actually building a railroad is the cost of raising the necessary capital. It is not theory but fact which ought to be taken into consideration in every step of estimating the cost of reproduction of a railroad, and this is especially important in the consideration of the cost of capital. It is pure theory to say that money can be obtained to build a railroad at 5 per cent or 6 per cent, because money is being lent at these rates by the banks. It is fact, not

What Would It Actually Cost?

theory, that the money needed to build a railroad of any length could not be borrowed at the bank; it would have to be raised through the sale of stock and bonds of the proposed railroad company. If the railroad is to be built through Missouri, only bonds in a face amount equal to the par value of stock could be issued. Part of the money, therefore, would have to be raised through the sale of stock. Would anyone say for a moment that this stock could be sold at anything approaching par? Even if there was a provision by which dividends would be cumulative at the rate of 7 per cent it absolutely could not be done. The railroad builder who could sell stock of a company which proposed to build 1,000 miles of railroad at 50 and 5 per cent bonds at 80 would be a genius. Let some of the theorists who talk about 5 per cent money actually go out and try to raise some for building a railroad; they would very quickly find that, regardless of theories, the price that has to be paid for money, like the price of labor or of materials, is the price which the seller is willing to accept. It is just as much a false estimate to assume the price of money to be 5 or 6 per cent because money for other purposes and with other security can be obtained for that price as to assume that bricklayers or other skilled highly paid labor can be obtained for $1.50 a day because labor for other purposes can be obtained in some parts of the country at as low a price as this.

THE ARGUMENTS FOR STATE REGULATION

PRESIDENT THELEN of the National Association of Railway Commissioners and of the California Railroad Commission, presented very effectively before the Newlands committee last week the argument of the state commissioners against turning any of their regulatory powers over railroads over to the federal government. W. J. Bryan presented an argument along the same line that was a joke. Mr. Thelen gave the committee a very pleasing picture of the work of the California commission to show that it had not exercised its powers in a spirit of vindictiveness against the railroads, that it had co-operated with them in many ways which they appreciated, that it had not been afraid to raise rates when it considered an advance warranted, that it had not discriminated against interstate commerce, that it had not stopped railroad construction in California, and that, generally speaking, it got along very well with the railroads. But the fact that some state commissions are better than others or even that some state commissions are performing their duties in an efficient and highly laudable manner does not affect the argument of the railroads that the present system of dual state and federal regulation is unsystematic, uncoordinated and conflicting, that it imposes burdens upon the railroads which are largely responsible for their present condition and allows states whose commissions are either ignorant or narrow or selfish to discriminate against other states and against interstate commerce.

Mr. Thelen made a strong argument for "home" regulation which would be hard to answer if it were possible to secure some uniformity and consistency in the concurrent application of state and federal regulation and if it were possible to have commissions in all of the states as intelligent, as efficient and as fair as those we now have in a few states. But such a possibility, as long as the states retain their present powers, seems out of the question. Those who are so anxious that the federal government shall not interfere with the powers of the states do not seem to realize that many, if not most, of the states are interfering with the exercise of the authority of the federal government over interstate commerce and are discriminating against each other. Mr. Thelen seemed to think that cases of state discrimination in rate matters are a comparative rarity and that the Supreme Court in the Shreveport decision has given the Interstate Commerce Commission ample power to deal with them. That the commission itself does not think so is indicated by the recommendation in its annual report that it be given legal authority for a plan of co-operation with state commissions in the handling of cases involving the conflict between state and federal authority, but without abdicating any of the federal authority finally to control questions affecting interstate and foreign commerce. But co-operation is a rather difficult thing to provide by law, especially when so many of the state commissions, like that of Texas, insist on dealing with questions affecting the commerce of a nation from a narrow local point of view. Even the Shreveport case after five years is by no means settled yet and that such situations as that presented by the Shreveport case are by no means rare is shown by the Interstate Commerce Commission's statement in its annual report that it has had to deal with over 50 such cases. The commission said: "Were we to look about for opportunities to apply the principles of the Shreveport case we could find them in every part of the United States, and we have been requested in several instances to institute investigations upon our own initiative with a view to removing unjust discriminations in such cases, just as we have proceeded in scores of other instances on our own initiative to apply remedies which the law provides."

Mr. Bryan, out of the abundance of his ignorance, regaled the committee with two hours of claptrap in opposition to the proposals for exclusive federal regulation of railways. His principal objection seemed to be that there should be more regulation of railways, not less, and he said that federal regulation should be added to and not substituted for state authority. Mr. Bryan thought that the job was too big for a central authority, that giving so much power to the federal government would create too great a temptation for the railroads to corrupt the members of Congress and that the representatives of the people in Washington are less amenable to the control of the people than those in the state legislatures and commissions. He mentioned some examples of the influence of the railroads on Congress in the past, which he thought had been exerted by means of the pass book or the check book, but did not recall any instances in which the local statesmen had succumbed to such influences. As an illustration of his claim that the federal government is less anxious to carry out the will of the people than the state authorities, he cited the fact that some states have a two-cent fare law while the Interstate Commerce Commission has found a higher rate reasonable. He smilingly told the committee how he had recently saved 85 cents by buying a ticket to a point near a state line at the lower state rate and then buying another ticket for the remainder of his journey. He criticised the roads for ignoring the states by charging more for interstate travel than the sum of the local rates and probably would have been greatly surprised if the fact had been mentioned to him that he had violated a federal law in paying less than the legal fare for an interstate journey.

Mr. Bryan insisted that federal regulation of security issues should be concurrent with state regulation on the same subject. How hazy his ideas were is shown by his answers to questions by Senator Newlands as to how the plan would work in case the state and federal authorities should differ as to the amount of securities to be authorized. He said first that the action of the state would control only within the state, which is rather meaningless as applied to security issues, but when pressed further declared that if the state authorized a greater issue than the federal government the road would not need to take full advantage of the maximum allowed by the state. He added that state charters are permissive and that if one state should be more liberal than others no harm would be done because only the people of the state would be affected. Mr. Bryan was positive that

Congress ought not to interfere with state authority, but he either purposely or ignorantly missed the point entirely that the present difficulty lies in the fact that some states interfere with the rights of other states because their regulation is more restrictive than that of other states or of the federal government, rather than with any occasional excess of permissive liberality on the part of a state.

Mr. Bryan admitted that he was a little out of date with some of the statistics he used, as when he referred to the mileage of the railways of the United States as 160,000 and said that he was better acquainted with principles than with details, but he did not seem to realize that most of the facts he was using to criticise the railroads were of the same ancient vintage.

In discussing the amount that railroads should be allowed to earn Mr. Bryan was more liberal toward the railroads than he probably intended to be. He said he would allow them to earn enough to keep their stock at par and to provide a surplus up to, say, 25 per cent of their capitalization, on condition that the capitalization should be readjusted to the value of the property. But as he suggested that the valuation should be based on the present cost of reproduction of the property, which in the case of many roads would greatly exceed the present capitalization, it would be interesting to turn him loose at the job of trying to earn such dividends and surplus as he proposed out of two-cent fares and the kind of freight rates that some of the states whose rights he is so anxious to protect now choose to permit.

Mr. Bryan told the committee that he no longer desires government ownership, but that he regards it as inevitable if the proposals for an increase in the regulating authority of the federal government are carried out. Mr. Thom, representing the railroads, had told the committee that he regarded government ownership as inevitable unless there is a vast improvement in the system of regulation. If the idea of government ownership is to become a bugaboo to be used by both sides it will serve a useful function.

THE FIRST VALUATION REPORTS

MANY railway men have been apprehensive regarding the attitude which the department of valuation of the Interstate Commerce Commission would take regarding the many important questions involved in the valuation of their properties and as the work has progressed they have criticised the lack of knowledge of the practical problems involved in the construction of a railway property displayed by a considerable number of the men holding responsible positions with the government. A study of the reports which have been issued to date tend to confirm these fears. The first complete analyses of any of these reports are contained in the objections filed by the Atlanta, Birmingham & Atlantic and the Texas Midland to the so-called tentative valuation reports on their properties. If the 56 objections in the A. B. & A. are sustained in whole or even in part, they constitute a severe arraignment of the Division of Valuation.

It is to be expected that some differences of opinion will arise between the employees of the railways and the representatives of the commission but the attitude taken by the government forces on so many of these questions is creating an impression among railway men that they are not endeavoring to make a fair valuation but to fix minimum bases for valuation and force the railways to appeal to the commission or to the courts to prove their rights to more liberal allowances. According to the act of Congress under which this work is being conducted the commission is required to ascertain the fair value of the properties of the carriers. The figures incorporated in the so-called tentative reports may therefore be considered to represent the fair values of the properties as ascertained by the Division of Valuation. Their reputations as practical railway men must be assumed to rest upon their knowledge as reflected in these reports. It is for this reason that the reports are particularly disappointing.

If the valuation work is to be carried to a successful conclusion and is to be of value later it is essential above all things that the commission impress the carriers and the public alike with its attitude of fairness and establish a feeling of confidence in its decisions. If it allows the impression to become prevalent that it is a partisan interested only in forcing the valuations to the lowest possible figure, irreparable damage will be done to the carriers and to the cause of government regulation as well. It was unfortunate that when giving the capitalization of the A. B. & A. as $59,565,176 on June 30, 1914, the date of valuation, no mention was made of the fact that this had since been reduced to $39,290,000. As this reduction in the capitalization was made over nine months before the valuation report was completed it could hardly have been unknown to the commission. Such a statement would not have detracted in any way from the value of the report, while it would have prevented an injustice being done to the road.

An interesting commentary on the relative effects that the purposes of taxation and of valuation bodies may have on their reports is afforded by the statements in the reports of the Atlanta, Birmingham & Atlantic and the Texas Midland that "no other values or elements of value were found to exist," although the state of Georgia has taxed the A. B. & A. on the sum of $1,200,000 for "franchise values" which it had evidently found to its own satisfaction, and that the state of Texas has taxed the Texas Midland on the sum of $500,000 for other values which it believed to exist.

The government will have difficulty in convincing any railway man of its fair intentions when it makes no allowance in the valuation for the working funds on hand and the value of materials and supplies in store, although this must necessarily have been provided for in the capitalization. It is evident that credit must be allowed in one account or the other and as working capital and materials are essential to the operation of the road they should be included in the valuation. The commission would undoubtedly be the first to complain if the roads allowed their stocks of materials to decrease below the amounts normally considered necessary to insure safe, continuous operation.

Although the commission considers the cost of reproduction in arriving at most of its figures, it is interesting to note that it changes to "present value" in discussing land. It would be instructive to learn the reason leading to this action, since the valuation act does not contemplate the treatment of land in any way different from other classes of railway property. The commission will have a hard time to convince railway men or the land owners from whom the railways purchase property that the "present value" of the land is only that of adjacent acreage tracts without any allowances for cost of acquisition, severance damages, destruction or removal of buildings, etc. In other words, if the government maintains that the right of way and terminal properties of the railways can be reproduced for the bare acreage value of the land it shows that it is not familiar with facts which are common knowledge to all railway men.

In its objection, the A. B. & A. states that "it would not be a reasonable reproduction program that ignores physical obstacles actually encountered in the original construction, the removal of which was a proper charge to capital." In estimating costs of reproduction many assumptions must necessarily be made, but for the commission to ignore many of the items of value pointed out in the objections indicates either a surprising lack of knowledge of the problems actually involved in railway construction or a desire to force the railways to contest every valuation and to fight for their proper rights in this matter. The objection made by the A. B. & A. to the accounting report, that the effect "is not to

furnish facts or information but to discredit the actual investment of the carrier and its good faith in making same" is a serious one, but the failure to make any reference in the report on this road to the reduction of over $20,000,000 in its capitalization made subsequently to 1914 certainly does not indicate a disposition on the part of the department of valuation to be fair to this road.

THE RAILWAY SITUATION IN CANADA

THE railway situation in Canada at present is as peculiar as, from the standpoint of the public, it is unsatisfactory. Canada now has the largest mileage of railways in proportion to its population of any country in the world. In spite of this it is suffering from a "car shortage." It has so many miles of railway that the business available is not sufficient to support all the lines and a large part of the mileage is virtually bankrupt, and yet the railways are unable satisfactorily to move the available business.

These statements sound paradoxical, but they are plain recitals of facts. The trouble, from the standpoint of physical operation, is partly due to the circumstance that most of the mileage constructed within recent years was built with the intention of providing it with equipment later on when it should be needed. When it was finished it was impossible to provide enough equipment, partly because the financial resources of those who did the building were largely used up, and partly because it was impossible to get filled even the orders for equipment that were placed.

In addition to the physical condition of inadequacy of equipment, there is, as indicated, a financial condition of a serious character. The great Canadian Pacific system, which from its inception has been managed with extraordinary skill and efficiency, is handling a heavy business and earning handsome profits. The Grand Trunk, which is physically an excellent property, and which gives good service, but which has never earned much for its shareholders, also is doing unusually well. But the Grand Trunk is burdened with the Grand Trunk Pacific, which it built from Winnipeg to the Pacific coast with the aid of government guarantees, and which has not been able to earn interest on the investment. The Canadian Northern, likewise a transcontinental line to the Pacific, which closely parallels the Grand Trunk Pacific for many miles, and which also was built with the aid of government guarantees, also has proved unable to earn its interest.

The various governments of Canada, Dominion, provincial and municipal, have given cash aid to the private railway companies aggregating $238,832,000. They have granted them almost 44,000,000 acres of land of an estimated value of $4 per acre, or $176,000,000. The Dominion bought $33,000,000 of Grand Trunk Pacific bonds. In addition to all these things, the Dominion and other governments of the country have guaranteed interest on investments made by private railway companies to the extent of $351,000,000. It is these guarantees of interest, and especially those which have been made to the Grand Trunk Pacific and the Canadian Northern, which are causing the greatest concern to the Canadian public. The government already has had to pay some of the interest which it has guaranteed. It is practically certain that it will have to pay more. In fact, there is as much pessimism in Canada now regarding the railway situation as there was optimism a few years ago. Almost every intelligent person one talks to in that country now expects it to be years before the Canadian Northern and the Grand Trunk Pacific will be able to pay their way without government aid.

The whole situation presents a problem the only solution of which appears to many people to be government ownership and operation. There were recently published in the Journal of Political Economy and the *Railway Age Gazette* certain articles regarding government ownership in Canada, the tenor of which was indicated by the title of the first of them, viz., "The Failure of Government Ownership in Canada." These articles have attracted much attention in Canada. With great unanimity the advocates of an extension of the policy of government ownership in that country have rushed to attack them. They drew forth a reply from J. L. Payne, comptroller of railway statistics of Canada, which was published in the *Railway Age Gazette* for October 6 and a reply to which was published in this paper for October 13. Mr. Payne's article was fair, intelligent and temperate. But as much cannot be said for most of the articles which have been published defending and advocating an extension of government ownership in Canada. There is grave danger that that country, as has been the case with many others, will be committed to government ownership at a time of turmoil and stress when sober investigation and thought are difficult, and, in consequence, without the true merits of the policy of government ownership ever being thoroughly considered by the public or by public men.

The question as to what action should be taken regarding the railways whose interest the Dominion and provincial governments, especially the former, have guaranteed is a most serious and difficult one. But before it can be intelligently decided whether the true solution is for the government to take these railways over and operate them, some consideration surely should be given to the past history of, and the present situation with respect to, both government and private ownership in Canada. The Dominion government for more than 50 years has owned and operated the Intercolonial Railway. As has been conclusively shown in the articles above alluded to, which have appeared in this paper, this road has incurred enormous financial losses. These losses have been defended on the ground that they have been due to the lowness of the road's rates. The untenableness of this argument already has been shown in these columns; and further valuable evidence regarding this phase of the matter is presented in the article by Francis A. Bonner, which is published elsewhere in this issue of the *Railway Age Gazette.* As has been pointed out heretofore in these columns, and as Mr. Bonner shows in greater detail, the average revenues per passenger mile and per ton mile of the Intercolonial do not accurately reflect its absolute rates. All contentions to the contrary notwithstanding, it is not a difficult matter to demonstrate that the bulk of the losses of the Intercolonial practically throughout its existence have been due to wasteful management.

An equally glaring instance of mismanagement is afforded by the construction by the Dominion government of the National Transcontinental Railway. The building of this line afforded probably as bad an example of the combination of politics, incompetency and graft as has ever been known in the history of North American railroading. The government commission which investigated its construction reported that at least $40,000,000 "was needlessly expended in the building of this road, without including the money that was unnecessarily expended in building the railway east of the St. Lawrence river." The average cost of construction per mile is now officially reported at $76,632, and this includes nothing for equipment. In other words, this new road without equipment cost $10,000 per mile more than the average capitalization of the railways of the United States. Although it represented, without equipment, an investment of $153,000,000, it earned in 1915 a total of only $281,000, which was $76,000 less than its operating expenses. The total loss, including unearned interest which it inflicted on the taxpayers in that year was at least $6,000,000; and it is questionable if it ever will earn anything but deficits.

But, say the defenders of government ownership, it is

not fair to take the Intercolonial or even the National Transcontinental as an example of government ownership in Canada. One should take the Temiskaming & Northern Ontario. Just why one should take a railway having only 329 miles of line and which is owned and operated not by the Dominion, but by the Province of Ontario, to test what probably would be the results of the ownership and management by the Dominion of about 36,000 miles of railway is somewhat difficult to understand. As a matter of fact, the Temiskaming & Northern Ontario has been relatively far more successful than the other government railways of Canada. It has opened up a rich territory to settlement and development, and it seems to have been, in the main, well managed. But its average rates, although doubtless reasonable for this small property with its light traffic, are higher, as Mr. Bonner points out, than the average for all the railways of Canada. Furthermore, its management has one serious vice that characterizes the management of all the other government railways of that country, viz., that it imposes a burden on the taxpayers. The road has cost $20,085,000, and yet in 1915 its net earnings were only $69,000, or less than 3½ tenths of 1 per cent on the investment. The bonds issued to build it bear interest at 3½ per cent. It is reasonable to assume that less than par was realized from their sale, and that the interest paid on the money actually derived from them would be at least 4 per cent. But even at 3½ per cent the interest on the investment would be $700,000, which means that the road failed in 1915 by over $600,000 to earn its interest. This deficit had to be paid by the taxpayers. The year 1915 was financially the worst in the road's history, but its statistics for 10 years, as given in Poor's Manual, indicate that never in any year has it earned all of its interest.

There are now five government railways in Canada, with a combined mileage of over 4,000 miles. Not one of them earns the interest on the investment in it. In fact, four out of the five, having about 3,600 miles of the total mileage, failed in 1915 to earn even their operating expenses in spite of the fact that they represent an investment per mile which exceeds by $8,000 the capitalization per mile of the railways of the United States. And yet, in all of the defenses of government ownership that are being put forth in Canada almost no reference is made to who pays the enormous losses of these government railways. The advocates and defenders of government ownership twist, turn, dodge, and duck to avoid this point, when, as a matter of fact, it is one of the most important points to be considered in the whole controversy. If the Canadian public realized how many millions of dollars in taxes government ownership and management is already costing it each year, it would receive in a very different spirit the plausible but sophistical arguments for extensions of this policy with which it is now beguiled.

Let us turn now to the cases of the Grand Trunk Pacific and the Canadian Northern, which have failed to earn the interest which the government has guaranteed for them. The government cannot avoid paying or reduce this interest by the simple device of making these roads government property. It is already paying many millions of dollars a year in unearned interest on the railways which it now owns, and if it takes over the Grand Trunk Pacific and the Canadian Northern it will have to pay interest on the investment in them from taxes as long as their earnings are insufficient to meet it, just as it now pays from taxes the interest on the investment in the Intercolonial and the National Transcontinental. The question which ought to be considered, then, is as to whether the burdens which the public will have to bear and the benefits which it will derive from the Grand Trunk Pacific and the Canadian Northern will be greater if the government leaves them in private hands or takes them over as its own property. Since the interest to be paid on the investment will be substantially the same under either private or government ownership (the interest of the private companies being already largely guaranteed by the government) the really crucial question involved is whether these railways probably will be more economically and efficiently developed and operated under private or under government management. The economy and efficiency with which they are managed will determine the burdens they will impose on the public and the benefits it will derive from them. This point is receiving almost no consideration from the advocates of government management. Why is this? Obviously because private management of railways in Canada has, up to this time, been so much more economical and efficient than government management that the advocates and defenders of the latter dare not institute the comparison. Private management of railways in Canada has, in the main, been economical and efficient. Government management has, in the main, been incompetent and wasteful. The conclusion inevitably suggested is that under government management the burdens that would be imposed on the public by the Grand Trunk Pacific and the Canadian Northern would be greater and the benefits conferred less than under private management.

The railway companies are attacked upon the ground that their influence upon public affairs has been bad. They are denounced because, as is alleged, they have secured excessive concessions from the government of Sir Wilfred Laurier and from the succeeding administration of Sir Robert Borden. But assuming that these criticisms are just, there were two parties to every one of these transactions, the railway company on the one hand, and the government on the other. This being the case, should not the government as well as the railway companies be held responsible for any unwisdom, impropriety or dishonesty which marked these transactions? If the government in these transactions showed improvidence, or, as is sometimes implied, was actually corrupt, can this, by any process of reasoning, be tortured into an argument for government ownership and management of all the railways? Such allegations, if well-founded, simply mean that the government has been as incompetent and wasteful in dealing with the private railway companies as it has been in managing the state railways. This is hardly a valid argument for extending the policy of government ownership and management.

If the present railway situation in Canada is in large measure a result, as is now widely charged, of the exercise by the private railway companies of an excessive influence on politics and government, the remedy is not necessarily government ownership. The people of the United States have shown that government regulation can be used not only to break, but to completely destroy the influence of the railways in politics. The actual experience of Canada with government ownership and management is the very strongest argument that could be advanced against an extension of that policy in that country. The Canadian railway problem is at this time as difficult as it is important; but its solution should be found in some system of private management subject to public regulation, not in a dangerous and unnecessary extension of government ownership.

HELPING EXPORT TRADE

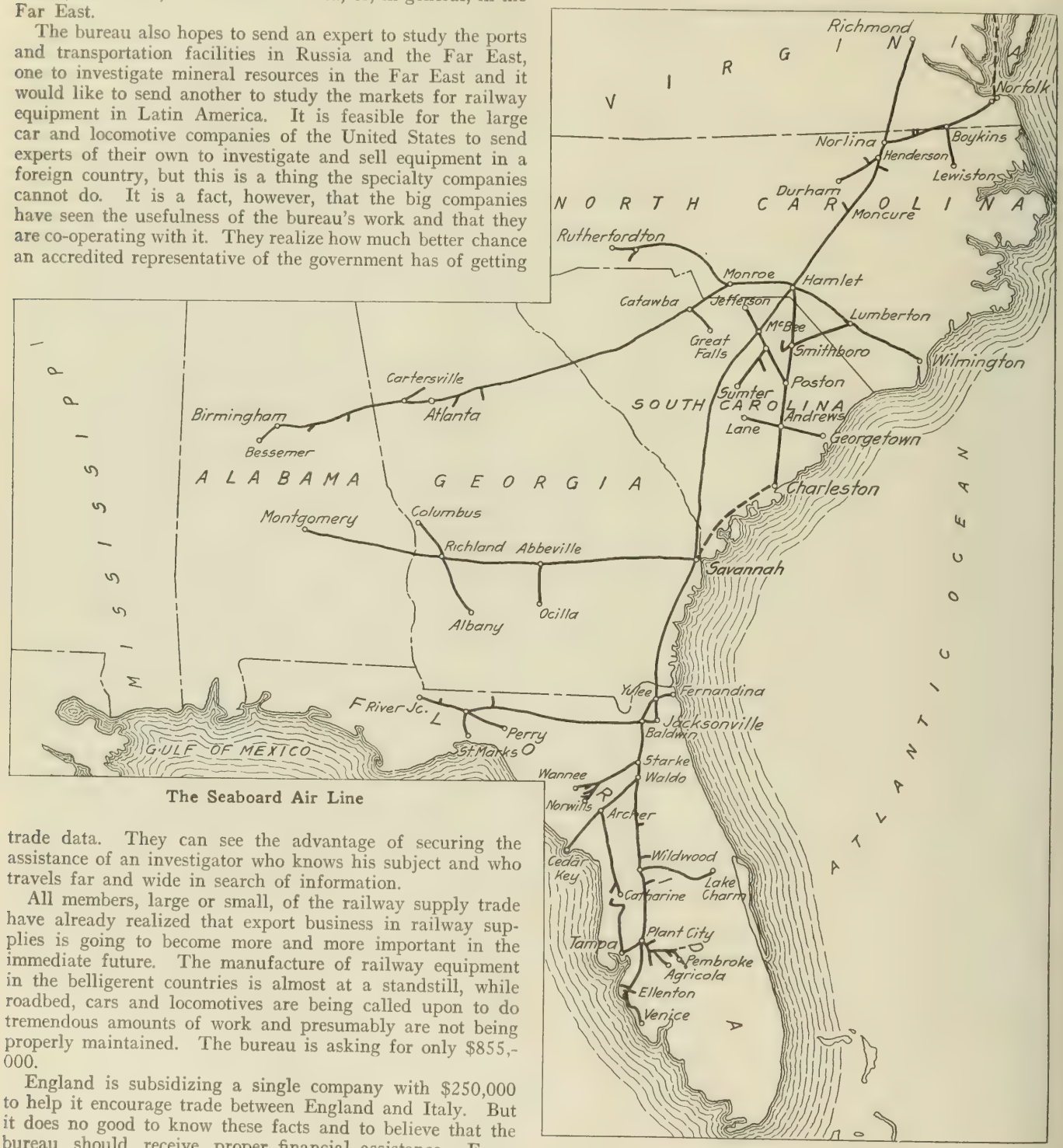
THE Bureau of Foreign and Domestic Commerce is that branch of the Department of Commerce which investigates the possibilities of American trade in foreign lands. The bureau last year at a time when export business was receiving an extraordinary degree of attention, worked under an appropriation of $505,000, although it asked Congress for $935,000 and could have used that and more. This year it has asked Congress for $855,000, exclusive of about $150,000 for printing which is taken care of by the Bureau

of Engraving and Printing. The Bureau of Foreign and Domestic Commerce is, of course, concerned with many kinds of export business, but it has been giving no small share of its attention to railway equipment. At present, for instance, Frank Rhea, formerly with the Interstate Commerce Commission Division of Valuation, is in Australia, having just left New Zealand. He will go on to study the markets for railway equipment in the countries of Japan, China, and India, also in South Africa, or, in general, in the Far East.

The bureau also hopes to send an expert to study the ports and transportation facilities in Russia and the Far East, one to investigate mineral resources in the Far East and it would like to send another to study the markets for railway equipment in Latin America. It is feasible for the large car and locomotive companies of the United States to send experts of their own to investigate and sell equipment in a foreign country, but this is a thing the specialty companies cannot do. It is a fact, however, that the big companies have seen the usefulness of the bureau's work and that they are co-operating with it. They realize how much better chance an accredited representative of the government has of getting trade data. They can see the advantage of securing the assistance of an investigator who knows his subject and who travels far and wide in search of information.

All members, large or small, of the railway supply trade have already realized that export business in railway supplies is going to become more and more important in the immediate future. The manufacture of railway equipment in the belligerent countries is almost at a standstill, while roadbed, cars and locomotives are being called upon to do tremendous amounts of work and presumably are not being properly maintained. The bureau is asking for only $855,000.

England is subsidizing a single company with $250,000 to help it encourage trade between England and Italy. But it does no good to know these facts and to believe that the bureau should receive proper financial assistance. Every railway supply firm and, in fact, every railway that has hopes of doing export business now or in the future, should get in touch with the representative and senator from its district and state and show them that export business in general and the welfare of its own plant in particular will be benefited by the bureau's assistance.



The Seaboard Air Line

SEABOARD AIR LINE

TOTAL operating revenues of the Seaboard Air Line were 12.46 per cent more in 1916 than in 1915. The same proportion of gross was appropriated for maintenance in 1916 as in 1915, which meant very considerably increased expenditures in 1916 for this purpose. Through a smaller proportionate expense for transportation $1,589,000 out of the total of $2,713,000 increase in revenues was saved for net, and after the payment of interest, rentals and the full 5 per cent on the adjustment income bonds there was a net income in 1916 of $1,270,000, comparing with only $15,000 surplus in 1915. More liberal expenditures for maintenance were justified, the Seaboard having cut its maintenance

of way expenditures down as low as was practicable and safe in 1915. The showing made in transportation expenses is a reflection of improvement in operating methods following better supervision and certain changes in the way of attacking some of the Seaboard's operating problems. It used to be thought that the use of heavy locomotives in freight service on the Seaboard was not practical because so much of the freight was high grade and had to be moved on a fast schedule. In 1915, however, 19 Mikado locomotives were bought for freight service. The full effect of the use of these heavier locomotives was shown in 1916.

The total revenue ton mileage in 1916 was 1,694,457,000, an increase over the previous year of 344,066,000, or 25 per cent. The number of passengers carried one mile was 233,528,000, an increase of 17,150,000, or 8 per cent. Transportation expenses amounted to $8,191,000, an increase of $226,000, or less than 3 per cent. Passenger train miles totaled 6,085,000 in 1916, an increase of 105,000 over 1915, or less than 2 per cent. Freight train mileage totaled 4,522,000 in 1916, an increase of 52,000, or about 1 per cent. The loaded car mileage east or north totaled 67,358,000, an increase of 14,022,000, and west or south 42,293,000, an increase of 3,813,000. The empty car mileage east or north totaled 10,614,000, a decrease of 2,632,000, and west or south 32,584,000, an increase of 1,933,000. The average freight train load of revenue freight was 336 tons, an increase of 57 tons or 20 per cent. The average loading per car was 15.45 tons as against 14.71 tons in the previous year.

The increase in tonnage of freight carried by the Seaboard Air Line last year was principally in low grade commodities and this tendency toward a greater and greater proportion of low grade commodities which permit of heavy loading, but carry a low ton-mile rate, is a factor to be borne in mind in the study of the development of operating methods on the Seaboard. With operations, character of equipment and general development of the property along the right lines, a lower average ton-mile rate will not only be offset by more economical transportation costs but in time the road will have a lower operating ratio and a larger net in consequence of the change that is taking place in the character of its traffic. In 1916 the total tonnage of all commodities carried was 9,769,000, comparing with 8,577,000 tons in 1915. Of the total tonnage carried in 1916 25.92 per cent was lumber and forest products as compared to 25.63 per cent in 1915. Products of mines furnished 24.18 per cent of the total in 1916 and 23.01 per cent in 1915. Manufactures furnished 34.82 per cent in 1916 and 33.18 per cent in 1915. Products of agriculture furnished 13.97 per cent of the total in 1916 as against 17.15 per cent in 1915.

The purchase of the Mikado locomotives was in anticipation of changing operating conditions.

The work of ballasting which has been going on in the last few years is another step in the direction of the development of heavier trainloading. The Seaboard Air Line now has 1303 miles of its main line ballasted with gravel or slag, and there remains only between two and three hundred miles of main line to be ballasted.

Another important step in the development of the property is now nearing completion. As of November 16, 1915, the Carolina, Atlantic & Western was merged with the Seaboard Air Line. The comparisons made in the annual report and in these comments are for the combined figures of the two roads for both years. The Carolina, Atlantic & Western was building a line from Charleston to Savannah, with a maximum of 0.3 per cent grades and 2 deg. curves. This line is being completed by the consolidated company. When this line is completed at least twice as heavy a trainload can be hauled from Hamlet, N. C., to Savannah, Ga., 250 miles, as over the old line of the Seaboard by way of Columbia, S. C. The Charleston-Savannah line runs through a very rich agricultural country, so that this line will develop local traffic as well as serving as a low grade line for through freight. Grade revision work between Hamlet and Charleston has been carried on, so that with the completion of the Charleston-Savannah line the Seaboard will have a main line from Hamlet to Jacksonville, Fla., 386 miles, with maximum grades of 0.5 per cent. Other grade revision work is being done between Raleigh, N. C., and Sanford and between Sanford and Hamlet. Besides cutting out short irregular grades this work will entirely eliminate two pusher grades.

The increased expenditures for maintenance have already been mentioned. The following table shows the percentage of each class of expenses to total operating revenues in 1916 and 1915:

	1916	1915
Maintenance of way and structures	11.94	11.45
Maintenance of equipment	14.27	14.72
Traffic expenses	3.37	3.57
Transportation expenses	33.44	36.57
Miscellaneous expenses	0.56	0.52
General expenses	3.10	3.37
Transportation for investment—Cr.	0.01	0.01
Total	66.68	70.19

In 1916 maintenance of way and structures expenses averaged $848 per mile, and repairs, exclusive of renewals and depreciation and overhead of equipment, averaged $2,304 per locomotive, $706 per passenger car, and $56 per freight train car. The maintenance of way figure looks low, but the characteristics of the property must be kept in mind when making a comparison with northern lines. Section labor, although not particularly efficient, is very cheap. One dollar a day is about what negro section hands get. Ties cost less than half of what they do on many roads in the North, and in 1916 1,606,000 cross ties and 977 sets of switch ties were put into track, the cost varying from a little over 30 cents to about 40 cents. The ties now being used are principally cpyress and oak, replacing pine. Most of the ballast on the Seaboard Air Line has only been put on in recent years, so that as yet there is almost no charge to expenses for ballast renewal.

During the year the company created a first and consolidated mortgage to secure an authorized issue of $300,000,000 bonds and under this mortgage there was sold during the year $22,459,500, series A, 6 per cent bonds. With the proceeds $6,000,000 5 per cent notes, due March 1, 1916, were paid off, $1,700,000 refunding mortgage bonds were purchased and pledged under the new mortgage, $5,725,000 underlying first mortgage 6 per cent bonds of the Carolina, Atlantic & Western were purchased and retired, and the treasury was reimbursed for expenditures for additions and betterments. At the end of the year the company had on hand $3,452,000 cash, with $942,000 special deposits against matured interest and dividends. There were no loans and bills payable except $63,000 which nominally came under this head, and during the year the company had spent $1,519,000 for additions and betterments to road.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	3,449	3,334
Freight revenue	$16,982,313	$14,681,060
Passenger revenue	5,032,431	4,686,885
Total operating revenue	24,494,789	21,781,316
Maintenance of way and structures	2,924,293	2,493,957
Maintenance of equipment	3,496,061	3,207,117
Traffic expenses	825,213	776,468
Transportation expenses	8,190,507	7,964,482
General expenses	758,433	733,772
Total operating expenses	16,332,546	15,287,552
Taxes	1,170,826	1,090,947
Operating income	6,983,151	5,393,915
Gross income	7,411,725	5,752,676
*Net income	1,269,978	15,046
Annual allotment of discount on securities	309,548	315,443
Surplus	960,431	†300,398

*After deducting interest on the adjustment mortgage bonds. †Deficit.

NEW BOOKS

Passenger Terminals and Trains. By John V. Droege. 410 pages, profusely illustrated. 6 in. × 9¼ in. Bound in cloth. Published by McGraw-Hill Book Company, 239 West 39th street, New York. Price, $5 net.

This book scarcely needs an introduction. Its author, general superintendent of the New York, New Haven & Hartford, at New Haven, Conn., is already well known through his former book "Freight Terminals and Trains." This is a companion book to that one. A mere reading of the titles of the 22 chapters conveys to the reader a good idea of the unsuspected range of matter included in the subject, and of the variety of viewpoints from which it should be considered. These titles include, besides those which are obvious, Interlocking and Approaches; Through or Side Stations; Waterfront Terminals; Trackage Agreements; Car Cleaning Plants; Passenger Trains and Terminals of Foreign Countries; Electrification; The Commissary; Statistics of Passenger Service.

This is a very interesting book. It is practical on every page, theories and opinions being constantly backed up by facts. Its chief fault is that it is too rich; the reader constantly reads pages full of more facts than he feels like digesting. Perhaps, however, this is not a fault; but the reader would have been helped by the introduction of more sub-titles or side heads, breaking up long chapters. On certain details the author might be criticised for a fault very common among railroad officers who write—the use of too mild language. Toilet rooms and station facilities generally could be treated more vigorously; good management should be praised and bad management should be denounced in a more incisive style—and the author of a book has such a fine opportunity! On page 189 the author forgot to denounce the train caller who never makes people understand what he says; and missed his chance to praise the man who can announce trains in a large room clearly. However, there are in the United States so few of these last mentioned that perhaps Mr. Droege never saw one!

But these criticisms are as the small dust in the balance. The main idea of the book—the careful compilation of thousands of useful and interesting facts and the avoidance of the error of flying off into theories and making only a literary essay—affords the reader constant satisfaction. A book so full of authentic statements of facts, by a man who has such a rich experience of his own and such a careful, judicial and industrious mind to gather the experiences of others, is a very unusual production.

Frankness is one of the prominent merits of the book. The criticisms of individual stations by name show the spirit of the author; show that he writes for the benefit of the reader, not for any lower purpose. The quotation of a general passenger agent's opinion of dining cars, page 373, and other like passages, show that the author is up-to-date. The photographic illustrations alone will sell the book to many persons. Every interesting large station, apparently, has been pictured, and with discrimination and taste. The photographic engravings as a whole produce a large and striking variety—and in this feature no one objects to richness.

This book seems to be addressed to the "general reader," and that is well; thousands of people who get their reading in public libraries ought to go through it with care; but its popular character is no detriment, and it will be wanted in every railroad officer's library. Much of the matter, especially some of the discussions, will be of little interest to anybody except railroad men as, for example, that on Rule 99—in which, by the way, the author, with the skill of a German diplomat, has avoided any danger of being torpedoed by the enemy.

The book has a good index which, however, would have been more satisfactory if the illustrated articles had been distinguished from those not illustrated.

Letters to the Editor

BITING SARCASM FROM C. THORNE

DES MOINES, Ia.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

My attention has been called to an editorial in your issue of November 24, in which you agree with me that the state commissions have had a low batting average, and you make the wise suggestion that, instead of roasting the umpire, possibly some of the state legislatures and commissions would improve their batting average by practicing a higher swing at the ball.

I gently suggest to your most wise understanding that if there is a grain of common sense that has any room amidst all the profound learning and wisdom with which your brain is burdened, that it might occur to you when there is a difference of opinion between parties, commissions or baseball teams, it might be well to have some other person act as umpire than one of the parties to the difference. I am sorry it seems to require a sledge hammer to drive home the proposition.

C. THORNE,
Chairman, Railroad Commission of Iowa.

A DESPATCHER ON THE EIGHT-HOUR DAY.

HAILEYVILLE, Okla.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

With the eight-hour day for trainmen and enginemen the item of overtime will be of increased importance and the despatcher will be looked to to do his share toward keeping expenses down. But we shall be working under the same conditions then as we are now; shall we receive credit for the difference? On single track there is bound to be delay in meeting trains, but the telegraph offices will be just as far apart, maybe farther. The train-men and enginemen will not be so eager to get over the road in eight hours as they were prior to September 1, when they were trying to show the managements that they could do it in that time (and some of them did). However, with the eight-hour day it will be extremely easy to make a couple of hours overtime, and then say in reply that it required that long to get over the road two years ago, etc.

On some lines the management lays down the rule that despatchers must keep twenty minutes off the time of passenger trains, in so far as concerns the assisting other trains; in other words, the passenger train must be twenty-five minutes late before we can use five minutes. It can readily be seen that this simply kills trains of an inferior class. When operating under an eight-hour day it will not take long for the eight hours to run out if there are many passenger trains to meet and let by. Another handicap will be on Sundays and holidays, where the operators at one-man stations only work three hours a day. And the trainmen and enginemen never fail to take advantage of the time to eat, regardless of what is going on. Should the eight-hour day become effective the company will receive about seven hours' service, for they will find an opportunity to eat twice on the trip, provided there is no improvement on the way that the matter is handled now.

J. L. Coss.

THE DIARY OF OUR OWN SAMUEL PEPYS.—Dec. 6: To the office early, and all day at my many tasks again; one of the greatest of them trying to find out, by telephoning, whether it is the Pennsylvania Terminal or the Pennsylvania Station; and learning, after having the young ladies bid me to wait a minute, please, that it is the later.—*F. P. A. in N. Y. Tribune.*

Is Intercolonial's Failure Due to Low Rates?

Further Analysis Affords Additional Evidence That Its Losses Have Been Due Mainly to Its Management

By Francis A. Bonner
Associate Director, Bureau of Railway News and Statistics

ONE may well doubt if there could arise in behalf of the government owned and operated Intercolonial Railway of Canada a more sincere and devoted champion than J. L. Payne, comptroller of statistics of the Canadian Department of Railways and Canals, shows himself to be in his argument appearing in the *Railway Age Gazette* of October 6. Mr. Payne, in the expressed purpose of his reply to Mr. Dunn's analysis of the Intercolonial's unbroken record as a financial failure, sets before himself three undertakings: "First, to present the true story of the Intercolonial Railway; second, to show that the experience of the Intercolonial cannot properly be taken as demonstrating either the success or failure of government ownership; and, third, to correct some of Mr. Dunn's assumptions and deductions which were manifestly based upon imperfect or misleading information." The historical facts reviewed, regarding political causes which produced the Intercolonial and considerations of Empire which resulted in its location, effectively dispose of all thought that the railway's projectors and builders ever harbored a notion that its ability to walk financially without a perambulator was a requisite.

As the keystone in his defense of the Intercolonial, however, as the outstanding reason for its financial insolvency, Mr. Payne urges the low level of rates charged upon its traffic. This factor was set forth also by Mr. Dunn, who estimated that probably one-third of the Intercolonial's losses might be attributed to low rates. Mr. Payne sets vital importance upon this one factor, for he says:

"The point I desire now to establish—and it is the kernel of this whole matter—is that the Intercolonial has not paid, in the commercial sense, simply and solely because its freight and passenger rates have been too low. If I fail to prove this contention I shall be left without a vestige of excuse for writing this reply to Mr. Dunn."

It will be hardly unfair to assume Mr. Payne's meaning to be that these low rates of the Intercolonial arise from a deliberate policy; for he goes on to consider the reasons actuating against an advance in rates "up to the Canadian Pacific level"; chiefly that it would be a flagrant breach of faith and that the Maritime Provinces protest against any idea of their railways paying interest out of transportation charges while Quebec and Ontario receive their canals interest-free. The only uncontrollable factor advanced, water competition, he finds should not be given undue importance. Proponents of ownership and operation of railways by the state invariably advance as an argument that public railways would consider first promotion of social progress through reductions in rates; and if application of such policy is the source of the Intercolonial's low rates and financial failure, advocates of state operation may still find some consolation in the performance of the railway. Mr. Payne builds upon these low rates the structure of his defense of the Intercolonial's performance. In so far, then, as their reality may be questioned the defense is weakened and other causes must be sought for the railway's failure to meet operating expenses than the deliberate granting of unremunerative rates.

A journey which the writer has just had the pleasure of making over nearly every mile of the Intercolonial system, extending from Quebec to Sydney, Cape Breton, and back to Halifax, gives rise to a belief that the reality of these low rates may seriously be questioned; that they are, first, in part fallacious; second, in part due to reasons germane to those which give the Virginian Railway, for instance, one of the most efficient of our own private railways, (operating as it does on a ratio of expenses to revenues of only 55.7 per cent) an "average freight rate" of only 3.4 mills per ton mile—about half the low rate cited as justification for the Intercolonial's ruinous operating ratio of 100.8 per cent.

Average Passenger Revenue Versus Actual Rates

It is true that the "average revenues" of the Intercolonial, whether per passenger-mile or per ton-mile, compared with those of either Canadian railways as a whole or the Canadian Pacific in particular—with which highly prosperous private railway Mr. Payne is bold enough to compare the achievements of the Intercolonial—are low. The Intercolonial's average per passenger mile in 1915, according to the official Railway Statistics of the Dominion of Canada, was 1.824 cents against 2.021 cents for all Canadian roads, and 2.071 cents for the Canadian Pacific. Its "average freight rate" was .616 cent per ton-mile against .751 for all railways and .772 for the Canadian Pacific. It seems reasonable at first glance, therefore, to accept the view that the government's rates are far lower than those of its competitors and that if, as Mr. Payne urges, the Intercolonial and Canadian Pacific were to "swap" rates the state road would be in affluence and the Canadian Pacific on the ragged edge of failure.

The defense, however, is based upon a confusion of average rates and average revenues, so often loosely termed average rates. The rates a railway charges are the actual quotations provided in its tariffs; the average revenue per ton or passenger-mile is merely the result of a division of passenger or ton-miles into passenger or freight revenues. The two may be far apart. United States railways operating in states where a strict application of the 2 cent per mile fare is adhered to will inevitably show an average revenue per passenger-mile a fraction under 2 cents. One of the most important reasons is competition with short line mileages. No road can well be the shortest line between every two points it in common with other roads connects. The shorter line in each case must, of course, set the fare upon its own mileage; the longer road must perforce meet the rate upon its longer mileage or give up the business. This has a particularly vital effect on the Intercolonial Railway of Canada. Between Montreal and St. John, N. B., it charges a first class limited one way fare of $14.30. Between the same two very important centers of traffic operates the Canadian Pacific. One looking for evidence of the social betterment application of government railway rates might receive his first jolt upon learning that the Canadian Pacific charges the selfsame rate. It could not, of course, be otherwise. Both must charge alike or one will get all the traffic. Now, the Canadian Pacific hauls its passenger 483 miles in performing the service of transporting him from Montreal to St. John; it has received, consequently, 2.96 cents per passenger-mile. The Intercolonial, on the other hand, has to haul its passenger 740 miles between the same two points and receives, consequently, only 1.93 cents per passenger mile.

Likewise, from Montreal to Moncton, N. B., the fare by either road is $14.30, first class, limited, one way. The Canadian Pacific performs the service (partly over the Intercolonial's own rails) in 572 miles, receiving 2.50 cents

per mile; the Intercolonial, to earn the same fare, has to cover 651 miles and receives therefore only 2.19 cents per mile. From Montreal to Halifax either road charges $18.45, first class, limited, one way. The Canadian Pacific, again partly over the Intercolonial's own lines, covers the journey in 758 miles at 2.43 cents per mile, while the Intercolonial consumes 836 miles at 2.21 cents per mile. From Sydney to Halifax, where there is no short line competition, it is interesting to see the fare for the 286 miles rise to $7.55, or 2.64 cents per mile.

Not any applied theory of a state railway's obligations to the public has caused these lower averages via the state railway, but the stern force of competition, from which there is no appeal. Government roads, like private, must meet rates to competing points and where there is disproportion in mileage the longer road must suffer. Travel in the Intercolonial territory gives an impression that a large part of its traffic consists of long haul business between Montreal or Quebec and the important centers of the Maritime Provinces, to which rates must be set via the shorter competing mileage of the Canadian Pacific. This, then, must be a powerful factor in pulling down the government railway's "average rates," thus to term loosely what is really average *revenue*. Such a conclusion is strengthened by a comparison of local fares not subject to competition. I have taken at random specific journeys local to the Intercolonial and compared them with random journeys of about the same mileage, local to the Canadian Pacific, with the following results:

Road	Journey	Miles	First class fare	Av. per pass. mile
Int....	Riviere du Loup, Que.—Trois Pistoles, Que..	27	$0.85	3.15c
C. P. R.	St. John, N. B.—Welsford, N. B.....	24	.80	3.33c
Int....	Campbellton, N. B.—Petit Rocher, N. B.....	51	1.60	3.14c
C. P. R.	Greenville Jct., Me.—Holeb, Me.....	53	1.60	3.02c
Int....	Riviere du Loup, Que.—Mont Joli, Que.....	83	2.55	3.07c
C. P. R.	St. John, N. B.—McAdam Jct., N. B.....	85	2.60	3.06c
Int....	Mont Joli, Que.—Campbellton, N. B.....	105	3.15	3.00c
D. A. R.*	Halifax, N. S.—Lawrencetown, N. S.....	108	3.25	3.01c
Int....	Campbellton, N. B.—New Castle, N. B.....	107	3.25	3.04c
C. P. R.	Sherbrooke, Que.—Montreal	107	3.20	2.99c

* Dominion Atlantic, controlled by Canadian Pacific.

First class rates in these instances are seen to hug 3 cents per mile for either railroad, in some instances the average figuring a bit higher for the government than for the private line. This similarity is not exceptional. Investigation discloses that first class fares on the Canadian Pacific in all territory east of Calgary, MacLeod and Edmonton generally speaking are 3 cents per mile, excepting only the line between Mattawamkeag and Vanceboro, Me., (territory competing with the Intercolonial) where, running over the Maine Central tracks, the Maine Central fares of 2½ cents are used. Turning now to the Intercolonial we find a flat mileage tariff in existence quoting 3 cents or more per mile, first class, on local distances. This tariff quotes 1 mile, 5 cents; 2 to 3 miles, 10 cents; 4 to 5 miles, 15 cents; 6 miles, 20 cents; 7 to 8 miles, 25 cents; 9 to 10 miles, 30 cents. Thence up to 200 miles the rate remains 3 cents per mile, as seen from the following examples:

Miles	First class fare	Miles	First class fare
15	$0.45	40	$1.20
20	.60	50	1.50
25	.75	100	3.00
30	.90	200	6.00

Beginning with 200 miles, there is a slight reduction which brings 300 miles to $8.10; 400 to $10.00; 500 to $12.00 and 1,000, the extreme quoted, to $22.00.

Low rates applied for political purposes or those of social betterment are a plausible, even if specious and deceptive, justification to poor financial showings of government railways; in the case of the Intercolonial's first class passenger fares, however, they do not seem to exist. If we turn to second class fares the government road does make a showing, although even the second class fares are based on a flat mileage tariff which up to 200 miles quotes 2 cents per mile, the rate fixed by law for first class travel in 11 states of the United States. Beyond two hundred miles there are again slight reductions bringing 300 miles to $5.40; 400 to $6.70; 500 to $8.00 and 1,000 to $14.70. Second class fares locally on the Canadian Pacific run from 2 cents to 2 2/3 cents per mile. Mark the effect, however, where competition enters: the Intercolonial charges $10.00 for the 740 mile journey second class Montreal to St. John, or 1.35 cents per mile; the Canadian Pacific meets the rate of $10.00, but as the distance is only 483 miles the average is 2.07 cents per mile. Where rates are competitive the two must charge the same second class as well as first and the Intercolonial, by reason of its tremendous haul, must work on its smaller per mile receipt. Where rates are purely local the Intercolonial's second class fares do seem to be slightly under the Canadian Pacific's. If, as in Europe, travel on the Intercolonial were overwhelmingly second class or poorer, this would have an important effect on the average passenger revenues. I find no data in the official Canadian report dividing second from first class passenger statistics. But as the Intercolonial has only 33 second class coaches against 140 first class, 8 parlor cars and 48 sleeping cars—196 cars in all carrying first class travel—it seems unlikely that second class travel preponderates. In Germany, where the low average passenger mile revenue results from a preponderance of low class travel, there are by contrast only 147 first class coaches against 3,705 second, 29,326 third and 17,563 fourth class.

How About the Freight Rates?

A more complex situation confronts one in the freight department. Intricate variations in character of territory reflected in currents of traffic; in peculiarities of production and consumption of materials; in differing necessities as to quotation of through or local, joint or reshipping rates and in other multitudinous factors affecting rate making, render it extremely difficult to find a common ground upon which to compare charges for hauling similar materials similar distances under similar conditions. Perhaps the most clear-cut comparison may be made in the province of merchandise moving under class rates. Here there are definite tariffs quoting a definite price for hauling closely classified articles a defined distance. The comparison is striking, for both railways quote absolutely the same figures. The following specimen rates are indifferently those per 100 pounds on either Intercolonial or Canadian Pacific:

Class Freight Mileage Tariff

Class	10 miles	25 miles	50 miles	75 miles	100 miles	St. John to Montreal
1.....	$0.10	$0.16	$0.24	$0.30	$0.36	$0.54
2.....	.08	.14	.21	.26	.32	.47
3.....	.07	.12	.18	.23	.27	.41
4.....	.06	.10	.15	.19	.23	.34
5.....	.05	.08	.12	.15	.18	.27
6.....	.05	.07	.11	.14	.16	.25
7.....	.04	.06	.09	.12	.13	.20
8.....	.04	.07	.10	.12	.14	.21
9.....	.04	.07	.09	.11	.13	.23
10.....	.04	.05	.07	.10	.11	.18

Again we find where shipments are purely local the two railways ask the same per mile; where rates are competitive they ask the same for the service and again the Intercolonial per mile revenue suffers. From St. John to Montreal, at 54c per 100 pounds, it receives for first class freight an average of only 1.46c per mile, whereas the Canadian Pacific, also at 54c a hundred, receives 2.24c per ton mile.

It is in commodity rates that the variations of traffic conditions enter most seriously to impede comparisons upon equal ground; it may be significant, however, that on bituminous and anthracite coal, by far the largest factor in the Intercolonial freight tonnage, both roads quote exactly alike at the following rates per 100 pounds:

Miles	10	25	50	75	100
Cents	2.5	3.5	4.5	5.5	6.0

On lumber, another important Intercolonial commodity, the Intercolonial is slightly under the Canadian Pacific; on live stock it is equal on short distances and higher on long. In all cases, however, it is important to remember that one

road meets the other's rate at competitive points, with the now familiar effect on the Intercolonial's average receipt per ton mile.

This leads to another important consideration—namely, the character of the freight; for it is elementary that a railway's average revenues per ton mile will vary as the preponderance of high or low class traffic. As stated already, the Virginian Railway of the United States has an average revenue of only 3.4 mills per ton mile. The reason is—coal. Now, one who has passed through the region about New Glasgow, Nova Scotia, would expect the Intercolonial to show a large coal tonnage. The proportion is, in fact, larger than expected. Of 4,442,510 tons comprising all freight in 1915, bituminous coal represented 955,556 tons, or 21.5 per cent. The Canadian Pacific's proportion of bituminous coal was 9.2 per cent. Including anthracite, the Intercolonial's proportion of coal was 22.8 per cent, against the Canadian Pacific's 14.1. Lumber, another low rate commodity, made up 15.0 per cent of the Intercolonial's freight, against 7.9 per cent of the Canadian Pacific's. Grain, a higher rated commodity, on the other hand, made up only 2.98 per cent of the Intercolonial's tonnage, against 15.4 per cent of the Canadian Pacific's; while the government railway's proportion of merchandise, the highest rated freight, was only 4.1 per cent, against 7.5 per cent on the Canadian Pacific.

Such a marked difference in character of traffic cannot fail to be a powerful factor in giving the Intercolonial a lower average freight revenue per ton mile. It is, however, no excuse for the poor financial showing. The Virginian, with all its low average, operates on a 55.7 per cent ratio of expense to revenue. Many an executive on roads of high class freights would welcome a change to the Virginian's average revenue, if he could likewise secure the same opportunities for heavy loading of a steady commodity like coal.

Taken all in all, the Intercolonial's tariffs do not seem to bear out any hypothesis that low rates arising from political considerations or social betterment theories of government ownership are a reason for its failures. Mr. Payne, evidently inferring that such a magnanimity under public ownership is the reason, asks: "If low rates account wholly for the poor operating results by the Intercolonial, why does the government not raise them up to the Canadian Pacific level?" The reasons, he says, are that (1) the Maritime Provinces believe it was part of the original agreement that the road should never produce more than operating expenses; (2) that it would be a breach of faith to attempt to earn interest on cost; (3) water competition, which, however, he says should not be given "undue importance"; (4) Ontario and Quebec get their canals interest free and New Brunswick and Nova Scotia demand their railways interest free in like manner. It is their own look-out, to be sure, if they prefer to fool themselves and pay the interest in form of taxes, when with rates sufficient to pay interest outsiders traveling or shipping could be made to bear their part of the cost. But a real reason why rates are not advanced "to the Canadian Pacific level" would seem to be that they already are there; that 3 cents a mile first class and 2 cents a mile second class is already enough for passenger travel on a road hauling practically the same number of passengers per train as United States railways and more than the average of Canadian railways; that to give the Intercolonial with its long mileage an *average revenue per ton or passenger mile* equal to the Canadian Pacific's the actual rates would have to be much higher than the latter's—which on competitive business would be impossible.

Mr. Payne shows the real splendor of the Intercolonial's achievement by changing shoes to the other feet. He gives the Canadian Pacific the Intercolonial's "average rates" and vice versa to show that under these exchanged conditions the Intercolonial would be rolling up a large surplus and the Canadian Pacific verging on bankruptcy. "Is there anything specious or unfair in the foregoing comparison?" he asks. I submit that it requires only recollection of the essential difference between "average revenues" and actual "average rates" to disclose a very serious fault. Average revenue per passenger mile, to repeat, is not a *rate* per mile, but the quotient of passenger revenue divided by passenger miles. To apply the average or quotient of one road's division to the passenger miles, or divisor, of the other and accept the result as indicating what would be the result on the other, whose passenger miles bear no relation to this quotient, results in an erroneous outcome which grows ridiculous where there is great disparity in passenger or ton miles necessary to do a given service. A concrete case is clearer:

Between Montreal and St. John the two railways now work as follows:

	Miles	Fare	Per pass. mile
Intercolonial	736	$14.50	1.97c
C. P. R.	483	14.06	2.96c

Give the Intercolonial the Canadian Pacific's "average rate," as the last column is incorrectly termed, and vice versa, and we have now:

Intercolonial	740 miles @ 2.96c	=	$21.90
C. P. R.	483 miles @ 1.93c	=	9.32

The high average which is the direct result of economic location of the second road is applied to the long mileage which is the very cause of the unprofitable average of the first, and vice versa. Hopeless, indeed, would be the railway which could not show up well in comparison with even the most prosperous on such an exchange.

Average Rates on Other Government Lines

In great measure, therefore, the Intercolonial's low average revenue per traffic unit mile, so vital a factor in its failure, must be attributed first to running around Robin Hood's barn to get anywhere, and second, to the greater proportion of low grade traffic; and not to any policy of deliberate general rate concessions. This is strengthened by the averages of other private and government railways in Canada, where volition has freer play:

	Average revenue per Pass. mile Cents	Ton mile Cents
All railways	2.021	.751
Intercolonial	1.824	.616
Canadian Pacific	2.071	.772
Grand Trunk	1.753	.687
Prince Edward Island	1.822	3.892
National Transcontinental	2.412	1.092
New Brunswick Coal & Ry.	2.680	3.325
Temiskaming & Northern Ontario	2.339	1.025

The Grand Trunk's average per passenger mile is lower than the Intercolonial's. But far above either of the great private lines and (excepting the Prince Edward Island's passenger average) far above the freight or passenger averages for the entire country are those of the last four named, all government owned and operated. Yet all, save only the Temiskaming & Northern Ontario, failed in 1915 to make bare operating expenses. The one exception consumed for operating expenses over $95 out of every $100 received that year. They are all failures despite freedom from the handicap of "low rates" advanced by Mr. Payne for the Intercolonial.

Confining ourselves again to the Intercolonial, since its failure is due largely to low average revenues, and these largely due to uneconomic location, and that location due to military considerations, it may be partly true, as Mr. Payne says, that its failure in particular is lessened as an argument against efficiency of government operation. But another argument is proved. The moment public ownership enters there come in its train a host of followers—factional politics, log-rolling between representatives, concessions to local demands, the pork barrel; or, if you will, as in the Intercolonial's case, considerations of military strategy, to crowd overboard those cold scientific facts of economy unescapable,

in the settlement of administrative questions, for successful enterprise. The result is mismanagement, or, as in the Intercolonial's case, a road so poorly located as to be unprofitable. If in some instances national defense conflicts with economy, economy must be discarded; or if people are willing to hoodwink themselves into a delighted dream that because they are not paying interest charges out of rates they are getting the property free, while at the same time they joyfully pay their taxes with the other hand, it may be justifiable to discard economy. But if national and commercial needs are harmonious, and they generally are, it is ruinous self-deception to break the relentless laws. Impartial, judicial consideration of facts is and always must be foreign to management by popular democratic government, responsive to the selfish demands of sectionally selfish constituents.

As to service, like Mr. Dunn, I cannot subscribe to Mr. Payne's claim that "there is no better roadbed anywhere" and that the railway supplies an "unsurpassed service." From my own experience I should say that with the exception of the division from Campbellton to Moncton the roadbed, judged by its riding qualities, is rather under that of the average unpretentious railway of the United States, while in details of service it is not to be compared with our better railways.

THE RIGHT OF PUBLIC SERVICE EMPLOYEES TO STRIKE

The Economic Club of New York held its thirty-seventh quarterly dinner at the Hotel Astor on the evening of December 11. The question for discussion was, "Should the right to strike of public service employees be regulated by law?" Frank A. Vanderlip, president of the National City Bank and president of the club, presided and the speakers were Dr. Charles R. Van Hise, president of the University of Wisconsin, representing the point of view of the public; A. B. Garretson, president of the Order of Railway Conductors of America, representing the point of view of organized labor; and Elisha Lee, chairman of the National Conference Committee of Railways, representing the point of view of the railroad employers.

Dr. Van Hise said that he was in favor of the passage of an amendment to the Newlands law to prohibit a railroad strike until after investigation of the controversy and recommendations concerning its settlement, but he said that he did not believe that this would be a final settlement of the question and that a final solution would only be found in creating a wage commission either as a branch of the Interstate Commerce Commission or as an independent body.

A. B. Garretson said that industrial war was exactly like international war. By industrial war the American working man had fought his way up to his present position and he had suffered and died in making that fight just as soldiers die on the battlefields fighting for their country.

"Take away the laboring man's right to quit work," said Mr. Garretson, "and you might just as well enslave him." Mr. Garretson said that he heard a great deal about suffering which would be caused by a tying up of the transportation system of the United States, but that little, if any, of this talk came from laboring men or the laboring classes who would be the chief sufferers. This talk came largely, Mr. Garretson thought, from the employer class who feared a curtailment of profits. The laboring class was willing, Mr. Garretson said, to suffer,—and he did not make light of the extent of that suffering,—in the cause of bettering working conditions. Mr. Garretson said that unorganized labor was in sympathy with and supported organized labor because the unorganized laborers knew that the unions were fighting their battles for them. As to public opinion, Mr. Garretson said he knew of no place where it could be so well tested as at the polls, and the result of the recent election of Mr. Wilson looked to him like emphatic public approval of the course Mr. Wilson had taken in preventing a railroad trainmen's strike.

In part Mr. Lee spoke as follows:

"When the private rights of the railroads have come into conflict with their public duties, the public, through the courts, has declared that public duties are greater than private rights. To the railroads the public says: 'You must operate continuously, under such regulations as we provide, and under such tariffs as we approve.'

"But to the two million of our citizens who are actually engaged in this public service—and without whom it could not be conducted—the public has neglected to issue any instructions. It has failed to mark the difference between the private rights and the public duties of the employees. The unfortunate controversy of last August brought vividly before the country the weakness of a system of public regulation of railroads, which fails to provide insurance against a paralysis of the internal commerce of the nation.

"The employees have a legal right to leave their posts on every mile of railroad in this country. Is not this unrestricted right of the railroad employees to quit work in a body a menace to the public welfare? Does not the individual who chooses to earn his livelihood in the public service of transportation assume a duty to help keep open these arteries of commerce, a duty greater than the private right to strike? During the recent wage controversy when it became apparent that the problem could not be settled across the conference table, we asked the train organizations to join with us in laying the whole dispute before the Interstate Commerce Commission. It may be that this will be the ultimate solution of the railroad wage problem—regulation of wages by the same Government commission that regulates rates. When it is considered that nearly two-thirds of the cost of railroad operation is the wage bill, it is seen how closely related are rates and wages. A ten per cent flat increase in the wages of all railroad employees is equivalent to a seven per cent increase in all freight rates. The demands for higher wages made by the train organizations (only one-sixth of the employees) were equivalent to a five per cent advance in freight rates. Wage demands of the same magnitude by all the employees would have been equivalent to a rate advance of 18 per cent.

"If the all-embracing commerce power under the constitution covers railroad wages as well as rates, then the way would be open for Congress to turn the whole problem of railroad wages over to the Interstate Commerce Commission.

"No matter what remedy is finally adopted by Congress for safeguarding the nation against the sudden interruption of interstate commerce, will it not fail of its purpose if it does not provide for a continuous oversight of railroad labor conditions by a permanent body of expert commissioners—men of the same high attainments and integrity as the members of the Interstate Commerce Commission?

"We are at the parting of the ways. One path before us is a continuation of the system of unrestricted private wage bargaining that eventually leads to settlement by force. The other path is a restriction and regulation of private wage bargaining for the protection of the rights of the public—trial by jury instead of trial by brute force.

"I am not prepared to say that all wage problems on the railroads should be placed unreservedly in the control of a public commission, but I do believe that when a controversy between the managements and the men reaches a stage where the interests of the public are imperilled—that then there should be a peaceful settlement, a judicial settlement, that will conserve the public interest as well as the rights of the parties to the controversy, and if it is finally determined that any body of men be required in the public interest to subordinate their private rights to their public duties, it should be with the full understanding that their rights must be in every way safeguarded by the public."

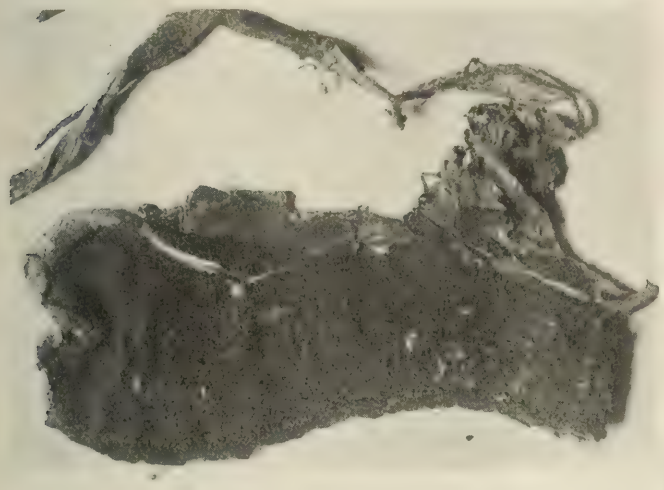
Timber Decay and Its Growing Importance*

Character of the Organisms That Destroy Wood and the Preventive and Remedial Measures Which Overcome Them

By C. J. Humphrey
Forest Products Laboratory, Madison, Wis.

DECAY is due almost entirely to the growth of wood-destroying fungi within the tissues of the wood. There are many hundreds of different species of these which disintegrate wood in the forest, but the greater part of the economic losses in structural timber is referable to a comparatively small number. These fungi are plants just as much as are trees and herbs. They differ merely in their form, lack of green coloring matter and methods of nutrition. While green plants absorb their food supplies from the soil through their roots, fungi derive their nutriment from the substance of the wood.

In the life-cycle of a wood-destroying fungus there are two distinct stages: 1, the vegetative stage, consisting of thread-like, usually much branched, filaments, termed *mycelium;* 2, the fruiting stage, which is nothing more than a



Fruiting Stage of Dry Rot Fungus

compact mass of mycelium which takes on a definite form on the surface of the decaying timbers and serves for the production of spores and, hence, the propagation of the species.

The mycelium is usually confined within the wood substance, the fine cotton-like filaments ramifying throughout the tissues and filling the pores of the wood and the cells of the pith rays, as well as boring through the walls of the wood elements. Sapwood is in most cases more susceptible to decay than heartwood because it contains a greater amount of the more easily digested compounds and, unlike the heartwood in many kinds of timber, is not infiltrated with compounds which in themselves retard the growth of the organisms.

Conditions Essential for Growth

In addition to available food supplies fungi require certain essential conditions for their development. These are sufficient moisture, at least a small amount of air within the wood and a suitable temperature. A suitable amount of moisture is, without doubt, the most important factor in decay. Certain ones classified as "dry rot" organisms seem to get along on a comparatively small amount, while others thrive only in highly humid surroundings. In the case of "dry rot" fungi it appears to be more a question of the ability of the organisms to tolerate dry conditions, or to produce their own moisture from the wood, than any essential need for such conditions, for observations and laboratory tests demonstrate that an increase in the moisture under such circumstances leads to more rapid decay.

The need for at least a certain minimum of water is well shown under practical conditions. The points of failure in ordinary dry buildings are the points at which a little extra water is brought to, or held within, the timbers; for example, the ends of joists or girders set in brick or concrete walls, outer window casings, wood surrounding water pipes which may sweat or occasionaly burst, porch floors and ceilings and other exposed trimmings where atmospheric moisture may collect at the joints, and last and often most important, basement timbers, either in contact with, or close to moist soil.

Most people are familiar with the way in which posts and telephone poles rot at or near the ground line. Below the ground line the sapwood completely decays, while above the ground line a thin shell of dry hard outer wood remains,



Pole Rotted Entirely to the Top

with the decay running up beneath it. This is entirely a result of moisture conditions. The same phenomenon often occurs in water tank staves where the outer face is too dry, and the inner face too wet, to decay, while an intermediate zone may completely disintegrate.

A certain amount of air within the wood is absolutely necessary for decay. The organisms need it for their growth.

*Abstracted from a paper presented before the Western Society of Engineers, at Chicago, on November 13, 1916.

In saturated wood the air is, for the most part, displaced by water and fungous growth is impossible. The very widespread idea that decay is due to alternate wet and dry conditions has developed through observation of the way timbers behave when exposed to the elements. Take, for instance, a railway tie partly embedded in soil. During a dry season it may dry out to such an extent that decay is very slow, then come the rains, and if only sufficient water falls to put the tie in a good moisture condition it begins to rot rapidly again, and will continue to do so as long as the moisture and temperature are favorable. If, on the other hand, there is a long-continued rainy period the tie may soon become saturated and decay will stop again and remain practically at a standstill until the stick dries out sufficiently to admit the necessary amount of air. Thus, in the alternation of wet and dry conditions, one gets at some point intermediate between the dry and wet ranges a condition at which decay is at its maximum.

The third essential condition for rapid fungous growth is a suitable temperature. For the majority of species the most favorable temperature lies between 75 and 85 deg. F. There are some exceptions to this, however, in the case of certain of our very destructive fungi. Of a series of some 50 species which we have tested in our laboratory none would grow above 118 deg. F. However, this does not necessarily mean that they would be quickly killed at this temperature.

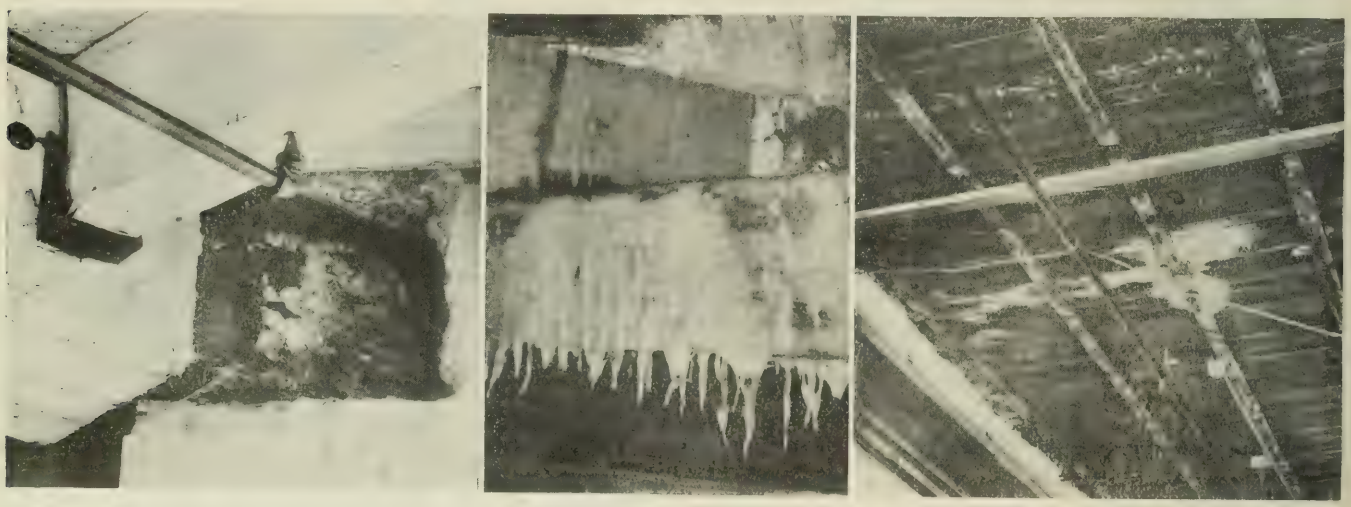
In general, wood-destroying fungi are much less tolerant of high temperatures than low ones, while temperatures slightly above the freezing point will usually permit some growth. In fact, the writer stored a large number of stock cultures of different fungi in an ice box where the temperatures vary around 40 to 60 deg. F. Under these conditions several fungi isolated from building timbers grew luxuriantly. The fact that all the species of fungi occurring naturally in a given locality can withstand the most severe winter weather shows their extreme hardiness to low temperatures. While growth may be almost completely suspended under these circumstances the organisms will normally recover their growth capacity soon after being placed under more favorable conditions.

Mycelium in wood is often very long-lived in timber dried in the air at moderate temperatures. Once it gets well distributed throughout the wood, it is doubtful, in very many cases, whether the wood can again become free of infection as a result of natural atmospheric conditions. One case on record shows that a stick infected with one of our common species contained very vigorous mycelium after having been kept in a warm dry room for a period of four years.

The second stage in the life-cycle of a wood-destroying fungus consists in brackets or shelves, "toadstools," or often only compact incrustations which appear on the surface of the timber after decay has become well started. Their function is to produce spores, which are comparable to the seeds of ordinary green plants. Being very minute (finer than flour) these spores are readily carried about by air currents and lodging on the surface of moist timber, at a favorable temperature, germinate to produce new infections. The number of spores produced is beyond the ordinary comprehension. According to Professor Buller's studies on *Polyporus aquamosus* the number of spores produced by a single specimen of this fungus may in the course of a year be "some fifty times the population of the globe."



Unsanitary Saw Mill Yard



End of Douglas Fir Girder Embedded in Concrete Completely Rotted in 4½ Years. Mycelium Growing on Girders in a Basement. Severe Rot in Laminated Floor Laid Green and Covered with Plaster

A large part of the infection of timbers in the open occurs through the agency of these spores, but in buildings, where fruit-bodies are less likely to develop, they play a less important role.

Decay in Building Timbers

The principal causes for decay fall, roughly, under the six following heads:

1—Placing non-durable timber in moist, ill-ventilated

basements or enclosures beneath the first floor, or laying sills in direct contact with the ground.

2—Embedding girders and joists in brick or concrete without boxing the ends.

3—Placing laminated flooring in unheated buildings in a green or wet condition.

4—Covering girders, posts, or laminated flooring with plaster or similar coating before being thoroughly dried.

5—General use of non-durable grades of timber in a green or only partially seasoned condition.

6—Use of even dry timber of low natural durability in buildings artificially humidified to a high degree, as in textile mills.

A further element of danger lies in the use of timber infected during storage or which has become infected through neglect after purchase and delivery.

There seems to be some divergence of opinion regarding the use of laminated flooring. In many buildings it has proven completely satisfactory. In others it has given very poor service. All the complaints investigated by the writer have shown the trouble to be due to the use of wet material. This, at best, dries very slowly in an unheated building. Covering such timber with plaster, or any other heavy coating, when moist will almost invariably cause trouble. If difficulties with laminated flooring are to be avoided the timbers will have to be thoroughly air seasoned and kept dry during construction.

This leads us to a consideration of the advisability of covering materials in mill-constructed buildings. A number of cases already investigated indicate clearly that the practice should not be recommended except with extreme caution, and a close knowledge of the condition of the timber as it goes into the building. A building was erected about 3 years ago, in which the construction was under way throughout the winter, so that the timbers were subject to periodic wetting from rains and snow, the timbers being for the most part, of poor quality, low density, mostly rapid growth, very knotty, and often with a large proportion of sapwood. Laminated floors of mixed quality, usually sappy and wide-ringed southern pine, scant 3 in. by 6 in. in size, were laid throughout the building, with the ends resting directly on the girders, with about a 5-in. bearing. The ceiling, girders, and posts were all encased in plaster board, leaving a narrow air space between the board and timbers.

This combination of circumstances—low quality timber, high moisture content, and plaster board covering—caused the timber to rot rapidly, particularly at the bearings of the laminated floor on the girders.

How to Control Decay

The possibility that timber may reach the consumer with infection already in it is by no means remote. Many lumber yards are in a highly unsanitary condition as regards the presence of destructive fungi. For this reason the material should be carefully inspected and all pieces bearing incipient rot rejected. Likewise, it may prove advisable to inspect the yard where the purchase is made. Upon delivery of the material it should not be thrown about on the ground, but should be carefully placed on skids and kept dry. The soil is often a prolific source of infection.

Such timbers as are to be placed in situations favorable to decay should either be select grades of naturally durable stock or else treated with a good wood preservative. Neither non-durable timber or sapwood is objectionable when used in a dry condition and kept dry. Hence, every effort should be made during construction to keep moisture away from the timbers, and especially the joints.

Moist timbers should never be cased in, nor should timber of any sort be embedded in concrete or brick walls without boxing. In all cases thorough ventilation of moist stagnant basements should be provided.

Whenever timbers begin to fail, the need of a thorough inspection of the building is indicated. If poor ventilation is the cause, the building should be opened up to secure rapid drying of the timbers. At the same time tests should be made to determine whether the wood contains living fungus. It is also important to know what species the fungus is, as further control measures may hinge on its identity. For instance, the true dry-rot fungus, *Merulius lachrymans*, being a low-temperature organism, can be controlled by the application of heat, while such a procedure would be useless with most other species. Some fungi may prove susceptible to a certain amount of drying, where others would not.

Where serious and active decay exists, without the exact method of control being indicated, the timbers should be carefully removed and replaced with select durable stock or with lower grade material treated with antiseptics. Likewise all incipient infection which appears in timbers which it is not considered necessary to remove should be given two or three applications of a wood preservative. Either a hot 3 to 4 per cent water solution of sodium fluoride or a cold 1 per cent alcoholic solution of mercuric chloride is well suited to interior timbers. Exterior timbers, where odor and color are not objectionable, can be satisfactorily treated with a good grade of hot coal tar creosote.

WASHINGTON CORRESPONDENCE

Washington, D. C., December 13, 1916.

Outlook for Railroad Legislation in Congress

The decision of the Newlands Joint Committee on Interstate Commerce to suspend its hearings for the present and to ask Congress for an extension of time before continuing its investigation into the question of transportation regulation and control leaves the program recommended by President Wilson in his address to Congress last week as the principal work before Congress in the way of railroad legislation for this session. As it is understood that the President intends to insist on his program being carried out and as Congress has already laid out for itself more work than it can probably accomplish in the short session, the decision to postpone the Newlands investigation seems practically necessary, as the members of the committee are members of the committees in the House and the Senate that will have to handle the bills proposed by the President. The House Committee on Interstate and Foreign Commerce held a meeting on Friday to consider its plans for the session, but temporarily postponed consideration of the President's proposals. The Senate Committee on Interstate Commerce also had a meeting and decided that it will probably hold public hearings, at which representatives of the railroads, the employees and all of the business interests will be asked to present their views.

That there is to be great difficulty in securing the passage of a law to prohibit strikes pending a public investigation is indicated by interviews with a number of the prominent members of Congress opposing the President's plan. It is reported that congressional action on this subject may await the result of the efforts which the labor leaders say they are making to draft a substitute plan which they propose to submit to the President and to the railroads.

No bills to carry out the President's recommendations have yet been introduced in Congress, but it is stated that the intention is to handle these proposals as amendments to the bill providing for the enlargement and reorganization of the Interstate Commerce Commission, which has already passed the House and is now before the Senate. Senator Underwood has introduced a bill to give the Interstate Commerce Commission the power to fix the hours of labor and determine wages for employees of carriers engaged in interstate commerce, which contains provisions similar to an amendment which he urged at the time of the passage of the Adamson law. Senator Townsend has also introduced a bill providing for the creation of a special commission to be ap-

pointed by the President in case of controversies affecting transportation to make an investigation and submit recommendations to the President. Senator Hardwick has also introduced a bill to amend the Adamson law, to give the Interstate Commerce Commission power to determine the hours and other conditions of labor for the employees affected by the act and making it unlawful for the employees to strike because of their dissatisfaction at any such decision of the Interstate Commerce Commission.

Unless it postpones consideration of labor legislation until the last minute Congress will not be able to be guided in its deliberations by what the Supreme Court decides as to the constitutionality of the Adamson law. The court on Monday granted the government's motion to expedite the test case instituted by the Missouri, Oklahoma & Gulf, in which Judge Hook held the law unconstitutional, and set the case for argument on January 8, ahead of other important cases, making it possible for the court to render a decision before Congress adjourns, but such an early decision is not certain.

Proposed Changes in Act to Regulate Commerce

Now that the Interstate Commerce Commission has come forward with recommendations for changes in the act to regulate commerce it is possible to compare in a general way the proposals to be advocated before the Newlands committee by both federal and state commissions, the railroads and the shippers, as well as by many other organizations. Although the railroads are the only interest that has yet laid definite plans before the committee, many of the resolutions adopted at the recent annual convention of the National Association of Railway Commissioners bear on the problems under consideration by the congressional committee, and the position of the state commissioners has been explained to the committee by Mr. Thelen, president of the association. The National Industrial Traffic League expressed its position toward the investigation in resolutions adopted at its recent annual convention. The Interstate Commerce Commission's recommendations in its annual report to Congress are probably to be followed by others to be presented to the Newlands committee.

As to the railroad proposal for exclusive federal regulation, the state commissioners are squarely opposed to it, the National Industrial Traffic League favors it "provided it can be accomplished in a way that will permit the same degree of protection and expedited attention to, and speedy determination of, wholly intrastate matters, as now obtains," and the Interstate Commerce Commission proposes a plan of legalized co-operation between the federal and state commissions. The league has endorsed the proposal for federal incorporation, as to which the Interstate Commerce Commission has announced no opinion. The attitude of the state commissions on this point has not been expressed, but is undoubtedly covered by their resolution on the rate question. The railroads, the shippers and the commissioners are all for federal regulation of security issues, although the railroads use the word "supervision," and some of the states want to retain their present powers. The railroads want the period during which rates may be suspended reduced from 10 months to 60 days, the Interstate Commerce Commission wants it increased to a year and the National Industrial Traffic League opposes any change in the present law respecting suspension. The railroads want the commission to have the power to prescribe minimum as well as maximum rates, the National Industrial Traffic League is opposed to this plan, and the Interstate Commerce Commission recommends that the rates existing as of a certain date be declared reasonable for the past and that no change be made except upon order of the commission.

The state commissioners agree with the railroads as to the desirability of regional commissions, while the league contents itself with endorsing the recommendations of the Interstate Commerce Commission that its membership be increased and that it be given authority to subdivide its work, provided not less than a majority of the commission shall pass upon questions arising between shippers and carriers.

The railroads want the commission's functions as a prosecutor turned over to the department of justice or some other agency of the federal government. The National Industrial Traffic League is opposed to any change in section 12, which apparently covers this point.

Both the state commissioners and the shippers ask that the shipper be given the same right to an appeal from negative orders of the Interstate Commerce Commission as from affirmative orders. The state commissioners and the Interstate Commerce Commission agree that the latter should have jurisdiction over matters pertaining to car interchange.

A large number of commercial and other organizations have announced their position on various proposals for change in present methods of regulation. The Railway Business Association, representing the railway supply manufacturers, has outlined a program which agrees in general with that of the railways. The Investment Bankers' Association has endorsed the plan of federal regulation, as have many trade associations and commercial organizations of various kinds. The livestock shippers, on the other hand, are strongly opposed to a reduction of the power of the state commissions over rates.

Congress Hears From Unorganized Employees

Congress is beginning to hear from the railroad employees which it failed to take into consideration in September when it legislated an increase of wages for the train employees who were threatening it with a strike. It was briefly noted in last week's issue that a number of petitions were filled in Congress on the opening day's session by various representatives of the unorganized railway employees. A committee headed by Robert T. Frazier, Jr., of the engineering department of the Nashville, Chattanooga & St. Louis, and representing what has been termed the 80 per cent movement, called on Chairman Newlands of the Senate Committee on Interstate Commerce and presented a petition signed by 300,000 railway employees, not members of the brotherhoods, from 35 different states, asking that provision be made for thorough investigation by a duly appointed commission of the hours of service and wages of all railway employees. In a letter to Senator Newlands the committee stated that since Congress has taken upon itself the burden of regulating wages for some of the men engaged in the transportation service, it should likewise legislate equitably for all men so engaged.

Senator Gallinger, of New Hampshire, also presented a petition which he had received by mail signed by 51 railway employees on behalf of the employees in the maintenance of way department of American railways, numbering over 400,000 men, asking Congress to include these employees in the eight-hour law. The petition set forth the arduous character of the work of these employees, which they described as "of a most strenuous nature, rough, dirty and laborious and has to be performed often under most unfavorable conditions, in heat and cold, winter and summer, rain or shine."

Postmaster General to Ask Reduction of Mail Pay Rates

The Interstate Commerce Commission is to be asked on January 1 by the postoffice department to reduce the rates paid to the railways for the transportation of mails, which were tentatively fixed by Congress in the last postoffice appropriation bill and which went into effect with the inauguration of the space basis of payment on November 1. This announcement is made in the annual report of Postmaster General Burleson to Congress, in which he says that the rates now in operation are excessive, but that under the law the department will on January 1 file with the commission

its comprehensive plan of service which will embody the recommendation looking to a reduction of the rates "but at the same time assure to the railroads a just and adequate compensation for the service performed."

In the report the postmaster general criticizes the railroads for their opposition to the space basis of compensation, saying that "certain railroads conducted a nation-wide propaganda to secure a wholly unwarranted increase in their compensation for carrying the mails" and to continue "an indefensible, unsuccessful and uneconomical plan for fixing the compensation for mail pay." The postmaster general is glad to be able to say "that this effort to saddle the department for another indefinite period with the old weight basis of determining mail pay with extra allowances carrying unreasonable increases of pay, was finally rejected by Congress and the adjudication of the matter left to the Interstate Commerce Commission, as suggested by the department." This last statement should be an interesting piece of news to the members of the Senate committee on postoffices and post roads before which representatives of the postoffice department made a most strenuous opposition to the proposal of the railroads that the question of mail pay rates be referred to the Interstate Commerce Commission.

It is stated that the payment of the additional compensation to railroad companies authorized by Congress on account of the increased value of the mails, resulting from the department's orders raising the limits of size and weight for parcel post mail, was delayed owing to the failure of the postal appropriation act for the fiscal year 1916. "It is a source of satisfaction to the department that this matter has been finally adjusted, but it is considered only fair to state that the delay of this settlement was directly attributable to the activities of those assuming to speak for the railroads."

The department objects to an act of Congress which provides that before any changes proposed by the postmaster general in the limit of size and weight of parcel post packages are put into effect they shall be approved by the Interstate Commerce Commission after thorough and independent consideration. It is stated that this requirement would greatly retard the improvement of the service and that this legislation should be repealed.

Report on Railway Mail Service

Otto Praeger, second assistant postmaster general, has also issued his annual report for the fiscal year ended June 30, 1916, which deals principally with the subject of railway mail transportation. It is stated that "as might be expected of a vast institution which originated on a very small scale and developed rapidly, the operations of the bureau of the second assistant in course of time became barnacled with many sacred, but impracticable, precedents and practices which extended to its contractual relations with the great carriers of the country." A large part of the work during the past fiscal year has been devoted, according to the report, to freeing the bureau from antiquated and impracticable methods and policies with a view to diverting unproductive energies to some fruitful field of endeavor.

One of the myths said to have grown up into the service is the theory that a railway carrier once having obtained a contract for carrying mails has somehow acquired "a proprietary interest or right in those mails as affecting any proposal for better service that might be made by some competing railroad line." This long-standing policy has been reversed and the superintendents of railway mail service have been informed, so that they in turn may inform the railroads, that any line offering a mail schedule sufficiently valuable to warrant a change will receive the mail, regardless of any belated promise by the railway holding the mail to meet the improved service offered by its competitor.

The attention of the bureau has been called by railway postal clerks and others "to what appears to be a deplorable condition on certain railway postal routes." It develops "that men are on continuous duty on some lines in excess of 50 hours on trains, while instances of 12 to 20 hours' continuous employment on running trains are not infrequent." The bureau was impressed with the inhumanity of expecting clerks to take on the labor and responsibility of handling the mails for such long periods, and investigations are under way to cut these long runs to such proportions as will give them reasonably continuous hours of work. The attention of the bureau has been called to instances where men make two or more hard round-trip runs before they are given the layoff to which they are entitled. It has been represented that "such hard work is more than the human body and mind can endure." These and other similar unfortunate conditions in the service are receiving careful attention and "an investigation is under way to determine the feasibility of cutting some of these runs and of giving the clerks the rest period to which they are justly entitled."

The legislation passed by Congress regarding railway mail pay is reviewed and it is stated that the rules for the operation of the service on the space basis, which went into effect on November 1, are founded on the principle that the department will pay for only such service as is actually rendered and will not ask the railroads to perform service without compensation, the adequacy of which is to be determined by the Interstate Commerce Commission.

Railway mail transportation during the year was conducted over 3,479 routes, having a length of 234,175 miles, at an annual expenditure of $57,148,381. The annual travel, 502,937,359 miles, represents an increase of .81 per cent and the increase in the expenditure was 5.98 per cent. During the fiscal year the mails were weighed on the railroad routes in the second section, embracing the southeastern states, and the increase in the annual rate of compensation as compared with the last quadrennial weighing was found to be 19.25 per cent. The increase in pay resulting from the last preceding readjustment in this section in 1912 was 9.56 per cent.

The plan of transporting certain periodical mail matter in fast freight trains was continued during the year and it is contemplated to inaugurate such additional shipments as may be found to be practicable and economical. A total of 5,167 carloads of periodical mail matter was transported in fast freight trains during the year at a saving to the government of $1,436,137 as compared with what it would have cost to have transported it in regular mail trains.

The policy of equalizing the rates of pay for the transportation of mail by railroad routes on the basis of the lowest cost, where the department has the choice of despatching mails by competing lines to the same destination with equal advantage, has been followed when practicable in the readjustment of compensation in the second section under agreement entered into between the department and the railroads.

Order No. 412, requiring the use of the whole number of days in the weighing period as a divisor in obtaining the average daily weight, instead of making an allowance for Sundays, was first applied in the readjustment of 1907 and it is estimated that the total amount of excess payment to the railroads avoided by reason of the new method to and including the fiscal year 1916 was $40,800,000. It is stated that the railroads generally have objected to this order and in an effort to make effective their protest have modified their agreements with the department by excepting this order. In every case the railroads have been notified that their pay will be fixed by the postmaster general in accordance with the terms of this order and that that is all that will be paid them. Appeals to the Supreme Court by the Chicago & Alton and the Yazoo & Mississippi Valley from the decision of the court of claims sustaining the legality of the order are now before the Supreme Court for reargument. The annual rate of expenditure for railway postoffice cars during the year was $4,096,286, being $117,062 or 2.78 per cent less than for the preceding year.

Protest Against the Federal Valuation

Atlanta, Birmingham & Atlantic and Texas Midland Object Strongly to Many Figures in Government Report

THE Interstate Commerce Commission has made public the protests filed by the Atlanta, Birmingham & Atlantic and the Texas Midland against the tentative valuations served on those roads late in October. These protests were filed in compliance with the order of the Interstate Commerce Commission requiring the submission of all objections to these valuations within 30 days after they are served on the carriers. These original reports of the government and the protests of the carriers are of particular interest at this time as the Atlanta, Birmingham & Atlantic and the Texas Midland are the first two roads on which the federal forces have completed their work. The following is an abstract of the objections filed by these roads:

The Atlanta, Birmingham & Atlantic

Although the government presented separate valuations of the properties of the Georgia Terminal Company and the Alabama Terminal Railway Company, these properties have always been owned and used by the Atlanta, Birmingham & Atlantic; and the latter road has considered the three valuations as one in presenting its protests.

Exception is taken to the statement in the tentative report that the outstanding capital liabilities amounted to $59,565,176 on June 30, 1914, for the reason that while this statement was correct on that date, no mention is made of the fact that the property has since been reorganized so that the total outstanding securities since December 31, 1915, have been but $39,290,000. Also the report showed a net profit and loss debit balance on June 30, 1914, of $4,446,695.25, and no mention is made of the fact that the business of the carrier has shown a substantial increase since that date, that it has earned and paid all of its fixed charges and has a large cash balance in the treasury. As the tentative valuation report was not completed until October 19, 1916, the carrier states that the information it contains regarding the capitalization and the deficit from operation is misleading at the present time and the report should have called attention to the changes between the date of valuation and that on which the report was completed.

The road objects that the tentative valuation is incomplete in that it omits property owned and used by it solely for carrier purposes on the ground that it was not being used for these purposes on the date of valuation; and that it omits to report on actual properties owned by the road and used jointly with others on the ground that the right of use was fixed by lease on the valuation date. This includes the telegraph lines and fixtures owned by the road and leased to the Western Union with the right of use reserved to the railroad, which right is exercised.

Objection is also raised to the statement in the report that "no other values or elements of value were found to exist," since the state of Georgia taxes the road on the sum of $1,200,000 for its "franchise" value. The road maintains that there are many such factors which must be considered in the valuation of its properties, including its location and gradients; the right to use properties not owned; the continuity of land, making a complete right of way and terminals; and a completely organized and equipped property ready for business and doing business. The carrier points out that the federal report itself states that the road "interchanges traffic with 27 railroads at 28 points" and also that it is "privileged to use jointly facilities of other companies."

Attention is also called to the fact that there are many "costs" incurred in the construction and development of the property which would again be incurred in the reproduction of these properties under any reasonable program of reproduction which are not allowed for in the valuation. The tentative valuation does not contain any information regarding the methods by which the original cost to date, the cost of reproduction new and the cost of reproduction less depreciation were arrived at, making it impossible to check many of the conclusions of the government.

The road states that the valuation has seemly been prepared upon a series of arbitrary assumptions, some of which are contrary to both law and fact and others of which are contradictory and mutually destructive each of the other, for instance, the present value of the right of way has been assumed to be normal acreage value of the adjacent land without other cost, damage or expense incurred in its acquisition. The arbitrary assumption has also been made that certain lands actually acquired and held for carrier purposes were not so acquired and held, without consulting with the carrier and inquiring regarding its purpose in securing and holding this property. It has also been assumed in reproduction that the right of way and terminal lands will be ready on the date that the construction begins without the necessity of a prior purchase and expenditure upon which interest will accumulate.

Objection is made to the assumption that when the physical parts of a railroad have been connected for initial operation the construction is complete and no other construction expenses are necessary, which assumption is contrary to the experiences of all roads in the construction of their property. Attention is called to the inconsistency in the report whereby the conclusion is reached that highway crossings actually paid for by the carrier would again have to be paid for in reproduction while railroad crossings would not.

It has been assumed that, in reproduction, there will be no depreciation in engineering costs, but there will be depreciation in labor costs and in taxes, interest and all other overhead costs. Another assumption was that with reference to certain physical properties only the *cost* figures were to be ascertained while with other properties such as land, only the figures of *value* were to be reported upon, and that by a combination of these several figures of *cost* and *value* an intelligent result as to the *value* of all the property and its cost of reproduction might be determined.

No Allowance for Materials or Working Capital

Although the tentative valuation reported materials and supplies on hand amounting to $433,502.27, it omitted to include them or their cost in the cost of reproducing the property. The federal forces arbitrarily determined that certain lands were conveyed as gifts, grants or donations without knowledge of the fact. In one instance referred to, one section of right of way, while appearing to be given without consideration, was in reality the result of a contract giving to a town a substantial concession in the matter of rates, which concession has cost, is now costing and will continue to cost the road a substantial sum of money.

The tentative valuation also failed to include any working capital in the cost of reproducing the property, while the road had a total of current assets including cash on hand on the date of valuation amounting to $1,576,359.74. The road maintains that a sum of not less than $200,000 should be included for this item. The road also protests that,

although a net loss from operation up to June 30, 1914, amounted to $4,446,095.25, a part of which was undoubtedly incurred in developing the property, no allowance was made for any part of this amount. It maintains that not less than $2,500,000 should be included for the cost of development. Likewise no credit is allowed for money expended to meet assessments for public improvements, although the engineering report stated the amount of such assessments paid by the carrier to be $6,109, and as this is incomplete the road maintains that this amount should not be less than $10,000. Likewise no allowance is made for the cost of reproducing a number of overgrade railroad crossings actually paid by the carrier as shown in the engineering report to amount to $48,022. The actual cost of these overhead crossings was $59,040.57.

Referring particularly to the engineering report, exception is taken to numerous items of property omitted entirely and also to the unit prices which "in many instances are wholly inadequate and grossly less than those which would have to be paid in reproducing the property and in many instances less than those actually paid by the carrier in the construction of the property." The carrier also maintains that the period allowed for the construction of the property should be not less than 36 to 60 months instead of the 18 to 36 months estimated in the federal reports. It maintains that interest should be allowed at not less than 6 per cent per annum and that the total interest should be 16 per cent on accounts Nos. 1 to 47 inclusive, except No. 2, for all lines requiring five years to reproduce and 10 per cent for the same account on those lines requiring three years for reproduction and that 4 per cent should be allowed on the total investment in equipment.

Attention is called to the omission of items of cost incurred by the road in its construction for properties then used, but since abandoned. Particular reference is made to the purchase of the Eastern Railway of Alabama at a total cost of $429,000, this being a railway 29 miles long, of which 8.3 miles was incorporated in the final construction of the Atlanta, Birmingham & Atlantic and the remainder abandoned. This line interfered materially with the new road and it was more economical to the carrier to purchase it and to utilize such portions as were available, while abandoning the remainder, than it would have been to have undertaken the construction of an entirely new line. The carrier states that "it would not be a reasonable reproduction program that ignores physical obstacles actually encountered in the original construction, the removal of which was a proper charge to capital."

Appreciation and Depreciation

Although no appreciation of the property was allowed the road maintains that $1,250,000 should be added for appreciation in road bed. It also protests that the property should not be depreciated $4,750,000, as the methods by which this figure was determined "are contrary to established rules of law and to fair and just principles." The carrier also objects to this depreciation because of the implied inference that the property is not maintained in an appropriate, economic and safe operating condition, although the report does not contain any specific statement to this effect. In determining this depreciation attention is called to the fact that the government has ignored the fact that a railroad property is a continuing property; it has assumed that the normal condition of each physical item is one of newness and that to the extent to the departure from such newness there is depreciation; there is a confusion of the cost of maintaining a railroad by repairs and replacements as a mere cost of operation with a loss in capital or investment; the depreciation reported is a speculation based first, upon a speculation as to the present age of the plant units and second, upon a speculation as to the length of its normal service life; the government has entirely ignored the legal and economic right of the carrier to fully maintain its property out of earnings and to charge the cost of such maintenance, including the cost of replacement, to the cost of operation, the value of which right completely offsets all accrued physical deterioration in the property. The road states that on the date of valuation, some of its equipment and ties were not in a proper and well-maintained condition, but that shortly after this date, they were placed in a thoroughly proper economic operating condition at a cost far less than the amount of depreciation reported in the engineering report, all of which was a simple charge to operation and involved no additional charge to capital or investment and was not, therefore, depreciation.

A comparative estimate of the cost of reproduction new of the road and equipment was made by the road, in which it arrives at a valuation of $39,079,260.74, as compared with $24,154,989, reported by the government.

Referring more directly to the land report the road maintains that all of the physical properties including land must be treated alike and that either the present value or the cost reproducing the entire property should be used. The tentative valuation reports the "present value" of carrier land of the railways as $2,291,413. The road maintains that this value was determined wholly without reference to and without including the cost, damages and expenses that would be incurred in acquiring this land, and that it, therefore, does not represent the present cost of acquisition or the cost of reproduction of these properties. It also objects to the classification of certain lands as non-carrier lands, since the road acted reasonably and with good judgment in acquiring and holding this property. The statement is also made that the "present value" of some of the land is placed at less amounts than the road actually paid for these lands, notwithstanding the fact that adjacent lands have increased in value and there is no inference in the land report that the road was either reckless or improvident in the purchase of this property. The road maintains that in the absence of such evidence it cannot be allowed a less amount than it actually paid in determining the cost of reproduction of the property. Several instances of this are noted in the objection, including one parcel of land for which a "present value" of $3,843.75 was allowed, while it actually cost the road $39,992.17.

In determining these values no consideration was given to the rights which a carrier has to acquire in order to construct its railroad; to the damages which the road had to pay to the owners because of the cutting off of means of access to the land, interference with the water supply, damages to buildings, etc. No allowance was given to the road for the removal of or injuries to buildings, or to severance damages paid by the road. The carriers protest that the present cost of acquisition or the present cost of reproduction of the lands owned and used by it for carrier purposes on the valuation date would not be less than $8,192,369.

Particularly serious objection is made to the accounting report, the road stating "because of the many erroneous conclusions, deductions and inferences therein, the tendency and effect of which is not to furnish facts or information, but to discredit the actual investment of the carrier and its good faith in making same." The objection further states that "the said accounting report is not and does not report to be a true report of the actual disbursements and receipts of the carrier and is not and does not report to be a true and correct report of the syndicating, banking and other financial arrangement under which stocks, bonds and other securities were issued by the carrier, nor the actual expenditures of the carrier. It appears to be merely an attempt to discredit the accounting records of the carrier, and having done this, to announce that the true investment of the carrier or the original cost to date of its properties cannot be ascertained, and thus leaves the estimates made by the field

parties of the commission of the present cost of reproducing the properties unchecked by any figures of cost whatever."

The Texas Midland

The protest filed by the Texas Midland is similar in general to that of the Atlanta, Birmingham & Atlantic, but some points are raised in the latter report which were not brought out prominently in the protest abstracted above.

Particular attention is called to the property used but not owned by the Texas Midland, including 13 miles of line between Commerce, Texas, and Greenville, owned by the St. Louis Southwestern, passenger terminal facilities at Paris, Texas, and Ennis, in which the Texas Midland is a tenant; and lands occupied by industrial tracks, also the telegraph lines built on the carriers' right of way, for the installation of three wires on which the materials were furnished by the Western Union and the labor by the railroad, the maintenance being handled on the same basis. Objection was also made to the omission of 40 acres of land at Enloe, operated as a ballast pit but not in actual service at the time of valuation.

Although the federal report omits to ascertain and report on other values and elements of values, the Texas Midland calls attention to the fact that the state of Texas has for many years taxed the railway on account of intangible elements of value on the sum of $550,000.

Exception is taken to the use of these figures as indicating either the cost of reproduction or the present cost of acquisition of the right of way and terminal lands, the statement being made that this is "based on the unjustified and arbitrary assumption that such lands may be acquired at the normal acreage value for general, not including railway, purposes of the adjacent and adjoining lands and without any payment on account of improvement. The figure $236,689.65 reported with respect to land does not represent any facts required by the valuation act to be ascertained and reported." The objection further states that "the report does not show the present cost of condemnation or damages or the expense of acquisition."

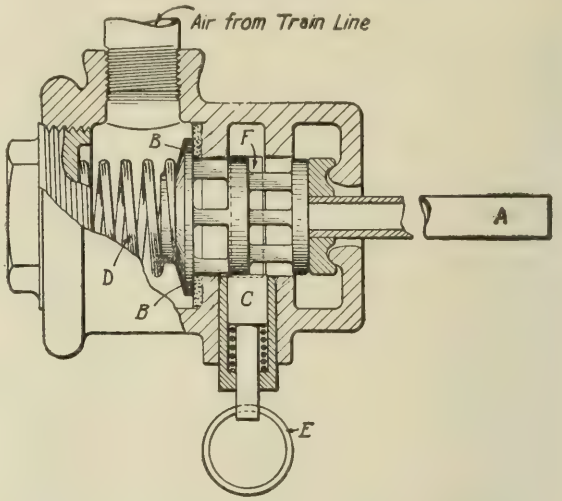
The report further states "that it has been assumed without justification and contrary to the fact that no assessments for public improvements would have to be paid, notwithstanding the fact that the carrier has actually paid and in case of reproduction would be required under existing laws to pay large amounts on account therefor; that the cost of materials and supplies which were actually on hand at the date of valuation is not a part of the cost of reproduction new; that the working capital actually on hand on the valuation date is not to be included in the cost of reproduction new; that no allowance on account of contingencies is properly to be included in the cost of reproduction new; and that nothing should be allowed to cover the cost of developing the physical properties in their earlier stages after the parts had been assembled.

The reference to the accounting report states that "this report appears to be an attempt to rewrite the accounting records of the carrier and does not state the actual expenditures of the carrier. It is not a true summary or synopsis of the actual, financial and accounting history of the carrier and it does not disclose nor can there be determined therefrom the true original cost to date of all the property owned or used by the carrier for its purposes as a common carrier."

German Train Service Cut.—Press despatches on November 27 reported that a general curtailment of railroad traffic, due to the requirements of the army in the matter of rolling stock for the transportation of troops and a desire to save coal, was scheduled for December 1. The report said that train schedules were being revised to eliminate all trains that could be readily dispensed with. Sleeping and dining cars were to be dropped from most of the trains.

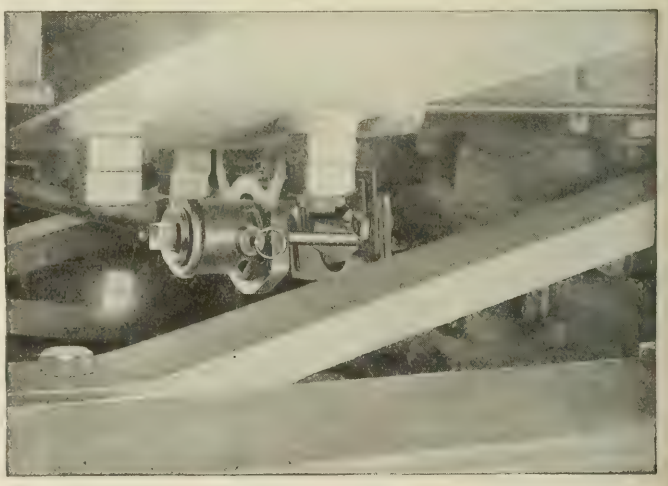
TRUCK SAFETY ATTACHMENT

An attachment the function of which is to set the air brakes whenever the car or tender truck to which it is attached is derailed, broken, or deranged in any way, has been placed in successful operation on several railroads by the Wright Safety Air Brake Company, Greensboro, N. C. It consists of a valve, attached to the body of the car or tender, connected to the brake pipe underneath. A section of this valve is shown in one of the illustrations. It is operated by the pin *A* which is in line with the center bearings of the



Section of Valve for Truck Safety Attachment

car and extends through an adjustable collar located near the center bearing of the truck. As the pin *A* is moved in any direction by this collar it rocks the disc to which the pin is attached, forcing the valve *B* from its seat and allowing air from the brake pipe to pass out through the opening *F*, thus setting the brakes. If this pin is deflected to any great extent, as it would be in case the truck was derailed, it will force the valve back far enough to allow the plug *C* to spring in behind the valve holding it in the open position. The valve is held in the closed position by the spring *D* and when once opened

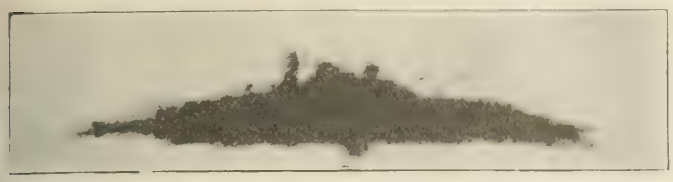


Truck Safety Attachment Applied to a Freight Car

to its extreme position is reclosed by pulling out the plug *C* by means of the ring *E*.

The collar surrounding the pin *A* is adjusted to suit the conditions of the truck so that the device will not be operated by the normal movement of the truck. This movement may be taken by test, a pencil replacing the pin and a chart the collar. The record of the movement of a baggage car truck is

shown in one of the illustrations. This device has been installed on several railroads where it has prevented serious wrecks by stopping the train when the truck to which it was applied became defective or was derailed. It will operate whenever the trucks leave the rails whether due to a broken rail, spread rails or for any other reason. It will also be operated by a broken journal, arch bar or spring, by splitting



Record of the Movement of a Baggage Car Truck with Reference to the Car Body (slightly over full size)

a switch, or by any other abnormal condition affecting the movement of the truck and threatening the safe progress of the train. Cases have been reported where the device has operated due to excessive rocking of the trucks of cars and tenders. In these cases, however, the value was opened just enough to make a light service application of the brakes. As the speed was reduced the valve closed of itself.

PROPOSED LEGISLATION AFFECTING RAILROADS

The following bills affecting railroads have been introduced in Congress, in addition to those summarized in last week's issue:

H. R. 18375. By Mr. Sparkman, Dec. 7. To Committee on Judiciary. Prescribing a rule of evidence in certain cases. In suits brought against carriers for loss or damage to goods when liability is based on section seven of act of June 29, 1906, all books and records kept in the usual course of business by carrier regarding icing, etc., may be introduced in evidence by the carrier and shall be prima facie evidence of the facts in said records.

S. 7239. By Mr. Hardwick, Dec. 8. To Committee on Interstate Commerce. To amend the act of September 3 and 5, 1916, entitled, "An Act to establish an eight-hour day," etc. Adds two new sections (5 and 6). The Interstate Commerce Commission to have authority to fix hours and other conditions of labor for all employees of interstate railroads actually engaged in interstate commerce; and power from time to time to change hours and conditions and the rate of wages either upon its own initiative or upon the petition of the employees, or of the railroads, or of the public.

It shall be unlawful for any two or more of such employees by concerted action with each other to hinder, delay, or obstruct the operation of railroad trains engaged in interstate commerce because of their dissatisfaction at any decision of the Interstate Commerce Commission . . . or to attempt to do so, or to conspire to do so, and any person who shall in such manner hinder such railroad trains, or hinder or conspire to do so, shall be punished by a fine not to exceed $5,000 and by imprisonment not to exceed one year, either or both . . .

Bill H. R. 17854, introduced by Mr. Oliver on December 4, which was noted in last week's issue, empowers the Interstate Commerce Commission to prescribe and enforce regulations for the exchange and moving of cars in interstate business. Commission shall have right to require reports from roads showing cars owned, condition and location of same; in general as is now done by the American Railway Association.

It authorizes the commission to fix demurrage charges and to order immediate return of cars to owners. Penalty for first offense not less than $200, subsequent offenses not less than $500 or more than $1,000. Commission to have power when it is ascertained that cars are being used for storage or warehouse purposes, to require said material to be immediately unloaded. Failure to comply shall subject the railroad to a fine of $200 a day for every day that any car shall remain loaded after the expiration of five days' notice by commission.

Bill S. 7031, introduced by Mr. Underwood on December 5, briefly noted in last week's issue, provides that the Interstate Commerce Commission shall have power to fix hours of labor and reasonable wages for employees of common carriers, with the exception of railroads, independently owned and operated, not exceeding 100 miles in length, except those whose principal business is furnishing terminals or transfer facilities. The rate of wages and the hours of labor would remain fixed until changed by the commission.

Bill S. 7066, introduced by Mr. Townsend on December 5, also briefly noted last week, provides as follows: When controversies arise between carriers and employees as to wages and hours of labor, the President may investigate causes. He may appoint a special commission, not exceeding seven in number, of persons specially qualified, and all parties to controversy shall be entitled to a hearing. Having made investigation and ascertained facts, commission, with all convenient despatch, shall formulate its report, locating so far as may be possible responsibility therefor and making such specific recommendations as shall put an end to the controversy. Report of commission shall forthwith be transmitted to the President and by him communicated to Congress, with such recommendations thereon as he may deem advisable. A commission appointed under this act shall continue for a period of not over three months from the date of the appointment thereof.

Representative Adamson, chairman of the House Committee on Interstate and Foreign Commerce, on December 5 moved to take up and proceed to the consideration of the Rayburn bill, H. R. 563, providing for the regulation of security issues; but a motion to take a recess prevailed. On December 6, the Speaker laid this bill before the House as the unfinished business on the calendar, but on the point being raised that the call did not rest with the Committee on Interstate and Foreign Commerce, the bill was laid aside and cannot again be brought up except by unanimous consent, until the committee is again reached in the alphabetical call of the committees.

20,000 Cars for France.—The British government, according to press despatches, has engaged to send immediately to France 10,000 freight cars, taken from British railroad companies. Ten thousand additional cars are to be sent over during the first few months of 1917, with a certain number of locomotives. This is to be done, it is understood, because Great Britain's military operations in France have been requiring the use of 20,000 French freight cars.

Brazilian Railway Reorganization.—A plan for reorganizing the Brazilian Railway Company has been agreed upon by W. Cameron Forbes, former governor general of the Philippines, who is the receiver, and local and European bankers. The proposal provides for the raising of $5,000,000 new capital in France, sanction for the transaction having been secured from the French government. The French have $100,000,000 invested in the property, which was organized with $150,000,000 capital by Percival Farquhar and the late Dr. F. S. Pearson. The existing funded securities will not be disturbed, although they may be made income bonds instead of mortgage issues until earnings are well built up. The company's principal obligation is an issue of $50,000,000 of Sao Paulo & Rio Grande bonds, which were guaranteed by the Brazilian Government. The company will be managed after the reorganization by French bankers and financiers.

Congressional Inquiry on Railroad Regulation

Newlands Committee Concludes Its Hearings for the Present; Will Ask Congress for Extension of Time

BECAUSE of the pressure of other work before Congress, the Newlands Joint Committee on Interstate Commerce which has been holding hearings since November 20 on the subject of government regulation and control of transportation, decided to suspend the hearings for the present and adjourn without date, subject to the call of the chairman. The joint resolution of Congress creating the committee requires it to submit a report by January 8. It is understood that before that time the committee will ask for an extension and that the hearings will be resumed at a later date, possibly not until after the close of the present session of Congress in March. The cross-examination of those who have already appeared before the committee has not been completed and will be continued when the hearings are resumed.

Max Thelen, president of the California Railroad Commission and president of the National Association of Railway Commissioners, appeared before the committee on December 6 and made a statement on behalf of a committee of the National Association of Railway Commissioners opposing the proposal of the railroads for a greater centralization of the powers of railroad regulation in the hands of the federal government as outlined before the committee by Alfred P. Thom, counsel for the Railway Executives' Advisory Committee. Mr. Thelen's statement was postponed on Thursday, December 7, to give W. J. Bryan an opportunity to express to the committee his views in opposition to exclusive federal regulation and Mr. Thelen concluded his statement on Saturday. He was followed by S. W. Brookhart of Washington, Ia., who made an argument in favor of government ownership of railroads.

Mr. Thelen's Argument

Mr. Thelen agreed with Mr. Thom that Congress could take over the exclusive regulation of interstate railroads without an amendment to the Constitution and opposed the plan of federal incorporation on the ground that it would pave the way for the exercise of such complete federal control.

He agreed that the railroads must secure large amounts of additional capital for extensions and improvements, but disagreed with the claim that the financial credit of the railroads is greatly impaired. He referred to the large earnings of some roads in the present year, saying that although certain roads are in financial difficulties many are abundantly able to secure the additional funds they need on reasonable terms. He desired to take issue with the claim that impaired credit is largely due to regulation, saying that it was proposed to show the committee later the "real causes."

Some of the proposals of the railways, he said, the state commissioners thought were good, but some of them they objected to. He first discussed the plan of federal incorporation, explaining that while a committee of the National Association of Railway Commissioners had reported in favor of it, the report had been politely killed by ordering it to be filed and printed. The plan proposed by the railroads he considered to have been presented "frankly as the agency and instrumentality for taking away from the states practically all their power over railroads" and he linked this plan with the proposal to eliminate state control over rates, saying that the proponents of federal incorporation are usually to be found in favor of federal control of rates. He suggested that the committee ask the carriers to present their proposals more definitely to indicate whether they advocated a general statute or the issuance of charters directly to each railroad.

That the federal government has authority to create such agencies and instrumentalities as are necessary to carry out its admitted powers, Mr. Thelen said, is clear, and he cited the fact that there have been four federally incorporated railroads, the Union Pacific, the Northern Pacific, the Atlantic & Pacific and the Texas & Pacific. He outlined the history of litigation involving these roads, saying that they had contested state regulation of their rates on the ground that they were federal corporations and that the Supreme Court had held against them only on the ground that Congress had not specifically exempted the roads from state control. Mr. Thelen said he desired to bring these decisions to the attention of the committee to show that Congress by passing a federal incorporation act could exclude state regulation without an amendment to the commerce clause of the Constitution.

"We have the clearest kind of intimation three times in the decisions of the Supreme Court," he said, "that if in the language incorporating a federal railroad Congress clearly expressed the intention that the state should be deprived of its authority over rates, that effect will be accomplished, not under the commerce clause, but under the military power, or under the power over post roads. I have presented this argument so that you may have before you clearly the danger of doing one thing and thinking one thing is being done when in fact another thing is being done."

Mr. Thelen further argued that the power of the states in the matter of taxes would be affected by federal incorporation, and that, although the railroads have proposed that the states retain their taxing powers, "some day, if the door is opened, the states will find they have lost their taxing power as well as their power over police regulations." He cited a number of court decisions in support of this contention.

Turning to the question of regulation of security issues, Mr. Thelen predicted that the first large constructive piece of work to be done by the committee would be to provide for adequate regulation by the federal government of the issues of securities of all interstate roads. There is considerable difference of opinion among members of the association, he said, as to whether the action of the federal government shall be concurrent with state action or whether it should be exclusive. He believed that Congress has the full power, by amendment of the commerce act, without federal incorporation, to assume complete and exclusive regulation of security issues, and asserted that in case of any doubt on the subject, it would be very easy to take a test case to the Supreme Court. On the other hand, he said, federal incorporation would cause "a legal fight all along the line greater than any legal fight in which the railroads of this country ever have been engaged."

States Might Lose All Control

Mr. Thelen discussed the subject of service, equipment and facilities, saying that these matters are now efficiently regulated by the states, but that if the federal government can take away from the states their powers over rates it can do the same thing as to their powers to regulate service. He made a similar argument as to safety regulations and the exercise by the states of police powers, citing the decision of the Supreme Court in the "white slave" cases to show that the federal power can also be exerted in this field.

Mr. Thelen said that in his judgment, "the railroads are now suffering from the hysteria of pessimism," and that although their earnings are greater than at any other time in their history they "are engaged in the absurd task of trying to ruin their own credit." He stated that the railroads desire to retain the advantages which they now enjoy under state charters while destroying the powers which the states may possess under the present charters. Under a plan of compulsory federal incorporation he thought that if the present capitalization were left unchanged the railroads would have an opportunity to claim that their securities were outstanding under the compulsion of the federal government.

He did not agree with Mr. Bryan that capitalization should be based on cost of reproduction, on the ground that many railroads, because they were unwisely constructed or because their traffic has diminished, are not now worth the cost of reproducing them. He referred to the Western Pacific, which he said cost over $81,000,000 to build originally and would cost more to reproduce today, but which was sold at a receiver's sale for $18,000,000. On the basis of present and prospective earnings, Mr. Thelen said, that is all the road is worth. He did not believe that the suggestion that stock be issued without a par value would solve the problem.

The entire plan of federal incorporation, Mr. Thelen insisted, is unnecessary because it is possible for Congress to do everything under the commerce clause of the Constitution without it, which it could do with it.

If the states make rates that discriminate against interstate commerce, he said, the condition ought to be remedied, but he thought the Supreme Court had done so in the Shreveport case decision, and if there is anything wrong with the state regulation of securities "we are willing and anxious that it be made right. In fact, you will find among the strongest advocates of action by the federal government in this field of security regulation commissioners of the various states of the Union. We have entered this field because the federal government did nothing. Whatever action the judgment of this committee and of this Congress may think is necessary in connection with control of security issues by the federal government, whether concurrently with the states, or exclusive, no one will applaud more heartily than the commissioners of the various states."

Mr. Thelen described to the committee at some length the work of the California railroad commission to show that it had co-operated with the roads on many occasions which had been appreciated by the railroads, that over 99½ per cent of the commission's decisions in formal cases had gone into effect without any court action, and that railroad construction in California is still active.

He opposed the proposed plan of regional commissions subordinate to the Interstate Commerce Commission on the ground that they would merely supplant the state commissions with federal office-holders who would be strangers to local conditions. "If the railroads had the intention of making all public regulation ineffective," he said, "they could not do it in any way better than that which they now suggest: first, take away the powers from the states, which are on the job, and secondly, overload the federal government in such a way that the federal government's regulation will break down."

Mr. Thelen concluded his argument by insisting that the railroads have made an entirely wrong analysis of the causes of impaired credit and that they "propose to cut off the good right arm of state railroad regulation, on the plea that state railroad regulation has injured their credit, when the real trouble with them is acute gastritis resulting from an overdose of securities which they have not been able to digest." He read into the record some extracts from the Interstate Commerce Commission reports of its investigations in the Alton, Frisco, New Haven, Rock Island and Puget Sound cases.

Bryan Against Exclusive Federal Regulation

William Jennings Bryan testified before the committee on December 7 in opposition to the extension of federal regulation of railroads at the expense of the authority now exercised by the states, urging that federal regulation should be in addition to and not a substitute for state regulation. To give the federal government exclusive control is open to objection, he maintained, "if what we desire is more stringent regulation," and he expressed the opinion that its effect would be to weaken regulation.

His first objection was that "in the nature of things there cannot be an efficient regulation from this central source without the creation of machinery that is far beyond the calculation of those who have considered it from that side."

His second objection was that "the farther you remove the work of regulation from the people, the more difficult it is for the people to control their representatives," and that it would be too great a temptation to the railroads to bring pressure to bear on the members of Congress.

"The third point," he said, "is that the absorption of legislative power by the federal government and the surrender of all legislative power by the state governments will practically obliterate the lines of the states and weaken them in the discharge of their duties, while it will tremendously increase the centralizing forces that are at work in our government. The people at home can better attend to the things at home."

Mr. Bryan said that the fact that the railroads asked for greater federalization "is conclusive proof that it is not intended for greater regulation." This, he said, was not intended as a reflection upon the railroads, but that those in charge of the railroads are "just like other people."

The present laws regulating railroads, Mr. Bryan asserted, originated principally with the states, and he referred to the two-cent fare laws in a number of states, objecting that the railroads in some instances charge more for interstate travel than the sum of the local state rates. He mentioned the fact that only a few days ago he and a friend had each saved 85 cents by buying a ticket to a point near a state line at the two-cent rate and buying another ticket for the remainder of the journey. He said he had written to a member of Congress some time ago, suggesting that there ought to be a federal statute requiring railroads to sell interstate tickets at a rate no greater than the sum of the local rates. Mr. Adamson interrupted and said he had referred a bill to that effect to the Interstate Commerce Commission and that the commission had replied in substance that to enact it would enable the different states to make rates for the Interstate Commerce Commission and that they could not approve that.

Not For Government Ownership

Mr. Bryan told the committee that he does not now advocate government ownership. "I have believed for a number of years," he said, "that government ownership was inevitable, and inevitable only because the railroads will not consent to effective regulation. It is now some ten years since I had occasion to say that unless our experience with the railroads was different from our experience with municipal corporations, the people for their own protection would be compelled to take charge of the railroads. My opinion is that nothing would hasten the government ownership of railroads more than the success of the plan which is under discussion.

"Now, personally, I cannot say that I desire government ownership, because I lean to the individual idea rather than to the collective idea; that is, I believe that government ownership is desirable only where competition is impossible.

I only favor government ownership on the condition that a proper regulation is impossible.

"I am perfectly willing to give to private ownership a fair and complete trial and I have gone so far in my willingness to try effective regulation as to suggest this: that the railroad capitalization be reduced to an honest basis and that then the railroads be allowed to earn a sufficient income to keep their stock at par and in addition a sum be put into a surplus, from which the railroads could draw in bad years to keep their dividends at a just and reasonable point."

Mr. Bryan said he would like to see the stock of a railroad made "as substantial and as unvarying as the value of a government bond." Capitalization, he thought, should represent the cost of reproduction. In reply to questions by Senator Newlands as to what he regarded as a fair return to be earned by railroads, Mr. Bryan said he thought it would be impossible to fix it definitely in figures, but that the principle was easy to ascertain. He suggested that the dividends should be sufficient to keep the stock at par with a reasonable margin to cover fluctuations that could not be calculated.

"I would allow the market price of money to determine," he said, "so that a margin of, say, from 1 to 10 per cent above the par value might be allowed: that whenever the dividend paid raised the value of the stock above 10 per cent it ought to be reduced. If the dividend paid reduced the value of the stock below 1 per cent it ought to be raised. To illustrate what I mean, suppose we allow the rates to be sufficient to collect a dividend of 5 per cent and then suppose we allowed 2 per cent to be collected in addition to be put into surplus until the surplus reached, say, 25 per cent of the capital."

Regulation of Securities

Mr. Bryan advocated federal regulation of security issues, but concurrently with, and not as a substitute for, state regulation. Senator Newlands asked how a corporation could obey both the national government and the state governments in case they differed as to the amount of securities to be authorized. Mr. Bryan replied that if the federal government fixed a maximum lower than the maximum fixed by the state there would be no conflict. He was not asked what would happen in case the maximum fixed by the state were lower than that fixed by the national government. He said that after the government has ascertained the actual value of the railroads that value ought to be represented by stocks and bonds and that thereafter no stocks and bonds should be issued except under supervision and for actual money invested.

"I would not be willing to say that as soon as you ascertain what the actual value of the road is you should by law wipe out all the rest," he said, "because there may be equities to be considered."

If any excess of capitalization above value were found to exist, he suggested, this excess should be disposed of in some way, possibly by division between the stockholders and the general public.

Senator Newlands asked if the states acting as a unit through the national government have not been able to do more in the way of properly regulating the railways than the individual states have been able to do.

"I cannot agree with you on any evidence that I know of," replied Mr. Bryan, "but I shall be glad to consider any evidence which you have in support of that proposition."

"I had the impression that it was self-evident," said the chairman.

Mr. Bryan was invited to appear before the committee again at a later date.

Mr. Brookhart, who appeared as representing the Iowa State Railway Commission, and who has been associated with Clifford Thorne in rate cases, read a lengthy statement advocating government ownership of railroads. He said that ten years ago he did not believe in government ownership, regarding it as a "socialistic vagary," but that he now believed it a desirable and immediate solution of the railway problems. He asserted that government ownership of carriers would result in an annual saving to the United States of $1,200,000,000, made up of a saving of $500,000,000 a year because of the ability of the government to obtain capital at a low rate of interest, $300,000,000 saving of unearned increment of railroad real estate, and $400,000,000 now alleged to be wasted through competition in the duplication of equipment and operating forces. He said that railroad real estate exclusive of improvements, is now worth six billions of dollars and that in the next 20 years this value will double, involving an annual interest charge of $300,000,000.

"Fifty-three governments now own their railroads," said Mr. Brookhart. "In all of them labor is better treated than under private ownership. The work is not so intensive, more men are employed and wages are better. This improves service and increases safety. If $300,000,000 were used in this way, it would still leave a saving of $900,000,000 each year to be used in lowering rates, improving the service and enlarging facilities. This vast sum would take care of all of the needs of the future."

MEETING OF WESTERN ASSOCIATION OF SHORT LINE RAILROADS

At a meeting in Denver last month the Western Association of Short Line Railroads decided to have introduced in each of the eleven western states in which it has members, a bill to provide for the regulation of motor vehicles carrying freight and passengers for hire as common carriers. This action followed an address on the subject by Edgar M. Heigho, receiver of the Pacific & Idaho Northern. The association also further endorsed a resolution passed at its August meeting in San Francisco favoring the centralization of the regulatory power over railroads engaged in interstate commerce in the Interstate Commerce Commission, and the creation of regional boards under the control of that commission. This action followed a paper covering the subject which was presented by M. W. Cooley, general manager of the Uintah Railway Company, Mack, Colo.

The association's decision to introduce legislation providing for the regulation of motor vehicles followed unsuccessful efforts to accomplish this end before the Railroad Commission of California and in the courts of that state. The association filed a complaint with the California commission asking for the application of the provisions of the public utilities act to motor vehicles. When the commission dismissed the complaint the association went to the State Supreme Court and briefs on the case were submitted to the court in May, 1916, but as yet no decision has been rendered.

The Denver meeting was presided over by D. M. Swobe, president of the association, who is also vice-president of the McCloud River Railroad. Three directors were elected to succeed themselves for a term of three years, viz., Guy W. Talbot, president of the Walla Walla Valley, Walla Walla, Wash.; Clarence M. Oddie, general counsel for the Nevada Central, and Edgar M. Heigho.

A Steel Plant for Siberia.—A new iron and steel plant in Siberia is contemplated. The plan, as a result of a recent meeting between representatives of the Russian Government and of the iron industry, is to raise a capital of $10,000,000, the interest to be guaranteed to the banks subscribing. The Government is to lease the district of Kusnezk, where the works are to be located, to the company for 60 years, the company to supply a fixed tonnage of rails and other railroad material yearly at current prices.

Pulverized Fuel for Locomotive Service*

Abstract of a Paper Presented Before the Railroad Session of the A. S. M. E., Including the Discussion

By J. E. Muhlfeld
President, Locomotive Pulverized Fuel Company

DURING the past decade the cost for money, labor and material entering into the financing, new general construction and equipment, and the maintenance and operation of railways, including taxes, has increased enormously; while the gross operating revenues per passenger and per ton-mile have decreased. For this reason the credit of many properties, which is dependent upon the net profits and the probability of expansion of earning capacity, has seriously depreciated.

To continue or establish satisfactory credit in order to provide adequate capital at reasonable cost, a steam railway must preserve the proper ratio between gross operating revenues and expenses; and this ratio is largely contingent upon the effectiveness of its developed means for moving traffic. As next to labor the largest single item of cost for transportation is the fuel used in locomotive operation; and as in the final analysis the cost per revenue passenger or per ton-mile is largely conditional upon the capacity, effectiveness and economy of the unit of motive power per hour, it is easy to realize to what extent the credit of a steam railway is controlled by its locomotive performance and expense.

The expenditure for locomotive fuel for the steam railways in the United States now approximates $300,000,000 per annum, of which from $75,000,000 to $100,000,00 represents the proportion that is expended to kindle, prepare, clean, and maintain fires on grates when locomotives are standing, drifting or otherwise not actually using steam to move themselves, either light or with trains.

The opportunity for reducing the non-productive time of existing locomotives and for relieving terminal congestion that is now caused by the necessity for cleaning fires, ashpans, flues, and smokeboxes; inspecting and repairing draft, grate and ashpan appliances and for firing up and supplying firing tools and equipment to locomotives burning coal on grates, makes the use of pulverized fuel one of the most effective and economical means for increasing the net earning capacity of present single and double track steam roads. Steam locomotives will be equipped to approximate electric service by the use of pulverized fuel, which in turn will eliminate smoke, soot, cinders, sparks and fire hazards; reduce noise, time for despatching at terminals, and stand-by losses; and increase the daily mileage by producing longer runs and more nearly continuous service between general repair periods.

The principal fuels adaptable for use in pulverized form in locomotives are anthracite, semi-anthracite, semi-bituminous and bituminous coals, lignite and peat. These fuels differ more in physical characteristics than in chemical composition, but as the carbon and hydrogen content are the most valuable elements and determine the calorific value, they are usually taken into account for classification purposes. The "clinkering" and "honeycombing" of ash is one of the worst troubles to be contended with in the combustion of coal, and its formation may be either chemical or by fusion. Clinker is of two kinds, hard and soft. Hard clinker is formed by the direct melting of some of the ash content. It hardens as it forms and usually gives but little trouble. Soft clinker is formed by the slagging of the ash and is either pasty or fluid and steadily grows in size. "Honeycomb" or flue-sheet clinker is formed by the condensation or coking of tarry matter or vapor as it strikes against the firebox sheets, and results in the accumulation of a relatively soft, light, ashy substance that grows or spreads over certain of the refractory or metal parts of the furnace.

With the use of pulverized fuel the usual difficulties resulting from the formation of hard and soft clinker on grates are eliminated, but with fuels containing certain intrinsic combinations of ferrous silicates which fuse at comparatively low temperatures (2,000 to 2,300 deg. F.) the honeycomb formation will result when the proper air-supply and combustion conditions do not obtain to produce ferric silicates, which fuse at relatively high temperatures (2,500 deg. F. and above).

For the fiscal year ended June 30, 1914, the Interstate Commerce Commission reports a total of 64,760 locomotives of all classes in the United States having made a total of 1,755,972,325 miles. This gives an average for each locomotive owned of about 27,115 miles per annum, 74 miles per day, or but little over 3 miles per hour. From the foregoing figures it is easy to imagine that over one-half of the time of locomotives is now spent at terminals in the hands of the transportation and mechanical departments, and that most of this delay is due to the necessity for cleaning fires, ashpans, flues and smokeboxes; inspecting and repairing draft, grate and ashpan appliances; and for firing up and supplying firing tools and equipment. Frequently the delays to locomotives waiting to reach ashpit tracks and to rekindle fires exceeds the time required to do this work, and during the interim much fuel is needlessly consumed and the boiler subjected to excessive contraction and expansion.

With pulverized fuel a locomotive having the boiler filled with cold water may be brought under maximum steam pressure within an hour, and the fuel feed then stopped until it is called for service. When standing or drifting at terminals or on the road, the fuel feed can also be discontinued as the steam pressure can always be quickly raised. After the trip or day's work the locomotive can be immediately stored or housed, the usual ashpit delays being entirely eliminated. The possibilities for increasing the productive time of existing locomotives and for relieving terminal congestions that are now brought about by the necessity for cleaning and rebuilding fires on grates, makes the use of

TABLE I.—PERFORMANCES OF TEN-WHEEL TYPE LOCOMOTIVE WITH PULVERIZED COAL

	1	2	3
Fuel	Bituminous	Bituminous	Bituminous
Fineness, per cent through 200 mesh	0.85	0.85	0.85
Moisture, per cent	0.40	0.81	0.59
Volatile, per cent	24.72	36.27	24.36
Fixed carbon, per cent	68.43	58.29	65.05
Ash, per cent	6.85	5.44	10.59
Sulphur, per cent	1.96	0.68	0.84
B.t.u., per lb	14,739	14,334	13,912
Miles run, total	1,324	426	398
Cars per train, average	61	65	60
Adjusted tonnage per train, average	1,719	1,808	1,759
Speed when train was in motion, miles per hour, average	26	25	24
Boiler pressure when using steam (200 lb.), average	198.3	193.5	194.9
Front-end draft when using steam, in. of water, average	7.15	7.79	6.69
Firebox draft when using steam, in. of water, average	3.50	3.2[illegible]	3.18
Temperature of steam, deg. F.	562	573	555
Coal fired per hour of running time, lb. (average)	3,275	3,06[illegible]	3,457
Adjusted ton-miles per lb. of coal (average)	12.84	13.97	11.59

*For an illustrated description of the locomotive equipment for burning pulverized coal see the *Railway Age Gazette* for February 25, 1916, page 351. A description of the C. & N. W. pulverized coal burning locomotive will be found on page 227 of the issue of August 11, 1916.

pulverized fuel one of the most attractive and quickest methods for increasing the earning capacity of present single- and double-tracked steam railways.

The performances of a ten-wheel type freight locomotive,* rated at 31,000 lb. of cylinder tractive effort, with 69-in. driving wheels, when used in fast through-freight service on runs of from 91 to 138 miles in length for the purpose of testing various fuels under identical adjustment conditions, will be found in Table I.

The locomotive was worked at its maximum capacity on all trips, about 10 per cent more tonnage being hauled than usual for like locomotives burning coal on grates, and at practically fast-freight schedule speed. The exhaust-nozzle opening was about 25 per cent larger than the maximum for hand firing. The general results were excellent, particularly as regards tonnage, speed, combustion, and steam pressure, the latter being maintained at full speed with the injector supplying the maximum amount of water to the boiler.

With the highest-sulphur coal (No. 1) and the highest-ash coal (No. 3) there was less than 1 cu. ft. of slag in the slag box at the end of each run, and practically no collection of ash or soot on the flue or firebox sheets. In fact, with the No. 3 fuel there was less than 2 handfuls of slag, ash and soot collected on each trip.

The steam railways in the anthracite-coal-mining district generally use for their locomotive fuel mixtures which will run from 25 to 50 per cent of bituminous and the balance of anthracite pea and buck sizes which will pass through a ⅞-in. and over a 5/16-in. round opening. As anthracite coal is very low in volatile, ignites slowly, and is a poor conductor of heat, the bituminous mixture is used to overcome the trouble this causes when the smaller sizes must be burned on grates, and even then it necessitates the use of unusually small exhaust nozzles to create sufficient draft.

In the experiments with pulverized anthracite fuel for locomotives the idea has been to utilize the grade of coal of lowest commercial value, such as birdseye, which is of a size that will pass through a 5/16-in. and over a 1/16-in. round opening, as well as the refuse called culm or slush, which passes through the 1/16-in. round opening and is usually wasted in the washery water or used for back-filling the mines. To reclaim this slush a couple of wooden bins were installed, through which the washery water could be finally passed for the collection of the solid matter. The analyses of the various fuels used may be approximated as given in Table II.

Table II.—Analysis of Fuels Used in Experiments with Pulverized Anthracite and Bituminous Mixtures

Item	Bituminous Run-of-Mine	Anthracite	
		Birdseye	Slush
Moisture, per cent	0.50	0.50	1.00
Volatile, per cent	29.50	7.50	6.00
Fixed carbon, per cent	60.00	77.00	71.00
Ash, per cent	10.00	15.00	22.00
Sulphur, per cent	1.50	1.00	2.5
B.t.u per lb.	13,750	12,750	11,250
Fineness, per cent through 200 mesh	86.00	86.00	86.00

At the commencement of the development work the locomotive was equipped with an arrangement of refractory baffles and fuel and air inlets for burning 100 per cent. bituminous coal, and after this had been properly accomplished successive adjustments were made to burn the following mixtures, the last of which is now being used with as satisfactory results as the 60 per cent bituminous and 40 per cent birdseye:

First.—75 per cent run-of-mine bituminous and 25 per cent anthracite Birdseye.
Second.—67 per cent run-of-mine bituminous and 33 per cent anthracite Birdseye.
Third.—60 per cent run-of-mine bituminous and 40 per cent anthracite Birdseye.
Fourth.—60 per cent run-of-mile bituminous and 40 per cent anthracite slush.
Fifth.—50 per cent run-of-mine bituminous and 50 per cent anthracite slush.
Sixth.—40 per cent run-of-mine bituminous and 60 per cent anthracite slush.

*The operation of this locomotive was referred to in an article on page 941 of the *Railway Age Gazette* for April 30, 1915.

Further work along this same line will determine just how great a percentage of anthracite slush can be used to the best advantage, but the evaporative results so far obtained, *i.e.*, about 7 lb. of water from feed-water temperature per lb. of coal, indicates that considerably more than a 60 per cent anthracite-slush mixture may be utilized. This accomplishment not only means a decrease of 25 per cent in the cost per ton for locomotive fuel, but also the release of a large tonnage of commercial anthracite, which is becoming more scarce and in greater demand each year.

The principal trouble to be overcome has been on the intermittent runs, as it is more difficult to maintain proper combustion with a slow fire and to re-ignite the fuel after the feed has been stopped for a time, with the low than with the higher volatile coals.

The same increase can be made in the size of the exhaust-nozzle openings (about 25 per cent) for anthracite as for bituminous coal when burning in pulveried form, as compared with hand firing of coal on grates.

The development of sufficient drawbar pull in a Consolidation type of freight locomotive with 63-in. diameter driving wheels, rated at 61,400 lb. of cylinder tractive power, to haul a freight train of 23 loaded cars (representing about 1,562 actual tons) over a ruling grade of 1½ miles of 1.65 per cent grade with a 6-deg. curvature, further indicates the advantages of sustained boiler horsepower in combination with reduced cylinder back pressure, which is only made possible by this method of stoking and burning fuel.

The average results of a number of trips made by an Atlantic type passenger locomotive, rated at 21,850 lb. cylinder tractive effort, with 81-in. diameter driving wheels, when used in high-speed passenger service on round-trip runs of 171 miles in length, are shown in Table III.

Table III.—Performance of Atlantic Type Passenger Locomotive

	Per Cent
Analysis of Fuel Used	
Kentucky unwashed screenings—	
Fineness, through 200 mesh, per cent	83
Moisture, per cent	2.46
Volatile, per cent	36.00
Fixed carbon, per cent	54.00
Ash, per cent	7.94
Sulphur, per cent	0.79
B.t.u. per lb	13,964
Locomotive Performance	
Miles run	171
Running time, hours	3.87
Train, number of cars	5.8
Train, tonnage	291
Speed, miles per hour	44.2
Drawbar pull, pounds	2,711
Horsepower per hour	319.5
Fuel used, tons	3.82
Water used, gallons	8,381
Fuel per hp.-hour, lb.	6.17
Water per hp.-hour, lb.	56.48
Evaporation, water per lb. of coal, lb.	9.15
Evaporation from and at 212 deg. F., lb.	11.1
Boiler efficiency, per cent	77

The combustion results may be indicated by the smokebox-gas analysis given in Table IV.

Table IV.—Smokebox Gas Analysis for the Test Recorded in Table III

Pounds of coal burned per hour	CO_2 Per Cent	CO Per Cent	O Per Cent
3,067	14.5	0.0	4.5
3,498	15.2	0.0	2.8
3,931	15.2	0.0	4.0
4,000	16.0	0.4	2.6

This locomotive could be fired for the round trip with a variation of not over two pounds in the boiler pressure, and the size of the exhaust nozzle used was 5½ in. in diameter and the temperature of the superheated steam averaged about 635 deg. F. for steam of 185 lb. boiler pressure and the smokebox gases about 460 deg. F., although maximum temperatures of 715 deg. F. for superheated steam and of 482 deg. F. for smokebox gases were recorded.

From tests made with pulverized lignite having an analysis of about 1.8 per cent moisture, 47 per cent volatile, 41 per cent fixed carbon, 9.5 per cent ash, and 0.75 per cent sulphur, and a heating value of 10,900 B.t.u. per lb., in regular passenger locomotive service, the same satisfactory results were obtained as with bituminous coals, the combus-

tion and operation being entirely smokeless, sparkless and cinderless, and the steam pressure being fully maintained.

With pulverized fuel the control of the fuel feed and thereby of the over- or under-production of steam is nearly perfect. A locomotive can be fired up and the fuel consumption then stopped until a few minutes before starting time. At the end of the run, or when drifting, the fire can be extinguished at will and quickly re-ignited without any special equipment or materials. A locomotive with boiler full of water and 185 lb. of steam pressure, after standing 11 hours, without fire, still had 80 lb. of steam pressure.

Comparative tests made between similar locomotives in the same service resulted in the use of 2,775 lb. of lump coal, hand-fired to get up steam and for terminal handling and dead time, as compared with 1,569 lb. of pulverized screenings to produce the same result, or an increase of over 75 per cent. The greatest saving is in the firing up alone, this requiring 1,700 lb. of lump coal as compared with 750 lb. of pulverized screenings, or an increase of over 225 per cent. In the engine-house terminal handling there is the least possible delay and expense. No more time or facilities are required than for fuel-oil-burning locomotives. A locomotive fired up at 6 a. m. can leave with its train at 7 a. m., and upon arrival at the destination engine house can be immediately fueled, watered and housed, the slag-pan being dumped over the engine stall pit.

Through the possibility of enlarging exhaust-nozzle openings from 25 to 50 per cent as compared with the areas required for burning coal on grates or fuel oil, the full benefit of expenditures for improved cylinders, valves and valve gears, particularly in connection with cylinders of large volume, can now be obtained. Heretofore the necessity for maintaining relatively small exhaust-nozzle openings to produce the required firebox draft has enabled but little benefit to be gained from improved steam distribution, as cylinder back pressures of from 15 to 30 lb. when operating at maximum capacity of engine and boiler are not at all uncommon in some of the most recently built stoker-fired single-expansion locomotives. As every pound of cylinder back pressure saved is equal to at least two pounds added to the boiler pressure when a locomotive is working at its maximum capacity, and further provides freer movement and less wear, tear and fuel consumption, the benefits to be derived are obvious.

As the limiting factor of a steam locomotive is, or should be, the ability of the boiler to produce steam, the rate and effectiveness of combustion become the controlling factors. When coal is burned on grates a rate of about 50 lb. of run-of-mine, and of about 60 lb. of lump bituminous coal, per sq. ft. of grate surface per hour is the maximum allowable for the greatest boiler efficiency. However, as this limits the rate of consumption to a total of from 3,000 to 6,000 lb. per hour for the average modern locomotive of great power, and as the actual coal supplied to the firebox by mechanical stoking frequently reaches a rate of 150 lb. per sq. ft. of grate area, or a total of from 9,000 to 15,000 lb. per hour, the boiler efficiencies frequently run as low as from 55 to 45 per cent and even less. Therefore the necessity for eliminating grates if much over 12 lb. of water per sq. ft. of evaporating surface per hour is to be obtained with reasonable efficiency.

From results established during the past six months, the quantity of live steam required for the operation of pulverized fuel burning equipment when the locomotive is being worked at its maximum boiler-horsepower capacity, is about 1½ per cent of the saturated steam generated, which is considerably less than what is required for the steam-jet operation of mechanical stokers when firing coal on grates, and very much less as compared with what is used in the generally existing steam-jet practice of burning fuel oil; this latter amount, according to reports made by the U. S. Naval Board, is about 6 per cent of the total steam generated.

Comparing the use of pulverized fuel and fuel oil for steam-locomotive purposes, it may be stated that with pulverized coal at 13,750 B.t.u., costing $2.35 per ton, and fuel oil at 19,500 B.t.u., costing $2.75 per hundred gallons, an amount of at least $2.50 must be expended for the fuel oil necessary to perform the same useful work as will obtain from $1.00 expended for pulverized fuel.

The development work pertaining to the use of pulverized fuel for locomotives has been carried along in direct conjunction with the use of like fuel in one 463-hp. nominal rating Stirling type of stationary boiler, various tests being made for the purpose of determining the best combination of fuel and air admission, flameway, and draft and furnace construction for the maximum boiler capacity and efficiency consistent with minimum renewal of refractory materials. Both bituminous and anthracite fuels have been used, the principal work being in connection with the latter on account of the greater difficulty in maintaining combustion due to the low volatile content.

In general, it may be stated that the use of pulverized anthracite slush will double the steam-generating capacity of boilers now burning birdseye anthracite hand-fired on grates, and at the same time eliminate fire cleaning, greatly decrease the amount of ash to be handled, and reduce the boiler-plant labor cost about 40 per cent. Furthermore, with the pulverized fuel, the boiler pressure can be more readily maintained or increased or reduced to meet the requirements and when one or more of the boilers are not needed temporarily, the fuel feed can be stopped and started at will, thereby eliminating the necessity for maintaining banked fires and burning fuel when not required in order to have the boilers ready for instant use.

An investigation of the culm banks in the anthracite-coal-mining district would undoubtedly disclose many millions of tons of domestic and steam sizes of fuel that can be reclaimed, and in addition, the large percentage of slush that would be produced in this process could all be utilized in pulverized form for power-generating purposes.

Discussion

W. L. Robinson, supervisor of fuel consumption, Baltimore & Ohio Railroad, in discussing Mr. Muhlfeld's paper, called attention to the effect which the car shortage had in impairing the regularity of the supply of coal of the proper grades for use in passenger and stoker-fired freight service. On account of the irregularity of the supply it has been necessary to put lump coal on stoker-fired locomotives and in some cases to put slack coal on passenger locomotives. With the general use of pulverized fuel, all locomotives using the same class of coal, the minimum interference with the coal supply resulting from car shortages would be produced. He also referred to the effect on the cost of operation which is being produced by the continually increasing price of the commercial grades of coal. Referring to Mr. Muhlfeld's statement that $75,000,000 to $100,000,000 of the $300,000,000 expended annually for fuel is accounted for by stand-by losses, he stated that results of some dynamometer tests on the Baltimore & Ohio almost exactly checked with this statement, only about 66 per cent of the total amount of coal purchased being accounted for in actually hauling trains.

From a conducting transportation standpoint Mr. Robinson considered one of the biggest advantages in the use of pulverized coal to be the possibility of reducing delays at terminals. Another point emphasized by Mr. Robinson was the ability of the fireman to check the engineer on signal indications, because with pulverized fuel it is unnecessary for him to leave the seat box.

C. W. Corning, chief service inspector, Chicago & North Western—Discussing this subject from the viewpoint of a locomotive engineman, of the many things which contribute

toward the lightening of his cares in the discharge of his duties, probably the two most essential conditions are properly working injectors and the free steaming of the engine. In all the runs made by the Chicago & North Western Atlantic type locomotive equipped for burning pulverized fuel, it has never failed to deliver all the steam required. A locomotive is often operated in accordance with the fireman's physical endurance. On one occasion, through no fault of the engine or train, there was a delay of several minutes, at which time it was noted by the engineer that provided he could maintain a certain speed over the last 25 miles of the trip, the train would be brought to the terminal on time. This was accomplished and the steam pressure never varied more than two pounds under the maximum. Under the same conditions it would have been impossible to have obtained the same results had the engine been hand-fired, as it would have been beyond human endurance to have maintained the steam pressure required.

Another feature which impresses itself on the mind of the engineman is that in the event of the failure of the injector it is a simple matter to shut off the supply of fuel until the difficulty can be remedied and the fire relighted and very often it is unnecessary even to stop. On the other hand, should it become necessary to draw the fire in one of our modern locomotives, it would be practically an impossibility and an attempt either to extinguish or deaden the fire would mean a very serious engine failure.

The draft appliances, when once adjusted on a pulverized fuel burning locomotive need not be changed to meet conditions necessary to burn different grades of fuel, or to meet changes in climatic conditions. It is the practice at this time of year to change drafting appliances to produce a stronger draft on the fire in order to overcome the frozen moisture in the fuel.

J. H. Manning, superintendent of motive power, Delaware & Hudson—The Delaware & Hudson, located in the anthracite coal fields of Pennsylvania, closely connected with a territory that produces about 80,000,000 tons of anthracite coal per year, it is not hard to understand that from the time this coal is put in the mine car to proceed to the breaker and there be prepared for the market, with a size that starts probably with 12-in. irregular lumps and ends with birdseye, a great deal of extremely fine coal and dust accumulates in the process. This cannot be burnt on the grates; but, if at all, in suspension in a refractory furnace. For this purpose there is available in our neighborhood 550,000 tons a month. This latter and the fact that there were located around us a number of industrial plants successfully burning bituminous coal in pulverized form, encouraged us to build an experimental locomotive producing approximately 2,700 cylinder horsepower.

We soon found out it would be impossible to burn clear anthracite coal in pulverized form. Due to the low volatile, it would promptly snuff out if the engine slipped or worked extremely hard, and the firebox temperature would not permit it to again flash. We, therefore, determined to start with 75 per cent bituminous and decrease until it was found that the objectionable feature was removed. This continued until a mixture of 60 per cent anthracite and 40 per cent bituminous was obtained. We find this gives splendid results, the engine steams freely with very little smoke and is very nicely controlled by the fireman to the extent of keeping the engine within three pounds of the maximum pressure continuously without popping, under the different operations necessarily obtaining in a day's work with an engine of this character, and we have experienced no firebox trouble whatever.

Such difficulty as we have had with the pulverized fuel mechanism for the introduction of the fuel into the firebox has been satisfactorily eliminated and the successful burning of pulverized fuel in suspension in locomotive fireboxes, to my mind, has passed beyond the experimental stage.

S. S. Riegel, mechanical engineer, Delaware, Lackawanna & Western—The paper inspires the belief that the initial work has been well done along correct lines. In the use of an induced draft for the secondary air of combustion lies possibly its greatest assurance of success, as this overcomes (properly applied) the destructive heat action of the fuel jets against the brick work of the combustion chamber and furnace linings, and at the same time furnishes a convenient way to secure the necessary air for combustion with the effort required to remove the ashy deposits from the heating surfaces and front end of the locomotive.

It is particularly interesting to find that a satisfactory system of utilizing pulverized fuel in locomotive service so easily adapts itself to locomotive conditions, as a locomotive must operate on such greatly varying conditions, and always in doing the maximum work on an intensive draft condition. From the viewpoint of the possibility of overcoming the standby and firing up losses of the locomotives, powdered coal is given an opportunity which is not possible in stationary practice. As the author states, the standby losses may constitute from one-fourth to one-third of the total fuel consumption, and it is obvious the opportunity for reducing these losses is very great.

Likewise, as it is necessary to separate the fuel particles and surround them with sufficient air for perfect combustion, it would seem equally desirable to separate the particles of the crushed materials in the drying process, and the most effective dryer would be the one which best effected this separation of the particles of fuel. The burden of about 40 cents per ton in the present method is a large handicap and it must be reduced as much as possible.

George L. Fowler referred to some tests which he has made to determine the movement of firebox sheets in service, which showed the extreme sensitiveness of the sheets to changes in temperature. The opening of the firedoor was found to cause a drop in temperature of the adjacent sheets of about 250 deg. F. in 15 sec. He pointed out that in burning pulverized coal, the firebox sheets may be maintained at a much more uniform temperature, with a reduction in the stresses produced by sudden temperature changes.

C. D. Young, engineer of tests, Pennsylvania Railroad, said that in some tests made on a locomotive-type boiler in stationary service, the greatest difficulty was to prevent the destruction of the brickwork when burning coal in the quantities used in road service, and that when the temperature of the firebox is reduced to overcome this difficulty by the use of excess air, the efficiency of the combustion is reduced. He also called attention to the fact that the Chicago & North Western Atlantic type locomotive is a light locomotive and was lightly loaded in the test runs; and that under the same conditions with proper supervision, hand-firing would have produced smokeless operation. He also pointed out that the performance of this locomotive was very poor, probably being accounted for by the water rate, which was 56 lb. per indicated horsepower hour, whereas, a fair figure would be 20 lb. to 21 lb. Allowing for the excessive water rate the fuel performance was about what might be expected with hand-firing.

Charles W. Baker, editor of the Engineering News, emphasized the economic importance of the development of pulverized fuel. He considered the point of immediate interest, however, the possibility of using pulverized fuel in switching service as a means of smoke elimination in yards and terminals about large cities.

THE GREEK RAILWAY STRIKE.—The Greek cabinet sat for 10 hours in Athens on October 28 discussing the railway strike with the directors of the Larissa Railway. Ultimately the principal demands of the railwaymen were conceded.

General News Department

The Interstate Commerce Commission has postponed the effective date of its order as to safety appliances on railroads in Porto Rico until January 1, 1918.

The freight transfer shed of the Baltimore & Ohio at Brunswick, Md., was mostly destroyed by fire on December 7, together with eight loaded freight cars and much merchandise; estimated loss, $50,000.

The attorneys for the government on Monday at Washington asked the Supreme Court to dismiss the government's appeal in the New Haven case in the suits against three directors, John T. Billard, James S. Elton and William Skinner.

The Public Utilities Commission of Illinois reports 709 persons killed on the steam railroads of the state in the year ending June 30, 1915, which is 15 fewer than in any year since 1899. Sixty per cent of the killed were trespassers, and less than two per cent were passengers. The decrease in total fatalities, as compared with 1914, is 20.5 per cent.

Milton H. Smith, president; A. R. Smith, vice-president; and George W. Jones, attorney, of the Louisville & Nashville, filed in the Supreme Court on December 9 an appeal from the ruling of the Supreme Court of the District of Columbia, directing them to answer questions asked by the chief counsel of the Interstate Commerce Commission regarding expenditures of the roads for political purposes.

The Pennsylvania Railroad is distributing a colored poster warning of the danger of walking on tracks. It bears a facsimile of the standard hand signal used by crossing watchmen, a white disk with the word "Stop" in large black letters. This poster is to be displayed at places where people are accustomed to take short cuts across the tracks or to use the railroad right-of-way as a highway; also on all bulletin boards and in stations and waiting rooms.

At a meeting of the board of managers of the Station Agents' Association of the Chicago Great Western, held at Chicago on December 8, the following officers were elected for the year 1917: President, G. H. Hunt, freight claim agent; vice-president, G. A. Brown, superintendent car service; secretary, W. J. Cunningham, auditor of freight receipts, all of Chicago, Ill. The annual meeting of the association will be held at St. Joseph, Mo., on January 24, 1917.

The union labor organizations of Texas will attempt to secure the enactment of a law by the legislature of that state at its coming session in January, placing interurban railways under the jurisdiction of the railroad commission. The movement is said to have the support of the steam railroads, which are now at a disadvantage in competing for passenger traffic with the interurbans which are under no regulatory laws. The interurban companies are vigorously opposed to the proposal.

Frank Wightman, superintendent of safety of the St. Louis-San Francisco, is inducing schools along the railroad to change their time of assembly, recess or dismissal if it coincides with that of fast trains. At many points Mr. Wightman has arranged with the schools to assemble earlier than the time of the arrival of a fast train. For example, in cases where schools assemble at nine o'clock, and a train passes through the town at that hour, the assembly time has been made 8:45, and school is dismissed a quarter hour earlier. At another point a recess has been postponed until a fast train has passed.

The 720-ft. span of the Metropolis (Ill.) bridge over the Ohio river has just been swung clear of the falsework, thereby marking the successful erection of the longest simple span in the world. This bridge forms the important link to the Paducah & Illinois Railroad, a 12-mile line connecting the Chicago, Burlington & Quincy with the Nashville, Chattanooga & St. Louis, and owned jointly by the two companies. The long span weighs 4,000 tons, and was erected from falsework, entailing the use of over 600 piles. Aside from the record length, the structure is notable for the use of silicon steel in all the main compression members and other special features. The design and construction were under the direction of the late C. H. Cartlidge, bridge engineer of the Burlington, and chief engineer of the Paducah & Illinois.

I. C. C. Changes Fiscal Year to End December 31

The Interstate Commerce Commission has issued an order that all common carriers subject to the provisions of the act to regulate commerce are required hereafter to file in the office of the commission on or before March 31 in each year, reports covering the period of 12 months ending with December 31, giving the particulars heretofore called for in the annual reports required by the commission.

A Rival to Mr. Dow

According to the St. Louis Dispatch, Louis W. Hill, president of the Great Northern, has turned his pen to the writing of scenarios. It has to do with a couple of kings and a beautiful princess. It is for the Spokane Apple show. It tells the story of King Pip IX and Princess Apple Blossom. There is a King Crab of Crabland in the story.

The Switchmen's Controversy

Horace Baker, chairman of the special conference committee of the railways, in summing up for the railways before the board of arbitration in the switchmen's controversy, said the switchmen in their demands have requested what amounts to an increase in wages of approximately 42.5 per cent, and that it would mean a heavy increase in expenses.

He also referred to the men's claim of long hours of service under adverse conditions, and said that the average time on duty for all the men involved was 10 hours and 48 minutes, with 30 per cent of crews working 10 hours or less, and spoke of how men with seniority rights always took runs with greatest number of hours. He added that the hours of service were not fixed by the railroads, but by the demands of their customers, and that an arbitrary eight-hour day was impossible in switching service. He said the high cost of living for switchmen and other employees, as well as for the railroads, is due to abnormal conditions on account of the war.

He declared that punitive overtime would mean nothing more or less than a substantial increase in pay—this for the reason that the railways at best would be compelled to continue to operate to suit the public needs as at present and not to suit their own convenience.

He said the total number of employees on railroads represented is approximately 235,400, all of whom should be taken into consideration. That there are nearly 3,700 switchmen affected by this movement. These men, as has been previously stated, comprise but 8 per cent of all of the switchmen employed in the United States, and only 1½ per cent of all the employees on the 13 roads represented in the arbitration.

Mr. Baker also mentioned that wage increases, regulation, etc., had made railway securities a poor investment with the result, for one thing, that the railway mileage built in 1915 was only about 900 miles.

S. A. Heberling, president of the Switchmen's Union, said that the cost of living had increased to such an extent as to depreciate the dollar of the switchman. He said that he and his fellows would not agree to a reduction when hard times came to the railroads.

He declared the work of a switchman was extra hazardous and for that reason should have better pay; that the Switchmen's Union was not making its demands with a club in its hand, but was basing its plea on justice, reason and facts; that the number of men should make no difference; that right should prevail whether it was 100 or 1,000,000 men involved.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF OCTOBER, 1916

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Atlanta, Birmingham & Atlantic	640	$253,107	$58,617	$332,778	$50,517	$47,161	$15,028	$102,856	$21	$11,561	$227,145	$105,633	$13,160	$92,533	.....
Baltimore & Ohio Chicago Terminal	79	.....	513	167,996	15,589	29,530	798	80,804	1,348	6,340	133,302	34,695	22,689	12,140	$25,447
Boston & Maine	2,298	2,926,426	1,472,213	4,857,573	583,579	599,033	32,147	1,957,196	25,258	106,392	3,303,605	1,553,968	168,206	1,385,762	137,367
Carolina, Clinchfield & Ohio	283	276,526	22,398	306,721	20,156	41,002	17,551	57,593	.....	11,942	147,378	159,343	14,250	145,090	33,452
Carolina, Clinchfield & Ohio of S. C.	18	17,356	1,307	19,048	1,332	92	2,450	2,433	.....	814	7,111	11,938	750	11,188	5,862
Central of Georgia	1,924	937,120	324,329	1,411,781	182,544	202,843	37,940	362,099	1,056	39,896	825,161	586,620	64,410	521,454	141,942
Central Vermont	411	270,424	89,784	394,896	52,605	59,290	8,753	158,909	2,259	10,631	292,448	102,452	15,565	86,845	4,657
Chicago & Erie	270	676,668	56,213	775,532	64,118	73,916	19,439	268,448	2,730	17,050	443,073	332,459	34,048	298,411	57,018
Colorado & Southern	1,102	716,460	131,199	904,271	90,586	150,997	9,462	224,863	3,848	22,952	502,708	401,563	39,000	362,544	56,159
Delaware & Hudson Co.—R. R. Dept.	886	1,945,274	252,244	2,323,814	187,316	425,706	25,223	801,990	19,161	72,505	1,529,499	794,316	58,650	735,584	—184,533
Delaware, Lackawanna & Western	955	3,343,327	771,468	4,537,218	394,276	646,046	72,372	1,467,702	38,341	82,464	2,696,940	1,840,278	232,500	1,606,473	—226,432
Denver & Rio Grande	2,578	2,060,951	367,019	2,574,170	242,634	364,486	39,930	649,984	28,699	70,403	1,396,136	1,178,034	98,000	1,079,834	162,416
Denver & Salt Lake	255	159,640	22,047	191,387	21,497	32,878	2,468	62,567	.....	4,933	123,957	67,430	11,002	56,429	—3,642
Detroit & Mackinac	393	75,218	27,895	110,249	13,316	18,608	3,384	35,433	.....	3,321	74,061	36,188	8,000	28,188	—3,539
Erie	1,988	4,563,999	812,605	5,888,798	537,301	1,308,424	93,168	2,297,183	37,434	123,490	4,393,816	1,494,982	154,782	1,339,719	—1,010,154
Galveston Wharf	14	.....	.....	127,857	1,339	1,176	332	29,508	24,477	386	57,218	70,639	10,300	60,339	40,123
Georgia	307	245,400	77,773	350,037	19,624	44,511	14,440	109,274	146	9,501	197,105	152,933	4,879	148,050	70,817
Georgia, Southern & Florida	402	149,700	70,065	249,796	29,204	40,950	7,294	78,682	.....	9,991	166,120	83,675	11,199	72,343	16,073
Grand Canyon	64	760	14,233	21,145	5,836	859	627	11,212	.....	162	18,697	2,448	1,832	617	—61,513
Great Northern	8,189	6,348,637	1,299,158	8,353,673	782,506	987,103	96,062	2,256,567	86,398	114,937	4,283,760	4,069,913	479,176	3,589,668	—1,211,669
Minneapolis & St. Louis	1,647	807,097	163,929	1,031,049	156,281	138,500	17,696	343,066	85	24,156	679,784	351,265	42,792	308,332	5,085
Missouri, Oklahoma & Gulf Ry. of Texas	134	32,307	587	33,027	3,414	2,635	1,755	10,418	.....	1,754	19,975	13,052	188	12,864	12,078
New York Central Railroad	6,073	12,522,670	4,514,433	19,787,125	1,898,609	3,616,743	261,550	6,203,865	275,358	393,274	12,649,399	7,137,726	823,227	6,313,249	—22,953
New York, Susquehanna & Western	140	170,733	48,747	245,798	20,534	36,424	2,077	114,716	.....	7,052	180,791	65,008	13,785	51,222	—36,510
Northwestern Pacific	507	229,003	138,392	407,409	51,225	47,430	4,888	136,624	923	10,398	251,010	156,399	18,197	138,202	—28,803
Oahu Railway & Land Co.	114	58,151	21,270	85,921	9,292	8,113	769	25,228	.....	4,642	48,045	37,876	9,500	28,376	—1,310
Peoria & Pekin Union	19	12,265	5,947	95,536	10,088	13,634	33	50,940	.....	2,752	77,447	18,089	7,000	11,089	—4,062
Pittsburgh, Shawmut & Northern	205	107,096	4,843	114,644	21,325	44,119	1,176	43,961	.....	3,885	114,467	178	2,064	—1,886	—85,651
St. Louis, San Francisco & Texas	244	79,784	39,296	126,044	26,662	21,421	3,074	46,083	.....	5,414	102,654	23,390	1,565	21,739	—1,813
St. Louis Southwestern	943	755,067	152,772	953,550	73,056	136,273	30,125	197,089	2,840	24,770	463,466	490,084	33,398	456,614	74,919
St. Louis Southwestern of Texas	810	425,237	117,520	580,132	56,092	93,387	12,595	165,038	1,625	22,832	350,519	229,613	17,162	212,389	80,940
Southern Pacific	7,063	7,974,119	2,452,687	11,342,496	1,014,096	1,562,687	165,845	3,593,411	160,723	257,607	6,722,198	4,620,299	642,305	3,975,042	—160,058
Texas & Pacific	1,944	1,628,381	673,554	2,425,898	220,293	302,577	41,910	728,729	12,725	52,830	1,355,773	1,070,125	85,000	984,863	425,734
Ulster & Delaware	129	46,443	14,966	78,070	12,600	12,331	916	37,187	338	3,746	67,118	10,953	4,000	6,986	—16,061
Western Pacific	939	661,252	93,310	800,532	129,302	71,465	19,622	207,930	9,922	18,933	457,174	343,358	32,749	310,604	99,409

FOUR MONTHS OF FISCAL YEAR ENDING JUNE 30, 1917

Atlanta, Birmingham & Atlantic	640	$846,982	$220,442	$1,147,544	$179,124	$191,939	$58,996	$388,506	$92	$38,878	$857,535	$290,009	$52,400	$237,593	.....
Baltimore & Ohio Chicago Terminal	79	.....	2,380	630,643	79,833	102,908	3,535	292,662	7,716	25,353	505,138	125,505	90,754	33,348	—$71,563
Boston & Maine	2,298	11,172,064	6,515,059	19,670,482	2,373,805	2,397,083	152,440	7,646,101	102,656	422,430	13,094,515	6,575,967	677,531	5,898,437	969,617
Carolina, Clinchfield & Ohio	283	766,826	87,209	889,863	75,385	137,264	62,706	199,862	.....	44,896	518,117	371,746	57,000	314,743	—94,606
Carolina, Clinchfield & Ohio of S. C.	18	36,848	4,591	42,938	2,479	348	8,725	10,048	.....	3,194	24,789	18,149	3,000	15,108	—3,992
Central of Georgia	1,924	3,179,490	1,227,504	4,887,955	693,642	789,008	154,932	1,408,165	3,475	161,413	3,205,024	1,682,931	241,525	1,439,384	374,970
Central Vermont	411	988,961	400,311	1,534,568	224,250	225,686	38,209	627,351	8,946	38,019	1,162,462	372,106	62,260	309,742	29,448
Chicago & Erie	270	2,504,767	256,911	2,960,670	290,223	275,933	74,600	1,046,718	8,909	65,936	1,751,021	1,209,648	100,738	1,108,910	260,840
Colorado & Southern	1,102	2,361,513	665,636	3,248,851	380,143	577,450	45,356	847,233	18,556	91,196	1,959,934	1,288,917	155,000	1,133,534	349,777
Delaware & Hudson Co.—R. R. Dept.	886	7,296,794	1,348,924	9,212,342	735,241	1,804,567	122,643	3,126,923	86,681	338,210	6,206,573	3,005,769	234,600	2,768,458	—581,335
Delaware, Lackawanna & Western	955	12,809,806	3,252,962	17,806,484	1,915,237	2,602,526	296,950	5,560,793	153,290	341,251	10,849,466	6,957,019	900,000	6,055,168	503,151
Denver & Rio Grande	2,578	7,107,960	1,715,893	9,465,519	1,121,182	1,443,246	166,743	2,317,959	130,495	271,021	5,450,647	4,014,871	380,000	3,634,001	375,386
Denver & Salt Lake	255	558,959	161,630	757,972	110,342	130,707	10,606	223,878	.....	19,988	495,134	262,838	42,049	220,789	—30,727
Detroit & Mackinac	393	287,553	127,221	447,820	52,338	72,895	9,422	143,580	1,147	11,858	291,241	156,579	32,165	124,414	35,691
Erie	1,988	17,293,695	3,616,480	23,102,613	2,168,871	4,831,769	372,097	8,477,931	160,924	522,821	16,513,567	6,589,046	737,223	5,849,410	—2,542,937
Galveston Wharf	14	.....	.....	429,710	4,919	7,709	1,626	108,911	85,519	1,499	210,184	219,527	41,200	178,327	153,011
Georgia	307	844,783	299,152	1,235,433	92,830	173,420	55,232	405,241	503	36,999	763,809	471,623	19,474	452,091	255,703
Georgia, Southern & Florida	402	527,842	258,002	881,855	110,677	163,959	29,948	298,804	45	35,678	639,092	242,764	44,543	197,835	43,048
Grand Canyon	64	3,603	73,504	101,548	46,146	3,351	2,586	44,153	.....	679	96,914	4,635	6,805	—2,170	—395,776
Great Northern	8,189	23,427,348	5,766,489	32,059,214	3,628,420	3,704,254	396,643	8,290,820	348,307	473,916	16,629,447	15,429,766	1,861,713	13,566,031	—263,985
Minneapolis & St. Louis	1,647	2,907,643	731,585	3,858,655	548,842	586,499	71,652	1,242,982	341	93,251	2,543,566	1,315,089	167,126	1,147,337	20,433
Missouri, Oklahoma & Gulf Ry. of Texas	134	106,650	2,289	109,672	12,918	11,170	6,779	41,027	.....	6,645	78,540	31,132	751	30,381	35,763
New York Central Railroad	6,073	47,356,827	20,066,069	78,482,559	7,754,437	13,402,772	1,153,708	23,870,140	1,072,661	1,610,706	48,864,423	29,618,136	3,032,081	26,577,648	4,083,609
New York, Susquehanna & Western	140	709,332	199,544	1,029,036	89,215	141,315	8,171	468,207	.....	29,382	736,237	292,799	56,085	236,674	—93,847
Northwestern Pacific	507	923,412	791,782	1,909,832	206,442	180,497	21,654	557,474	3,603	37,522	1,004,090	905,742	72,663	832,781	96,241
Oahu Railway & Land Co.	114	402,809	85,809	516,285	43,112	34,985	3,335	111,788	.....	19,150	212,334	303,951	38,000	265,951	—46,825
Peoria & Pekin Union	19	45,588	19,543	354,875	34,221	53,037	386	178,479	.....	11,114	277,238	77,638	27,500	50,137	19,046
Pittsburgh, Shawmut & Northern	205	589,160	31,450	630,987	115,861	208,753	5,309	219,184	.....	17,057	566,164	64,823	9,064	55,759	—158,321
St. Louis, San Francisco & Texas	244	292,642	128,596	444,378	85,414	80,229	10,024	171,467	.....	20,166	367,300	77,078	6,261	70,702	24,416
St. Louis Southwestern	943	2,407,768	580,961	3,160,817	232,367	531,931	123,032	720,921	12,101	97,409	1,715,570	1,445,247	140,907	1,303,837	303,937
St. Louis Southwestern of Texas	810	1,305,701	414,277	1,850,064	212,005	389,167	56,550	613,062	6,606	81,685	1,356,430	493,634	67,484	425,920	199,323
Southern Pacific	7,063	30,906,875	10,366,925	44,975,359	4,031,630	6,361,157	674,573	13,890,851	635,621	977,713	26,460,317	18,515,043	1,983,342	16,508,939	493,523
Texas & Pacific	1,944	4,906,467	2,068,636	7,442,778	820,257	957,461	162,400	2,499,954	47,651	218,274	4,697,722	2,745,055	329,000	2,414,950	969,089
Ulster & Delaware	129	163,938	191,924	432,623	49,483	49,252	7,009	173,889	1,253	14,358	295,243	137,380	16,000	121,412	—24,301
Western Pacific	939	2,582,658	448,928	3,213,680	502,061	278,775	79,478	843,629	42,160	74,804	1,820,908	1,392,772	130,977	1,261,756	316,573

Central States Conference on Transportation

The Central States Conference on Rail and Water Transportation, which is being held at Evansville, Ind., this week, is under the auspices of the Evansville Chamber of Commerce. The purpose of the conference was to bring together representative business men of the Central Western States in order that they might discuss the vital problems of railway and water transportation. Among the speakers were proponents of the viewpoints of the railway, the employee, the investor and the public. The program included the following speakers and subjects:

Henry C. Murphy, Evansville Chamber of Commerce, Chairman of the Conference—The Purpose and Scope of the Central States Conference.

Alfred P. Thom, Counsel of the Railway Executives' Advisory Committee on Federal Legislation and General Counsel of the Southern Railway—The Needs of American Railroads.

John Muir, President of the Railway Investors' League—The Real Owner of the Railroad, the Investor; Why He Is Worried Over the Present Situation and How Fair Treatment Will Supply a Solution of the Present American Transportation Problems.

Frank P. Walsh, formerly Chairman of the United States Commission on Industrial Relations—The Interest of the American People in Transportation Legislation.

Clifford Thorne, Chairman of the Board of Railroad Commissioners of Iowa—Does Legislation Pay?

W. G. Lee, President of the Brotherhood of Railway Trainmen—Hours and Working Conditions of Railway Employees.

Lansing H. Beach, Colonel United States Army, Corps of Engineers—The Improvement of the Ohio River.

Frank Trumbull, Chairman of the Railway Executives' Advisory Committee on Federal Legislation—The American Railways.

N. C. Kingsbury, Vice-President of the American Telephone & Telegraph Company—Co-operation.

The following were also scheduled to speak: G. M. Freer, president of the National Industrial Traffic League; John Russell, chairman of the transportation bureau, Detroit Chamber of Commerce; J. E. Edgerton, president, Tennessee Manufacturers' Association; J. M. Glenn, secretary of the Illinois Manufacturers' Association, and J. S. Hazelrigg, president of the Indiana Grain Dealers' Association.

One of the purposes of the conference was to discuss the feasibility of effecting a permanent organization for neighboring Central States, which will in the future afford similar opportunities for the intelligent and authoritative discussion of important transportation problems.

Operating Revenues and Expenses of Express Companies

The Interstate Commerce Commission has issued the following statement, subject to revision, from the monthly reports of operating revenues and operating expenses of the principal express companies for August, 1916:

FOR THE MONTH OF AUGUST

Item	Adams Express Co.		American Express Co.		Canadian Express Co.		Great Northern Express Co.		Northern Express Co.	
	1916	1915	1916	1915	1916	1915	1916	1915	1916	1915
Mileage of all lines covered	45,154.98	44,930.22	74,364.85	74,260.80	12,049.93	10,238.13	9,837.99	9,568.79	8,274.70	8,233.03
Charges for transportation	$3,846,285	$3,041,197	$5,555,769	$4,207,623	$380,452	325,941	$357,104	$326,408	$326,925	$301,913
Express privileges—Dr.	1,885,748	1,498,955	2,712,722	2,106,437	220,090	170,060	217,165	197,723	176,246	162,260
Operations other than transp	50,410	45,793	237,391	248,645	6,067	5,370	6.041	5,066	4,583	3,999
Total operating revenues	2,010,947	1,588,035	3,080,438	2,349,831	166,429	161,250	145,980	133,752	155,261	143,651
Operating expenses	1,904,238	1,445,440	2,688,987	2,136,784	163,043	133,942	101,173	89,940	99,534	92,260
Net operating revenue	106,708	142,595	391,450	213,046	3,385	27,307	44,807	43,811	55,727	51,391
Uncollectible rev. from transp	613	571	1,148	365	10	13	6	48	7	16
Express taxes	22,988	17,012	45,557	35,422	4,700	4,200	5,148	4,221	5,500	5,000
Operating income	83,105	125,010	344,744	177,258	*1,325	23,094	39,652	39,541	50,219	46,375

Item	Southern Express Co.		Wells Fargo & Co.		Western Express Co.		Total for companies named	
	1916	1915	1916	1915	1916	1915	1916	1915
Mileage of all lines covered	34,774.60	34,728.60	107,540.75	114,622.94	5,248.89	5,232.87	297,246.69	301,815.38
Charges for transportation	$1,297,275	$977,176	$4,339,701	$3,355,619	$155,064	$124,655	$16,258,578	$12,660,536
Express privileges—Dr.	665,534	498,225	2,231,863	1,733,318	74,671	57,815	8,184,043	6,424,797
Operations other than transportation	27,873	22,617	109,739	90,228	3,704	3,200	445,812	424,921
Total operating revenues	659,614	501,568	2,217,577	1,712,529	84,096	70,039	8,520,347	6,660,660
Operating expenses	558,101	485,440	1,867,136	1,556,328	61,341	53,840	7,443,558	5,993,980
Net operating revenue	101,512	16,127	350,441	156,201	22,755	16,198	1,076,789	666,680
Uncollectible revenue from transportation	65	46	1,300	1,307	2	...	3,156	2,370
Express taxes	14,768	12,943	42,464	34,944	1,066	930	142,194	114,675
Operating income	86,678	3,137	306,676	119,949	21,685	15,268	931,439	549,635

FOR THE TWO MONTHS ENDED WITH AUGUST

Item	Adams Express Co.		American Express Co.		Canadian Express Co.		Great Northern Express Co.		Northern Express Co.	
	1916	1915	1916	1915	1916	1915	1916	1915	1916	1915
Charges for transportation	$7,546,936	$6,140,316	$10,687,441	$8,554,163	$763,266	$633,515	$703,522	$640,257	$666,222	$630,821
Express privileges—Dr.	3,658,596	3,031,609	5,278,220	4,293,436	410,191	327,182	427.123	387,499	359,913	337,265
Operations other than transp	103,791	93,709	475,232	460,406	11,719	10,632	12.394	10,026	8,687	7,726
Total operating revenues	3,992,131	3,202,417	5,884,453	4,721,132	364,794	316,966	288,793	262,785	314,996	301,283
Operating expenses	3,768,870	2,895,032	5,290,872	4,218,756	321,456	270,763	198,099	181,162	202,168	186,559
Net operating revenue	223,261	307,384	593,581	502,375	43,337	46,202	90,694	81,623	112,828	114,723
Uncollectible rev. from transp	873	852	2,043	1,002	55	13	9	68	22	49
Express taxes	42,782	32,613	84,892	70,845	9,400	8,400	19,401	8,505	10,500	10,000
Operating income	179,605	273,918	506,644	430,527	33,881	37,789	71,284	73,050	102,306	104,674

Item	Southern Express Co.		Wells Fargo & Co.		Western Express Co.		Total for companies named	
	1916	1915	1916	1915	1916	1915	1916	1915
Charges for transportation	$2,496,445	$2,030,672	$8,578,921	$6,833,082	$304,840	$246,921	$31,747,598	$25,709,751
Express privileges—Dr.	1,269,260	1,035,849	4,403,073	3,539,612	147,032	114,007	15,953,411	13,066,462
Operations other than transportation	48,468	44,721	204,351	182,862	7,432	6,627	872,078	816,714
Total operating revenues	1,275,652	1,039,545	4,380.199	3,476,331	165,240	139,540	16,666,265	13,460,003
Operating expenses	1,102,349	984,050	3,675.787	3,132,594	123,126	109,809	14,682,731	11,978,729
Net operating revenue	173,302	55,494	704.412	343,737	42,114	29,730	1,983,534	1,481,274
Uncollectible revenue from transportation	119	117	2,892	2,189	12	12	6,028	4,305
Express taxes	29,090	26,736	80,434	69,655	2,133	1,855	278,636	228,612
Operating income	144,092	28,641	621,085	271,892	39,969	27,862	1,698,870	1,248,357

*Loss.

Illinois Manufacturers Warned of Strike Danger

At the annual meeting of the Illinois Manufacturers' Association at Chicago, on December 7, Samuel M. Hastings, who was re-elected president, emphasized the necessity of the business interests of the country bringing influence to bear to prevent a strike by the railroad trainmen's brotherhoods in January. He said in part: "Great crises often have taken place before the public has been fully aroused, such as the war in Europe and the firing on Ft. Sumter. Are we to meet a similar situation in January? Nothing of importance will take place if the industrial men of this country and the business men generally will give the situation the attention it deserves. If we slumber and allow it to get into the hands of those who wish to force class legislation, the battle next time may not be one of ballots."

Theodore P. Shonts, president of the Interborough Rapid Transit Company of New York, made the principal address before the association and said in part:

"This country will not get far in meeting the competition of other nations if its workmen force higher wages or shorter hours than capital can grant with profit to itself and meet the condi-

tions imposed by international competition. The laboring men of this country will not permanently advance their own interests if they enforce in our domestic development demands so great that capital cannot be secured for our normal expansion. Paralysis is not a sign of health nor atrophy of enduring vigor. The laboring men of this country need to guard against the predatory spirit in the union just as they do against the predatory spirit in the corporation. Force without fairness spells failure."

California Railroad Commission Report

The banner year's business in the history of public utilities in California is detailed in advance sheets of the annual report of the State Railroad Commission. The total operating revenue of California public utilities, including the entire business of the interstate railroads, which has not been segregated by them, was $384,617,734. The operating expenses were $249,303,932, leaving a net operating revenue for the year of $135,313,802. These figures do not reflect the very great increase in the earnings of the steam railroads during the fiscal year ending June 30, 1916, for which the data is not yet completely available.

Under regulation by the Railroad Commission and notwithstanding general financial depression, the net operating revenues of California utilities were $2,879,708 greater in 1915 than in 1913 and $5,710,327 greater in 1915 than in 1914.

During the years 1913, 1914 and 1915 additions, betterments and new construction were made by the California steam railroads at a cost of $55,048,885.

Considerably in excess of $200,000,000 in cash has gone into the further development of California public utilities during the period of supervision and regulation by the Railroad Commission.

From January 1, 1911, to June 30, 1916, the Railroad Commission rendered 2,704 decisions in formal proceedings, and from January 1, 1912, to June 30, 1916, over 9,000 decisions in informal proceedings. No decision of the Railroad Commission establishing a public utility rate or a public utility valuation has been reversed by the courts. The most recent available data of the activities of Commissions in the fourteen most populous states of the union show that, excepting California, the New York Public Service Commission of the Second district was the highest with a total number of formal and informal decisions of 2,748.

Under the authority of the Railroad Commission the main track steam railroad mileage constructed in California from January 1, 1911, to June 30, 1916, was 686 miles. The following steam railroads are now engaged in actual construction work: the California Southern, the Patterson & Western, and the Hetch Hetchy Valley Railroad. Construction work is starting on an extension of the Minkler Southern from Lindsay, Tulare county, south, a distance of approximately 30 miles and on the Indian Valley from near Keddie, Plumas county, in a northeasterly direction, to Eagle Camp No. 2, known as Lower Camp, a distance of approximately 27 miles. The construction of main track mileage from January 1, 1911, to June 30, 1916, represents an expenditure of approximately $34,300,000. New station buildings have been erected in California by the Southern Pacific and the Atchison, Topeka & Santa Fe subsequent to January 1, 1911, as follows:

Los Angeles, $690,000; San Francisco, $1,000,000; San Diego, $300,000; Richmond, $20,000; Sisson, $6,000; Berkeley $15,000; Burlingame, $5,000; Davis, $8,000; Empire, $10,000; Earlimart, $5,000; Suisun, $6,000; Turlock, $10,000; Visalia, $15,000; Modesto, $15,000. Total $2,105,000. The Railroad Commission is making a complete survey, by districts, of all railroad grade crossings in California, and is working, in co-operation with the railroads and the local authorities, to secure the elimination, insofar as reasonably possible, of danger at railroad grade crossings. This survey will undoubtedly lead to proceedings to eliminate gradually the most dangerous of the existing railroad grade crossings. The Railroad Commission has directed the installation of safety devices at railroad grade crossings, has eliminated unnecessary grade crossings where possible and has investigated each railroad accident. Negotiations to secure a more rapid block signaling of the line of railroad of the Atchison, Topeka & Santa Fe in California are now pending.

American Association of Railroad Superintendents

At a meeting of the executive committee of the American Association of Railroad Superintendents, held in St. Louis last Friday, it was decided to hold the annual meeting of the association at Minneapolis, August 8 to 10, inclusive, 1917.

Master Boiler Makers' Association

The eleventh annual convention of the Master Boiler Makers' Association will be held May 22 to 25, 1917, at the Hotel Jefferson, Richmond, Va.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Demurrage Officers.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

American Wood Preservers' Association.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 30 Church St., New York. Next annual meeting, January 16, 1917, Waldorf-Astoria Hotel, New York.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The Railroad Commission of Louisiana has issued an order adopting the demurrage tariff recently put into effect by the Interstate Commerce Commission for application in intrastate traffic.

November, 1916, was the record month for American ship building. The American yards completed 90,636 gross tons, all officially numbered for the American flag except two steamers of 7,847 gross tons for Norwegian owners.

The "Stonemen," of Philadelphia, members of a religious organization who visited New York City on Sunday last, made up a little excursion of 5,480 passengers. They traveled in 11 special trains, over the Philadelphia & Reading and the Central of New Jersey.

The National Rivers and Harbors Congress held its annual convention at Washington on December 6, 7 and 8. At its concluding session the convention adopted lengthy resolutions in favor of a public policy of waterway improvements and the enactment of annual rivers and harbors bills. The resolutions called for a complete co-ordination of service between the railways and waterways, and Congress was asked to empower the Interstate Commerce Commission to fix minimum as well as maximum rates.

The inspectors of the Department of Agriculture in charge of the enforcement of the Food and Drugs Act, have found several interstate shipments of packages of fruits and vegetables, such as grapes, tomatoes and berries, which contain no statement on the packages as to the quantity of contents. The Federal Food and Drugs Act now requires that all packages of foods which are shipped into interstate or foreign commerce shall be marked with a statement of the quantity. Several shippers have been cited to hearings for violating the law.

From an advertising investment of $15,000, four roads serving Colorado received a return of $90,000, without specific mention of the names of any of the roads in the advertising matter. The campaign was carried on by the Denver Tourist Bureau, which expended $50,000, altogether, to which sum Colorado business interests contributed $35,000, while the railroads contributed the remainder, as follows: Union Pacific, $5,000; Chicago, Burlington & Quincy, $5,000; Colorado & Southern, $2,500; Denver & Rio Grande, $2,500. Of 9,855 prospective tourists who during the past year sent inquiries to the bureau with reference to transportation, 30 per cent bought tickets on one or more of the roads mentioned.

The traffic through the Panama canal is assuming normal proportions. The cargoes carried through the canal in October, 1916, aggregated 647,893 tons, exceeding the average for the months since the reopening of the canal in April, 1916, by 79,915 tons, and being surpassed only by three months since the opening on August 15, 1914. In the six months from May 1 to November 1, 1916, 856 ships passed through the canal, aggregating 2,612,916 net tons, carrying 3,493,105 long tons of cargo. This record is only a little below that for the six months preceding September, 1915, the period of heaviest traffic through the canal. During that time 872 ships used the waterway, aggregating 2,943,103 net tons, and carrying 3,620,592 long tons of cargo.

Twenty-seven all-Pullman special trains are carrying delegations from all parts of the country to a convention of Willys-Overland dealers at Toledo, Ohio. Over 5,000 dealers will make the trip, arriving and leaving at different times during the 19 days from December 4 to December 23. Twelve trains from western points travel over the New York Central from Chicago to Toledo. Indicative of the widely divergent points from which the convention will draw are the following trains: The Pacific Coast Special, leaving Seattle, Wash., on December 1; Portland, Ore., and Los Angeles, Cal., on December 2; San Francisco on the third, and Ogden on the fourth; the Lone Star Special, leaving Houston, Tex., on December 9; the New England Special, leaving Portland, Me., and Boston, Mass., on December 12; the Capital Special, leaving Washington, D. C., and Roanoke, Va., on December 5; the South Atlantic Special, leaving Raleigh, N. C., and Columbia, S. C., on December 2; and the Northwest Special, leaving Butte, Mont., on December 8.

In a statement to the press, J. W. McClymonds, general agent of the Pacific Fruit Express, asserted recently that the shortage of refrigerator cars can be considerably relieved if cars are loaded to maximum rather than to minimum weights. He pointed to the unusual measures taken by the carriers to reduce the car shortage, among which he made special mention of the placing of special agents at all large loading and receiving stations to hasten the release of cars. Material assistance can be rendered also by the shipper and consignee. If eastern buyers in ordering would request shippers to furnish maximum instead of minimum cars, the benefit would be widespread. In the case of potatoes the minimum weight per car is 30,000 lb., whereas they could well be loaded to 35,000 or 40,000 lb. without damage to the freight. The minimum weight for apples is also 30,000 lb., and he says that this fruit, if boxed, could easily be loaded to 40,000 lb. or better. The same possibility exists with reference to casabas, sweet potatoes, celery, other vegetables and citrus fruits. He stated that shippers of citrus fruit had been induced to load cars seven boxes wide instead of six. If all cars were thus loaded, the California crop would require 45,000 cars, whereas under the old loading 50,000 are required.

At a hearing in the United States district court before Judges Evans, Landis and Carpenter upon the application of Illinois railroads for a temporary injunction restraining the State Public Utilities Commission of Illinois from interfering with the filing of intrastate passenger tariffs, based on 2.4 cents a mile, the court ordered, upon motion of the attorney general of Illinois, that the United States of America and the Interstate Commerce Commission be made parties defendant to the respective bills. The plaintiffs' motion for a temporary injunction was continued until the final hearing of the case, which will be held on January 3. Leave was granted to plaintiffs to file supplemental bills until December 16, and defendants were ordered to have their answers on file before December 18. The effective date of the order of the Interstate Commerce Commission, dated October 17, 1916, for the removal of existing discrimination between intrastate and state passenger fares is January 15, 1917. Until after the hearing on January 3, assuming that it will be concluded on or before January 15, it is thought unnecessary to make any application to the Interstate Commerce Commission for an extension of the effective date of the order. Until that time, however, the present intrastate rate of 2 cents will continue to be in effect.

New England Traffic Club

The New England Traffic Club at its meeting in Boston, December 7, elected as president C. W. Robie, New England manager of the American Express Company. Other officers elected were: James H. Eustis, H. M. Biscoe, General William A. Bancroft, and A. H. Van Pelt, vice-presidents, and C. A. Anderson, secretary-treasurer.

Railroad Freight Embargoes

The New York, New Haven & Hartford has materially modified its embargoes on freight, and reported, on Wednesday of this week, that congestion of freight has been relieved at many places; but the restoration of normal movement is by no means complete. Embargoes were announced by a number of important roads during the past week. The New York, Chicago & St. Louis had to refuse eastbound freight from its western connections. The Grand Trunk was unable to take eastward from Detroit river all the freight offered west of there. The Pennsylvania refused much freight, both westbound and eastbound, through Pittsburgh. The Baltimore & Ohio was this week refusing all grain consigned to Locust Point, Baltimore, either for export or domestic use. The New York Central announced on Saturday last that nothing from points west could be taken east of Buffalo except live stock and perishable foodstuffs. The Wabash refused grain in carloads to points east of Detroit. The Erie was so crowded that similar action was taken at points west of Marion, O. At Pittsburgh there was discus-

sion of a proposition for a general closing of factories during the holidays, so as to allow the railroads to catch up with shipments. At Cleveland, O., and Youngstown, O., shortages of coal and various embargoes on outgoing merchandise threatened to cause the stopping of work at important plants.

Pictures of New England

"New England, Its Beauties and History," is the title of a group of five illustrated lectures given by E. S. Jones, official photographer of the Boston & Maine Railroad; and from a circular which has been issued by the railroad company it appears that these lectures are available anywhere for any gathering wishing to pay the small expenses of Mr. Jones' visit—which expenses do not include railroad fare. He is about to make a trip through southern and western New York state, western Pennsylvania and other regions, as far west as Iowa, along lines of railroad with which the Boston & Maine has through car arrangements.

Mr. Jones in his lectures advertises New England, not the Boston & Maine Railroad—a notable instance of modesty on the part of a railroad company. However, the Boston & Maine is such a prominent factor in the life of northern New England that the lecturer's name is, no doubt, one of the most profitable of those on the payroll of the passenger department. Mr. Jones has made photographs and lantern slides for this railroad for 25 years.

Car Service Commission to Post Names of Delinquent Roads

Fairfax Harrison, president of the Southern Railway and chairman of the American Railway Association's Commission on Car Service, has advised the Interstate Commerce Commission that the association proposes to use publicity against railroads that refuse to co-operate in efforts to relieve the car shortage. The Car Service Commission has also issued a notice to the members of the American Railway Association in which, among other things, it says that: "The commission is gratified by the extent to which co-operation is manifested on the part of a majority of railroads, but regrets that a number have not yet accorded it to the same extent. In justice to those who are co-operating, and in order to perform its duties equitably, the Commission on Car Service proposes to make public the names of the roads which do not comply with its request for information and for action. . . ."

The instructions issued by the Car Service Commission call for the return of cars to the owning railroads, as heretofore announced, and for the use of drastic embargoes to prevent sending to congested points freight which cannot be disposed of promptly.

CUBAN RAILWAY CONSTRUCTION.—The President of Cuba signed a decree on November 16 granting the Compañia del Ferrocarril del Norte de Vuelta Abajo a subsidy of $6,000 per kilometer ($9,650 per mile) for the construction of a railway connecting the city of Pinar del Rio and the port of Esperanza on the north coast, with a connecting branch to La Palma.—*Commerce Report.*

NEW GERMAN RAILWAY CARS.—The cars of the famous Wagon-Lit Company, so familiar to Americans traveling on Continental railways, will, so far as German railways, and probably her allies' railways, are concerned, be replaced by similar but thoroughly modernized cars of a new German company, which has just been founded, with the modest capital of $1,000,000. The old French-Belgian company had a monopoly in nearly the whole of Europe to run its sleeping cars, dining cars, and parlor cars over the various railways, and the famous trains, such as the North and South Express, connecting Petrograd and Constantinople with the west of Europe, were composed entirely of wagons-lit. When the war broke out, this French-Belgian service ceased abruptly, and its handsome cars have since been turned into rolling hospitals and carry the wounded from the battlefields, instead of bridal couples on their honeymoon trips, as in peace time. Even before the war the Prussian-Hessian Union of State Railways decided not to renew the contracts with the French-Belgian company, but create a service of its own. Since the beginning of the war the new company has been forming, in which Austrian, Hungarian and German capital participate proportionately.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has denied a petition of the Bangor & Aroostook for an order directing the postmaster general to weigh the mails on its road.

The commission has issued an order vacating its suspension of tariffs of the Canadian Government Railways in connection with its order of July 27 in the New England lumber rate case.

The commission has suspended until June 13, 1917, proposed increases in a tariff issued by F. A. Leland in the carload minimum weights of grain screenings, oat clippings and elevator dust.

The commission has suspended proposed increased rates in a tariff issued by F. A. Leland on cattle from New Orleans and other points in Louisiana to various stations in Texas, including Galveston.

The commission has suspended a proposed cancellation of joint rates on grain, grain products and other commodities from stations in Oklahoma on the St. Louis-San Francisco to Little Rock, Ark., and other points taking the same rates or basing thereon.

The commission has been compiling information for the use of the department of justice in its investigation of causes for the recent advances in prices of many commodities. The commission has been asked to furnish data to aid in the investigation of reports that at the time of the recent rise in coal prices on account of an apparent shortage, hundreds of loaded cars were held in railroad yards in the middle west under demurrage.

Fares from Chicago to San Francisco

Public Service Commission of Washington v. Alabama & Vicksburg et al. Opinion by Commissioner Daniels:

The commission finds that the all-year excursion passenger fare and summer tourist excursion passenger fare from Chicago to San Francisco, Cal., applicable in either direction by way of Seattle, Wash., or Portland, Ore., are prejudicial to the extent that they exceed the corresponding fares from Chicago to San Francisco, applicable in either direction by way of New Orleans, La., or El Paso, Tex. Complaints against the higher fares via the northern routes were made largely on the part of the hotel keepers, commercial clubs, etc., of Tacoma, Seattle, Portland, Spokane and other cities. (42 I. C. C., 54.)

Rates on Yellow Pine

Wisconsin & Arkansas Lumber Company et al. v. St. Louis, Iron Mountain & Southern et al. Opinion by Commissioner Daniels:

Rates on yellow-pine lumber from Little Rock and Malvern, Ark., to Thebes and East St. Louis, Ill.; St. Louis and Kansas City, Mo., and Wichita, Kan., are not found unreasonable.

Rates on yellow-pine lumber from Malvern to Memphis, Tenn., and from Malvern and Little Rock to Springfield, Carthage and Joplin, Mo.; Pittsburg, Coffeyville and Fort Scott, Kan., and Wagoner, Okla., are found unreasonable, and reasonable maximum rates prescribed. (41 I. C. C., 642.)

Lumber Rates from Helena, Ark.

In re lumber rates from Helena, Ark., and other points to Omaha, Neb.; Des Moines, Ia., and other destinations. Opinion by Commissioner Hall:

Tariffs proposing increased rates on yellow-pine, cypress and hardwood lumber from southwestern points and points in Mississippi and eastern Louisiana to the Omaha group and other destinations were canceled in compliance with an order issued in connection with the commission's first report in this case, 33 I. C. C., 297. Upon rehearing, in connection with various fourth section applications, the rates formerly filed are found to be justified. Fourth section relief is granted lines having cir-

cuitous routes, but other fourth section relief denied. (41 I. C. C., 565.)

Passenger Fares on the Illinois Traction System

St. Louis, Mo.-Illinois Passenger Fares. Opinion by Commissioner Clements:

By the tariff under investigation in this proceeding the Illinois Traction System proposed to increase from 5 cents to 10 cents the fares over its line of electric railway between St. Louis, Mo., and points in the towns of Venice, Madison, and Granite City, Ill., north of the Main street station in Venice. New commutation fares and strip tickets are also proposed. The commission finds that these increased fares are justified. It also holds that interstate fares prescribed by a municipal ordinance are not conclusively presumed to be reasonable, even if accepted by the interstate carrier as one of the conditions of a franchise.

The St. Louis Electric Terminal Railway Company is held to be a common carrier of passengers and freight in interstate commerce, and as such it is subject to the jurisdiction of the commission.

A tariff item providing for the sale of commutation tickets valid only during specified "rush" hours is tentatively approved. (41 I. C. C., 584.)

Rates from Des Moines, Ia.

Greater Des Moines Committee v. Chicago, St. Paul, Minneapolis & Omaha et al. Opinion by Commissioner Daniels:

Upon complaint that rates between Des Moines, Iowa, and points in Missouri, Nebraska, Minnesota, North Dakota and South Dakota are unreasonable and prejudicial; the commission holds that

Rates between Des Moines and points in Missouri are not shown to be unreasonable or prejudicial to Des Moines except where certain of such rates, increased since January 1, 1910, exceed rates fixed by the mileage scale prescribed by the commission in Missouri River-Nebraska Cases, 40 I. C. C., 201. Reasonable rates are prescribed as maxima for the future.

Rates between Des Moines and points in Nebraska are not passed upon; rates between Des Moines and South Dakota and North Dakota are held prejudicial to Des Moines and unduly advantageous to certain Mississippi river crossings, where certain differentials are not observed; reasonable differentials are prescribed.

Rates between Des Moines and Minnesota points are not shown to be unreasonable or prejudicial to Des Moines except as to stations on the Rock Island 50 miles or less north of the northern boundary of Iowa, and reasonable maximum rates prescribed for said points. (42 I. C. C., 65.)

Hearing on Shreveport Case

The attorney general of Texas, appearing on behalf of the Texas Railroad Commission, and representatives of Texas shippers presented oral arguments before the Interstate Commerce Commission on December 6 and 7, urging the commission to reopen the Shreveport rate case on the ground that the Texas commission had not heretofore been a party to the case, and that Texas shippers should be afforded an opportunity to show that the railroads, in removing the discrimination against Shreveport, have so increased the Texas rates as to injure the commerce of the state. In explaining why the Texas commission had not taken any part in the proceedings heretofore, Assistant Attorney General Nickels said that the commission had never realized that under authority from the interstate commission the railroads could violate the provisions of their Texas charters. The Louisiana commission, the original complainant in the case, was not represented, but it sent a message to the commission stating that it was not opposed to a reopening of the case, nor to allowing other parties to take part. George T. Atkins, representing the Shreveport chamber of commerce, opposed the reopening of the case, and pointed out the benefits which had already accrued to Shreveport by the removal of the discrimination created by the lower Texas rates, which he said had attracted new manufacturers to his city, and had brought new customers to Shreveport concerns that had formerly been shut out of the state. J. W. Terry, attorney for the Gulf, Colorado & Santa Fe; H. M. Garwood, attorney for the Sunset-Central Lines, and Gentry Waldo, general freight agent of the Sunset-Central Lines, opposed the reopening of the case. Mr. Garwood said that if there was to be further litigation, as threatened by the Texas authorities on the ground that the railroads had violated their charters, it might as well begin now without waiting for a new decision by the commission. Mr. Waldo answered the contention that Texas rates have been advanced beyond the level of rates in the surrounding states by saying that it is the purpose of the roads to advance interstate rates from Kansas, Oklahoma and other territory affected by the adjustment to remove the depression in them caused by the influence of the former Texas scale of rates. In reply to questions by Commissioner Clements, Mr. Waldo said that the only remedy for such situations was exclusive federal control of rates.

STATE COMMISSIONS

The Tennessee Railroad Commission has authorized the adoption, on short notice, of revised demurrage rules similar to those adopted for interstate commerce.

At a hearing before the Illinois Public Utilities Commission in Chicago on Wednesday, shippers and railroads agreed on demurrage rates, for all commodities, to correspond with those approved by the Interstate Commerce Commission for interstate business. The discussion of reconsignment regulations was postponed until next week.

The Pennsylvania Public Service Commission, in an opinion by Chairman Ainey, holds that "jitney buses" are subject to the authority of the commission. The act of June 1, 1915, authorizing cities to regulate and license motor vehicles, does not affect this authority. Chairman Ainey says that the act creating the Public Service Commission and defining its duties makes it necessary for "jitney" men to obtain a certificate of public convenience. They must also obtain a city license in case the municipalities have any ordinance prescribing motor vehicle regulations. The case came before the commission on complaint of the Wilkes-Barre Railway Company.

PERSONNEL OF COMMISSIONS

James Blaine Walker, of New York, has been appointed acting secretary of the National Association of Railway Commissioners, in place of William H. Connolly, deceased. Mr. Walker, hitherto assistant secretary of the association, is secretary of the New York State Public Service Commission, first district, and his office is at 120 Broadway, New York City.

Lawton T. Hemans, chairman of the Michigan Railroad Commission, announcement of whose death at the Battle Creek Sanitarium, Battle Creek, Mich., on November 17, has previously been made in these columns, was born November 4, 1864, at Collamer, Onondaga County, N. Y. A year later his parents moved west and in 1868 settled in Mason, Ingham County, Mich. He received his early education in Mason and vicinity, graduating from the High School at Eaton Rapids, Mich., in 1884. For a time he worked upon his father's farm and taught school, later choosing the profession of law and matriculating at the University of Michigan in 1889. Upon graduating from the legal department of this institution he became associated with the law firm of Huntington & Henderson, of Mason, Mich. In 1891 he was elected mayor of Mason, and subsequently was re-elected for several terms. He was elected a member of the legislature in 1901, and a little later became minority leader. When the State Constitutional



L. T. Hemans

Convention was called in 1907 he was chosen a delegate, and in the following year, and again in 1910, he was nominated for governor, but both times was defeated. Chase S. Osborn, who in 1910 defeated him for governor, later appointed him a member of the Michigan Railroad Commission. In January, 1913, he was elected chairman. During his service as a commissioner he contributed much to the conservative extension and application of utility regulation, and his opinions have been uniformly sustained by the Michigan Supreme Court and the Supreme Court of the United States, when appeals have been carried to them. He found time to interest himself in various quasi-public institutions, such as the Michigan Pioneer Historical Society and the Michigan Historical Commission, of which latter organization he was president. He was a contributor to a number of high-class publications on historical and kindred subjects. At his death he was just completing a biography of Michigan's first governor, Stephen T. Mason.

COURT NEWS

Safe Place to Work

A foreman placed two gangs at work 32 feet apart spiking rails, but the rear gang worked up to the other, and one man was struck by a sledge. The Indiana Appellate Court held that the railroad was not chargeable with having placed the men in a dangerous place, in the absence of orders to work together, or with knowledge that the two gangs had worked together.—N. Y. C. & St. L. v. Allen (Ind.), 113 N. E., 315.

Contributory Negligence of Freight Conductor

A freight conductor, without authority from the yardmaster to use a track, and without examination of the track to see if it was clear, stood on the rear end of the engine to show a light in backing down on the track; and was killed in a collision with standing cars. In an action for his death, the Supreme Judicial Court of Massachusetts holds that his own negligence was the proximate cause of his death, and recovery could not be had under the federal employers' liability act.—Gillis v. N. Y. N. H. & H. (Mass.), 113 N. E., 212.

Construction Contract

A railroad construction contract provided that the amount finally due the contractor should be estimated by the railroad's chief engineer. In an action for balance due, the Illinois Supreme Court holds that a final estimate by a subordinate engineer in immediate charge of the work was not binding on the company. By the contract the monthly estimates were not binding for any purpose. It is held that the making of monthly payments on estimates made by the engineer in charge, and approved by the chief engineer, did not estop the railroad company from rejecting the subordinate engineer's final estimate.—Costello v. Delano (Ill.), 113 N. E., 689.

Published Tariffs Binding on Shippers

Where a sliding scale of charges, based on the value of the articles carried, is provided in the tariffs filed with the public utilities commission of the state, the Ohio Supreme Court holds that it is the duty of the carrier to require the shipper to declare the value, and to demand and collect from him the rate fixed. Where a copy of this tariff, or so much thereof as the commission shall deem necessary, is prinfed in plain type and kept on file or posted in such places and in such manner as the commission may order, shippers and travelers are charged with notice of the rates named in the tariffs, and must abide thereby, unless they are found to be unreasonable by the state commission.—Erie v. Steinberg (Ohio), 113 N. E., 814.

Limitation of Liability—Time for Notice of Loss

The North Carolina Supreme Court holds that a clause in a bill of lading requiring notice of loss or damage within ten days is invalid, the time being unreasonably short. It holds that reasonableness of time does not depend on whether goods are perishable or not, the same rule applying in any event. Where stipulations for filing notice of loss are reasonable and valid, the written notice of loss need not be expressed in any special way if it is a plain and intelligible statement of the demand.—Phillips v. S. A. L. (N. Car.), 89 S. E., 1,057.

Not Libel to Carry Intoxicating Liquor Billed in Assumed Name of Another

An action for libel was brought against a railroad company asking damages because of its custom of delivering whisky in the plaintiff's name, for the purpose of concealing the identity of the real consignees. The barrels were marked as containing whisky and labeled to the plaintiff. The Georgia Court of Appeals holds that the plaintiff had no right of action against the railroad. Under the rules of the Georgia railroad commission the railroad was bound by law to notify the named consignee of the arrival of the whisky. Under these rules, though the road had been notified through one of its agents that the plaintiff had not ordered any intoxicating liquors and would not receive any, it was still its duty to address a notice by mail to one of the name in which the freight came, or to notify him personally, and for so doing it could not in any way be held liable in damages. Notwithstanding that it may be a violation of law for a common carrier to deliver intoxicating liquors to a person using an assumed or fictitious name, even if it be the true name of another person, and though the receipt be signed in the assumed or fictitious name, it does not give a right of action for libel against the carrier to the person whose name is thus assumed.—Knight v. Georgia Southwestern & Gulf (Ga.), 90 S. E. 81.

Hill Roads Win Tax Suit in Minnesota

The suit of Ramsey county, Minn., against the Great Northern and the Northern Pacific for delinquent taxes on stocks and bonds of the Chicago, Burlington & Quincy, the Spokane, Portland & Seattle, and other properties has been decided favorably to the railroads by the Ramsey county district court. The Great Northern was assessed by the auditor of the county as the owner of stock in the Chicago, Burlington & Quincy, stocks and bonds in the Spokane, Portland & Seattle, and upon stocks and bonds and advancements in numerous town site companies, coal companies and lumber companies, and upon other minor securities which it owned out of the ordinary course of its business. The resulting tax for one year amounted to over $3,000,000, of which the tax on stocks other than the Burlington and the Spokane, Portland & Seattle securities made up only $19,000. The Northern Pacific was assessed upon its ownership, with the Great Northern, of Burlington and Spokane, Portland & Seattle securities, and a few other securities of insignificant value. This resulted in a tax assessment of something less than that against the Great Northern. The Chicago, St. Paul, Minneapolis & Omaha was also assessed on such bonds as it owned in subsidiary terminal companies, the tax amounting to less than $10,000. If the right to the collection of these taxes had been established it could have been enforced retroactively over the past 17 years.

The question at issue was whether or not the railroads in paying to the state 5 per cent of their gross earnings, in lieu of all other taxes upon property owned or operated for railway purposes, paid their taxes upon these stocks and bonds, or whether, as contended by the state, their payment of the 5 per cent was equivalent to paying a tax only upon their properties literally used in the operation of their railway lines. If the latter contention had been upheld by the court, the railroads' securities would have been taxable on an ad-valorem basis in the same manner as if they were owned by an individual. The district judge held that the Great Northern and the Northern Pacific owned and used the Burlington and the Spokane, Portland & Seattle stocks and bonds in the operation of their railway lines, and that taxes upon them were assessed and fully paid through the gross earnings tax. As to the stocks in coal, lumber and other companies owned by the Great Northern, the court held that they were not included in the gross earnings tax and were taxable. He ordered judgment against the Great Northern accordingly for $19,000. There was a similar decision in the Northern Pacific case, but the court held that even as to the lesser stocks held by the Northern Pacific, no tax was collectible because the state had no jurisdiction to tax a foreign corporation. No decision has been rendered in the Omaha case, but as this road is also a foreign corporation, the judgment of the court is likely to be favorable to the railroad. The state

will appeal all cases to the Supreme Court of Minnesota, where the matter is expected to be heard in April or May next.

Uniform Bills of Lading—Compression of Cotton

Action was brought in New York on a bill of lading issued by the defendant railroad for the value of a shipment of cotton destroyed by fire at Houston, Texas. The facts were undisputed. The cotton was delivered to the carrier at El Centro, California, for shipment to New Orleans, on a uniform bill of lading. The written parts of the bill of lading were filled in by a member of the consignor firm with the words: "To be compressed at Cleveland Compress Company, Houston, Texas." It was upon the effect of these words the case rested. The bill of lading was signed by the railroad's agent at El Centro. The cotton was shipped to the compress company's plant, and while there was destroyed, by no fault of the railroad, in a fire which consumed the plant and a great part of the city. When shipped the cotton was contained in plantation bales. Compression reduces the bulk to about one-third the original size, and has been held to be mainly for the railroad's benefit (Matter of Compression of Cotton, 29 I. C. C. 585), and a much lower rate of freight is charged for the carriage of compressed than of uncompressed cotton. The rate paid by the shipper was the lower rate filed by the carrier for compressed cotton. The only option given to the shipper by the company's filed rules and regulations regarding compressed cotton was to require by indorsement on the bill of lading that the cotton should be delivered uncompressed at the higher rate. If he does not so require, it is in the discretion of the carrier whether the compression shall take place at point of origin, in transit, or at destination. It was conceded that if the bill of lading had been silent as to the place of compression, the railroad would have been liable, under the terms of the bill of lading, because the compressor would have been deemed the agent of the carrier. The railroad, however, claimed that by the indorsement the shipper made the compress company its agent for the process of compression, that transportation and custody by the railroad had been interrupted, and the cotton was in the hands of the shipper's agent. This claim was based on a condition in the bill of lading providing that except in case of negligence of the carrier or party in possession, "the carrier or party in possession shall not be liable for loss, damage, or delay occurring while the property is stopped and held in transit upon the request of the shipper, owner, or party entitled to make such request."

The decision of the New York Appellate Division was based mainly on the fact that the tariffs filed by the railroad contained nothing conferring on a shipper or owner of cotton any right to select the place at which his cotton is to be compressed. It held that the railroad could have ignored the request in the indorsement. that its selection of Houston as the place of compression was voluntary, and that it was liable for the loss. Mr. McLaughlin, J., dissented on the ground that when the shipper designated the place for compression in the bill of lading, it was for the railroad either to refuse to accept the shipment on the terms stated or else to deliver the cotton at the place designated; that its delivery to the compress company was a stoppage and holding in transit on the request of the shipper, and that the railroad was exempted from liability under the above quoted provision of the bill of lading. D'Utassy v. Southern Pacific. (November, 1916.)

UNITED STATES SUPREME COURT

The Supreme Court of the United States on December 4 issued a decision affirming the decision of the lower court, sustaining a damage verdict of $145,130 against the Pennsylvania Railroad obtained by the Sonoman Shaft Coal Company of Cambria County, Pa., for failure to furnish cars for the shipment of coal.

Carrier Need Not Furnish Special Cars

The Supreme Court on Monday of this week decided that the Interstate Commerce Commission has no authority to require railroads to furnish oil tank cars on request by shippers. The court sustained the decision of the district court for the western district of Pennsylvania, enjoining an order of the commission directing the Pennsylvania Railroad to furnish tank cars to the Crew-Levick Company. A similar case involving the Pennsylvania Paraffin Company was decided similarly.

Necessity for Notice of Claim for Damage

A shipper sued for injuries to a horse transported from Lexington, Ky., to Seebert, W. Va., under a uniform live stock contract, providing that no claim for damages should be allowed or sued for unless claim be made in writing, verified, to the company's claim agent at his office in Richmond, Va., within five days from the removal of the stock from the car. Such verified claim was not made. The United States Supreme Court held the agreement to be on its face unobjectionable, and nothing was shown tending to establish circumstances rendering it invalid or to excuse failure to comply therewith. Following Northern Pacific v. Wall, 241 U. S. 87, and Georgia, Florida & Alabama v. Blish Milling Co., 241 U. S. 190, decided earlier in the year, the court reversed a judgment for the plaintiff.—C. & O. v. McLaughlin (decided December 4, 1916).

Long and Short Haul Rates—Commission's Powers

The long litigation, begun in 1910 by application by six railroads, under section 4 of the act to regulate commerce, for relief in respect to westbound transcontinental commodity rates, has resulted in a decision by the Supreme Court of the United States, briefly reported last week, page 1066, reversing the district court's decision that the Interstate Commerce Commission had no statutory power to grant the relief which it did, because it was not the precise relief applied for. Section 4, as amended in 1910, empowers the commission, "upon application," to authorize a carrier "to charge less for longer than for shorter distances." The Supreme Court said: "These carriers asked leave, among other things, to charge on westbound transcontinental freight to about 193 coast and interior cities much less than to intermountain territory. The commission permitted them to charge, to eight of these cities which were ports, *as much less* as the application requested; but as to the other 185, which were interior cities, including the four complaining here [Sacramento, Stockton, San Jose and Santa Clara], permitted the carriers to make the rates only *somewhat less.* In other words, the commission granted a part of the relief asked. The district court says it had no power so to do. But there is nothing in the act to justify limiting the power of the commission to either a grant or a denial *in toto* of the precise relief applied for. Such a construction would make section 4 unworkable, and defeat the purpose of the amendment. It is at variance with the broad discretion vested in the commission and the prevailing practice of administrative bodies."—United States, I. C. C., Atchison et al. v. Merchants' and Manufacturers' Traffic Assoc. of Sacramento (decided December 4, 1916).

Switching for Competitors

The Nashville case, briefly reported last week, was a suit for a preliminary injunction against the Louisville & Nashville, the Nashville, Chattanooga & St. Louis, and the L. & N. Terminal, to restrain the enforcement of the order of the Interstate Commerce Commission to abstain from refusing to switch interstate competitive traffic to and from the tracks of the Tennessee Central at Nashville on the same terms as interstate non-competitive traffic. The injunction ordered by the Supreme Court of the United States, forbidding the commission to compel the older roads to switch for the Tennessee Central as cheaply as for each other, is to be issued "without prejudice to the commission's making orders to prevent the appellants from discriminating between competitive and non-competitive goods, so long as they open their doors to both, the appellants being entitled to reasonable compensation, taking into account the expense of the terminal that they have built and paid for." Mr. Justice Holmes, in delivering the opinion, said, in part: "The fact principally relied upon to uphold the order of the commission is that, instead of each road doing its own switching over the terminals used in common, they switch jointly, and [the commission says] that therefore each is doing for the other a service that it cannot refuse to a third. We cannot believe that the rights to their own terminals reserved by the law are to be defeated by such a distinction."

Justices Pitney, Day, Brandeis and Clarke dissented. In the dissenting opinion, given "in view of the far-reaching effect of the decision upon the commercial interests of the country," Mr. Justice Pitney said in part: "In my opinion the present case is

controlled by our decisions in the former case between the same parties (L. & N. v. United States, 238 U. S. 1, 18, 19) and the earlier case of Pennsylvania v. United States 236 U. S. 351, 366. In these cases many of the same arguments that are here advanced were considered and overruled by the courts."—Louisville & Nashville v. United States (decided December 4, 1916).

Damages for Suffering Immediately Preceding Death

In the William B. Ward case damages were given by the Supreme Court of Minnesota for the injuries suffered by him prior to death as well as for pecuniary loss, the evidence tending to show that, after being run over by one or more cars, although wholly unconscious, the deceased continued to breathe for perhaps ten minutes. The Supreme Court of the United States has reversed this judgment for the following reason: "In St. Louis & Iron Mountain v. Craft, 237 U. S. 648, 655, 658 (June 1, 1915), we held that under the employers' liability act, as amended in 1910, the administrator of a fatally injured employee might recover the beneficiary's pecuniary loss, and also for pain and suffering endured by deceased between the moment of injury and final dissolution. We were careful, however, to say—'But to avoid any misapprehension it is well to observe that the case is close to the border line, for such pain and suffering as are substantially contemporaneous with death or mere incidents to it, as also the short periods of insensibility which sometimes intervene between fatal injuries and death, afford no basis for a separate estimation or award of damages under statutes like that which is controlling here.' And, referring to the two separate grounds of controversy—'Although originating in the same wrongful act or neglect, the two claims are quite distinct, no part of either being embraced in the other. One is for the wrong to the injured person, and is confined to his personal loss and suffering before he died, while the other is for the wrong to the beneficiaries, and is confined to their pecuniary loss through his death. One begins where the other ends, and a recovery upon both in the same action is not a double recovery for a single wrong, but a single recovery for a double wrong.' The present record presents the very circumstances which we declared afforded no basis for an estimation or award of damages in addition to the beneficiary's pecuniary loss."—Great Northern v. Capital Trust Co. (decided December 4, 1916).

Limitation of Liability for Passenger's Baggage

In an action for the value of lost baggage it appeared that the plaintiff purchased in New York a first class ticket to Kansas City, purporting to be subject to the liability limitation of $100 for baggage for a full fare ticket unless value was declared; and this was repeated on the receipt given to the passenger when the trunk was checked. The railroad admitted liability for $100. A jury was waived. The trial court held that no agreement limiting liability resulted from acceptance and use of the ticket and check, or from the existence of the published tariffs; plaintiff would be entitled to recover the reasonable value of her trunk and contents, unless she expressly assented to the provisions of said tariffs limiting liability. A judgment for $1,771.52 was affirmed by the Kansas City Court of Appeals. This has now been reversed by the Supreme Court of the United States for the following reasons: "The transactions in question related to interstate commerce; consequent rights and liabilities depend upon acts of Congress, agreement between the parties, and common law principles accepted and enforced in federal courts. And the carrier is entitled to the presumption that its business is being conducted lawfully. In the circumstances disclosed, acceptance and use of the ticket sufficed to establish an agreement prima facie valid, which limited the carrier's liability. Mere failure by the passenger to read matter plainly placed before her could not overcome the presumption of assent. In order to determine the liability assumed for baggage it was proper to consider applicable tariffs on file with the Interstate Commerce Commission; and the carrier had a federal right not only to a fair opportunity to put these in evidence, but also that when before the court they should be given due consideration. After their admission in evidence by the trial court the tariffs could not be disregarded arbitrarily without denying the railroad's federal right; and we think they were so treated by the court of appeals."—N. Y. C. v. Beaham (decided December 4, 1916).

Railway Officers

Executive, Financial, Legal and Accounting

George C. Gahan has been appointed assistant general auditor of the Canadian Pacific, with office at Montreal, Que.

J. B. Webb has been appointed assistant freight claim agent of the St. Louis-San Francisco, Texas Lines, at Ft. Worth, Tex.

R. E. Kimbell, assistant to the first vice-president of the St. Louis-Southwestern, with office at St. Louis, Mo., has been appointed valuation accountant, with same headquarters.

E. Alexander, assistant secretary of the Canadian Pacific at Montreal, Que., has been appointed secretary and assistant to president, succeeding W. R. Baker, who at his own request has been relieved from his duties and placed on the retired list.

Clarence W. Huntington, who has been elected chairman of the board of the Virginian Railway, with headquarters at New York, as has been announced in these columns, was born on May 31, 1857, at Newark, N. J., and was educated in the public schools, the Newark Academy, and Dorchester High School, Boston. He began railway work in September, 1876, as a freight brakeman on the Chicago, Rock Island & Pacific, and for 16 years held various positions on the same road. He was then for one year assistant superintendent of the Des Moines Northern & Western, now a part of the Chicago, Milwaukee & St. Paul, and later for one year was superintendent of the same road. From November, 1894, to May 12, 1902, he was general superintendent of the Iowa Central, and then went to the Central of New Jersey as general superintendent, with headquarters at New York. In February, 1914, he was elected vice-president and general manager of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn., from which position he resigned to become chairman of the board of the Virginian Railway and president of the Richmond Light & Railroad Company, with headquarters at New York.



C. W. Huntington

James Russell, whose appointment as vice-president and general manager of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn., has been announced in these columns, was born in February, 1865. He began railway work with the Grand Trunk in 1879, and was employed as agent and operator until 1882. The following year he worked as telegraph operator for the Chicago, St. Paul, Minneapolis & Omaha, the Kansas Pacific and the Atchison, Topeka & Santa Fe, and from 1883 to 1887 was telegraph operator and train despatcher on the Canadian Southern and the Michigan Central. He was then successively train despatcher, chief despatcher and superintendent on the St. Paul, Minneapolis & Manitoba and the Great Northern until 1903, when he was appointed superintendent on the Missouri Pacific. Four years later he became a superintendent of the Chicago, Burlington & Quincy, and from 1909 to January 1, 1914, he was general superintendent of the Spokane, Portland & Seattle. He was then appointed general superintendent of the Great Northern, which position he held until April 1, 1914, when he went to the Denver & Rio Grande as assistant to the vice-president, with headquarters at Denver, Colo. Later on he became general manager, the position he resigned to become vice president and general manager of the Minneapolis & St. Louis.

Operating

N. E. Bailey, general superintendent of the United Verde & Pacific Railway and the Verde Tunnel & Smelter Railroad at Jerome, Ariz., has resigned to engage in other business.

S. V. Rowland, trainmaster of the Chicago Great Western, with headquarters at St. Paul, Minn., has been appointed assistant superintendent, with office at Red Wing, Minn., succeeding J. M. Baths, resigned. George G. Rutherford has been appointed trainsmaster at St. Paul, succeeding S. V. Rowland.

M. L. Masteller, general manager of the Jucaro & Moron Railroad at Ciego de Avilo, Cuba, has been appointed head of the freight traffic and transportation departments of the United Railways of Havana, the Havana Central Railroad, the Western Railway of Havana, and the Havana Terminal Company, with headquarters at Havana, Cuba.

George James Fox, whose appointment as superintendent of the Canadian Pacific, with headquarters at Schreiber, Ont., has already been announced in these columns, was born on September 24, 1883, at Montreal, Que., and was educated in the public schools. He began railway work in June, 1898, with the Canadian Pacific, and has been in the continuous service of this road ever since. He served consecutively as a clerk in the car service department at Montreal, stenographer, secretary to general superintendent, assistant chief clerk, and as chief clerk at Montreal, Que. He was then assistant chief clerk in the general manager's office, and later was clerk in the vice-president and general manager's office, at Winnipeg, Man. In September, 1912, he was appointed night yardmaster, and shortly afterward became day yardmaster at Saskatoon, Sask. On November 1, 1913, he was appointed general yardmaster at Swift Current, Sask., and in July, 1915, was transferred in the same capacity to Fort William, Ont. In April, 1916, he became trainmaster at Winnipeg, Man., which position he held at the time of his recent appointment as superintendent of the Schreiber division of the same road, as above noted.

Edmund Crawford, whose appointment as superintendent of car service of the Canadian Northern, on lines east of Port Arthur, Ont., with headquarters at Toronto, has already been announced in these columns, was born on March 20, 1884, at Fernhill, Ont. He was educated in the public and high schools at Strathroy, Ont., and began railway work on October 7, 1901, as a clerk in the office of the superintendent of transportation of the Pere Marquette, at Detroit, Mich. He remained in that position until December, 1905, and the following April became clerk to the freight agent of the Pennsylvania Railroad, at Washington, D. C. From December, 1907, to April, 1912, he was chief yard clerk on the Grand Trunk at London, Ont., and from June to September, 1912, was chief clerk to the general foreman at the same place. In June, 1913, he was appointed car agent of the Canadian Pacific at Vancouver, B. C., then from September, 1915, to May, 1916, was traveling car agent of the Canadian Northern, Eastern lines. On June 1, 1916, he was appointed chief clerk to the superintendent of transportation on the Eastern lines of the Canadian Northern, which position he held at the time of his recent appointment as superintendent of car service of the same road, as above noted.



E. Crawford

Traffic

F. P. Tinker has been appointed district freight agent of the Canadian Pacific, with office at Ottawa, Ont., vice G. P. Ruickbie, transferred.

F. S. Brooks, general live stock agent of the Atchison, Topeka & Santa Fe, has resigned to become general agent for Swift & Co., Chicago, Ill.

Everett D. Davis, soliciting freight agent of the Buffalo, Rochester & Pittsburgh, has been appointed division freight agent, with headquarters at Rochester, N. Y.

H. C. McFadden, traffic manager of the Georgia & Florida at Augusta, Ga., has been appointed general eastern agent of the Norfolk Southern, with office at New York City.

W. F. Richardson, commercial freight agent of the Baltimore & Ohio at Boston, Mass., has been appointed assistant general freight agent, with headquarters at Philadelphia, Pa.

George Stephen, assistant freight traffic manager of the Canadian Northern, and the Duluth, Winnipeg & Pacific, with headquarters at Winnipeg, Man., has been appointed freight traffic manager for lines west of and including Port Arthur, Ont., and Duluth, Minn., with office at Winnipeg, Man.

William Crosswell Ragin, whose appointment as assistant general freight agent of the Atlantic Coast Line, with headquarters at Savannah, Ga., has already been announced in these volumns, was born on August 10, 1880, at Summerton, Clarendon county, S. C., and graduated in 1901 from Emory College, Oxford, Ga. He began railway work in August, 1898, with the Atlantic Coast Line as stenographer and clerk at Wilmington, N. C., and in 1902 was appointed soliciting agent at Macon, Ga. In 1905 he became traveling freight and passenger agent at Goldsboro, N. C.; then from September, 1908, for one year was special traffic agent at Savannah, Ga. From September, 1909, to September, 1912, he was commercial agent at Ocala, Fla.; then to 1914 served as commercial agent at Albany, Ga. In March, 1914, he was appointed division freight agent, at Montgomery, Ala., remaining in that position until his recent appointment as assistant general freight agent, at Savannah, Ga. Mr. Ragin's entire railway service has been with the Atlantic Coast Line.

Daniel S. Roberts, the announcement of whose appointment as assistant general freight agent of the Kansas City Southern, with office at Kansas City, Mo., has been made in these columns, was born on April 29, 1883, at Westminster, Md. In 1902 he began railway work with the St. Louis & San Francisco at Oklahoma City, Okla., in a clerical capacity, but shortly afterward left this position to go into other work. Mr. Roberts returned to railway work on the St. Louis & San Francisco, first as yard clerk and then as bill clerk at Oklahoma City, Okla. In 1905 he was appointed assistant cashier, and was soon promoted to cashier of this company. From 1906 to 1908 he was traveling freight agent of the Kansas City Southern, with headquarters at Chicago, Ill., and from 1908 to 1911, commercial agent with the same office. In 1911 he was appointed general agent, with office at Pittsburgh, Pa., which position he held at the time of his appointment as assistant general freight agent, in charge of outside solicitation and industrial development.



D. S. Roberts

Engineering and Rolling Stock

E. L. Cannon, chief clerk to the chief engineer of the Seaboard Air Line, has been appointed office engineer at Norfolk, Va.

C. R. Harding, chief draftsman to consulting engineer of the Southern Pacific at New York, has been appointed assistant to consulting engineer, with office at New York.

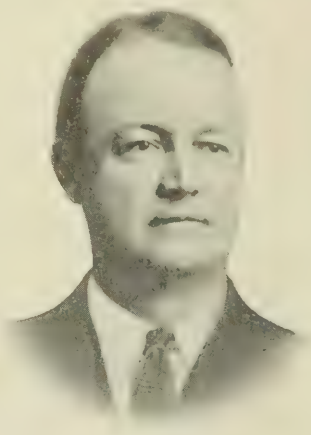
J. H. Schuch has been appointed chief engineer of the Butte, Anaconda & Pacific, succeeding Charles A. Lemmon, who re-

signed some time ago to enter the service of the Anaconda Copper Company, Anaconda, Mont.

Samuel T. Armstrong, division master mechanic of the International & Great Northern, has been appointed superintendent of motive power, succeeding F. W. Taylor, resigned to accept service with another company. Effective January 1.

E. L. Crugar, assistant engineer of the Illinois Central, with office at Chicago, Ill., has been appointed district engineer, with office at New Orleans, La., succeeding C. E. Weaver, appointed engineer maintenance of way of the Central of Georgia.

George McCormick, whose appointment as general superintendent of motive power of the Southern Pacific, lines west of El Paso, Tex., has been announced in these columns, was born on July 15, 1872, at Columbus, Tex. He was graduated from the Agricultural and Mechanical College at Bryan, Tex., with the degree of mechanical engineer in 1891. He began railway work in 1891, as an apprentice in the shops of the Galveston, Harrisburg & San Antonio, at Houston, Tex. In a short time he was transferred to San Antonio, Tex., as a draftsman, returning to Houston in 1895 as chief draftsman. In 1900 he was appointed mechanical engineer, in which position he remained until December, 1911, when he went to El Paso, Tex., as assistant superintendent of the El Paso division. He held this latter connection until his appointment in February, 1913, as assistant general manager (mechanical) of all the Southern Pacific, Texas lines, with headquarters at Houston, Tex. His new headquarters will be at San Francisco, Cal., and his jurisdiction will include all the Southern Pacific lines in the states of New Mexico, Arizona, California, Oregon and Nevada.



G. McCormick

Purchasing

A. H. Mulcahey has been appointed assistant purchasing agent of the Grand Trunk Pacific, with office at Winnipeg, Man.

C. B. Porter, chief clerk to receiver of the International & Great Northern, has been appointed purchasing agent and general storekeeper, with office at Houston, Tex., vice E. O. Griffin, resigned to accept service with another company.

E. O. Griffin, purchasing agent and general storekeeper of the International & Great Northern, with office at Houston, Tex., has resigned, effective December 15, having been appointed general purchasing agent for the St. Louis Southwestern, with headquarters at St. Louis, Mo.

OBITUARY

J. T. Jones, president of the Gulf & Ship Island, with headquarters at Gulfport, Miss., died on December 6 at Buffalo, N. Y.

Robert Kerr, formerly passenger traffic manager of the Canadian Pacific at Montreal, Quebec, died on December 9 at Toronto, Ont. He was born in August, 1845, at Toronto and began railway work in 1866, serving consecutively as warehouse clerk and in various positions with the Northern Railway of Canada until 1879, when he was appointed through freight agent of the same road. He subsequently served as general freight and passenger agent of the Northern and Northwestern railways. From June, 1884, to January, 1896, he was general freight and passenger agent of the Western and Pacific divisions of the Canadian Pacific at Winnipeg, Man., and then was appointed traffic manager of the lines west of Lake Superior. In June, 1899, he was appointed passenger traffic manager of all Canadian Pacific lines, remaining in that position until October 1, 1910, when he retired from active service.

Equipment and Supplies

LOCOMOTIVES

The Central of New Jersey is in the market for a number of ten-wheel locomotives.

The Norfolk & Portsmouth Belt Line is reported in the market for 2 switching locomotives.

The Texas, Oklahoma & Eastern has ordered one Prairie type locomotive from the Baldwin Locomotive Works.

The Baltimore & Ohio has ordered 30 Mallet and 10 Pacific type locomotives from the Baldwin Locomotive Works.

The J. W. Paxson Company, Philadelphia, Pa., has ordered 2 four-wheel locomotives from the Baldwin Locomotive Works.

The Canadian Government Railways have recently ordered 10 Santa Fe type locomotives from the Montreal Locomotive Works.

The Whitaker-Glessner Company, Portsmouth, Ohio, has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

The Great Northern, reported in last week's issue as being about to issue inquiries for 40 locomotives, has ordered 50 Mikado locomotives from the Baldwin Locomotive Works.

The New York, New Haven & Hartford, reported in the *Railway Age Gazette* of September 1 as asking for prices on 28 Santa Fe type locomotives, has increased its inquiries to 40 Santa Fe type engines.

The Duluth, Missabe & Northern, reported in last week's issue as having placed an order for 2 Mallet type locomotives, ordered these locomotives (2-8-8-2 type) from the Baldwin Locomotive Works, and has also ordered 4 eight-wheel switching locomotives from the same company.

The Erie was reported in last week's issue as having ordered 10 Pacific type locomotives from the American Locomotive Company. These locomotives will have 25 by 28 in. cylinders, 69-in. driving wheels, a total weight in working order of 287,000 lb., and will be equipped with superheaters.

The Russian Government has placed additional orders for locomotives, bringing the total now ordered to 331 engines, divided as follows: American Locomotive Company, 140; Baldwin Locomotive Works, 150, and Canadian Locomotive Company, 41. It is understood that a total of 350 locomotives will be placed at this time, and probably more later.

The Maine Central has ordered 2 superheater six-wheel switching locomotives from the American Locomotive Company. These engines will have 21 by 28 in. cylinders, 51-in. driving wheels, and a total weight in working order of 166,000 lb. It is understood that the Maine Central may also place orders for some more locomotives.

FREIGHT CARS

The Long Island is reported in the market for 100 box and 100 gondola cars.

The Piedmont & Northern is in the market for 100 50-ton gondola cars.

The Wheeling & Lake Erie has issued inquiries for 500 70-ton gondola and 500 70-ton hopper cars.

The San Antonio & Aransas Pass is rebuilding about 350 freight cars in its own shops at Yoakum, Tex.

The Minneapolis & St. Louis has ordered 300 flat bottom and 200 drop bottom gondola cars from the Haskell & Barker Car Company.

The Baltimore & Ohio is inquiring for 1,000 55-ton steel underframe composite hopper cars, and will probably place orders for 2,000 cars.

THE CLARK CAR COMPANY, Pittsburgh, Pa., has placed an order with the Cambria Steel Company to build 500 Clark dump cars.

THE NEW YORK, CHICAGO & ST. LOUIS, reported in the *Railway Age Gazette* of November 24 as inquiring for 750 gondola and 500 hopper cars, has ordered the gondola cars from the Standard Steel Car Company, and is understood to have dropped the inquiry for the hopper cars.

PASSENGER CARS

THE BOSTON ELEVATED has issued inquiries for 35 subway cars.

THE INTERBOROUGH RAPID TRANSIT is contemplating the purchase of a large number of subway cars.

THE CENTRAL OF NEW JERSEY has issued inquiries for 25 coaches and 10 passenger and baggage cars and is understood to be contemplating the purchase of 15 baggage cars.

THE BOSTON & MAINE, reported in the *Railway Age Gazette* of November 17 as being in the market for 6 postal cars, has ordered these cars from the Osgood-Bradley Car Company.

THE NEW YORK CENTRAL'S recent order for 25 baggage cars given to the Pullman Company has been divided as follows: Michigan Central, 10, and the Cleveland, Cincinnati, Chicago & St. Louis, 15.

IRON AND STEEL

THE MISSOURI, KANSAS & TEXAS has ordered 47,000 tons of rails for 1918 delivery.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE has ordered 50 miles of 85-lb. open hearth rail from the Illinois Steel Company for 1918 delivery.

ARMOUR & CO. has placed orders for five oil storage tanks at Fort Worth, Tex., 784 tons, and for two 37,500 bbl. capacity standard steel oil storage tanks at Texas City, Tex., 364 tons.

MACHINERY AND TOOLS

THE CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA has issued inquiries for 50 machine tools for car shops.

THE CHICAGO, BURLINGTON & QUINCY will receive bids until December 24 for 75 machine tools for its new West Burlington shops.

SIGNALING

NORFOLK & WESTERN.—This company proposes, during the coming year, to install automatic block signals on 120 miles of line.

THE ATLANTA & WEST POINT, during the past year, has completed the installation of automatic block signals on its line from East Point, Ga., to Newnan, 33 miles; and expects to complete, in 1917, 32 miles more, Newnan to Lagrange.

THE DETROIT UNITED (electric) lines have under construction three interlocking plants at crossings with the Grand Trunk; and two others are to be installed during the coming year; one of 52 levers at the crossing of the Michigan Central and the Grand Trunk, and one of 24 levers at the crossing of the Pere Marquette.

THE CHICAGO & NORTH WESTERN plans in 1917 to equip 177 miles of road, single track, with automatic block signals; Milwaukee, Wis., to Manitowoc, 75 miles, and Clyman Junction, Wis., to Wyeville, 102 miles. In connection with this work, all passing tracks will be lengthened so as to hold 100 cars each; and this will mean 20 miles of new track.

THE ILLINOIS CENTRAL has completed 170 miles of automatic block signaling during the past year. It is to be found on the line from Gilman, Ill., to Mattoon, 90 miles; and 80 miles between Paducah, Ky., and Eddyville, and between Dugan and Cecilia. On the Mississippi division, in the states of Mississippi and Tennessee, automatic block signals are now in course of construction on 183 miles of line, the work to be completed about March 1 next; and on the Louisiana division, in the states of Mississippi and Louisiana, 191 miles, now about half completed, will be put in operation March 1 next.

Supply Trade News

Charles B. Moore has resigned as vice-president and director of the Boss Nut Company, Chicago, Ill.

Edward L. Pollock, People's Gas Building, Chicago, has been appointed western representative of the Wilson Welder & Metals Company, New York.

A. J. Boyle, formerly with the Pittsburgh Screw & Bolt Co., Pittsburgh, Pa., has been appointed general manager of the Boss Nut Company, Chicago, Ill.

Holden & White, dealers in electric railway specialties, Chicago, Ill., have been appointed general sales agents by the Garland Ventilator Company, for the sale of Garland ventilators in the steam railway field, as well as in the electric railway field.

W. V. D. Wright, formerly sales agent of the Chicago district for the Railway Steel Spring Company, has been elected vice-president of the Edgewater Steel Company, which is constructing a plant at Pittsburgh, Pa., for the manufacture of locomotive tires and rolled steel wheels.

F. A. Purdy, Canadian representative of the Chicago Car Heating Company at 61 Dalhousie street, Montreal, has also been appointed direct representative of the U. S. Light & Heat Corporation to the railroads of Canada, and will henceforth represent both companies.

Samuel A. Benner, who has represented the American Steel Export Company in London and Petrograd, and returned to the United States a few days ago, has been made general manager of sales of the company, with headquarters in the Woolworth building, New York.

Norman C. Naylor has been appointed sales agent of the Chicago district, in charge of the Chicago office, for the Railway Steel Spring Company of New York. Mr. Naylor has been in the employ of the Railway Steel Spring Company since 1902. He was born in Rochester, N. Y., June 3, 1881, and entered the employ of McKee-Fuller & Co. September 8, 1895. In June, 1896, he left this company to attend school in Colorado. He entered the employ of the Steel Tired Wheel Company, July 5, 1898, going to the Railway Steel Spring Company in 1902, when the Steel Tired Wheel Company was merged with the latter. He has been employed in the Railway Steel Spring Company continuously since that time.



N. C. Naylor

N. B. Ford, who for 10 years traveled for the Corbin Screw Corporation of New Britain, Conn., from its Chicago office, having his headquarters in Kansas City, and who left some two years ago to become connected with the Ford Chain Block & Manufacturing Company of Philadelphia, has re-entered the employ of the Corbin Screw Corporation as salesman, with headquarters in New Britain, and covering the territory formally traveled by A. H. Harrop.

The Factory Appliance Company, 3814 Prospect avenue, Cleveland, Ohio, advises that Jacques Vieyra, 24 Rue de Lubeck, Paris, France, would like to receive from companies who may be interested in French export trade, catalogues on railway supplies and machinery, with a view to the taking up of the importation and sale of such products in France and her colonies. Mr. Vieyra wishes to consider exclusive representations only.

The Factory Appliance Company will be pleased to supply further details regarding Mr. Vieyra and his facilities.

Frederick C. Fisher, president of the Ferro Construction Company, Chicago, Ill., died at his home in that city on Tuesday, December 5. He was born at Lake Linden, Mich., on May 24, 1871. After graduating from the engineering college of the University of Michigan, he was employed by the Detroit Bridge Company as a draftsman, and a short time later by the American Bridge Works, Chicago, Ill. In 1899, he went with the Kelly-Atkinson Construction Company, and while in their employ had charge of the erection of the Great Northern's large grain elevator at Superior, Wis., a railroad bridge crossing the Mississippi river at Thebes, Ill., and the Fort Dodge, Des Moines & Southern bridge at Fort Dodge, Ia. On March 15, 1907, he was elected president of the Ferro Construction Company, Chicago. From that time up to his death, as noted above, he was in charge of the construction of many large structures, the most recent including the 600-ft. steel arch span for the new Detroit-Superior viaduct and the new Clark avenue viaduct, both in Cleveland, Ohio.

W. J. Leighty, the announcement of whose resignation as mechanical engineer of the St. Louis-San Francisco, with office at Springfield, Mo., to become chief engineer for the Oxweld Railroad Service Company, Chicago, Ill., has been made in these columns, was born at Tonganoxie, Kan., on October 19, 1878. Upon leaving the University of Kansas, where he spent four years, he entered railway service in August, 1904, as a machinist in the Atchison, Topeka & Santa Fe shops at Topeka, Kan. In April, 1905, he was transferred to the efficiency department of the same road, in which capacity he remained until the following September, when he reentered the University of Kansas. In June, 1906, he graduated from the mechanical and electrical engineering departments of that institution, following which he returned to the efficiency department of the Santa Fe at Topeka, Kan. On June 1, 1907, he left the Santa Fe to enter the service of the St. Louis & San Francisco in the office of the general superintendent of motive power, devoting his time to the standardization of mechanical equipment. On December 21, 1907, he became one of the motive power assistants in the experimental and betterment departments on the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kan., being transferred to the position of assistant to the engineer of tests on August 1, 1912. In October, 1913, he was appointed mechanical engineer of the St. Louis & San Francisco, with headquarters at Springfield, Mo., from which position he resigned to enter the service of the Oxweld Railroad Service Company, as above noted.



W. J. Leighty

A Correction

The statement made in the *Railway Age Gazette* of December 8 to the effect that Franklin Morey, who died recently, was president of the Commonwealth Steel Company, St. Louis, Mo., was in error. Mr. Morey was the father-in-law of Clarence H. Howard, who is the president of this company.

Union Switch & Signal and Westinghouse Air Brake Companies to Merge

At separate meetings of the boards of directors of the two companies last Friday, it was unanimously voted to merge the Westinghouse Air Brake Company and the Union Switch & Signal Company. The matter will be submitted to stockholders of both companies for approval within the next two weeks. It is planned to increase the capital of the Air Brake Company from $20,000,000 to $30,000,000, and make an exchange of stock on the basis of four shares of the Air Brake Company for five shares of Union Switch preferred and two shares of Air Brake for three shares of Union Switch common.

The object of the merger is to reduce overhead expenses, as both companies are controlled by practically the same interests, and are now engaged in similar kinds of business. What changes in the physical status of the plants will result from the merger has not been decided upon.

Steel Corporation's Unfilled Orders 11,058,542 Tons

The United States Steel Corporation reported unfilled orders on hand November 30 as totaling 11,058,542 tons. This is again a new record, and the increase of 1,043,282 tons over the October 31 figures of 10,015,260 tons represents the largest gain yet made during a single month. At the present rate of production the total of unfilled orders will be sufficient to maintain full operations for at least seven months. Unfilled orders on September 30 totaled 9,522,584 tons; on August 31, 9,660,357 tons; on July 31, 9,593,592 tons, and on November 30, 1915, 7,189,489 tons.

More About Draft Gear Patent Decisions

In last week's issue, page 1071, announcement was made of the decision rendered by Judge John R. Hazel, of the United States District Court for the Western district of New York, holding that the T. H. Symington Company had infringed certain patents of William H. Miner and the O'Connor patent in the manufacture of draft gears. In order that this statement may not be misunderstood, it should have been added that the decision rendered involved the method of manufacture of a tandem draft gear cheek plate, covered by patent No. 1,097,740, granted to Thomas H. Symington, and in no way involved the patents covering the Farlow draft gear, manufactured by the T. H. Symington Company.

The United States Circuit Court of Appeals for the Seventh circuit, sitting in Chicago, has just rendered a decision reversing the decision by District Judge Landis, and holds that C. J. Nash and the Universal Draft Gear Attachment Company do not infringe patents Nos. 758,677, of May 3, 1904; 829,728, of August 28, 1906, and 858,746, of July 2, 1907, all relating to tandem draft rigging and owned by W. H. Miner.

It should be noted that the O'Connor patent, No. 829,728, which was cited by Judge Hazel against the Symington company, was also cited in the case against C. J. Nash and the Universal Draft Gear Attachment Company.

American International Corporation

The annual report of the American International Corporation issued under date of December 6 contains some interesting details concerning the work of this company. The corporation was organized November 23, 1915, with a capital of $50,000,000, of which one-half is now paid in. During the year ending December 1, 1916, the estimated surplus earned was $2,231,495, exclusive of the appreciation of stocks and bonds. The directors recently declared a dividend of 75 cents a share.

The American International Corporation, as its name indictates, and as is well known, was organized to direct American capital, technical skill and administrative experience into the international field. It has as chairman of the board, Frank A. Vanderlip, of the National City bank; as president, Charles A. Stone, of Stone & Webster, and its board of directors has been chosen from the leading men in this country in industry, transportation, manufacture and finance. Its working organization has its headquarters at 120 Broadway, New York.

During its first year the corporation has become interested in the following: Pacific Mail Steamship Company, the Allied Machinery Company of America, the Uruguayan contract, the Latin-American Corporation, the Rosin & Turpentine Export Company, the International Mercantile Marine Company, the United Fruit Company, the American International Terminals Corporation, a ship-building company, and the tea business; and it has extensive interests in Russia and China.

The last two are of special interest to the railway field. Concerning Russia the report says that on August 31, 1916, Frederick Rollins, an engineer and head of the Holbrook, Cabot &

Rollins Corporation, was chosen vice-president of the corporation to represent its interests in Petrograd. The report adds that Mr. Holbrook, with the help of other experts has made arrangements to investigate certain railroads and steel and coal enterprises, etc., and that, "We are now filling orders for the Russian government for a large amount of steel rail and other railway equipment."

Readers of the *Railway Age Gazette* are already familiar with the Siems-Carey Railway & Canal Company, which has been organized to build and finance railways and canals in China. (See *Railway Age Gazette* of October 13, page 660.) Mr. Carey, of the Siems-Carey company, and a group of engineers and experts have been in China since August. The corporation has advanced $500,000 to be expended by the Chinese government for surveys and investigations for the proposed lines. Engineers are at present on the ground studying the situation.

TRADE PUBLICATIONS

LOCOMOTIVE GRATE SHAKER.—Bulletin No. 700, recently issued by the Franklin Railway Supply Company, New York, gives information relative to the advantages and operation of the Franklin steam grate shaker.

GEARS.—Facts About Gears is the title of a 40-page booklet recently issued by the Van Dorn & Dutton Company, Cleveland, Ohio. The booklet is termed a reference book for gear buyers. It is divided into 21 sections giving such information as: Gearing terms, how to order gears of all kinds, spur gear specifications, bevel and mitre gear specifications, worms and worm gears, sprocket specifications, Lewis' rule for strength of gear teeth, diametral pitch-formulae, diametral pitch-table, circular pitch-formulae, circular pitch-table, decimal equivalents, metric pitch module, standard keyways, comparative size of gear teeth, etc.

ASBESTOS BUILDING MATERIALS.—The H. W. Johns-Manville Company, New York, has issued two 32-page pamphlets covering transite asbestos shingles and corrugated asbestos roofing respectively. Both of the pamphlets are illustrated with views of buildings of all kinds in various parts of this country in which these materials have been used. Several pages are also devoted to data concerning the size, shape, weight, etc., to facilitate estimating, particularly the pamphlet on corrugated roofing, which contains a number of sketches of construction details for the use of this material on steel frame shop buildings.

TIN PLATE. The American Sheet & Tin Plate Company, Pittsburgh, Pa., has issued an attractive 28-page booklet, No. 120, entitled "Black Sheets and Special Sheets." The booklet describes the various kinds of tin plate made by the company and contains a number of tables, among them being one of weights of American painted roofing and siding, a bundling table of black sheets, etc. Another of the interesting features of the booklet is a diagram of the manufacture of steel showing the processes from the ore, limestone and coal to fabricated structures, rails, frogs and switches, wire and nails, tin plate, etc.

THE PENNSYLVANIA RAILROAD SYSTEM.—The Pennsylvania Railroad System has recently issued, in booklet form, an historical and descriptive treatise covering the territory traversed by its lines. The booklet gives a brief description of the cities, and of the more important towns on the Pennsylvania Railroad, east and west of Pittsburgh, with the business advantages and achievements of each. One of the principal objects in its publication is to preserve the most interesting and picturesque incidents connected with the settlement and subsequent development of this region. Another purpose is to set forth the present character of the various portions of the territory with reference to industry, mining, agriculture and commerce. Many of the historical incidents recorded are little known, and were obtained with difficulty from obscure sources to rescue them from oblivion. They relate chiefly to events in the discovery period of American history, to happenings during Colonial days, the Revolution, the War of 1812, the wars with Mexico and the Indians, and the Civil war, with some or all of which practically every portion of the territory traversed by the Pennsylvania Railroad System was in one way or another associated. The book is profusely illustrated, and is accompanied by a large annotated map.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—Within a few days this company will award contracts for grading, bridge work, track laying, fencing and buildings required for the North Texas & Santa Fe extension from Shattuck, Okla., southwesterly to a point near Hansford county, Tex. The company will furnish the track and bridge material. There will be 82 miles of main line, 12 miles of sidings, 2,500,000 cu. yd. of excavation, 2,800 lineal ft. of trestle bridging and 400 ft. of steel bridging. Four frame combination depots containing agents' cottage, section and bunk houses and water stations will be required. One three-stall engine house also will be constructed.

This company is calling for bids for the Brownfield extension of the South Plains & Santa Fe from Lubbock, Tex., to a point about 24 miles southwest of Brownfield, Tex. The company will furnish the track and bridge material only. All other work is to be let by contract. There will be 64 miles of main line, 8 miles of siding, 1,000,000 cu. yd. of excavation, 650 lineal ft. of bridging, three small frame combination depot buildings containing agent's cottage, section and bunk houses and a water station, and a three-stall engine house.

CHESAPEAKE & OHIO.—Construction work is now under way on lines as follows: From Seth, W. Va., to Jarrolds Valley, 13.3 miles, contract let to the Boxley Brothers Company, Orange, Va.; from Little Marsh Fork to Hazy Creek in West Virginia, 6.5 miles, on which the Rowland Land Company is handling the grading work; on the Pond Fork Railway from Madison, W. Va., to mouth of West Fork, 11.6 miles, contract let to Board & Duffield, Charleston, W. Va.; from Man, W. Va., to Gilbert Creek, 12.8 miles, contract let to Ballard Herring & Severs, Yancey Mills, Va., and from Cow Creek, W. Va., to Conley Creek, 3 miles, on which the grading work is being carried out by Cole & Crane. In addition the following new work has been authorized, but construction has not yet been started: On the Big Elk Run of Coal River in W. Va., 3.5 miles; extension up Pond Fork on Pond Fork Railway in W. Va., 4 miles, and extension up West Fork, 4 miles; extension of Beech Creek up Beech Creek in W. Va., 2 miles; extension of Logan & Southern up Pine Creek, in W. Va., 2.5 miles; up Little Creek, 1 mile, and up Island Creek from Conley Creek Branch, 1.5 miles. This company has also projected second track work to be carried out in the states of Virginia and West Virginia aggregating 18.21 miles.

CHICAGO, BURLINGTON & QUINCY.—This company has applied to the Missouri Public Service Commission for permission to build a line from Monroe City, Mo., to Moberly, 40 miles, and from Mexico to Moberly, 36 miles. The Burlington is also negotiating with the Santa Fe to induce it to build a line from Carrollton to Moberly, 60 miles, thus giving both roads a low grade line from Kansas City to St. Louis, and the Burlington a low grade line from Kansas City to Chicago.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—Work is now under way on a change of line on the Hannibal branch, Wis., which will shorten the distance 1.6 miles. This work is necessary by reason of a dam being built by the Wisconsin-Minnesota Power Company at Chippewa, Wis., which will cause the original track to be under water.

GRAND TRUNK PACIFIC.—Work is now under way by the Grand Trunk Pacific Branch Lines building a 24-mile extension of the Prince Albert branch in Saskatchewan from mile 87.4 to mile 111.66. The grade has already been resurfaced for track laying, and track will be laid early in 1917.

MIDLAND PENNSYLVANIA.—Surveys are now being made to build an extension from Gratz, Pa., to Gordon, 25 miles. Walter S. Aldrich, Audubon, N. J., is the contractor.

MORGAN & FENTRESS.—Work is now under way building an extension from Obed Junction, Tenn., towards Jamestown, 10 miles. F. H. Enright, Harriman, Tenn., has the contract. This company now operates an 18-mile line from Nemo to Obed Junction, which is eventually to be extended west to a point in Fentress county, 56 miles.

Murphysboro & Southern Illinois (Electric).—This company has let contracts, and work is in progress on a new line from Murphysboro, Ill., to Carbondale, a distance of 7 miles. There will be about 100,000 cu. yd. of excavation, one 52-ft. steel bridge and several pile trestles running from 50 ft. to 600 ft. in length. Rolling stock and other equipment will be purchased by R. G. Smith, chief engineer, Third National Bank building, St. Louis, Mo.

North Texas & Santa Fe.—See Atchison, Topeka & Santa Fe.

Pocatello Traction & Interurban.—This company is being organized, and proposes to build a new line from Preston, Idaho, through Pocatello, Blackfoot, Idaho Falls, Shelley and St. Anthony, to Ashton, 172 miles. Richard Douglas, president, Pocatello, Idaho.

St. Paul Southern (Electric).—This company, operating between St. Paul, Minn., and Hastings, Minn., about 25 miles, is extending its line from Hastings to White Rock, 23 miles further. About 60 per cent of the grading work has been done. The average grading per mile is about 15,000 cu. yd., the grades average about 2 per cent, and the curves 10 deg. There will be two 160-ft. and six 80-ft. steel spans erected on piles. On the completion of this extension the company contemplates the construction of a line through White Rock, Dumbrota, Rochester, Chatfield, Preston and Harmony in Minn., down through Burr Oak, Ia., to Decorah, a total distance of 126 miles. H. A. Genung, chief engineer, St. Paul, Minn.

Sand Springs.—This company, which operates partly by steam and partly by electricity a road from Sand Springs, Okla., to Tulsa, about nine miles, has let contracts for double tracking the line, and for the construction of a combination freight and passenger station at Tulsa. The station will cost $25,000.

RAILWAY STRUCTURES

Chicago, Ill.—The Illinois Central has purchased 1,500 tons of structural steel from the American Bridge Company for the construction of a single leaf Strauss bascule bridge 260 ft. long over the south branch of the Chicago river on the St. Charles Air Line. About 3,000 cu. yd. of masonry will be placed, for which bids will be asked on or before March 1, 1917. The estimated cost of the entire project is $350,000.

Eureka, Cal.—The Northwestern Pacific intends shortly to erect over Eureka Slough, between Eureka and Arcata, a single-track swinging bridge with two openings, each 75 ft. in the clear on center line. The bridge is now being fabricated by the American Bridge Company under Harriman lines common standard specifications.

Galveston, Tex.—It has finally been decided to carry out the reconstruction of the damaged portion of the Galveston causeway, which was destroyed by a hurricane in August, 1915, in accordance with the plans as prepared by the Concrete-Steel Engineering Company, New York. This design provides for an arch structure consisting of 84 additional concrete arches.

Indianapolis, Ind.—The Indianapolis Traction & Terminal, and the Terre Haute, Indianapolis & Eastern, have purchased the old Federal League baseball park, and intend to convert the property into a new freight depot, which will serve all the interurban lines entering the city. The proposed freight depot will cost about $400,000. Robert I. Todd, president, Indianapolis Traction & Terminal, Indianapolis, Ind.

Richmond, Va.—The Atlantic Coast Line is building a reinforced concrete arch over Arch street at Richmond.

New Line in Central America.—The International Railways of Central America has projected a line to run southeasterly from Santa Maria to Santa Ana in Salvador. It is stated that when this and other lines in Central America, projected or under construction, are completed, a direct through route will be afforded between Vera Cruz, Mexico, and Panama and Colon, extending along the western portion of Central America through the five republics of Guatemala, Salvador, Honduras, Nicaragua and Costa Rica.

Railway Financial News

Boston & Maine.—Judge Morton, in the United States District Court, in the course of the hearings on the question of making the temporary receivership of the Boston & Maine permanent, ruled that the validity of the outstanding $27,000,000 notes, or the purposes for which the money from the sale of these notes was used, could not be attacked in the present proceedings.

Chicago, Rock Island & Pacific.—The Wall Street Journal says that unofficially it may be stated that an understanding has been reached between the reorganization committee and the committee representing the refunding 4 per cent bonds, by which the petition of the refunding committee for foreclosure of that mortgage will not be pressed. This means that the proposal for a new open mortgage under which bonds would be issued to be exchanged for the outstanding refunding 4 per cent bonds has been abandoned.

Cleveland, Cincinnati, Chicago & St. Louis.—Stockholders have voted to buy the Saline Valley and the Evansville, Mt. Carmel & Northern. The Saline Valley operates two miles of road, and the company was organized to build a line from Harrisburg, Saline county, Ill., to Marion, in Williamson county. All of its securities are owned by the Cleveland, Cincinnati, Chicago & St. Louis, and its road is leased to this company. The Evansville, Mt. Carmel & Northern runs from Mt. Carmel, Ill., to Evansville, Ind., 33 miles, and is now leased to the Cleveland, Cincinnati, Chicago & St. Louis.

Evansville, Mt. Carmel & Northern.—See Cleveland, Cincinnati, Chicago & St. Louis.

Gulf, Mobile & Northern.—It is understood that an agreement has been reached between the railroad commission of Mississippi and the New Orleans, Mobile & Chicago, which will permit the reorganization of this company, now in the hands of a receiver, under the name of the Gulf, Mobile & Northern.

Michigan Central.—Stockholders are to be asked on February 7 to approve the placing of a refunding and improvement mortgage on all of the property of the company under which bonds can be issued not to exceed $100,000,000. The Michigan Central debentures of 1909 will be secured by this mortgage on a parity with the bonds to be issued thereunder.

New Orleans, Mobile & Chicago.—See Gulf, Mobile & Northern.

Saline Valley.—See Cleveland, Cincinnati, Chicago & St. Louis.

Railway Improvement in Guatemala.—One of the most important railway improvements in many years in Guatemala will be made effective January 1, 1917, when the International Railway of Central America will begin freight and passenger service on its newly located 12-mile line leading from Puerto Barrios to Manoca, where connection will be made with the company's existing line to Guatemala City. The operation of the newly located line will mean the utilization of the big tunnel that cuts the high grade at Corozo Hill, 7 miles from Puerto Barrios, thus reducing the gradient from nearly 5 per cent to 0.9 per cent. The reduced grade will enable the road to put into effect an improved passenger schedule, and at the same time will increase the drawing capacity of the engines and permit betterments in the freight service. The new tunnel is 753 ft. long, 16 ft. in width and 18½ ft. in height.

Railroad Construction in Ecuador.—The Congress of Ecuador has recently passed a law providing for the construction of a railway from the port of San Lorenzo del Pailon, or some other suitable port in the Province of Asmeraldas, to the city of Ibarra. This will not affect the construction of the railway from Quito to Ibarra, which will connect at Ibarra with the railway from the port. An appropriation is also made for the construction of a branch road from Ibarra to Tulcan on the completion of the road from Quito to Esmeraldas.—*Commerce Report.*

[ADVERTISEMENT.]

ANNUAL REPORT

REPORT OF THE DIRECTORS OF THE SEABOARD AIR LINE RAILWAY COMPANY. FISCAL YEAR ENDED JUNE 30, 1916

PORTSMOUTH, VA., October 19th, 1916.

To the Stockholders of the Seaboard Air Line Railway Company:

The Board of Directors submits the following report of the operations of your properties for the year ended June 30, 1916:

Pursuant to Articles and Agreement of Merger and Consolidation dated October 11, 1915, entered into between Seaboard Air Line Railway and Carolina Atlantic & Western Railway and their respective boards of directors and approved by the stockholders of the respective companies at meetings duly called and held in November, 1915, your company, Seaboard Air Line Railway Company, a consolidated corporation, was formed, effective November 16, 1915. By resolution of the board of directors adopted November 23, 1915, the accounts of both the old companies were continued through November 30, 1915, and the accounts of the consolidated company begun as of December 1, 1915. In the following report, however, the accounts and statements are for the combined companies, for the full fiscal year ended June 30, 1916, the comparisons likewise being made with the combined accounts for the previous year.

INCOME ACCOUNT FOR YEAR ENDED JUNE 30, 1916, COMPARED WITH YEAR ENDED JUNE 30, 1915.

	1916	1915	Increase
Gross Revenue	$24,494,788.93	$21,781,316.22	$2,713,472.71
Operating Expenses and Taxes	17,503,371.36	16,378,498.71	1,124,872.65
Net Operating Revenue (after Taxes)	6,991,417.57	5,402,817.51	1,588,600.06
Uncollectible Railway Revenue	8,266.53	8,902.94	636.41†
Operating Income	6,983,151.04	4,393,914.57	1,589,236.47
Other Income	428,573.55	358,761.76	69,811.79
Gross Income	7,411,724.59	5,752,676.33	1,659,048.26
Rents and Other Charges	229,618.77	214,683.11	14,935.66
Hire of Equipment	(Dr.) 101,380.76	(Cr.) 28,343.79	129,724.55
Applicable to Interest	7,080,725.06	5,566,337.01	1,514,388.05
Fixed Interest Charges	4,560,746.71	4,301,291.39	259,455.32
Balance	2,519,978.35	1,265,045.62	1,254,932.73
Full 5% Interest on Adjustment (Income) Bonds	1,250,000.00	1,250,000.00	
Net Income	$ 1,269,978.35	$ 15,045.62	$1,254,932.73

†Decrease.

The Gross Revenue increased 12.46 per cent., Operating Expenses increased 6.84 per cent., Taxes increased 7.32 per cent., Operating Expenses and Taxes increased 6.87 per cent., and Operating Income increased 29.46 per cent.

The Operating Expenses, exclusive of Taxes were 66.68 per cent. of the Gross Revenue, as compared with 70.19 per cent. the previous year; and including Taxes, 71.46 per cent. of Gross Revenue as compared with 75.20 per cent. for the preceding year.

MILEAGE OPERATED.

The mileage of the Seaboard Air Line Railway in operation on June 30, 1915, was		3,123.14
Extension constructed between June 30, 1915 and November 16, 1915		.20
Mileage of the Seaboard Air Line Railway in operation Nov. 16, 1915		3,123.34
Mileage of the Carolina Atlantic & Western Railway in operation on June 30, 1915, and on Nov. 16, 1915, not including 1.87 miles which was owned by the Seaboard Air Line Railway		325.95
Mileage of the Seaboard Air Line Railway Company in operation June 30, 1916		3,449.29
Made up as follows:		
MILEAGE OWNED.		
The owned mileage of the Seaboard Air Line Railway on June 30, 1915, was		3,047.42
Extension constructed between June 30, 1915 and Nov. 16, 1915		.20
Owned mileage of the Seaboard Air Line Railway Nov. 16, 1915		3,047.62
*Mileage owned by the Carolina Atlantic and Western Railway when merged with the Seaboard Air Line Railway on November 16, 1915		325.95

*At the time of the consolidation, the C. A. & W. Ry. had under construction an additional eighty-six miles between Charleston, South Carolina, and Savannah, Georgia.

Mileage owned by the Seaboard Air Line Railway Company, June 30, 1916		3,373.57
LEASED LINES		
Meldrim, Ga., to Lyons, Ga.	57.65	
TRACKAGE.		
Howells, Ga., to Atlanta, Ga.	3.00	
Hilton, N. C., to Navassa, N. C.	2.40	
At Birmingham, Ala.	.07	
Freight Yard Jct., Birmingham, Ala., to Bessemer, Ala.	14.88	
At Bessemer, Ala.	.16	
Near Mulberry, Fla.	1.46	79.62
		3,453.19
DEDUCT.		
Amelia Beach branch, leased to City of Fernandina, Fla.	2.00	
Silver Springs, Fla., branch, leased to the Ocklawaha Valley Railroad Company	1.90	3.90
Total mileage operated by the Seaboard Air Line Railway Company, June 30, 1916		3,449.29
Average miles of road operated during the year ended June 30, 1916, by the Seaboard Air Line Railway, the Carolina Atlantic & Western Railway and the Seaboard Air Line Railway Company		3,449.25
Average miles of road operated by the Seaboard Air Line Railway, the Carolina Atlantic & Western Railway and the Seaboard Air Line Railway Company, during the year ended June 30, 1916, shows an increase over previous year, of		3.45%
Sidings (including 22.00 miles on Leased Lines and Trackage)		933.84

NOTE.—Of the above sidings 43.30 miles were owned by the Carolina Atlantic & Western Railway.

SECOND TRACK.

Hamlet, N. C., Northwardly	9.61
At Birmingham, Ala.	3.05
Between Raleigh, N. C., and Cary, N. C.	7.59
At Tampa, Fla.	1.32
Total	21.57

FUNDED DEBT.

In connection with the consolidation, the following new mortgage was created and assumed by the consolidated company:

Seaboard Air Line Railway Company First and Consolidated Mortgage dated September 1, 1915, securing an authorized issue of $300,000,000 of Seaboard Air Line Railway Company First and Consolidated Mortgage Gold Bonds. These bonds are issuable in series, which series may vary in maturity, interest and redemption rates and in other respects.

Of said authorized issue, $25,644,000 have been issued for the retirement of $6,000,000 Seaboard Air Line Railway 5% Notes, due March 1, 1916; for the purchase of $1,700,000 Refunding Mortgage Bonds, pledged under the new Mortgage; for the construction of the Charleston-Savannah Line; for the retirement of equipment and other obligations, including the $5,725,000 underlying first mortgage 6% bonds of the Carolina Atlantic & Western Railway (of which $4,225,000 were guaranteed, principal and interest, by Seaboard Air Line Railway); for expenditures for betterments and improvements and acquisition of property and for reimbursement of same, and for other purposes of the consolidated company.

Said $25,644,000 bonds were issued as Series A, bearing interest at the rate of 6% per annum, maturing on September 1, 1945, and redeemable on any interest payment day at 107½ per cent. of their principal amount and accrued interest, in amounts of not less than $1,000,000 at any one time. $22,459,500 thereof are in the hands of the public and $3,184,500 are treasury bonds.

In addition to the securities retired as above, $2,280,000 Carolina Atlantic & Western Railway Refunding Mortgage 5% Bonds, Series A, due 1964, which the Articles of Consolidation provided should be exchanged for 6% Preferred Stock, were retired, and there were redeemed and cancelled during the year $8,000 Florida Central & Peninsular Railroad Company Land Grant Extension 5% Bonds.

For further details of the Funded Debt, see Table No. 4.

MAINTENANCE OF WAY AND STRUCTURES.

ROADWAY, TRACK AND STRUCTURES.

Roadway, track and structures of the company have been properly maintained at a cost of $2,924,292.52, which represents an expenditure per mile of $847.81.

SIDE TRACKS.

26.87 miles of new sidings and extensions of existing sidings were constructed, and there were deducted by removal and changes of old sidings, 3.55 miles, making a net increase over previous year of 23.32 miles.

There was also constructed .32 mile of new sidings on leased lines, and there was deducted by removal .15 mile, making a net increase of .17 mile over previous year.

TIE RENEWALS.

Tie renewals were 1,605,959 cross ties and 977 sets of switch ties, and the cost, $697,255.50, was charged to Operating Expenses.

RAIL.

90.40 miles of new 85-lb. and 33.99 miles of new 90-lb. steel rail, making a total of 124.39 miles were laid in the main line, releasing therefrom lighter worn rail. There was charged net to Operating Expenses therefor, $84,213.68, and to Capital Account $189,285.30.

In addition, 23.68 miles of released 68, 75, 80 and 85-lb. steel rail were laid on branch lines, releasing 60-lb. and lighter rail, and there was charged to Operating Expenses therefor, $5,916.89, and to Capital Account, $28,921.07.

BALLAST.

26,221 cubic yards of gravel and slag ballast were put under main line track during the year, and of the total cost thereof, $5,592.72 was charged to Capital Account.

In addition, 58,320 cubic yards of gravel ballast have been distributed ready to be put under the track.

TRESTLES FILLED.

1,937 lineal feet of wooden trestles were filled in during the year and of the total cost thereof, including culverts, $9,512.66, was charged to Operating Expenses.

TRESTLES REBUILT AND BALLAST DECKED.

There were built during the year out of creosoted timber 3,821 lineal feet of ballast decked trestles, replacing old open deck trestles, and the cost thereof, $44,544.17, was charged to Operating Expenses.

BRIDGES.

Work has been done on eight bridges, repairing, replacing with steel or concrete, or strengthening them for heavier traffic.

Six of the above bridges were authorized during the year and all of them have been completed.

Of the bridges completed, the principal ones are:

Duval Street Viaduct, Jacksonville, Fla., mentioned in last year's report, a reinforced concrete structure, 42 feet wide and 1,418 feet long, for highway and street railway traffic over Hogan's Creek, and the tracks of the Seaboard Air Line Railway Company and the St. John's River Terminal Company.

Blanding Street, Columbia, S. C., a reinforced concrete highway overpass, 32 feet by 111 feet.

The total expenditures for bridge work during the year were $53,422.98, of which $48,982.99 was charged to Capital Account and $4,439.99 to Operating Expenses.

In addition to the above, and in accordance with Government requirements, work has been started during the year replacing a portion of the Hilton Bridge near Wilmington, N. C. The new work will consist of one Strauss Bascule lift bridge, 111 feet center to center of bearings and two deck plate-girder spans, one 92 feet long, and one 73 feet long. This bridge is owned by the Wilmington Railway Bridge Company, which Company is owned and operated jointly by the Seaboard Air Line Railway Company and the Atlantic Coast Line Railroad.

RAIL IN MAIN LINE.

The total operated main line single track mileage of the system, 3,449.29 miles, is laid with steel rails of the following weights:

Miles.	Weight.	
48.37	90 lb.	rail.
491.82	85	"
67.38	80	"
1,21[illegible]96	75	"
259.00	70	"
190.29	68	"
18.87	65	"
60.48	63.5	"
3.95	60.5	"
565.93	60	"
235.98	58	"
267.26	56	" and lighter.

Total 3,449.29

The above does not include:

SECOND TRACK.

Northward from Hamlet, N. C.:		
9.09 Miles	90 lb.	rail.
.52 "	75	"
At Birmingham, Ala.:		
1.43 Miles	75	"
1.62 "	60	"
Raleigh, N. C., to Cary, N. C.:		
7.59 Miles	85	"
At Tampa, Fla.:		
1.32 Miles	75	"

LINES OWNED BUT NOT OPERATED—LEASED.

Silver Springs Branch:		
1.20 Miles	60 lb.	rail.
.70 "	56	"
Amelia Beach Branch:		
2.00 Miles	50	"

MAINTENANCE OF EQUIPMENT.

The equipment of the Company was fully maintained during the year at a cost of $3,496,060.89.

Included in the cost of maintenance is $55,461.61, representing value of equipment destroyed or retired from service during the year.

There was also included in the Cost of Maintenance $434,963.90 for depreciation, which was credited to Reserve for Accrued Depreciation.

The cost of maintenance per article owned was as follows:

Average cost per annum per Locomotive owned	$2,304.12
Average cost per annum per Passenger car owned	703.20
Average cost per annum per Freight car owned	55.25

GENERAL REMARKS.

The Carolina Atlantic & Western Railway, owning 325.95 miles of line located in North and South Carolina, was consolidated with the Seaboard Air Line Railway effective November 16, 1915, and the corporate name of the consolidated company was made the Seaboard Air Line Railway Company. The Carolina Atlantic & Western Railway extended through one of the richest and most productive agricultural sections of the South, serving the thriving towns of Hartsville, Sumter, Dillon, Florence and Darlington, and the ports of Georgetown and Charleston. The extension which had been begun by the C. A. & W. Ry., prior to the consolidation will, when completed, provide two main lines between Hamlet and Savannah, both serving different thriving sections.

The value of the Carolina Atlantic & Western lines to the consolidated company is largely due to, First: participation in the traffic of the important ports of Charleston and Georgetown. Second; large revenue that will be derived from the handling of cotton and perishable vegetables produced in the territory served by this line. Third; with the completion of the Charleston-Savannah line, now under construction, and the grade revision work between Hamlet and Charleston, the Company will have a main line with a maximum five-tenths per cent. compensated grade and three degrees maximum curvature between Hamlet, North Carolina, and Jacksonville, Florida, with the exception of three curves of four degrees. That portion of the new line between Charleston and Savannah will have a maximum three-tenths per cent. grade and two degree curves. This new line will save a large amount in the handling of traffic between Hamlet, North Carolina and Savannah, Georgia, as it will allow an increase of 127.5% in tonnage per train as compared with the tonnage which can be handled via the present Columbia route.

During the year extensive grade revision work has been done between Hamlet, North Carolina and Charleston, South Carolina, which will complete the five-tenths per cent. grade line above mentioned.

During the year work has been completed between Raleigh, N. C., and Sanford, N. C., correcting the short and irregular grades in this line, thus facilitating train operation through this district and making a large saving in operating costs. Grade revision work is now in progress on certain sections of the line between Sanford, N. C., and Hamlet, N. C., which will eliminate two pusher grades, and provide a five-tenths per cent. grade against Northbound traffic and an eight-tenths per cent. grade against Southbound traffic on these sections. This will increase thereon the train loading, and equalize the drawbar pull, thereby facilitating operation and reducing hazard and making a saving in operating cost. This grade revision work between Raleigh and Sanford and Hamlet is all located on one engine district.

During the year a modern fireproof machine and erecting shop and blacksmith shop were built at Portsmouth, Va., to replace buildings destroyed by fire. In addition, there has been provided a new power house, flue shop, engine, carpenter and paint shop. two wash and locker rooms, and one engine drop pit. A 50,000 gallon steel water tank was built in connection with the present fire protection facilities. New and modern machinery has been provided for the additional facilities including heavier power cranes for handling locomotives.

New shop facilities and additions to present facilities to serve both the Car and Locomotive Departments are now under construction at Howells, Ga., Raleigh, N. C., and Hamlet, N. C., all of which will be completed during the coming year. The facilities being provided at Hamlet, N. C., are principally steel car repair shops.

Construction is now in progress on an extension from the end of the Lake Wales line eastwardly about 10.00 miles. This construction will add to the main line mileage of the system and will be finished during the coming year.

During the year, construction has been practically completed on industrial spur tracks in Florida as follows: Christina Spur, near Mulberry, approximately 1.00 mile long, and Phosmico Spur, near Bartow, approximately 1.46 miles long. These spurs will be put into operation during the coming year and the mileage added to the main line mileage of the system.

At Plant City, Fla., where our earnings have shown large and steady increases, additional property has been acquired during the year in the vicinity of our freight depot to take care of the growth of business at that point. This will give an additional frontage of 420 feet on adjacent property owned by outside parties and suitable for industrial locations. Team tracks and paved driveways are now under construction on a part of this acquired property.

A joint industrial track with the Central of Georgia Railway is now being constructed at Savannah, Ga., to reach the cotton storage warehouses of the Savannah Warehouse and Compress Company. This track will also afford opportunity for other large industrial development.

Considerable trackage has been added at Jacksonville, Fla., to reach the industries located on the development of the Commodore Point Terminal Company's property on which are to be located wharves and terminal warehouses.

The former office building at Raleigh, N. C., has been remodeled and converted into a warehouse for industrial purposes.

Combination passenger and freight stations have been constructed during the year at Clarkton, N. C., and Ailey, Ga.

Construction is now in progress on a Union Passenger Station at Ocala, Fla., also on a passenger station at Florence, S. C. Both of these stations will be completed during the coming year.

Important paving and street work has been done at Henderson, N. C., Greenwood, S. C., Savannah, Ga., Orlando, Fla., Tampa, Fla., Bradentown, Fla., Manatee, Fla., and at several other points on the system to comply with municipal requirements.

Necessary dredging has been done during the year to maintain the required depths of water at the following terminals: Tampa, Fla., Jacksonville, Fla., Hutchinson Island, Savannah, Ga., and Charleston, S. C.

7 track scales were rebuilt with concrete foundations and steel "I" beams, replacing wood.

4 old water tanks were replaced with new 50,000 gallon tanks and suitable pumping facilities provided.

114 industrial sidings and extensions to industrial sidings already existing have been constructed or are in process of construction.

33 depots and freight stations have been constructed or substantially added to during the year.

43 passing tracks have been constructed or extended or are in process of construction.

The work of the Valuation Committee created in connection with section 19-A of the Federal Act to Regulate Commerce was continued during the year at a cost of $51,985.56 which was charged to General Expenses.

The accounts for the fiscal year were examined by Messrs. Haskins & Sells, whose certificate appears on page 11.

ORGANIZATION.

The officers of the consolidated company named in the Articles of Consolidation are as follows:

S. Davies Warfield,	Chairman of the Board.
W. J. Harahan,	President.
Chas. R. Capps,	Vice-President.
W. R. Bonsal,	Vice-President.
D. C. Porteous,	Secretary.
Robt. L. Nutt,	Treasurer.

At the meeting of the Board of Directors on November 23, 1915, the title of Vice-President Capps was designated as First Vice-President and W. L. Seddon was elected a Vice-President. B. H. Inness Brown, representing the law firm of Byrne, Cutcheon & Taylor, was appointed Advisory Counsel of the company.

In addition thereto all other officers of the Seaboard Air Line Railway were continued as officers for the consolidated company.

The following additional appointments were made:

C. S. Lake, formerly General Superintendent, was appointed General Manager, November 23, 1915, and the office of General Superintendent was abolished.

B. L. Hafmner was appointed General Development Agent on May 1, 1916, and the office of General Industrial Agent was abolished.

The Board renews its expression of appreciation to the officers and employees for the faithful discharge of their duties during the year.

By order of the Board:

W. J. HARAHAN,
President.

TABLE No. 9.

CAPITAL EXPENDITURES FOR ROAD AND EQUIPMENT

YEAR ENDED JUNE 30, 1916.

ROAD:		
Engineering	$ 17,785.46	
Land for Transportation Purposes	101,918.90	
Grading	246,509.57	
Bridges, Trestles and Culverts	24,368.14	
Ties	44,162.39	
Rails	230,390.99	
Other Track Material	74,119.74	
Ballast	79,136.95	
Track Laying and Surfacing	43,590.95	
Right-of-Way Fences	1,316.43	
Crossings and Signs	43,873.05	
Station and Office Buildings	111,556.80	
Roadway Buildings	1,626.96	
Water Stations	Cr. 209.51	
Shops and Enginehouses	174,913.83	
Storage Warehouses	2,879.01	
Wharves and Docks	7,110.29	
Telegraph and Telephone Lines	2,311.80	
Signals and Interlockers	5,543.95	
Power Plant Buildings	6,812.56	
Power Substation Buildings	7.74	
Power Transmission Systems	4,100.78	
Power Distribution Systems	7,742.48	
Power Line Poles and Fixtures	1,463.67	
Miscellaneous Structures	7,321.38	
Paving	16,997.55	
Assessments for Public Improvements	24,027.43	
Cost of Road Purchased	Cr. 1,247.50	
Shop Machinery	219,726.31	
Power Plant Machinery	18,970.90	
TOTAL ROAD		$ 1,518,829.00
EQUIPMENT:		
Steam Locomotives	$ 7,901.94	
Freight Train Cars	Cr. 90,238.09	
Passenger Train Cars	Cr. 4,981.37	
Floating Equipment	Cr. 1,615.00	
Work Equipment	20,794.62	
TOTAL EQUIPMENT		Cr. 68,137.90
GRAND TOTAL		$1,450,691.10
SUMMARY OF EXPENDITURES:		
Additions and Betterments on Existing Mileage	$	1,497,796.60
Equipment Acquired	Cr.	68,137.90
Expenditures for Extensions		21,032.40
TOTAL AS ABOVE		$1,450,691.10

Railway Age Gazette

Volume 61 December 22, 1916 No. 25

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Specifications for Postoffices on Wheels

That the postoffice department is exceedingly particular about the kind of postoffices on wheels the railroads furnish the government free of cost, is a painful, but well fixed fact in the minds of the officers of all transportation companies. It will probably be a jolt to the federal authorities who handle these free mail distributing plants to find that they have left any loose ends. However, according to a paper delivered by Arthur J. Wood, of the mechanical engineering department of the Pennsylvania State College, before the American Society of Refrigerating Engineers in New York City on December 5, there is still something left undone. Professor Wood's paper dealt with the heat transmission of insulated steel car sections, and in outlining the tests which he made, he called attention to the fact that by moving the heat insulating agents from the inner to the outer walls of the car sections in the pyrometer, figures so contradictory were obtained as to warrant the conclusion that the method of procedure required for these tests by the postoffice department was not trustworthy. Professor Wood stated in his report that his conclusions on this feature were based on a series of test observations, which included 10,000 readings. The specifications for insulating materials for postal cars are in detail and it is natural to suppose that they are correct. If this is not the case, and from Professor Wood's investigations it would appear that it is not, the postoffice department should make a thorough revision.

Miles Per Car Per Day

The analysis of the journey of a freight car, which appears in another column, is an instructive study of the car question presented in an interesting manner. While the figures contained in that article are based on conditions existing two years ago, when there was a surplus of cars and the average daily movement was reduced materially, the comparisons drawn apply in the main with almost equal correctness today. When using the figures regarding average miles made per car per day one should be careful to employ them with a full knowledge of their real meaning. He should know that this unit is based on all cars on the line, including bad order cars awaiting repairs, surplus empty cars for which there is no loading, cars in the hands of shippers and consignees, etc. It is an unsatisfactory unit for the reason that it is so easily misunderstood, and also because it is no true measure of the efficiency with which cars are being handled during a time of surplus equipment, since a railway is not responsible for the lack of loading for its empty cars. However, as this is the most practical unit which has been devised, it must be used, but this should be done with a full understanding of what it really means. If railway men employ it incorrectly, the public, with its less intimate knowledge of the technical details of railway operation, cannot be blamed for using it in a manner which may do the roads an injustice. The article referred to is of value chiefly because it brings out so clearly why the present average movement per car per day is so small, and the means which must be employed to increase it.

The President and the Railways

President Wilson is manifesting a disposition to stand firm for legislation to forbid strikes in railway train service until there has been investigation by a board representing the public regarding the matters in controversy. Should Mr. Wilson get legislation enacted which would reduce the danger of railway strikes, he would render a public service of such magnitude that it would almost overshadow the mistake made by him in jamming through the Adamson act last fall. There have been some complaints from railway sources because the President refrained from including in his railway programme a renewal of his recommendation that Congress specifically direct the Interstate Commerce Commission to take into consideration in fixing rates the increase in wages that would be caused by the Adamson law. As a matter of principle, however, the President's original recommendation as to this particular matter was not sound, and the reasons given by him for not renewing it are unanswerable. The Interstate Commerce Commission has ample authority already to take into consideration in fixing rates every expense properly in-

curred by the railways, and it is hardly conceivable that the commission would refuse to give full weight to an increase in expenses forced upon the roads by an act of Congress. It is proper and desirable for Congress to set forth in general terms in the laws the factors and elements that the commission must consider in fixing rates, but for it specifically to direct the commission to consider an increase in expenses due to a piece of special legislation would be to establish a bad precedent. One of the worst faults of our system of regulation has been the too frequent interference of legislative bodies, especially those of the states, with regulative commissions. When such interference takes place it is usually dictated by politics; and when it is dictated by politics the railways are usually the victims, not the beneficiaries of it. The railways should consistently oppose detailed interference by Congress with the Interstate Commerce Commission in the performance of its duties.

THE POLITICIAN AND THE INTERCOLONIAL

SOME persons in Canada have taken unkindly the charge that politics has been one of the most important factors in the management of the government railways of that country. This does not detract from the interest of a news item which appeared in the Montreal Gazette and other Canadian papers on December 1, regarding the case of a member of the provincial parliament of Nova Scotia, who resigned his office because of a difference of opinion between himself and the management of the government-owned Intercolonial Railway.

The politician in question was Frank Stanfield. The newspaper reports stated that, in addition to being a provincial representative belonging to the Conservative party, Mr. Stanfield "has been looking after federal affairs affecting Colchester on behalf of his brother, Lieut.-Col. John Stanfield, M.P. (member of the Dominion parliament), since the latter took up his military duties." The despatch continues that in connection with his work of looking after the political affairs of his brother, Mr. Stanfield "has had a disagreement with the management of the Intercolonial in regard to the appointment of an assistant superintendent at Truro. Mr. Stanfield was backing J. D. McNutt, who is now chief train despatcher, and has had long service with the Intercolonial. Mr. Stanfield claims that Mr. McNutt is qualified and should be promoted. On the other hand the management has, it is stated, appointed Mr. J. Mathison, and it is claimed that he is a Grand Trunk man, and should not be put over the head of Mr. McNutt."

The *Railway Age Gazette* hasn't the slightest idea as to the relative qualifications of Messrs. McNutt and Mathison for assistant superintendent. It simply calls attention to this incident as an illustration of what occurs under government ownership of railways in democratic countries. What business had a politician to attempt to influence the appointment of an assistant superintendent on the Intercolonial? He was in no position to judge of the relative qualifications of the possible appointees. That, however, made no difference to him. He was looking at the matter from the standpoint of politics, not of business.

The fact that the management of the Intercolonial under Minister of Railways Cochrane and General Manager Gutelius, unlike the management under their predecessors, has commonly refused to be controlled by political considerations is the main reason why it is securing so much better operating and financial results than were secured under former administrations when the road was run, not like a business concern, but like a political machine. It is an interesting question, however, as to how long those who stand for business methods in the management of the road will be able to hold out against the attacks of politicians, such as Mr. Stanfield.

ELECTRIFICATION, VOLUNTARY OR COMPULSORY

THE negotiations in progress between the Illinois Central and the city of Chicago are bringing the plans for the initial step in the electrification of the rail lines in that city into definite form. As shown on another page of this issue the railroad company is offering to substitute electric for steam power on all of its suburban service into Chicago, an undertaking involving the electrification of some 40 miles of line on a considerable portion of which four tracks are used exclusively for the service mentioned. This offer by the Illinois Central is made in connection with negotiations with the city which have been in progress for some time, and the satisfactory and speedy conclusion of which is of importance both to the corporation and the public. Public utterance has been given repeatedly to the idea that the railroad should be compelled to carry out the complete electrification of all classes of its traffic at once, with the further requirement that it must efface itself by placing all of its trains in covered subways.

Extravagant views of this kind arise largely from a resentment due to the railroad's occupancy of five miles of lake shore, which has had the effect of cutting off the public from an unrestricted use of this shore line. The injustice of this attitude was exposed by C. H. Markham, president of the Illinois Central, in his statement to the city council committee during the presentation of the railroad plans. "When the ordinance of 1852, authorizing the construction of the Illinois Central along the lake front was passed," Mr. Markham said, "the people of Chicago were thinking more about protection from the lake than anything else, and the railroad company was put to expense in the way of construction of break-waters many times in excess of what it would cost to locate and build its line in the interior away from the lake, which the promoters of the enterprise then desired to do. Location of the road on the lake front has always been a liability, and not an asset, as is generally believed."

It is estimated that the change to electric power for the Illinois Central's suburban service would cost $10,000,000. This service handles a heavy traffic, and its electrification would be an important step toward the elimination of steam power from the city limits of Chicago. Demonstration of its success would no doubt lead to other undertakings of a like nature within a reasonable time.

In the early days of the movement for track elevation in Chicago some twenty years ago, drastic and arbitrary action by the city was not only advocated but actually taken in an ordinance calling for the wholesale elevation of all tracks in the city within a limited time. Fortunately the repeal of this ordinance was secured before any harm was done. Subsequently various proposals for grade separation were formulated and made effective by contract agreements with the individual railroads. The work has been carried out in relatively short sections to be continued from year to year.

The wisdom of this policy has been demonstrated. While permitting the railroads to adjust their finances gradually to these non-dividend paying investments, it has made it possible to improve the designs and develop more efficient construction methods for carrying on the work. As a result, the later examples of track elevation are far superior in permanence, cost of maintenance and appearance to the earlier.

The analogy with electrification is obvious. In no other field is development more rapid or the eventual obsolescence of many designs and methods now adopted more certain than in that of electricity. Therefore, time must be allowed to elapse and experience must be allowed to accumulate before it will be safe for the public to make wholesale requirements for electrification.

THE CHANGE IN THE FISCAL YEAR

THE action of the Interstate Commerce Commission, in changing the fiscal year of the railways so that it will end on December 31 instead of June 30, will be of great assistance in promoting efficiency in the maintenance of way department, while its beneficial effects will also be felt in the mechanical and transportation departments. The Association of American Railway Accounting Officers deserves a great deal of credit for the manner in which it has led in the agitation of this subject, and brought it before the state and federal commissions, and its efforts were largely responsible for the successful outcome.

The termination of the fiscal year on June 30 has resulted in serious interference with the economical conduct of maintenance of way on many roads through the postponement of much work until after July 1 in order that the charges might be deferred until the next year, thereby making an artificially good financial showing for the current year. While some of the stronger roads have ignored this date to all practical purposes, others have adopted every expedient to make as favorable a showing as possible in order to maintain their credit. Maintenance of way work is largely seasonal in character. Some of it can be done only during the summer season, while other parts of it can be performed to best advantage at that time.

The normal working season may be said to extend from April 1 to November 1, a period of seven months. If the inauguration of work is postponed until July 1 three of the best working months are lost, and much larger forces are required during the remainder of the season. This has proved uneconomical in many ways. The best labor, and in seasons such as the last, all of the available supply is employed by the middle of the summer; the shortness of the season after that date requires that work be rushed; it is conducted during the hottest weather, when the efficiency of the men is reduced, and the lateness of the time at which the work is completed makes impossible in many instances the proper surfacing of the track before winter sets in. Considering all of these conditions the conclusion that the labor charge is increased 25 per cent by work handled in this way is not a rash one. The changing of the fiscal year removes the incentive to handle maintenance in this manner, and there should now be no reason for the maintenance of way department failing to organize its forces in such a way as to carry on its work with the maximum practicable effectiveness.

The benefits of this change are not confined to the maintenance of way department. The mechanical departments on many roads have also been handicapped by the restrictions on expenditures for the repair of equipment during the period of slack business in the spring. The best time to overhaul and repair locomotives and cars is when there is a surplus of them and they can be spared from revenue service. In spite of this fact it has been the practice on many roads to reduce the expenditures of the mechanical department to the minimum during the spring, and then to authorize large expenditures after July 1 to make up for the time lost. As business usually begins to increase at this time it then becomes necessary to rush equipment into service with the minimum amount of repairs, resulting in failures on the road and consequent delay.

The operating department has also suffered directly from this same trouble. Ordinarily business begins to pick up late in August and reaches its greatest density late in October. At this time there is often need for every car and locomotive that can be secured, and every one held out of service or failing in service means decreased revenue. If at the same time the maintenance of way department is carrying on its work most actively, the amount of interference with traffic by forces laying rail, renewing ballast, replacing bridges, etc., is considerable. Every slow order, regardless of the necessity for its existence, becomes an impediment to traffic, and adds to the cost of operation.

The recognition by the Interstate Commerce Commission of the existence of the general condition described, and its action in this matter, are to be heartily commended.

TOLEDO, ST. LOUIS & WESTERN—A CORRECTION

IN the review of the annual report of the Toledo, St. Louis & Western for the fiscal year ended June 30, 1916, published in the issue of the *Railway Age Gazette* for November 3, it was stated that the interest on the collateral bonds, series A and B, was earned and paid in that year. Later one of the holders of these bonds wrote stating that he was not receiving his interest. Inquiry was then made at the New York office of the Toledo, St. Louis & Western, and we were told that this interest was not being paid. The specific question was asked as to whether there was any place in the report to the stockholders where it was stated that this interest had not been paid, and the answer was made that there was not. Inquiry was then made at the office of the Interstate Commerce Commission in Washington, and it was found that in the report of the receiver to the Interstate Commerce Commission it was stated that interest on the collateral bonds, series A and B, had not been paid in 1916.

We then published an editorial in our issue for November 17 saying that the report to the stockholders was not in accordance with the facts. This statement was erroneous. It develops that there really are two places where it is shown that interest on bonds is in default, and in one of these specific mention is made of the collateral bonds, series A and B.

This double error did injustice to the management of the road, but it was not due either to malice or to carelessness. The review of the report and the later editorial were prepared by the financial editor of this paper, who has reviewed at least 500 annual reports since he has been on our staff. When a road is in the hands of a receiver and the receiver does not pay the interest on certain classes of bonds, it is customary for a statement of this fact to be attached directly to the income account. In the table on page 5 of the report of the Toledo, St. Louis & Western to its stockholders, which table is headed "The Receiver Submits Herewith Report of Operations for the Year Ended June 30, 1916," there is under "Deductions from Gross Income" the following line: "Interest on funded debt* $1,086,747.45." The footnote to which the asterisk refers reads, "Includes the interest on A and B gold bonds of 1917." There is nothing in this table to show that this interest was not paid. This is the explanation of the mistake made in assuming, first, that the interest on these bonds was paid, and then later that the report to the stockholders did not show that it was not paid. On the balance sheet in the report to stockholders under "Current Liabilities" there is an item, "Interest matured upaid, $1,097,197.50." There is nothing attached to the balance sheet to explain what this item includes. The balance sheet shows the principal of the gold bonds of 1917, series A, and gold bonds of 1917, series B, under "Funded debt unmatured." The item on the balance sheet, "Interest matured unpaid," includes, it develops, the interest on the collateral gold bonds of 1917, series A and B, but this is not specifically stated

In the table on page 18 of the report to stockholders headed, "Statement Showing Resources for the Year Ended June 30, 1916, and Their Application," under the heading "Increase in Liabilities" there is, however, the following line: "Interest matured unpaid $463,280.00." Following this, under the heading, "These Resources (the difference between gross income and cash on hand and the decrease in assets and increase in liabilities) Have Been Applied as Follows," there is the line, "Interest on A and B gold bonds (defaulted)

$461,080.00." Unquestionably, the reviewer should have noted these items and their bearing on those in the income account, but he did not. To put an asterisk against the charge in the income account for interest on funded debt with the reference "this includes interest on A and B gold bonds of 1917," and not to follow it by the statement that this interest on the A and B bonds is *not being paid*, may mislead, as is shown by the fact that this paper was misled by it. However, while the fact that the Toledo, St. Louis & Western's report was not as clear as it might have been may explain and mitigate, it does not excuse or justify the statements published by this paper regarding it in the editorial in our issue of November 17. Those statements were not only misleading, but absolutely incorrect; and we greatly regret the injustice that was done to the management of the Toledo, St. Louis & Western by their publication.

THE COMMISSION'S RECOMMENDATIONS

THE Interstate Commerce Commission presented some unusually interesting and important recommendations for changes in the act to regulate commerce in its annual report to Congress, an abstract of which was published in the *Railway Age Gazette* of December 8. The most interesting and important of these is that Congress shall by statute fix the rates, rules and regulations existing at a specific date as reasonable for the past and that no change shall be made in them for the future except upon order of the commission.

This is a substantial recognition of the fact that the most vital questions affecting rates no longer involve complaints of their unreasonableness but their relationship to each other. The commission has long possessed adequate power to prevent excessive rates, but, as the report shows, its powers have not been adequate to enable it to deal effectively and satisfactorily with the complicated problems involved in the adjustment of rates as between competing communities and commodities, and it is well worth careful consideration whether the time has not arrived to give the commission the more complete authority which it asks. Railways can hardly object that the plan would deprive them of control over rates because they cannot now advance a rate without the commission's permission if any one protests against the advance. It would merely increase the authority of the commission by depriving the carriers of their present freedom to reduce rates at will, and the roads have already proposed to the Newlands committee that the commission be given the power to prescribe minimum instead of merely maximum rates and to determine the relation of rates or differentials whenever necessary or appropriate to establish or maintain a rate structure or a relation or a differential found to be proper by the commission.

The plan proposed by the commission not only meets these suggestions, but it goes even further and would free the roads from the possibility of claims for reparation for the past. While it would give the commission absolute control over rates, it would not deprive the carriers of any of their initiative to propose changes either upward or downward, and it would give the commission a power to prevent discrimination, which is now possessed neither by the commission nor by the carriers. For this reason the commission's recommendation would seem to be a constructive suggestion for a great improvement in methods with advantages for all concerned.

The principal interest of the shippers and of the public is in being protected against discriminations. In the case of a discriminatory rate adjustment now the commission cannot advance the lower rate, even if it believes it to be unreasonably low. It can only reduce the higher rate, and then there can be no assurance that the discrimination will not be continued by a further reduction.

There are many instances in which one or two roads have reduced rates on particular commodities or between certain communities in order to increase their own traffic or under pressure from a powerful shipper in such a way as to create serious discriminations against other commodities and other communities. If other roads are required to meet the reduction their revenues are often reduced unreasonably.

The commission in its report gives some strong reasons for the proposed change. One of these is that it would relieve the commission of the burden of passing upon claims for reparation, a large proportion of which are instituted by agencies established for that purpose, and the commission believes that its energies could more profitably be expended in the direction of constructive work for the future. It points out that in the absence of any definite fixed standard of reasonableness the carrier often cannot know whether a certain rate is reasonable until the commission passes on it, and that since all interstate rates have been subject to its regulation for more than 10 years, in the interest of uniformity and stability of rates there should come a time when, as to the past, the general level and relationship of rates should be fixed as reasonable. It also shows that under the present limitation of its authority to the fixing of the reasonable maximum rate for a period of two years the carriers are at liberty to adopt the maximum so fixed or anything lower, or to re-establish the condition sought to be corrected after two years. A single road, therefore, has the power to overthrow or seriously disturb an adjustment reached after a long investigation that is recognized as reasonable and fair by the overwhelming majority of the carriers and shippers interested.

In this respect the commission says the present plan of regulation "resolves itself largely into a sort of continuous moving around in a circle." The plan it proposes should lead to a much more businesslike method of rate regulation.

The commission's suggestion that it be given jurisdiction over the rules and regulations governing the interchange of cars may be objected to on the ground that it takes more authority from the managements, but there is an effective reply to any such objection in the fact that the roads have not thus far been able to exercise successfully the authority they have had in this respect.

The commission's report on the subject of car shortage expresses a thorough appreciation of the difficulties that the roads have been confronted with in handling this troublesome problem, but it also shows the fact that they have been unable to enforce their own car service rules during the times when they are most needed. Whether or not the rules are adequate to meet the conditions has never been satisfactorily demonstrated because of this fact. The difficulty is that while a majority of the roads may be earnestly endeavoring to do the right thing, they have no control over those that shortsightedly regard only their own selfish interests. This condition has been responsible for most of the regulation that has been imposed on the roads in the past and which will probably make more of it necessary. Whether there is need for giving the commission this power over car interchange will doubtless be demonstrated by the results of the work now being done by the commission on Car Service of the American Railway Association in the attempt to relieve the conditions of car shortage and congestion. This work has thus far been hampered by the refusal of some roads to co-operate. If they wish to head off such legislation as that proposed by the commission, the best way to do so will be to make it unnecessary.

In its discussion of the subject of trespassing, the commission makes a constructive suggestion which will meet with the hearty approval not only of the carriers but of all who have given thought to the problem. In this case it is no fault of the railroads that leads the commission to urge the advisability of a federal statute against trespassing. It is the inaction of the states and other local authorities, while the number of trespassers killed annually has been steadily increasing until it is now over 56 per cent of the total fatalities in railroad accidents. While 13 states have legislated against trespassing, the commission says, it appears to be difficult to secure the enforcement of such laws, and the carriers thus fail to obtain the protection which the public welfare demands.

Letters to the Editor

M. C. B. RULES AND REPAIRS TO FOREIGN CARS

West Springfield, Mass.

To the Editor of the Railway Age Gazette:

As one who for a number of years has made a deep study of car repairs, as well as the M. C. B. rules governing them, I read with considerable interest Mr. Ballantine's article in your issue of November 24. His analysis of the ultimate cost of repairs to foreign cars is clear and concise and deserves a great deal of consideration.

An error appears in his interpretation of the M. C. B. rules, however, which is serious enough to affect to a considerable degree the conclusions arrived at. He says in part, referring to improper repairs to foreign cars, "why then should there not be more latitude permitted in this direction without penalizing the holding road by depriving it of a right to collect for having put the car in safe and serviceable condition. . . ."

The M. C. B. rules do not now nor have they ever within the knowledge of the writer imposed upon foreign lines making wrong repairs the burden of expense incident to that operation; in fact, they expressly provide reimbursement for the maker of improper or wrong repairs.

The example which Mr. Ballantine gives under the heading "Repairing Foreign Cars" is therefore clearly in error. Under the conditions outlined the maker of wrong repairs would be entitled to collect for the cost thereof, and by this I mean the actual cost under the rules of the operation, regardless of the fact that the center plate applied might be of a much heavier or more expensive design than that standard to the car. It is apparent, then, that the repairing line is permitted to make repairs as "though it owned the car."

It is quite true, of course, that the owners may at their discretion correct such wrong repairs and collect from the repairing line the cost of so doing. Credit for M. C. B. standard material removed in certain cases must be given at the second hand value thereof.

The mistake in assuming that the foreign line is not entitled to collect the cost of making wrong repairs makes the first of the suggested changes of questionable value and the second of no value whatever.

It is doubtful if there is a car man the country over, be he a strong supporter of the rules as they are or not, who would not welcome a change whereby the holding of foreign cars awaiting material from owners could be avoided. Practical men would instantly say that the desired end could be brought about more rapidly than in any other way by more strict adherence to the standards of the M. C. B. Association. The principal purpose of these standards, formed after years of experience by the best talent in this line, is to prevent just such conditions as exist on many roads today. I refer to the holding of foreign cars awaiting parts which it is often impossible to replace from a reasonably large stock of car material.

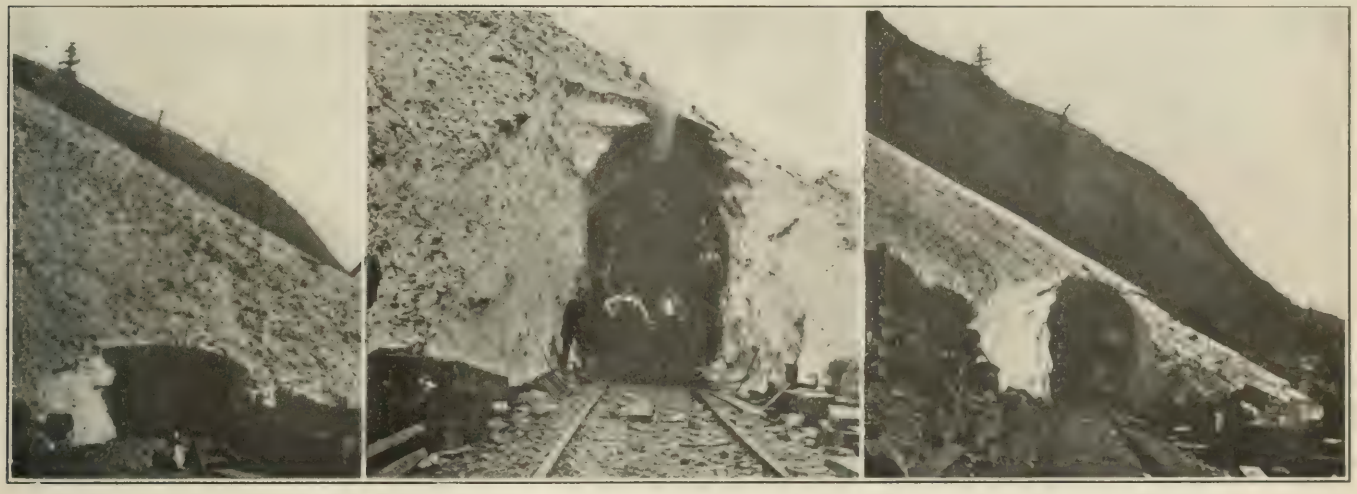
E. R. Hooper.

DO DREAMS COME TRUE?

New York, N. Y.

To the Editor of the Railway Age Gazette:

Some 24 years ago, when employed on the construction of a western railway, I had occasion to visit an adjacent town where was located a prominent newspaper, which built more railroads on paper than have ever yet been constructed. In an interview with a reporter regarding some bad snow slides which had occurred, I enlarged somewhat, possibly tenfold, on the lineal dimensions of the slides, which amazed the reporter. When he asked how we were going to overcome the difficulty I replied that we had already tunneled through by the use of steam pipes and that we were freezing the inside by the use of pipes through which ammonia was circulated. After I had left, a friend of mine told the reporter not to publish this story. He, however, felt abused and published a story which I had given him confidentially regarding the deputy sheriff who was managing a dance hall in a railway construction town, as a result of which my trip back to the mountains through this town was not any too safe.



Tunneling Through a Snow Slide

When I saw the enclosed photographs which were handed to me by the chief engineer of a small western railway, the above incident was recalled very vividly to my mind.

The photograph at the left, taken on June 14, 1916, shows a snow slide on the track between 40 and 50 ft. high. It was assumed that by cutting a small hole through this slide, the air currents passing through would melt the snow, but instead of this, the evaporation inside caused freezing, and the surface was simply glazed over. The small opening was then enlarged to the size of a real tunnel without supports of any kind as shown in the photograph in the middle which was taken on June 25, 1916. After the tunnel was cut through, no further work in the way of snow shovelling was done. The snow simply melted away from the surface without requiring any work of any kind to be done on the tunnel. The photograph at the right was taken on July 12, 1916, and shows some of the roof still remaining over the tunnel.

A Dreamer.

RELATIONS BETWEEN CAPITAL AND LABOR

Iowa City, Iowa.

To the Editor of the Railway Age Gazette:

Both capital and labor are interested in the successful prosecution of any enterprise in which both are engaged, and if each can be made to see the other's interest, it ought to be possible (I had almost said, comparatively easy) to so apportion the earnings that both will be justly dealt with and will be satisfied. Would it not be possible to determine in a given case about what the real relative interests of labor and capital are, and then to distribute the earnings in accordance with these interests?

Only a few years ago the total sum paid in wages and salaries by American railroads, capitalized at 6½ per cent, just about equaled the total paper capital apparently invested in the railroads. At the time in question stocks were receiving an average dividend of between 4 and 5 per cent, while stocks of those roads that were paying dividends averaged a little over 7 per cent. Paper capital was undoubtedly too large in some cases, and possibly in other cases it was less than a fair modern valuation would warrant. If, therefore, it may be assumed that the total amount of capital was not far from what it should be, it would be recognized that as an average it was not receiving as large returns as it should; that if on the average it had received 6½ per cent, perhaps no one could complain; this would make the interests of capital and labor at that time practically the same.

Assuming then, for the purpose of illustration, that capital and labor are equally interested in the success of a railroad enterprise, but recognizing that the capital owns the property and, therefore, should have the major voice in its operation, might it not be possible to deduct taxes and expenses other than the cost of service from the gross earnings, and, after setting aside a proper surplus if needed, to divide the remainder into two equal portions, one of which should be distributed to labor and the other to capital. The portion going to capital would again be divided into two parts, one to pay interest on debt and the other to pay return on evidence of ownership. The portion going to labor would perhaps be more difficult to divide, and moreover labor must have had a portion of its assignment paid from week to week or month to month through the fiscal period because frequent payments to labor are necessary to enable the laborer to live. In order, then, to distribute this portion of earnings that goes to labor, let it be determined by a board of arbitration or a commission that a certain class of labor should be assigned a minimum wage per hour; that to each other class of labor should be assigned an agreed multiple of the first, or base, class as its minimum hourly rate. Throughout the year employees will receive their respective minimums, which must aggregate for the year somewhat less than the fairly, surely to be expected share of earnings that is to go to labor, and at the end of the year the balance that has not been paid should be distributed to employees in proportion to their several hourly rates. It is quite possible that there should be more than one rate to be paid in any particularly service in order to encourage efficiency, although the mere fact that total earnings of individuals are to depend upon the earnings of the road would tend to produce the utmost efficiency of which the various employees are capable. The superior officers would, of course, have to have power of promotion and dismissal, and an arrangement would have to be made to cover payments to those who serve only part of a fiscal period.

It would seem to be wise even that labor should be represented on the board of directors, if for no other reason than that greater confidence would be likely to be felt by labor in the fairness of the management. In the case of railroads perhaps it would not be amiss to have one director to represent each of the three great divisions of labor, namely: maintenance of plant, engine and train service, and the commercial or station and other office service connected with the business of operation as distinguished from the physics of operation.

Perhaps I am oversanguine, but I do not see any insurmountable difficulty in putting this plan into effect, although it would be by no means easy. The question that does occur to me is as to the psychology of the matter; whether or not if fairly undertaken under a well-thought-out plan, this method of dealing with capital and labor would do what it seems to me it would do, namely: Forever prevent such disgraceful contests as we have recently witnessed. It is possible that labor unions would still exist, but rather for settling the questions among themselves than those between labor and capital. The Brotherhood of Locomotive Engineers might have some quarrel with the other trainmen as to the proper multiples to attach to their respective services, and the entire service force might some time have a quarrel with capital as to their relative interests and the fair division of earnings, but we would never see one group quarreling with capital; it would require the united action of all groups to raise the question here, and it would be settled by a commission.

Labor leaders, I fancy, would not favor such a scheme as this, because, if I mistake not, their business would largely disappear if it were adopted. Moreover the brotherhoods would, for purely selfish reasons, hesitate to give up the rights and privileges they have acquired and the degree of control they now exercise. On the other hand capital may not favor such a plan as this because it will wish to reserve the right to manage in its own way all business that it creates and presumably owns. But, with respect to public utility capital, it may be said that it is not an entirely free agent. It is already under control with respect to rates that it may charge, and apparently is not to be allowed to make its own arrangements with labor. Much regulation that has been had has been burdensome rather than helpful, and it seems to be quite possible that, unless some fairly permanent equitable arrangement of the relations of labor and capital can be developed and put into practice, regulation may become more burdensome and finally result in complete public control, because it seems to be fair, and perhaps even trite, to say that only as capital and labor work together harmoniously will the service be satisfactory to the people served. If some such plan as is here suggested should become general, would it not follow that public regulation would be likely to be more carefully studied?

It may be urged that the unproductive property or failing venture is not provided for in the foregoing. There are some but very few such failing ventures among railroad properties now, if those that are such from unwise or wicked manipulation are excluded from consideration. It is not forgotten that there have been such failing ventures in the past, however. In the failing venture labor must of course be given the first claim on earnings, and will get its minimum rate if that is earned.

The relations of labor and capital are in an evolutionary period. May it not be that some such suggestion as is here made is pertinent, or will it require a millenium to secure what would seem to be such a just and friendly attitude between the two great forces engaged in public service?

Wm. G. Raymond,
Dean, College of Applied Science, University of Iowa.

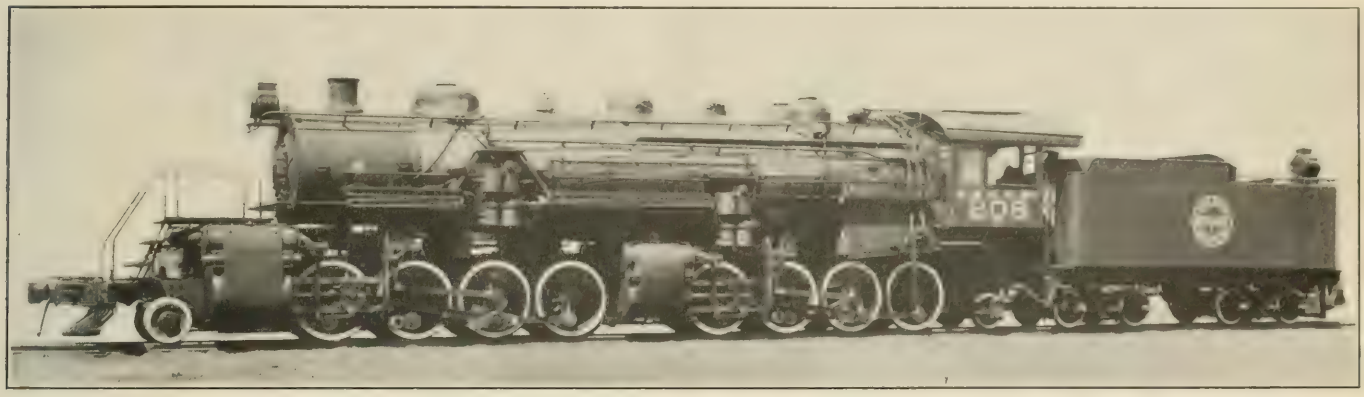
Swiss Railway Surtax.—A surtax has been imposed by the Swiss railways upon passenger, freight, and express traffic since October 1, 1916. Railway tickets from 50 centimes ($0.0965) to 95 centimes ($0.1833) pay 5 centimes ($0.00965) additional; those of 1 franc ($0.193) and over pay 10 centimes ($0.0193). Baggage and express charges pay 10 centimes surtax and freight 1 centime per 100 kilos (220 pounds), with a minimum of 10 centimes.—*Commerce Report.*

Heavy Freight Locomotives for the D. M. & N.

Mallet and 2-10-2 Types In Ore Service; Mallets Handle the Empty Cars Up a 2.2 Per Cent Grade

IN 1910, the Baldwin Locomotive Works built eight Mallet locomotives of the 2-8-8-2 type for the Duluth, Missabe & Northern, which have been in service between the ore docks at Duluth and the yards at Proctor, Minn., handling empty ore cars up a grade of 2.2 per cent, and bringing loaded cars down the hill. They exert a tractive effort of 91,000 lb., working compound.

This road has recently received from the same builders, two additional Mallet locomotives developing the same tractive effort as the earlier engines, for use in the same service, and six locomotives of the 2-10-2 type, for road service between the mines and Proctor. These locomotives are all suitable for heavy work at comparatively slow speed. Conditions on this road limit the weight per axle to approximately 55,000 lb., and while the locomotives are not the largest of their respective types which have been built, they constitute a notable group of heavy power of modern design.

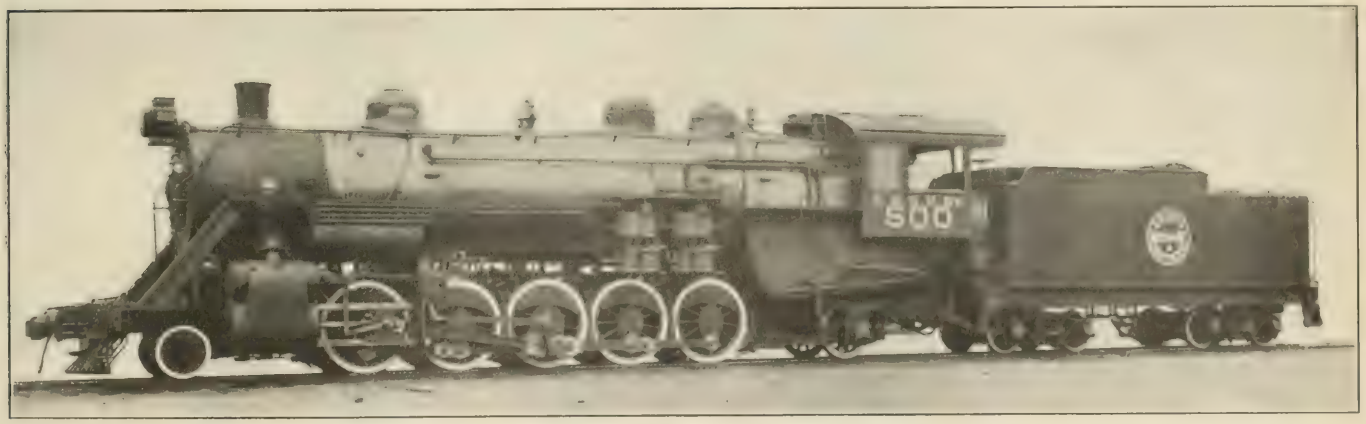


D. M. & N. Mallet Locomotives with a Tractive Effort of 91,000 Lb.

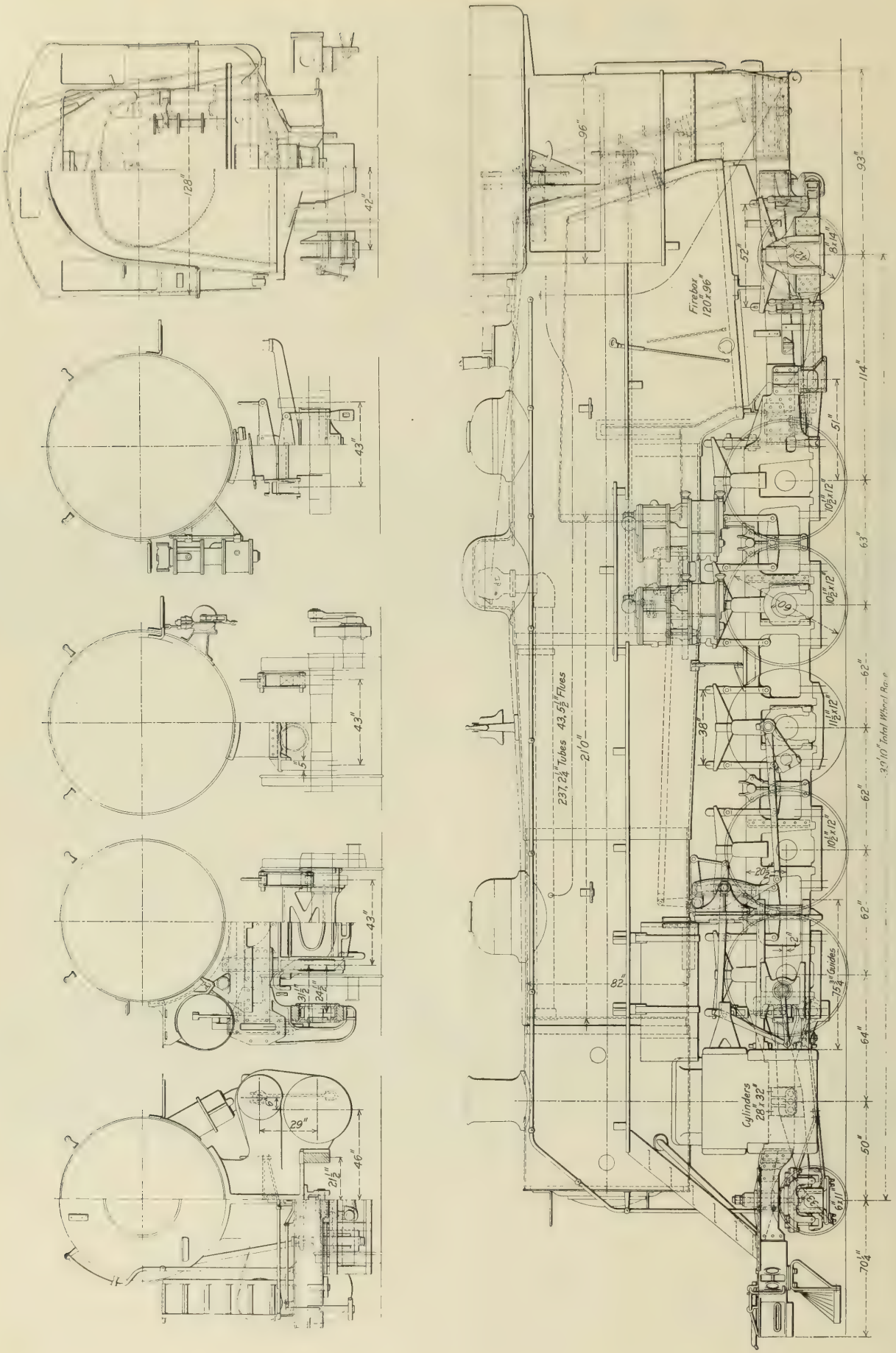
The Mallet locomotives have the same size cylinders and driving wheels as the locomotives built in 1910, but as marked improvements have been made in locomotive construction during recent years, the details and equipment have been thoroughly revised. The original locomotives used saturated steam and were hand fired, while the new locomotives are equipped with Schmidt superheaters and Street mechanical stokers. The furnace is built with a combustion chamber, extending forward into the boiler barrel, and it contains a sectional arch which is supported on five water-tubes. The second ring in the boiler barrel is conical, increasing the shell diameter from 86 in. to 96⅛ in. The tubes have a length of 24 ft. Further details of the boiler construction include longitudinal seams which are welded at the ends and have a strength equal to 90 per cent of the solid plate, and three rows of Baldwin expansion stays over the front of the combustion chamber crown. The superheater flues are welded into the back tube-sheet. The fire-door and grate shaking rigging are both power-operated.

The steam distribution to all the cylinders is controlled by 15-inch piston valves, arranged for inside admission. The valves are driven by Walschaert motion which is controlled by the Ragonnet power reverse gear. The pistons are steel castings of dished section, with bull rings and packing rings of Hunt-Spiller metal. This material is also used for the cylinder and steam chest bushings and the valve packing rings. The piston rods are of vanadium steel.

A flexible arrangement of articulated frame connection is used. The rear end of the front frames is braced by a large steel casting, which serves as a fulcrum for the driver brakes, and supports a long transverse pin. To this pin the forward end of the radius bar is attached. The hinge-pin is fitted into a spherical bushing which is inserted into the back end of the radius-bar. The front and rear frames are not interlocked in any way, so that they are free to move relatively



D. M. & N. 2-10-2 Type Locomotive



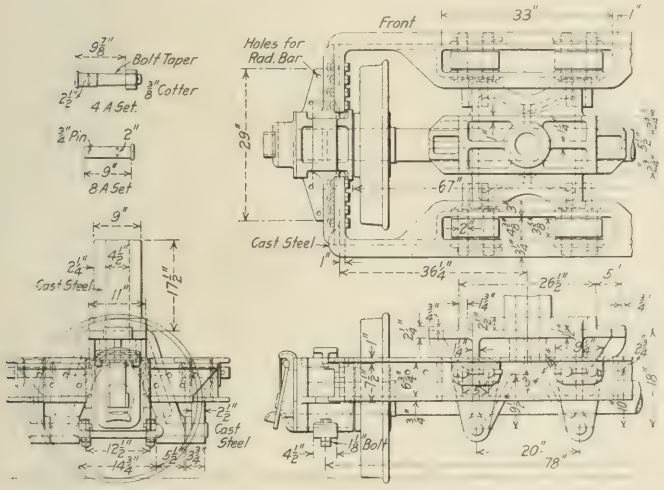
Elevation and Cross Sections of the D. M. & N. 2-10-2 Type

both horizontally and vertically. Both the waist bearers on the front frames are normally under load.

The trailing truck is designed with outside journals and has a rectangular frame composed of two transverse steel castings which are bolted directly to the journal boxes. The bolster is hung from this frame on three-point suspension links, and the back foot-plate acts as a guide for the bolster center pin. The truck springs are of the half-elliptic type, and are seated directly on the bolster and are equalized with the driving-wheels. The rear spring links are pinned to the foot-plate casting, while the front spring links are pinned to the equalizing beams. The truck frame is bolted to a radius bar, and is allowed a swing of 4 in. on each side of the center line.

The 2-10-2 is a new type on this road, and represents an increase of approximately 50 per cent in hauling capacity as compared with the Consolidation type locomotives formerly used for the heaviest road hauling. The 2-10-2 locomotives, with a tractive effort of 65,800 lb. and a weight on driving-wheels of 276,600 lb., have a ratio of adhesion of 4.2, which is liberal for a large freight locomotive. Approximately 80 per cent of the total weight is carried on the driving-wheels.

The firebox has a throat 22 in. deep, and is placed back of



Trailer Truck for the Mallet Engines

the driving-wheels and over the rear truck. The design incorporates a combustion chamber 48 in. long, and tubes 21 ft. in length. The boiler barrel is composed of three long rings, the second of which is conical. The longitudinal seams are all placed on the top center line; on the third ring, which carries the dome, the seam is welded full length on either side of the dome opening, while on the first and second rings the seams are welded for 12 in. at each end. These seams have a strength equal to 90 per cent of the solid plate. A triple riveted seam connects the third ring with the roof and throat sheets.

As in the case of the Mallet locomotives, these engines are equipped with Schmidt superheaters, Street stokers, fire-brick arches, and power operated fire-doors and grate-shakers.

The machinery details are generally similar to those of the Mallets. The cross-head link in the 2-10-2 design, is pinned directly to the crosshead wrist-pin. This arrangement, provided there is room for a sufficiently long combination lever, is desirable as it simplifies construction and saves weight.

A system of cross-equalization which has been applied by the builders to a large number of trailing truck locomotives, is used on these engines. This arrangement consists of two transverse beams placed one above the other, the upper beam being suspended from the rear driving springs, and the lower one being connected, by suitable links, with the back equalizers. The transverse beams are connected by a central, vertical link. This plan of cross-equalization prevents any transverse rocking action of the driving springs from being transmitted to the truck springs, or vice versa. The truck is of the Hodges type.

The tenders of both types of locomotives are carried on arch-bar trucks, and have 13-in. steel channel frames. As the Mallets are used on short runs, their tenders are of less capacity than those of the road engines.

The principal dimensions of both types are given in the following table:

General Data

	Mallet Type	2-10-2 Type
Gage	4 ft. 8½ in.	4 ft. 8½ in.
Service	Freight	Freight
Fuel	Soft coal	Soft coal
Tractive effort	91,000 lb.	65,800 lb.
Weight in working order	470,200 lb.	346,600 lb.
Weight on drivers	415,200 lb.	276,600 lb.
Weight on leading truck	28,300 lb.	23,900 lb.
Weight on trailing truck	26,700 lb.	46,100 lb.
Weight of engine and tender in working order	647,000 lb.	537,000 lb.
Wheel base, driving	40 ft. 3 in.	20 ft. 10 in.
Wheel base, total	55 ft. 9 in.	39 ft. 10 in.
Wheel base, engine and tender	83 ft. 6½ in.	72 ft. 6¾ in.

Ratios

Weight on drivers ÷ tractive effort	4.6	4.2
Total weight ÷ tractive effort	5.2	5.3
Tractive effort × diam. drivers ÷ equivalent heating surface*	722.8	628.0
Equivalent heating surface* ÷ grate area	85.4	78.5
Firebox heating surface† ÷ equivalent heating surface, per cent	5.3	5.9
Weight on drivers ÷ equivalent heating surface*	57.9	44.1
Total weight ÷ equivalent heating surface*	65.5	55.2
Volume both cylinders	27.7 cu. ft.‡	22.8 cu. ft.
Equivalent heating surface* ÷ vol. cylinders	259.1	275.4
Grate area ÷ vol. cylinders	3.0	3.5

Cylinders

Kind	Compound	Simple
Diameter and stroke	26 in. and 40 in. by 32 in.	28 in. by 32 in.

Valves

Kind	Piston	Piston
Diameter	15 in.	14 in.

Wheels

Driving, diameter over tires	57 in.	60 in.
Driving, thickness of tires	3½ in.	3½ in.
Driving journals, main, diameter and length	11 in. by 12 in.	11½ in. by 12 in.
Driving journals, others, diameter and length	10½ in. by 12 in.	10½ in. by 12 in.
Engine truck wheels, diameter	30 in.	33 in.
Engine truck, journals	6 in. by 11 in.	6 in. by 11 in.
Trailing truck wheels, diameter	30 in.	42 in.
Trailing truck, journals	6 in. by 11 in.	8 in. by 14 in.

Boiler

Style	Conical	Conical
Working pressure	200 lb. per sq. in.	185 lb. per sq. in.
Outside diameter of first ring	86 in.	82 in.
Firebox, length and width	126 in. by 96 in.	120 in. by 96 in.
Firebox plates, thickness	Sides, back and crown, 5/16 in.; tube, ½ in.	Sides, back and crown, 7/16 in.; tube, ½ in.
Firebox, water space	Front, 6 in.; sides and back, 5 in.	Front, 5 in.; sides and back, 4½ in.
Tubes, number and outside diameter	253—2¼ in.	237—2¼ in.
Flues, number and outside diameter	43—5½ in.	43—5½ in.
Tubes and flues, length	24 ft.	21 ft.
Heating surface, tubes and flues	5,045 sq. ft.	4,215 sq. ft.
Heating surface, combustion chamber	108 sq. ft.	90 sq. ft.
Heating surface, firebox§	271 sq. ft.	283 sq. ft.
Heating surface, total	5,424 sq. ft.	4,588 sq. ft.
Superheater heating surface	1,168 sq. ft.	1,128 sq. ft.
Equivalent heating surface*	7,176 sq. ft.	6,280 sq. ft.
Grate area	84 sq. ft.	80 sq. ft.

Tender

Tank	Water bottom	Water bottom
Weight	176,800 lb.	190,400 lb.
Wheels, diameter	33 in.	33 in.
Journals, diameter and length	6 in. by 11 in.	6 in. by 11 in.
Water capacity	9,000 gal.	10,000 gal.
Coal capacity	16 tons	18 tons

* Equivalent heating surface = total evaporative heating surface + 1.5 times the superheating surface.

† Including arch tubes and combustion chamber.

‡ Volume of equivalent simple cylinders.

§ Including arch tubes.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., December 20, 1916.

EXTENSION OF TIME ASKED FOR NEWLANDS COMMITTEE INQUIRY

Representative W. C. Adamson, vice-chairman of the Joint Committee on Interstate Commerce, introduced a resolution in the House on Saturday providing for an extension from January 8, 1917, until January 1, 1918, of the time within which the committee is required to present its report to Congress as a result of its inquiry into the subject of railroad regulation. The resolution also provides for an increase in the appropriation for the expenses of the committee from $24,000 to $40,000 and for the retention as a member of the committee of Representative Cullop of Indiana, whose term in Congress expires on March 4. This course was decided upon at a meeting of the committee on December 15, because it was considered impracticable to attempt to hold further hearings at this time and because the committee has not yet proceeded far enough with its inquiry to present even a tentative report.

The necessity for asking an extension of time will give an opportunity for members of Congress who are opposed to curtailing the powers of the states to make a fight against the continuance of the investigation. Representative Rayburn of Texas attacked it in the House on Monday, saying it has amounted to nothing "except to stay all railroad legislation in the House," and he called upon all friends of railroad regulation and of state commissions to join him when the resolution for an extension of time comes up in "smothering this chloroform resolution." On Tuesday he prevented its being considered by unanimous consent, and Mr. Adamson introduced a special rule for its consideration.

In announcing the plan for an extension, Senator Newlands, chairman of the joint committee and of the Senate Committee on Interstate Commerce, said that Congress should act as soon as possible on the proposed legislation recommended by the President, providing for the reorganization of the Interstate Commerce Commission, empowering the President to take over the railroads and telephone and telegraph lines for military purposes and to make railroad strikes unlawful pending investigation. "Congress should not permit the continuance of present conditions of the law under which there can be at any time an absolute paralysis of transportation throughout the country," he said. "The subject, in my opinion, is so important as to warrant an extra session if Congress does not have time to act."

HEARINGS ON LABOR LEGISLATION

A meeting of the Senate Committee on Interstate Commerce was held on December 14 to consider plans for railroad legislation, at which Senator Newlands presented two tentative measures regarding railway wage disputes and the taking over of railroads in case of military necessity, which, he said, had been prepared by the collaboration of himself and several members of the committee and representatives of the department of justice as covering substantially the recommendations in the President's message. He stated that he wished to receive the suggestions of the committee before these measures were shaped for introduction in the Senate and urged immediate action. The committee concluded before acting in the matter to have hearings beginning on January 2, to allow the three parties in interest, the railway employees, the railway executives and the general public, to be heard.

The first of these tentative bills provides that "in case of actual or threatened war, insurrection or invasion, or any emergency requiring the transportation of troops, military equipment and supplies," the President, when in his judgment the public safety may require, is authorized to take possession in whole or in part of telephone and telegraph lines or railroads with their equipment, to prescribe regulations for their operation and to draft into the military service of the United States all officers and employees. It is also provided that the damages suffered or the compensation to which the companies may be entitled shall be determined by the Interstate Commerce Commission.

The second proposed bill is an amendment to the Newlands arbitration act, and provides that whenever a controversy regarding hours, wages or conditions of employment cannot be settled through mediation and conciliation or by arbitration, the President shall appoint a board of inquiry of three persons, to which the controversy shall be immediately referred and which shall submit a report within three months with its recommendations. A strike or a lockout would be prohibited during the period of investigation and for 30 days thereafter. Senator Newlands in his statement declared that the term "compulsory arbitration," as applied to the provisions of this bill, is a misnomer.

Senator Newlands' suggestion that an extra session be held, if necessary, was immediately opposed by Mr. Adamson and by Representative Kitchin, majority leader of the House, both of whom objected to the idea of a "railroad session" and insisted that any necessary legislation could be passed during regular session. President Wilson has told newspaper correspondents that he has received assurances that his recommendations will be enacted. It is reported, however, that several Republican senators have turned deaf ears to overtures by the President for support for his labor program, and have even declined to go to the White House to confer with him about it. There is a disposition in Congress to go slow before seriously considering the President's recommendations in the hope that something may come of the informal negotiations which have been held between the representatives of the brotherhoods and of the railroads, so that Congress may not have to take further action. The brotherhood leaders have evidently given up much of any confidence they may have had in the Adamson law, and would be very glad to reach an agreement with the railroads which would obviate the necessity for a compulsory investigation act, to which they are very much opposed. They would like, however, to have the railroads agree to a "compromise" which would give them practically what the Adamson law was supposed to give them before agreeing to any plan for permanent settlement of wage controversies in the future through the medium of a commission.

CHAMBER OF COMMERCE REFERENDUM

The committee on railroads of the Chamber of Commerce of the United States has issued a report presenting suggestions for a referendum vote of the commercial organizations of the country and declaring that the operation of the railways must not be interrupted either by the railroads or by the employees until after an investigation. Through this referendum the members of the chamber are given an opportunity to express their approval of three separate recommendations that existing laws shall be so amended or supplemented as to:

(a) Require full public investigation of the merits of every dispute between railroad carriers of interstate commerce and their employees, to be instituted and completed before any steps tending to the interruption of transportation shall be attempted.

(b) P rovide that, upon any beard of investigation of arbitration of disputes between railroad carriers of interstate commerce and their employees, the employers and employees shall have equal representation and the public, as having paramount interest, shall have a majority representation.

(c) Establish a separate, permanent division of the statistical department of the Interstate Commerce Commission, the functions of which shall be to make a continuous study of all questions relating to wages and conditions of service upon railroad carriers of interstate commerce and to

compile statistics which, together with the records and services of such division, shall be immediately available to any and all boards of investigation or arbitration created to consider disputes between such carriers and their employees.

The committee on railroads of the chamber as at present constituted is headed by C. F. Weed, president of the Boston Chamber of Commerce; Harry A. Wheeler, vice-president, Union Trust Company, Chicago; E. T. Meredith, publisher of "Successful Farming," Des Moines, Ia.; R. H. Downing, president, National Lumber Manufacturers' Association, New Orleans, La.; A. W. Smith, attorney, Atlanta, Ga.; G. W. Simmons, Simmons Hardware Company, St. Louis, Mo.; George A. Post, president Railway Business Association, New York; Edward P. Smith, attorney, Omaha, Neb.; W. Z. Ripley, professor of political economy, Harvard University, Cambridge, Mass.; Judge Frank C. Dillard, of Sherman, Tex.; Bishop Thomas F. Gailor, chancellor of the University of the South, Memphis, Tenn.; Dr. Emory R. Johnson, professor of transportation and commerce, University of Pennsylvania, and Dr. Charles R. Van Hise, president, University of Wisconsin.

The result of the voting will be known the last week in January.

SIGNALS IN NEW SOUTH WALES

The following is a summary of signaling apparatus in use on the New South Wales Government Railways, as given in a paper by C. B. Byles, signal engineer of the Government Railways, read before the Electrical Association of Australia Sydney, August 4, 1916:

1. *Block Telegraph Apparatus.* — Double-track, 483 miles, 203 sections. The apparatus is as follows:—74 sections worked by Preece's 2-position semaphore block instruments; 22 sections worked by 3-wire 3-position needle instruments employing constant current; 84 sections worked by Tyer's 1-wire 3-position instruments employing current intermittently at the moment of operation; 23 sections worked by the improved form of 2-wire block instrument.

In the new form of block instrument, the indications can be given only by means of the joint action of the signalmen at either end of the section. Means are also provided whereby, unless the instrument is showing "line clear," the signal for entering the section cannot be lowered. The use of these instruments is being rapidly extended.

Nil sections worked by means of lock and block instruments.

2. *Track Block [automatic] Installations.*—There are 80 miles of double line worked by means of the track block system, divided as follows:—26 sections worked by track block in conjunction with interlocking installations; 79 sections worked by track block entirely automatically.

3. *Train Stops and Cab Signals.*—These are not yet employed but the Chief Commissioner is arranging to test a set of apparatus on the principle adopted by the Great Western Railway of England. By this apparatus, the signal is repeated audibly and visually within the cab of the engine, and as the engine passes each signal the driver is required to acknowledge the fact that a signal has been given. Should the signal be set against the train, a partial application of the Westinghouse brake is made automatically. Automatic train stops will, it is anticipated, be installed throughout on the proposed city railways.

4. *Train Speed Control System.*—The use of a system of this description is contemplated in connection with the proposed city railways.

5. *Single Track Lines.*—There are 1,460 miles of single line operated by means of the electric staff or tablet system, divided as follows:—72 sections upon which the electric staff instrument is employed; 66 sections upon which the electric tablet system is employed; 43 sections upon which automatic staff working is in operation, whereby the staff can be worked by the trainmen without the employment of signalmen.

6. *Outlying Sidings.*—A special form of staff and tablet apparatus, enabling a train carrying the staff to be placed clear of the main line at some intermediate point, and to restore the instruments at either end to their normal position, is in use at one place.

7. *Auxiliary Apparatus.*—Short sections of track circuit within station limits, by means of which indicators are worked for the information of the signalman—24 cases.

Short sections of track circuit employed for the purpose of controlling signals, as, for example, at the "entrance" to terminal stations [electric slot]—four cases.

Short sections of track circuit for the purpose of holding the switch points during the passage of the train, chiefly in cases where the points are a considerable distance from the signal-box and are not readily seen—ten cases.

Track circuits for the protection of single-line crossing loops, so as to prevent the signal for entering the crossing loop being cleared, unless the line upon which it is to travel is actually clear—four cases (complete crossing loop installations).

8. *Crossing Bells.*—Bells, operated by means of track circuit or treadles, so that the approach of trains at level crossings may be known—six cases.

9. *Interlocking; Power Operation of Signals and Manual Operation of Switches.*—Electro pneumatic, eight plants, aggregate of 384 levers; all electric, d. c. 48 levers; all electric a. c. (two plants) 100 levers.

10 *Power Operation of Switches, Levers and Signals.*—

*Sydney Station Yard West Box	204	Electro-Pneumatic	
Sydney Station Yard East Box	119	"	"
Sydney Tunnel Signal Box....	59	"	"
Illawarra Jcn. Signal Box.....	131	"	"
Flemington Goods Junction...	88	All-Electric	

11. *Electric locks on switches manually operated; 26 places, 270 switches.*

12. *Signal Repeaters for indicating the position of the signal-arm to the signalman, and, in some cases, for indicating whether the light is in or out; approximate,* 700.

13. *Releasing apparatus for controlling distant switches from a signal-box—seven cases.*

14. *Communication; Morse Instruments,* 240; *telephones,* 2,600.

Extensive new installations of automatic block signals are now under construction.

CHANGES ROUTE OF CHINESE RAILROAD.—According to press despatches work will begin at once upon the railway which the American International Corporation is to finance in Hunan and Kwangsi provinces. Through an agreement between the Chinese government and the American contractors a route originally agreed upon for this line is to be somewhat modified. The railway will start from Chuchow, in Hunan province. Chuchow is the southern terminus of a railway which now extends south from Chang-sha, the capital of Hunan province. The line to be built by Americans will extend south, through Hengchowfu, and from that point will run southwest to Kweilin, then southwest to Nanning, on the West river. A spur of the railroad will extend to Yanchow, in Kwangtung province, a port of considerable commercial importance on the Gulf of Tongking. The extension of this railway to the sea makes it of far greater importance than the original line, which was to have Nanning as its terminus, as it will form a link in an all rail route from Peking directly south to the sea by way of Hankow.

*Note.—In all cases (except Sydney west box) in which power is employed for the operation of points or signals at interlockings, the various forms of protection by means of track circuit are given throughout, and such cases are, therefore, not included separately in paragraph 7.

SHORT LINE RAILROAD ASSOCIATION OF THE SOUTH

The annual convention of the Short Line Railroad Association of the South was held at the New Willard Hotel, Washington, D. C., on December 13 and 14. President Bird M. Robinson, president of the Tennessee Railway, Oneida, Tenn., presided.

In his address Mr. Robinson referred to the inquiry into the subjects of railroad regulation and control recently begun by the Congressional Joint Committee on Interstate Commerce, and urged the importance of preparation on the part of the short lines for presenting to the committee the conditions affecting the short lines and for co-operating with the trunk lines in the presentation of the general railroad case to the committee. Mr. Robinson said it is especially unfortunate that a majority of the short lines in the past have failed to co-operate for their own protection; because they comprise more than 40,000 miles of railroad, about one-seventh of the total railway mileage of the country, and because their officers and employees are closer to the people than those of the larger lines. He said that railroads recognize the necessity for regulation, and that they have in good faith accepted regulation as a principle, but their acceptance and approval goes to safe and sane regulation, not to regulation gone mad; and that they oppose the unreasonable kinds of regulation proposed and pressed for the punishment of railroads by politicians and others trying to break into office.

He pointed out that the question of railroad regulation is likely to occupy a very prominent place in public discussion in the near future, and that an unusual opportunity is presented to the railroads to show the public the effects of the defects in the present system of regulation, which has brought railroad construction nearly to a stand-still, and is making it difficult to raise new capital for existing railroads. He referred to the recommendation of the attorney general in his report to Congress for 1916, urging an amendment of the commerce law to prohibit a railroad from transporting in interstate commerce articles which it has manufactured or produced, or which were manufactured or produced by any corporation controlled by or affiliated with it. If this recommendation is adopted, Mr. Robinson said, it will be most effective in stopping the construction of short line railroads, and thereby deprive undeveloped sections of the country of their last hope of obtaining railroad facilities, besides bankrupting many such lines now in existence. He concluded with a recommendation that the members of the association "start without delay an open, frank business campaign, through personal appeal, through the press and on the platform, to show the public that we are carrying the burden, and 'that the beam is in the other eye.' "

The meeting of the association was devoted to a general informal discussion of the particular problems of the short line railroads. At the first day's meeting a committee of five was appointed to call on the second assistant postmaster general to urge relief for some of the short lines that were very seriously affected by the recent readjustment of railway mail pay. The committee was asked to file a brief with the department, setting forth in detail the conditions complained of, and the committee was continued with instructions to carry on the negotiations with the department. In the discussion it was stated that some of the short lines do not receive as much pay for the handling of mails as do the rural free delivery carriers for considerably less service. Another committee was appointed to confer with the commission on car service of the American Railway Association to point out that the short lines would be adversely affected by the increase in the per diem rate from 45 cents to 75 cents a day, which went into effect on December 15. It was arranged that the committee should prepare a more detailed presentation of their case for consideration by the American Railway Association. A committee of three was appointed to make an investigation of the Edison storage battery motor car. It was decided to maintain a permanent office of the association in Washington. It was also decided to appoint a committee on publicity.

The annual dinner of the association was held on the evening of December 13, and addresses were made by Representative William C. Adamson, chairman of the House Committee on Interstate and Foreign Commerce; Senator Hardwick, of Georgia, and Representative R. W. Austin, of Tennessee, who expressed appreciation of some of the conditions which are burdening the short line railroads, and urged the association to present its case before the Newlands committee.

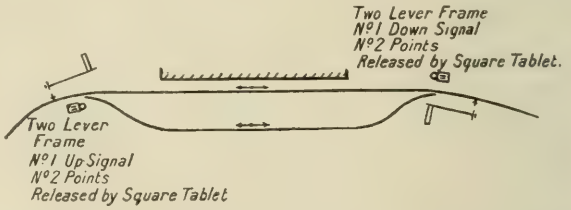
At the meeting on December 14 a committee of five was appointed to represent the association before the Newlands committee.

The officers were re-elected as follows: President, Bird M. Robinson; vice-president, B. S. Barker, vice-president Gainesville & North Western, Gainesville, Ga.; secretary-treasurer, T. F. Whittelsey, general manager Tennessee Railway, Oneida, Tenn.

A TABLET STATION WITHOUT ATTENDANCE

The drawing shown herewith, taken from a paper read recently before the Institution of Railway Signal Engineers, London, by A. C. Rose, shows the signaling at a passing loop (on the mountain section of a railroad, single track, operated by the tablet system) which is designed to permit the exchange of tablets between opposing trains without the intervention of a station attendant; this for the reason that only rarely do trains meet at this place. The paper, as reported, does not give the name of the place or country in which this railway is found but apparently it is India or Ceylon.

The siding in question is at or near the middle of a block section about 20 miles long. At either end of this section there is the regular tablet instrument and also an auxiliary instrument to provide for meeting at the midway point. This auxiliary instrument contains one square tablet; and it is interlocked with the other instrument, containing round tablets, so that a round and a square tablet cannot be taken



out together. At the midway siding, the eastbound and the westbound signals are interlocked with each other, so that only one of them can be cleared at the same time. Each signal is worked from a two-lever frame and the lever which opens the switch must be released by the square tablet.

A train which has nothing to meet at the midway station carries a round tablet; but it must be stopped at the siding while a trainman goes forward and clears the signal. The square tablet, given to trains which are to meet, confers right only to the siding. The train which arrives first enters the siding; then the switch is set straight and the tablet removed. When the other train arrives, it passes through on the main track and exchanges tablets with the train which stands on the siding. This train then, with the tablet which it has just received, unlocks the switch ahead of it, and moves along to the main track; the switch is set straight, the tablet is withdrawn, and the train proceeds on its journey.

ILLINOIS CENTRAL PRESENTS NEW TERMINAL PLANS

On Thursday, December 14, the Illinois Central submitted a tentative draft of an ordinance for consideration by the city council of Chicago covering a mutual agreement involving the railroad, the city and the Chicago South Park Commission and covering terminal improvements, park developments and plans for a municipal harbor. The passage of this ordinance and its ratification by the railroad and the South Park Commission would bring to a successful conclusion a movement on foot for a number of years for the filling and improvement of the submerged shore land of Lake Michigan for the distance of five miles between Twelfth street and Fifty-first street, where the Illinois Central occupies the shore line.

The plan includes a complete new passenger terminal to replace the existing Illinois Central station at Twelfth street and the electrification of the suburban service on its main line. South Chicago, Blue Island, and Kensington and Eastern branches involving a total of about 40 miles of line. It will involve the expenditure of $25,000,000 not including the cost of depressing the tracks for a distance of nearly three miles, nor the value of the land together with the improvements thereon which the railroad company gives to the public as a part of the agreement.

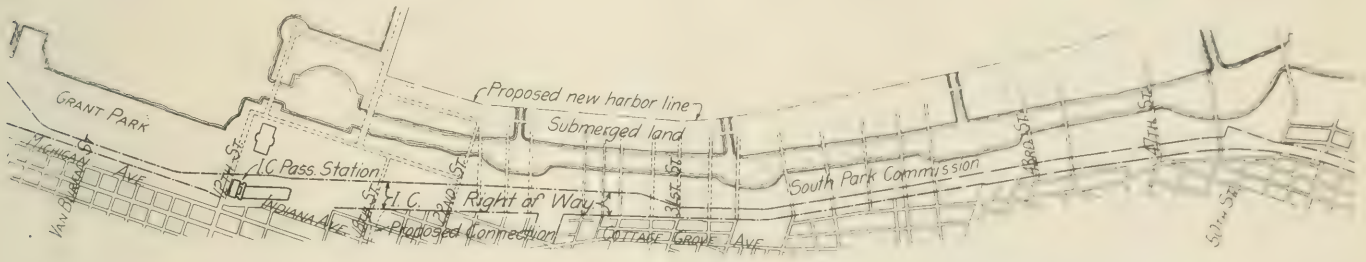
The Illinois Central was the owner of the riparian rights of this length of lake shore since it received the franchise for the construction of the line in 1852. The water is relatively shallow for some distance out into the lake for practically the entire distance and the railroad has sought to reclaim some of the submerged lands bordering its right of way, the most important development being the filling in of the lake east of the present station building for a dock and water terminal. This was partly completed, but with a view to co-operating with the public which desired to develop these lands for park purposes in accordance with the ideas of the Chicago Plan Commission, the railroad entered into an agreement with the South Park Commission for the purpose of securing authority from the War Department for a material extension of the harbor line.

Under this agreement the Illinois Central gave up its riparian rights to the South Park Board and, while the land to be secured would be divided between the two, the Park Board was to obtain the outer or larger portion and the railroad company a small addition along the east side of its right of way. As the pier which the Illinois Central was building into the lake lay between the existing Grant Park and the proposed new lake shore park, the ground occupied by it was also given to the Park System. This ground is now the site of the Field Museum, which is in process of construction. The advantage in this agreement lay very largely with the Park System, which in addition to securing the riparian rights for the distance of five miles obtained possession of 1,280 acres of submerged land as compared with 85 acres to be secured by the railroad.

This agreement became effective as between the two parties early in 1912, but they have as yet been unable to enjoy any benefits therefrom because the War Department refused to grant permission for the extension of the harbor line on the ground that the plans accompanying the agreement included no provision for a harbor, throughout the length of the shore line affected, or provision for access to the same by means of street or rail connections that would permit of dock development. Efforts have been under way for a considerable part of the time since the date of this refusal to secure the co-operation of the Chicago city authorities in the incorporation of harbor and dock development plans that would be acceptable to the War Department. It has been impossible up to the present time to obtain any definite progress along this line because of the extravagant demands made by the city in such negotiations.

On September 20, 1916, the Illinois Central presented plans for a new terminal implying the expenditure of a large sum of money and involving the electrification of the suburban traffic in a scheme that permitted of the eventual accommodation in the new passenger terminal of all the railroads now using the La Salle and Dearborn stations as well as the present Illinois Central station. The City Council took no action on this plan and in answer to certain objections then raised the railroad company presented the new plan together with the tentative ordinance which covers all phases of the plan specifically.

The plan presented in September was described in the



Property of Illinois Central and Park Commission in Relation to Proposed Harbor

Railway Age Gazette in the issue of September 22, page 517, and the proposed plan agrees substantially with this insofar as it concerns the track layout, station buildings, etc. As in the former scheme, the railroad is to give up a large portion of the ground occupied by the existing station to permit of the widening and extension of Twelfth street into Grant Park as well as the extension of Indiana Avenue to Twelfth street. The passenger station is to be a building of monumental character, facing on the south side of Twelfth street with separate accommodations for the through and suburban traffic. The latter is to be handled by electric power on four independent tracks with provision for the elimination of all grade crossings between these electrified tracks and the other tracks throughout the entire length of the suburban territory. This in itself involves no small expenditure

An alternative plan is provided whereby the suburban tracks north of Twelfth street would occupy a subway along the east side of Michigan avenue to the suburban terminal at Randolph street. This change in location would afford space for a loop and storage yard at that point which, aside from the more expeditious handling of trains it would afford, would bring all of the passengers several hundred feet closer to their destination in the business center of the city. It has also been suggested that the suburban stations could be equipped with subways passing under Michigan Boulevard and thus avoid the interference with the boulevard traffic which is very heavy at the suburban rush periods.

Another feature of the plan is the use of a portion of the reclaimed land south of Twelfth street for a switching yard to handle interchange business, which would greatly reduce

the number of movements required north of Twelfth street for the service to the Illinois Central freight stations located in the vicinity of Randolph street. As in the previous plan a new connection is proposed between the Illinois Central tracks and those of the other railroads located further west in the city, it being suggested that this connection occupy a right of way in the vicinity of Eighteenth street with provision for not to exceed six tracks. This would give the necessary access to the proposed passenger terminal for other railroads.

The feature of the plan in which the city is vitally interested is in the arrangement for access to the proposed harbor. The tentative ordinance grants the city permanent easements across the Illinois Central right of way and the lands of the South Park system for both streets and railroad tracks. The city is given the right to build a subway extending Eighteenth street under the tracks and to build viaducts for the extension of any street between Twenty-second street and Thirty-first street inclusive except Twenty-sixth street. To give these viaduct crossings advantageous grades, the railroad agrees to depress its tracks within these limits. Under these easements the city may construct and operate street and elevated railroads or grant franchises for the same.

The rail communication comprises the right for the city to build four double-track lines across the park area to connections with the Illinois Central tracks, and for railroad lines crossing over the Illinois Central on viaducts for connection with the property of other railroads to the west. One of these overhead connections may be brought to a junction with the proposed Eighteenth street connecting line to be built by the Illinois Central. In the case of the harbor tracks that are to connect directly with those of the Illinois Central, that railroad agrees to perform all the switching service for interchange with other lines without discrimination, at rates to be established by the Interstate Commerce Commission. The same provision is made for the use of the Eighteenth street line by other railroads for access to the harbor. Under the proposed arrangement the railroad and the park board each is to fill its portion of the submerged land at its own expense. The city will pay for and maintain all structures that are built for street and all rail traffic to the harbor.

An interesting feature of the ordinance is a restriction placed on the railroad against the erection of any building other than switch shanties, interlocking towers, signals, suburban shelters and the like, in the territory between a point 500 ft. north of Twenty-ninth street and the south line of Thirty-first street, as a means to keep out any obstruction to the view of the park from property west of the tracks within these limits. Another requirement is that the Park Board must establish and maintain four bathing beaches on the Lake Shore within the limits affected by the ordinance.

Before the provisions of this ordinance can become effective it must be passed by the City Council and receive the approval of both the park commissioners and the railroad company while the provisions effecting the extension of the harbor line must be granted by the War Department. The fulfillment of the plan will be of great advantage to the general public of the City of Chicago. It will also mean a very large expenditure for the railroad company, very little of which can be reflected in increased earnings.

PROPOSED RUSSIAN RAILROAD.—According to the Statist (London) for September 30, a Russian railroad is projected to extend from Kem on the White sea southeast to connect through Kotlas and Perm with the Siberian railway system. The total distance from Perm to Kola, the Arctic terminus of the new Murman Railroad, would be about 150 miles shorter by the projected route than by the present route via Petrograd. The new railroad will assist the marketing of western Siberian products through Kola.

ANNUAL REPORT OF THE CHIEF INSPECTOR OF LOCOMOTIVE BOILERS

The annual report of Frank McManamy, chief inspector of locomotive boilers, Interstate Commerce Commission, for the fiscal year ended June 30, 1916, has recently been published. During the year the work of this division has been materially changed and increased by the broadening of its scope to include the inspection of the entire locomotive and tender. The inspection rules and instructions concerning the inspection of locomotives and tenders were formulated during the year, and while the enforcement of them required no material change in the form of the organization of the division, it caused a substantial increase in the work of the inspectors, which is reflected by the number of locomotives inspected during the year. Much of the time of the inspectors was taken in what might be termed "educational work," so that the railroad inspectors and officers might have a correct and uniform understanding of the requirements of the law. The present inspectors were examined by the United States Civil Service Commission concerning their qualification and fitness to perform the additional inspections, and all the inspectors employed by the division passed a very creditable examination.

As the work of this division now embraces the entire locomotive and tender, the tabulation of accidents, injuries and defects found is such that no practical basis exists upon which the comparative tables of accidents as shown in former reports can be continued. The following is a summary of the tabulated data contained in the report:

Number of locomotives inspected	52,650
Number found defective	24,685
Percentage found defective	47
Number ordered out of service for repairs	1,943
Number of accidents	537
Number killed	38
Number injured	599

There were 71,527 defects found on the 24,685 defective locomotives. Of this number something over 23,000 defects are those which do not pertain to the boiler and its appurtenances. The following is a tabulation of the more important defects enumerated in the report:

Brake equipment	1,965
Cylinders, saddles or steam chests	5,395
Draw gear	1,562
Lateral motion	728
Rods, main or side, crank pins, or collars	1,176
Springs or spring rigging	1,671
Tanks or tank valves	1,594
Tender trucks	1,295
Wheels	1,407

This gives a clear idea of what the railroads should watch in the maintenance of locomotives and tenders. In this connection the report shows illustrations of locomotives in service with steam leaks which are such that the view of the engineman is almost entirely obscured. Mention is also made of an accident caused by the steam heat hose coupling on the rear end of the tender of the first engine on a double headed passenger train catching in a switch point, derailing the second locomotive and wrecking the train. The steam hose coupling hung too low, and was not hooked up as it should have been. This accident resulted in the death of six persons, serious injury to ten persons, and caused a property damage estimated at $14,565. The speed at which these engines were running was estimated at 40 m. p. h. This accident serves to illustrate the importance of looking after and repairing the small and sometimes apparently unimportant defects before locomotives are allowed to go in service.

Table I shows the number of persons killed and injured by failure of locomotive boilers or their appurtenances during the year ended June 30, 1916, and by failure of any part of locomotives or tenders since the amendment regarding the locomotive and tender inspection became effective, the classification being according to their occupations.

Briefly summarizing the accidents, and the casualties resulting therefrom, caused by the failure of locomotive boilers and their appurtenances only, for the purpose of comparison,

TABLE I.—CASUALTIES CLASSIFIED BY OCCCUPATIONS

	Killed.	Injured.
Members of train crews:		
Engineers	11	205
Firemen	12	225
Brakemen	9	74
Conductors	1	6
Switchmen	..	6
Roundhouse and shop employees:		
Boilermakers	1	11
Machinists	1	11
Foremen	1	3
Inspectors	..	3
Watchmen	..	8
Boiler washers	..	10
Hostlers	..	6
Other roundhouse and shop employees	1	21
Other employees	..	7
Non-employees	1	3
Total	38	599

it shows there were 352 such accidents with 29 killed and 407 injured thereby. This is a decrease over the preceding year in the number of accidents and in the number of casualties, but an increase in the number killed. This increase in the number of fatalities is due almost entirely to one single class of accidents, namely, crown sheet failures due to low water, where contributory causes of neglect were found, and forcibly emphasizes the importance of properly maintaining water gages and boiler feeding appurtenances. The report calls attention to the fact that during the period covered by this report unprecedented traffic conditions existed and every available locomotive was pressed into service, over 6,000 more locomotives being used than in the preceding year.

TABLE II.—ACCIDENTS AND CASUALTIES CLASSIFIED BY PARTS OR APPURTENANCES.

Part or appurtenance which caused accident.	Year ended June 30, 1916. Accidents.	Killed.	Injured.
Air reservoirs	6	..	9
Aprons	2	..	2
Arch tubes	5	1	7
Ashpan blowers	4	1	4
Axles	4	..	4
Blowoff cocks	19	..	20
Boiler checks	8	..	9
Boiler explosions:			
A—Shell explosions	..	..	..
B—Crown sheet; low water; no contributory causes found	23	7	38
C—Crown sheet; low water; contributory causes or defects found	16	13	21
D—Firebox; defective staybolts, crown stays or sheets	1	..	3
E—Firebox; water foaming	1	..	2
Brakes and brake rigging	4	1	6
Couplers	4	..	7
Crank pins, collars, etc	8	..	9
Cross heads and guides	3	..	4
Cylinder cock rigging	1	..	1
Cylinder heads	1	..	1
Dome caps	1	1	..
Draft appliances	1	..	2
Draw gear	22	2	21
Fire doors, levers, etc	2	..	2
Flues	37	..	46
Flue pockets	1	..	2
Footboards	2	..	2
Gage cocks	1	..	1
Grease cups	3	..	3
Grate shakers	23	..	23
Handholds	4	1	3
Headlights and brackets	6	..	7
Injectors and connection (not including injector steam pipes)	27	..	28
Injector steam pipes	11	..	14
Lubricators and connections	13	..	13
Lubricator glasses	11	..	11
Patch bolts	2	..	3
Pistons and piston rods	5	1	4
Plugs (arch tube and washout)	17	2	22
Plugs in firebox sheets	3	..	3
Reversing gear	38	..	38
Rivets	4	..	4
Rods (main and side)	15	1	16
Safety valves	1	..	1
Sanders	1	..	1
Side bearings	1	..	1
Springs and spring rigging	8	2	7
Squirt hose	62	1	61
Staybolts	1	..	1
Steam piping and blowers	16	..	22
Steam valves (inside and outside of cab)	10	1	13
Studs	10	2	8
Superheater tubes	3	..	4
Throttle glands	1	..	1
Throttle leaking	1	..	1
Throttle rigging	5	1	4
Valve gear, eccentrics and rods	7	..	7
Water bars	1	..	1
Water glasses	29	..	29
Water glass fittings	7	..	7
Miscellaneous	14	..	15
Total	537	38	599

Table II is a list of the accidents and casualties resulting from failures of locomotive boilers or their appurtenances during the year ended June 30, 1916, and by failures of any parts of locomotives or tenders since the amendment concerning the inspection of locomotives and tenders became effective, the classification being by parts or appurtenances causing the accidents.

A number of applications for extension of time for the removal of flues was asked for, and of 653 applications 103 were not granted, 79 were given part of the time asked for, 63 extensions were granted after defects disclosed by the government inspectors had been repaired, 43 were withdrawn, and the remaining 365 were granted as requested.

The total number of requests was much less than for the preceding year. The report also states that the roads with but few exceptions are bringing the locomotive boilers up to the required factor of safety in a satisfactory manner, and that all boilers will be brought up to the established standard within the limit of time set by the commission. The report closes by stating: "It is only fair to state that a large majority of the carriers are diligent in their reports to comply with the requirement of the law, and are sincerely cooperating with us with that end in view, and in such cases the beneficial results are particularly noticeable.

"A few carriers have attempted to place the burden of inspecting their locomotives upon us by continuing to use defective equipment until found and ordered out of service by a government inspector, which has resulted, in some instances, in considerable inconvenience to the shippers. While this is to be regretted, and is avoided as far as possible, we cannot permit it to influence our actions where we find evidence of the disposition on the part of railroad officials to use locomotives that are defective and in violation of the law."

THE ROTARY INTERLOCKING BLOCK SYSTEM

This name has been applied to a controlled manual block system of a simplified type which has been introduced recently on many miles of the Midland Railway of England. Following the collisions at Hawes Junction, December 24, 1910, and at Aisgill, September 2, 1913, this company ordered track circuit locks put in for signals at about 900 places, and improved the manual block signal apparatus at about that number of stations. With the arrangement adopted, full provision is made for compelling the signalman at the entrance of a block to secure the consent of the signalman at the outgoing end before clearing a signal, while at the same time the three-position needle block instruments already in use were retained.

The Railway Gazette (London) in connection with a description of the new block signal apparatus prints data, for a period of seven years, ending with 1913, showing the much greater frequency of collisions on lines operated by the simple manual block system than on lines using the controlled manual. Making comparisons on the basis of the number of collisions to the number of train miles to a mile of track, it is found that three prominent roads not using the controlled manual had one collision to 629, 688 and 480, respectively; while on four other lines, using the controlled manual, the proportion was one collision to 1,977, 2,580, 1,822 and 3,541, respectively.

STATE COMMISSIONER FOR FEDERAL REGULATION

A. P. Ramstedt, president of the Idaho Public Utilities Commission, has addressed a letter to Senator Newlands, chairman of the Joint Committee on Interstate Commerce, stating his position as to the questions affecting railway regulation under consideration by the committee. Mr. Ramstedt favors federal regulation of rates, federal incorporation, federal taxation, enlargement of the Interstate Commerce Commission, federal regulation of security issues, and the consolidation of short line roads. The letter discusses each subject in the outline of the Newlands committee investigation, which was issued by Senator Newlands. Some extracts are as follows:

"In discussing the question of regulating common carriers, I have in mind the provisions of the federal constitution vesting in Congress the power to regulate commerce among the several states, and the spirit and intent of the constitution that no preference shall be given one state over any other state by any regulation of commerce. I believe that it was to secure the freedom of interstate commerce from state control whenever the general welfare should demand it that the grant in the constitution was made, under which Congress may provide effective regulation and exclusive federal control

"We are today confronted with the possibility of one state, in the absence of any interference on the part of the federal government, to so regulate purely state rates as to build up shipping centers in other states. State regulation is always subject to the influence of state jealousy, resulting in discrimination against the people of other states. This discrimination, as I view it, is contrary to the very spirit of the federal constitution.

"The jurisdiction of the commerce commission should, I believe, be extended rather than restricted. I believe that the commission's jurisdiction should be extended to also include restriction of competition wherever competition is not clearly in the interest of the public. I am convinced from my experience in the regulation of other public utilities under a plan favoring regulated monopoly that such regulation would be in the interest of all the people. Under such plan the commission should have authority to prescribe fixed rates—not maximum rates as at present. The commission should also have power to prescribe the joint use of facilities whenever economy or the public convenience and necessity so require.

"This country, especially that part of the country wherein I live, needs more railroad facilities. These facilities cannot be had without added investment to railroad enterprises, and as far as I can see the investment will not be made unless there is some assurance that a reasonable return will be allowed on the investment, and that the money invested will be honestly expended. It follows, therefore, that the commission should also exercise jurisdiction over the issue of securities and perhaps the incorporation of railroad companies.

"I believe that improvements of existing railroads and construction of new lines has under the present system been seriously retarded. In order to secure the capital necessary to bring about needed improvements and new construction, it appears that a market must be found for railroad securities, and the public must be assured that the capital invested will be used for legitimate purposes and not for speculation.

"In order that railroad securities may find a market in the world's exchanges, and the people may know that the capitalization is honest, there should be some supervision over the issue of railroad securities and possibly incorporation in addition to such supervision over rates as will give reasonable assurance that the earnings will be sufficient to meet interest accounts as well as operating expenses. This supervision should on account of its very nature be federal, and, as stated before, centralized and of the highest class. To allow a state to supervise or regulate the securities of an interstate carrier appears to me to be unreasonable. The federal government alone should exercise such authority.

"Under the protection of the federal constitution, as I understand it, railroads are allowed to charge rates that will produce a reasonable return upon the capital invested. The determination of a reasonable return, as well as the capital to be invested, must, if successively determined, be determined by one authority. It seems to me that in justice to all concerned, you cannot leave the determination of these questions to several authorities, each acting separately and without co-ordination.

"If exclusive federal control is adopted there still remains a large field of operations for the several state commissions. The regulation of public utilities other than railroads will keep them all occupied.

"The attempt of the several states, each acting independently, to regulate our railroads has, in my judgment, resulted in waste, confusion and discrimination, which can be eliminated only by the institution of a single rate-regulating authority. If we are ever to fully enjoy the blessings that flow from efficient railroad regulation, the very nature of the thing to be regulated requires that the regulation be vested exclusively in the federal government.

"Interstate carriers are engaged in intrastate as well as interstate commerce. The assurance that a reasonable return will be allowed on the investment cannot be had without proper and exclusive federal control. The return cannot be determined without regard to revenue and expenses. The revenue is made up of the earnings from all sources—intrastate as well as interstate—and the expenses are incurred in the transactions of intrastate as well as interstate business. It is almost impossible to segregate the revenue and expenses of carriers between intrastate and interstate traffic. Even though such segregation could be made, control of state rates must be had under any scientific plan of regulation in order to justly distribute the expense of operation in fixing rates. Furthermore, under multiple regulation we are confronted with the conflict between states as regards demurrage penalties, Sunday and holiday restrictions and other matters.

"I believe it can be stated conclusively that rates are essentially interstate in their operation (Shreveport and other cases), and that the transportation question is a national problem.

"It has been said that federal regulation at present means higher rates. This statement is undoubtedly based on the fact that the commerce commission has consistently supported the higher interstate rate as compared with state-made rates. The tendency of state regulation is to reduce rates on account of the opportunity afforded to take advantage as between states. As a result there is a tendency to reduce certain interstate rates on account of the influence of the intrastate rates on interstate rates. The failure, or rather inability, of the commerce commission to prescribe minimum rates permits certain interstate rates to become unreasonably low, and as a result other interstate rates are increased in attempting to overcome loss resulting from the low rates. I believe that if the commerce commission could in all cases fix the rate, i. e., increase as well as decrease the rate, a great many interstate rates could be reduced as a result of increasing other rates which are now too low. This adjustment of rates could not be made without central control of all rates on account of the influence of the intrastate rate upon interstate rates."

TRANS-AUSTRALIAN RAILWAY.—It is stated that 917 miles of the Kalgoorlie-Port Augusta Railway have been laid, leaving 41 miles to complete the railway.

Analyzing a Typical Freight Car Journey

A Study of the Reasons for the Low Mileage Per Car Per Day and Measures by Which It Can Be Increased

By C. F. Balch

COMMERCIAL conditions seem to require more freight car equipment than is readily available and the clamor arising from the apparent shortage in this equipment has reached such proportions as to call for a special inquiry on the part of the Interstate Commerce Commission, the result of which is as yet indeterminate. It is, therefore, suggested that a review of a few pertinent facts relating to this subject may be of more than passing interest just at this time.

The facts available and quoted below, are drawn largely from the figures for the year ended June 30, 1914, as published by the Interstate Commerce Commission. While these are somewhat out of date and do not reflect the immediate conditions, they are the latest figures available and as such may point to some possible solution of the question or at least suggest a line of thought toward which effort may be directed profitably.

The facts relating to the year ended June 3, 1914, are as follows: (From text of the twenty-seventh annual report of statistics of railways of the United States. Pages 16, 22, 42 and 50).

Total number of freight cars in commercial freight service	2,325,647
To which may be added the private cars not included in the I. C. C. report—approximately	225,000
Making total cars available for use in freight service	2,550,647

We may use 2,550,000 as representing in round numbers the total number of cars in commercial freight service.

Total car miles	Loaded	13,669,210,232	
	Empty	6,519,815,602	
Aggregate capacity of 2,325,647 cars		90,977,098	tons
Average capacity per car		39	tons
Average haul of freight		260.19	miles
Total tons of freight carried		1,109,271,040	
Total tons one mile of freight		288,319,890,210	
From which we find			
Average miles made by each car during the year	Loaded	5,360	
Average miles made by each car during the year	Empty	2,557	
	Total	7.917	
Average miles made by each car per day	Loaded	15	
Average miles made by each car per day	Empty	7	
	Total	22	
Average number of tons of freight carried by each car per year		435	tons
Average number of ton miles freight carried by each car per year		113,067	
Average load per loaded car		21.09	tons
Average distance of loaded movement		260.19	miles
Average distance of empty movement		124.14	miles
Average number of trips each car makes per year or the number of loads carried		20.6	
Average number of days consumed by each trip		17.72	
Now assuming that cars actually in trains move at the rate of 10 miles per hour, we have the time consumed in loaded movement while in trains		26 hours	
Time consumed in empty movement while in trains		12.4 hours	
Total time in trains		38.4 hours	1.6 days

Thus we find that a typical trip of a freight car is 260.19 miles loaded, and 124.14 miles empty. The load consists of 21.09 tons of freight (54 per cent of the capacity of the car) and the time consumed is 17.72 days.

The typical car made 20.6 such trips in 1914, carrying altogether 435 tons of freight or not quite 12 times its capacity.

Grouping the facts above, we have:

	Days.	Ratio.	Total of all cars.
Time in trains (both loaded and empty)	1.6	9.03%	230,265
Time allowed for loading, by ordinary demurrage rules	2	11.29	287,895
Time allowed for unloading, by ordinary demurrage rules	2	11.29	287,895
Time consumed in other ways than loading, unloading or in trains	12.12	68.39	1,743,945
	17.72	100.00%	2,550,000

This shows that of the total time of cars, 68.39 per cent is not occupied by actual movement in trains or in loading and unloading; 11.29 per cent is consumed in loading; 11.29 per cent in unloading and 9.03 per cent is consumed in actual train movement.

Applying these ratios to the entire number of cars in service, we find that as an average situation, we have the following, viz:

Cars in trains actually moving	[illegible]
Cars being loaded	[illegible]
Cars being unloaded	[illegible]
Cars in repair yards, in company service, detained at [illegible] and held for all sorts of causes	[illegible]

In other words, for every car in a train there are:

1.3 cars being loaded
1.3 cars being unloaded,
7.5 cars being buffeted about in the service

It will be seen from this that the shipper has a longer time to load and the consignee a longer time to unload the freight than the railroad actually consumes hauling the empty car to the point of loading and the actual loaded movement; we notice also that between the shipper and consignee, they have 2.6 times as much time to use the car as the railroad actually consumes in hauling the freight.

The question of improvement as applied to these different features seem to point first to the question of demurrage and our information on that subject is as follows:

Demurrage

The demurrage collected in 1914 amounted to $11,025,343 and as applied to 2,325,647 cars (private cars excluded) is equal to $4.74 per car, which at the ordinary rates of $1 per car per day, shows that on the average each car is subject to demurrage less than 5 days out of 365 days of the year. The remedy for the trouble evidently does not lie in a change of the demurrage rules as now applied. If the demurrage rules could be extended to include cars held for reconsignment or otherwise subject to shipper's or consignee's order, it might have a good influence toward a better utilization of the cars.

If the free time allowed the shipper and consignee were to be reduced from two days to one day in each case, it would be equivalent to adding 287,895 cars to the service or more than 10 per cent. A further inquiry would disclose that the working of "average" agreements in connection with demurrage charges, has had a tendency to reduce the demurrage charges to the low minimum indicated above, and that through some process of elimination the carriers are receiving very little revenue from the demurrage arrangements.

Cars in Terminals

It is evident from a study of corresponding figures for individual companies, that one of the most important factors affecting this subject is the "extensive terminals." To illustrate: The Union Pacific, with no large terminals, approaches 50 miles per car per day, thus indicating a movement of cars more than twice as rapid as the average (22 miles); the Chicago, Milwaukee & St. Paul and the Chicago, Burlington & Quincy, both having large terminals and a long average haul, make more nearly the average, while lines like the Chicago & Eastern Illinois, with Chicago terminals and a short average haul, make considerably less than the average.

We have noted that the free time allowed the shipper to

load, and consignee to unload, is two days in each case. In Chicago terminals, the lines which have large terminals (C. B. & Q., C. M. & St. P., I. C., etc.) are allowed in the interchange switching agreement, five days in which to handle, unload and return the cars to connecting lines. From this it appears that it is generally understood that it requires three days in which to handle a car through the terminal outside of the time regarded as proper to allow the shipper to load the car. It is also noted that this is, generally speaking, three days more than similar allowances at other points in the United States, except such as may properly be classed as terminals of the first magnitude.

There are probably at all times in the principal terminals (the 15 largest) approximately 1,000,000 cars or 40 per cent of the entire car supply. This, it will be noted, is about four times as many cars as are shown in this analysis to be moving in trains and if the cars in repair yards and otherwise under disability be taken into consideration, the estimate should be increased considerably. It is, therefore, apparent that the handling in large railroad terminals where reconsignment privileges are numerous, is a very important part of this entire subject, and if the reconsignment privileges were curtailed, it would correspondingly improve the situation.

Among the influences which might be exerted to improve the situation may be mentioned the following:

Increase the Average Load per Car

If the average load could be increased from 21.09 tons to 23.19 tons or 10 per cent, it would be equivalent to adding 255,000 cars to the service. It may be claimed rightfully that commodities, such as lumber and coal, are being as heavily loaded now as is practicable; but at the same time it must be admitted that there are commodities which might be moved in larger carloads. The influence of state commissions has generally been to reduce minimum loading requirements and every low minimum tends to reduce the efficiency in the use of cars.

Merchandise loads lightest of all and claims a large share of the box car equipment and for this reason it presents a large field for the efforts of interested parties toward heavier loading per car. To increase the load per car by two tons would automatically add 42 tons to each train load and the increase in gross tons per train (42 tons) would only equal the increase in net tons per train and be as nearly as possible to "velvet." In a great many instances this might be accomplished without any perceptible increase in operating expenses. This would be the most advantageous gain that could be made and it would seem that the entire shipping public, if properly and intelligently advised on this subject, would cooperate promptly with the carriers in bringing about this result.

Dexterity in the Movement of Cars

The movement of cars in trains has been shown to be the smaller part (9.03 per cent) of the whole time of cars in service. It is, therefore, evident that it is not the slow movement of cars in trains, nor the loading of trains to full capacity of the locomotive that causes the delay in handling of cars. If the train moved only half as fast (five miles per hour) the time *in trains* would still be but 18.06 per cent of the entire time of the service of the cars and would not be equal to the free time allowed the shipper to load and the consignee to unload the cars.

The fact that 12.12 days per trip are used up in other ways than the loading or unloading of cars or their actual time moving in trains in revenue freight service, is the subject which should arrest the attention of every thoughtful student of this subject. Here seems to be an opportunity for improvement and it appears that 68.39 per cent of the time in service of all cars is in occupations, such as: (a) Cars in yards necessarily undergoing switching and assembling service, held under reconsignment or demurrage privileges, etc. (b) Cars being handled in interchange between carriers. (c) Cars standing idle in yards and terminals. (d) Cars standing idle at way stations. (e) Cars unfit for service. (f) Cars in shops awaiting or undergoing repairs. (g) Cars under load with company freight. (h) Cars assigned to service other than revenue service.

Is it risking undue presumption to suggest that it is possible to reduce the average time per trip for each car from 17.72 days to 12 days assuming that the average time of a car in service be divided approximately as below:

Time in trains	1.6 days
Time loading	2 days
Time unloading	2 days
Time in company service	2 days
Time in repair yards	1 day
Time necessarily at terminals and interchanging points between carriers	2.2 days
Time idle	1.2 days
Total	12.0 days

The question may here suggest itself, "What if trains were increased in speed to 12½ miles per hour as the result of the Adamson law, provided that it should be found to be a feasible expedient and would meet the requirements of the law?" The answer is as follows: The time in trains equals 1.6 days, the speed of the train, therefore, affects this time only and if increased 25 per cent would decrease the 1.6 days to 1.3 days or to the extent of 0.3 of a day per trip, which would be equivalent to adding 43,350 cars to the service. In other words, the question of speed affects only 1.6 days out of a total of 17.72 days and a 25 per cent improvement would be equivalent to only 1.7 per cent of the entire time that cars are in service.

To illustrate the result of increasing the average number of trips each car makes per year the following is given, viz:

	Trip of 17.72 days	Trip of 15 days	Trip of 14 days	Trip of 13 days	Trip of 12 days
No. days required for each trip	17.72	15	14	13	12
No. trips per year	20.6	24.3	26.1	28.1	30.4
Distance hauled loaded (miles)	260.19	260.19	260.19	260.19	260.19
Distance hauled empty (miles)	124.14	124.14	124.14	124.14	124.14
No. miles each car makes per year loaded	5,360	6,323	6,791	7,311	7,910
Tons of freight hauled at 21 tons per car	433	510	548	590	638
No. cars required to handle 1,000,000 tons	2,309	1,961	1,825	1,695	1,567
Saving on number cars as compared with Column 1	...	348	484	614	742

This means, that if cars which are making one loaded trip in 17.72 days could be handled with sufficient dexterity to make the same trip in 12 days, the result would be that 1,567 cars could be made to perform the same service that 2,309 cars now render. If this saving of the use of 742 cars applied to the entire United States, the accomplishment here suggested would be equivalent to adding 818,550 cars to the service of the public, which on a basis of a value of $1,000 each, would be equivalent to an added investment of $818,550,000. In other words, the present equipment would handle 32.1 per cent more traffic if the time per trip were reduced from 17.72 days to 12 days.

The desirability of increasing the utility of equipment in the manner suggested is emphasized when consideration is given to the fact that if the units of freight equipment are increased, there must be a corresponding increase in side tracks and storage tracks in order that the added units may be accommodated. A suggestion has been made that the government furnish, through a car trust, emergency equipment. If this should be done, it would necessitate a corresponding increase in the facilities of the carriers or the added equipment would prove a burden, and during a depression of business a veriable "White Elephant." It may be recalled that during the depression in 1908, the Pennsylvania railroad found it necessary to remove cars from its tracks and store them on open ground owing to its inability to store its own cars conveniently without discommoding even the diminished

traffic of its line. Such a situation might be easily realized if the government were to put 500,000 cars into the general service of the carriers.

Responsibility for Present Conditions

The present results are due to many and varied causes. *The public* is responsible for the time consumed by them in loading and unloading carload freight, which constitutes approximately 95 per cent of the total tonnage and 25 per cent of the total time in service. The station agent is responsible in part at least for the condition at stations. The yardmaster is responsible for the condition at yards. The division superintendent is responsible for the condition on his division. The general officers are responsible for general conditions. No one man or group of men can remedy the situation, but *some* improvement surely can be made by the combined efforts of all, and any improvement must be brought about by the cooperation of all concerned, responsible for, or affected by the situation and the results sought to be attained.

The Means To Be Used

The facts here presented for the entire United States may be duplicated for any individual line, and by comparison the lines may be enabled to learn which are the better or worse from this point of view. Again, if this information be produced through appropriate statistical compilation on any given line, by operating divisions, a valuable comparison could be drawn and an opening made through which to observe the influences which are directly responsible for the delays and which should be counteracted. With such information at hand, the right parties for proper cooperation can be brought into agreement and a combined and intelligent effort made to overcome the delays to cars.

This line of study suggests that in the usual routine of business, the question of car supply finds its place in the humdrum of railway existence; that under pressure or stress of heavy traffic, the freight equipment moves more freely, but when the emergency is passed the normal movement is resumed and things revert to the usual routine. The confirmed habits and customs thus established in the handling of cars are not sufficiently flexible to permit of expansion during a period of heavy traffic and a clamor is raised. Just at this point the public is most unresponsive and claims all the reconsignment and demurrage privileges allowed by the tariffs, thereby throwing the entire burden upon the carriers without cooperating in a manner which would assist greatly in overcoming the difficulty.

In conclusion, it may be said that while the figures quoted herein do not represent the situation at this date, it is suggested that while during this period of heavy traffic the cars are moving more freely than the average of the year quoted (1914), it is not likely that they are making better than an average of a trip in 15 days and there appears to be much still to be accomplished in this direction.



W. C. Nixon

W. C. NIXON

William C. Nixon, president of the St. Louis-San Francisco, died at St. Louis, Mo., on December 15, following a critical illness of two weeks' duration. Although in poor health for over two years, and on various occasions in that period temporarily unable to perform his duties, he continued to discharge his responsibilities ably and efficiently until the last.

Mr. Nixon came to the Frisco in 1906 as vice-president and general manager. As chief operating officer, as well as one of the receivers during the receivership of the road, covering a period of three years, he introduced far-reaching economies in operation, and developed an esprit de corps among the employees which not only made for greater individual efficiency but won for the road the favor of passenger, shipper and consignee. He introduced the Frisco agency plan which made the station agent the railroad's representative in the fullest sense of the word, giving him opportunities under the supervision of an assistant to the division superintendent to prove his worth as a business promoter, claim agent and general representative of the road in his territory. Typical of the results he achieved was the reduction of freight loss and damage from $514,000 in 1914 to $316,000 in 1915, or 38.5 per cent. He also fostered the development department of the road with excellent results. In the year ended June 30, 1916, 328 industries were located on the Frisco, employing an average of 19,627 men, who are paid wages aggregating nearly $13,000,000 yearly.

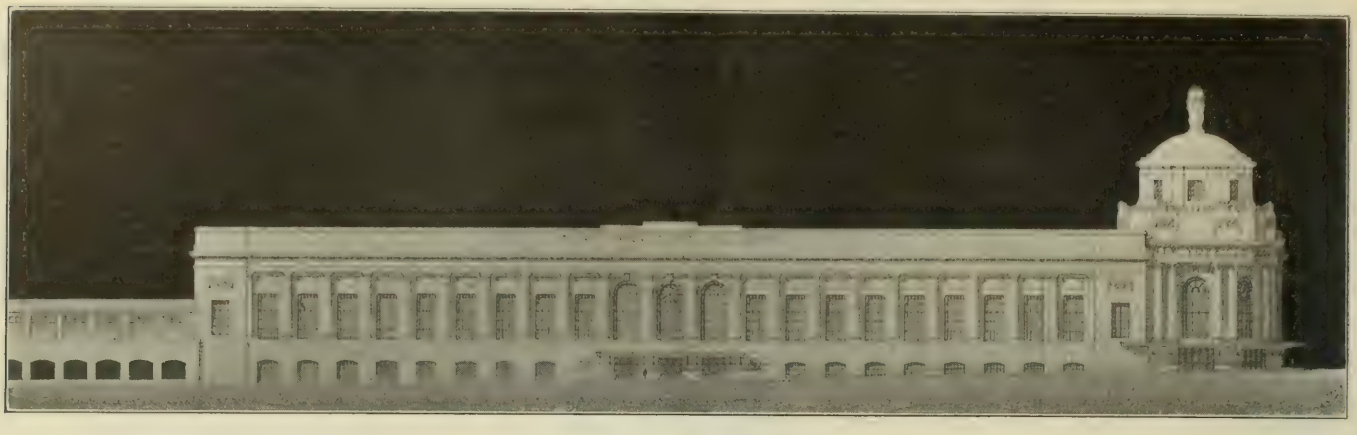
Mr. Nixon was born in Illinois in February, 1858, and entered railway service at the age of 20, with the Burlington & Missouri in Nebraska. After nine months with that road he was employed by the Atchison, Topeka & Santa Fe as watchman, and remained with that system until August 1, 1906, when he left the Gulf, Colorado & Santa Fe as second vice-president and general manager, to become vice-president and general manager of the St. Louis & San Francisco. In May, 1911, his title was changed to vice-president in charge of maintenance and operation, and when the line went into receivership in July, 1913, he was appointed chief operating officer and receiver. A full account of Mr. Nixon's career and the results he achieved on the Frisco was published recently in the *Railway Age Gazette*, on September 1, 1916, on the occasion of his election to the presidency.

War Bonuses for Women Railway Workers.—Albert Bellamy, president of the National Union of Railwaymen, recently stated at Glasgow that negotiations had just been completed with regard to the question of war bonuses for women railway workers. An agreement had been reached under which 3s. ($.72) a week would be given to women over 18, girls under 18 receiving a bonus of 1s. 6d. ($.36).

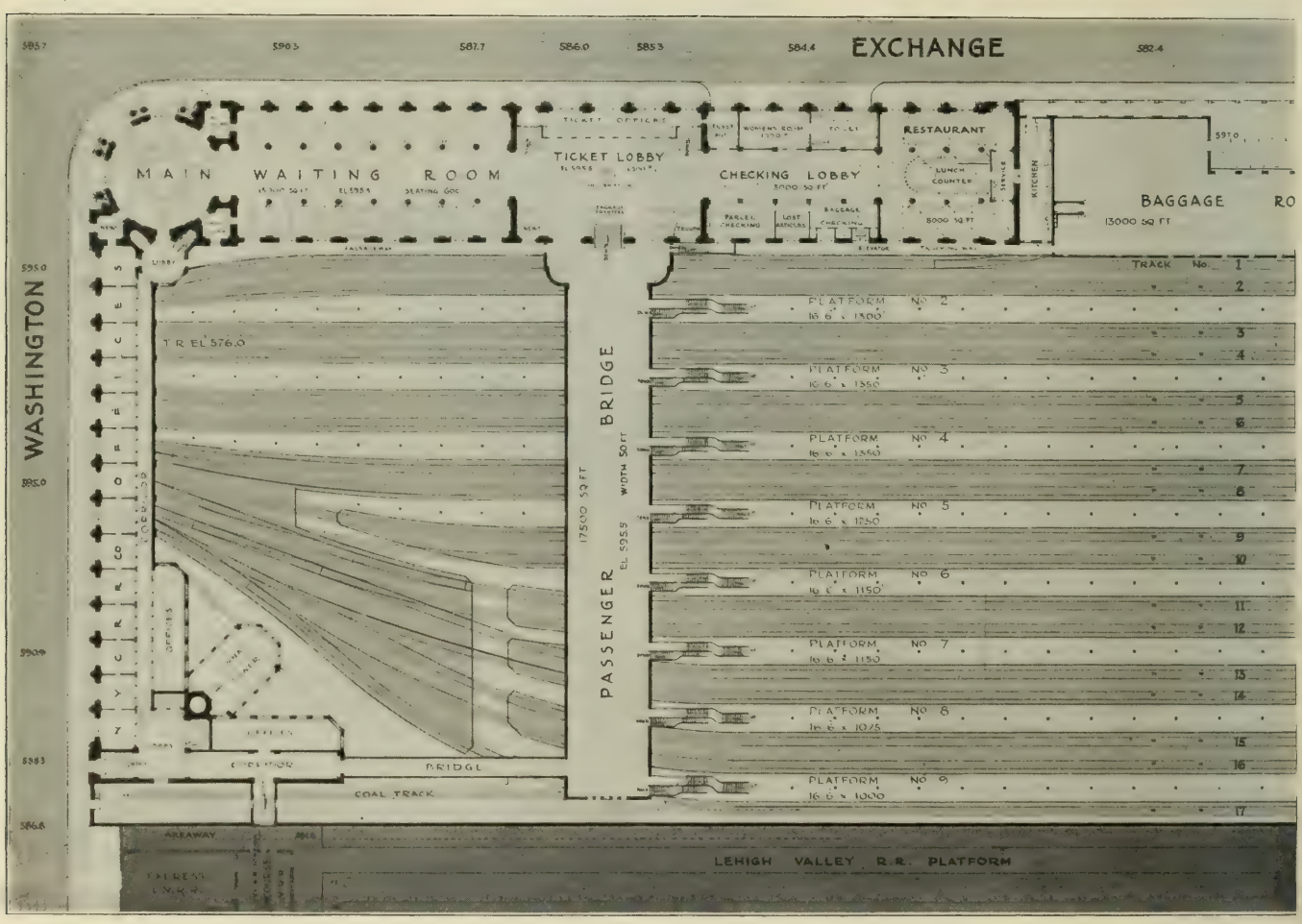
NEW YORK CENTRAL PASSENGER AND FREIGHT TERMINAL AT BUFFALO

The proposed plans prepared by the New York Central for new and enlarged terminal facilities at Buffalo, N. Y., were approved by the terminal commission of that city on December 14. The project, which involves the expenditure of approximately $6,000,000, includes a two-level passenger terminal to be built on the site of the present station, auxiliary passenger facilities for the use of through trains to be located at Clinton street on the main line of the railroad and enlarged and improved freight handling facilities.

The Terminal Commission was created about six years ago by a special act of the state legislature with power to negotiate with the railroads entering the city, to secure terminal improvements desired both by the railroads and the city. As a result the Lehigh Valley recently completed and opened to traffic a new freight and passenger terminal and the Lackawanna terminal improvements are well under way. The approval of the Central's plans under the resolution adopted was for the purpose of advertising the proposed plans and for holding public hearings early in next year, in compliance with the procedure as fixed by the act creating the commission. If, after the public hearings are concluded,



Architect's Drawing of the Exchange Street Side of the Proposed Passenger Station



Proposed Layout West End of Upper Level

the plans are accepted the commission will have disposed of the terminal problem at Buffalo as the other roads entering the city will become tenants in these three new stations.

The site of the proposed terminal adjoins the new Lehigh Valley station and is but four blocks removed from the new terminal now being constructed by the Lackawanna. When built the terminal will complete the so-called group plan of the Buffalo terminals that has been under consideration since the rejection, as impractical, of the union station scheme which was presented when the question of improved terminals was first considered.

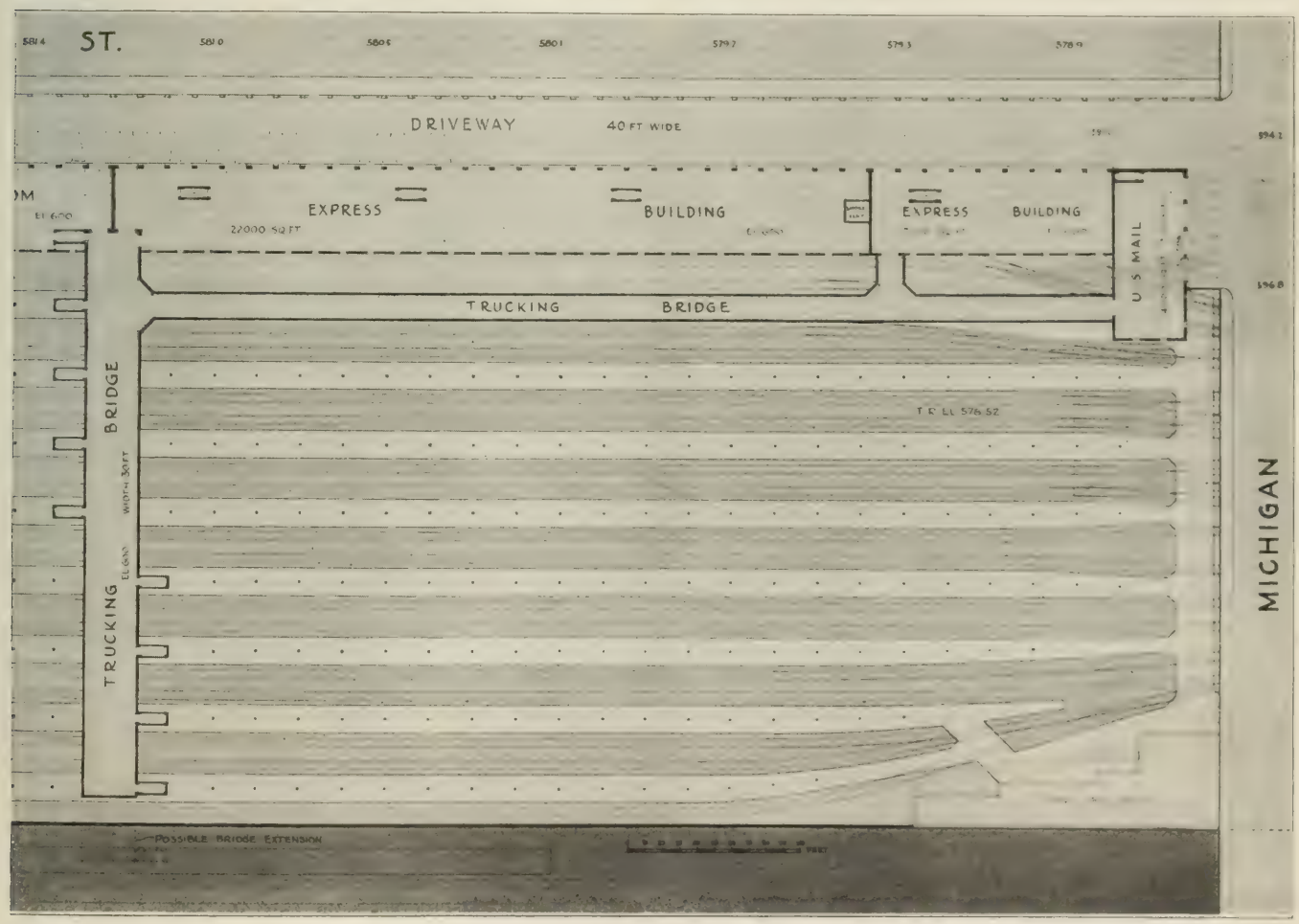
The new station will be located at the corner of Washington and Exchange streets facing 421 ft. on Washington street and 540 ft. on Exchange street. This portion of the building will be a five-story structure and is to be flanked by a two-story extension on Exchange street 860 ft. long which will provide the facilities for baggage, express and mail.

The principal entrance is to be located on the Washington and Exchange streets corner of the building and will be accentuated by a tower. The entrance will consist of three groups of five doors each leading into a 60-ft. circular corridor with the floor placed on a slight ramp connecting the street elevation with the floor of the waiting room which is to be placed at the second level. The corridor will open directly into the waiting room where 15,000 sq. ft. of floor space and a seating capacity for 600 will be provided. The ticket lobby, where 6,300 sq. ft. of area is to be provided, will occupy the central portion of the second level. The checking lobby, with 3,000 sq. ft. of floor space, will adjoin the ticket lobby on the east. The parcel checking, lost articles and baggage checking offices all open into this lobby, as will the ticket agent's office and the women's retiring room and toilets. The restaurant and the kitchen facilities will occupy the remainder of the upper level floor.

The lower level of the station building will provide space for the locker rooms and toilet facilities for trainmen, engineers, firemen and conductors as well as for the men's room and toilets. The central portion of the lower level is to be occupied by the entrance lobby. A cab stand and an express platform will occupy the remainder of this level. The arrangement of the stairways which will connect the entrance lobby with the ticket lobby above is cleverly worked out. Pedestrians entering from Exchange street will reach the upper level by means of stairs to be provided on either side of the entrance lobby, while passengers from the trains will leave the upper level for the lower by means of a stairway provided in the center of the lobby; an arrangement which will permit incoming passengers to reach the trains without interference from the outgoing.

A passenger bridge 50 ft. wide is to be provided at the upper level leading across the 17 terminal tracks. This bridge will be connected with the train platforms below by means of stairs. A trucking bridge 30 ft. wide will also be provided over the tracks from the express and baggage rooms. This bridge is to be connected with the mail room by trucking platforms.

Under the present arrangement a passenger and baggage transfer service is operated between the new Lehigh Valley terminal and the old Central station. In the new layout it will be possible to discontinue this transfer as passengers from the Lehigh Valley can leave the train shed by means of stairs to a corridor and secondary bridge to the main passenger bridge of the new terminal mentioned above, an arrangement which will virtually make a union station of the

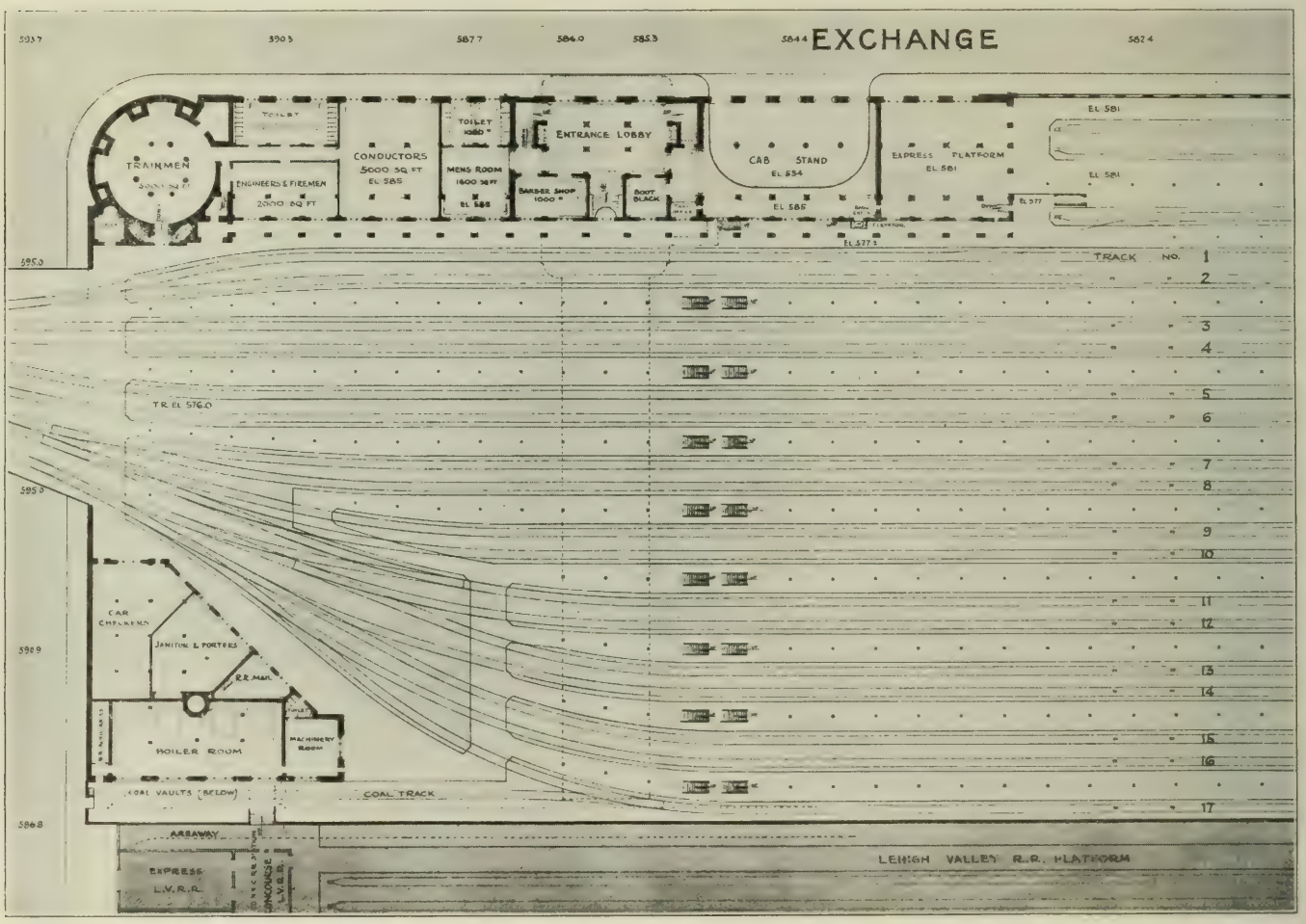


Proposed Layout East End of Upper Level

two terminals. Also by means of an elevator from the Lehigh platform to the Central trucking bridge, the transfer of baggage can be made between the two stations.

The baggage, express and mail rooms will be placed at the level of the main waiting room with the lower level devoted to platforms and express and mail tracks. Elevators will be provided between the two levels. This portion of the building will be placed back of the line of Exchange street to provide space for a 40-ft. drive. The drive will be placed at an elevation of 3 ft. below the floor of the baggage and express rooms and will be reached by means of the present viaduct at Michigan street. The terminal track layout will consist of 17 passenger tracks, all double-ended to permit of easy operation, four stub end express tracks and a stub end mail track.

The station site is one block east of Main street, the principal thoroughfare of the city, and the tracks leading west from the terminal will be carried under Washington and Main streets and between the streets in a walled cut. To add to the attractiveness of the layout it is proposed to place



Proposed Layout of the Lower Level

present these high speed trains stop in Buffalo there is no provision for handling passengers.

The present freight facilities at Louisiana street, east of passenger terminal are to be increased by the building of additional trackage and a double decked freight house with escalators provided between the two levels. Additional trackage at Ohio street and a team track terminal at Scott, Perry and Chicago streets and the central tracks will also be provided.

This project has been worked out for the railroad under the direction of G. A. Harwood, engineering assistant to the vice-president. Alfred Fellheimer, of New York, is the architect for the station building.

WHY THE CHIEF CLERK?

By William S. Wollner.

Clerical work in railroad service is so diverse in character that it is impossible to give any description of it, other than to state that it includes many functions that are not at all clerical. The compilation of statistics, bookkeeping, accounting, cost accounting, estimating, stenography and typewriting are some phases of it. In fact almost any employee who is neither an official, a mechanic, a laborer, nor in train service, is generally considered a clerk. The great distinction between a clerk and other employees in railroad service is a general impression that a man in any other class of service may advance without limit, while a clerk, having only a clerical knowledge of the business, can advance in the organization only to a point where clerical

one-story buildings around the walled cut to hide it from view. On the Exchange street side these buildings will be placed back from the street line to provide space for a drive to the new station.

The auxiliary passenger facilities at Clinton street will consist of a small passenger station building, four platforms and track provision for handling fast through trains. It will provide an additional convenience for passengers desiring to use the high speed trains that do not enter the Exchange street station because of its location about two miles removed from the main through tracks. While at

knowledge is the main requisite of the position. In other words, it is thought that a clerk may advance to the position of auditor or comptroller, but that he can never hope to be a superintendent or a general manager, while any other employee, even a humble section laborer, can rise to any position in the service.

This general impression, however, has no real basis in fact. Just as the section laborer must learn the clerical, or accounting, or statistical, phase of railroading to enable him to fill a higher position, so must the clerk master the operating and other features, to enable him to advance into the official family.

Assuming that a young man enters the employ of a railroad company in the capacity of clerk and wishes to make railroading his career, that he has carefully planned his course of advancement so as to rise to the greatest height in the shortest time, what is the next position he must aim to occupy? It is quite natural for a young man in a superintendent's office to hold the superintendent's job as the goal of his ambition, but he cannot step from a clerkship to a superintendency. Perhaps he is not physically able to enter train or engine service, and the necessity for immediately earning his living may preclude his studying telegraphy so that he may become an operator or despatcher. Yet he is willing to study and to observe, and in fact do anything that he can do to enable him to fulfill his ambition.

The man who stands between him and the superintendent is the chief clerk, and he strives for his position as the stepping stone to the superintendent's. After filling the various clerical positions in the office and having mastered all of the operating features of the division that it is possible to master through daily contact with reports and correspondence, he attains the position that he has set as his goal. From the day he takes his place as chief clerk he has ever before him the fact that, although his title makes of him a clerk, he must do everything in his power not to think, talk or act like one. He no longer represents the compiler of figures, the writer of reports, or the computer of time rolls. He represents the superintendent and he must represent him with the dignity that befits the official position of his superior.

If he is a successful chief clerk he will act as a buffer between the superintendent and his inferiors, and as mediator between him and his superiors. His duties are manifold, but, regardless of what he does, or how he does it, he is the representative of the superintendent, and his acts have the same force as if they originated with the superintendent himself. Disregarding for the present the fact that can not be overlooked, that some chief clerks assume authority and pretense of knowledge that is not theirs, let us consider the case of the man who tries to do his duty to himself, his job and the company, to the best of his ability.

The chief clerk is placed in his position primarily for the purpose of relieving his superior of routine work, and it is his duty to assume such work, without specific instructions to do so, as he is capable of handling. The more work he can relieve his superior of the more valuable is he to the organization, for, relieved of routine, his superior is free to give his attention to matters of greater importance, and thereby give to the company in service a far greater return than would otherwise be possible. But there is another side to the story. In reading the technical papers and books on railroad administration we every once in a while note the assertion that the chief clerk is the cause of inefficient railroad organization, that he has no place in properly constituted units, and that he is largely responsible for ill-feeling existing between employees and officials.

If that is the insider's viewpoint, how about the outsider? Of course the job-seeker is always sure that he could land a job if he could see the boss himself, and the salesman is certain that he would appreciate the merit of the article the salesman is selling if he had but a moment of his time to talk it over with him.

Assuming that the chief clerk's title correctly describes his duty, and that his work is to supervise the clerical work of the office of which he is the head, his responsibility is a great one, for the amount paid in salaries to clerical help is over 5 per cent of the entire railroad payroll. The increase in the cost of clerical work on the railroads of the United States for the past 10 years was 128 per cent, and while it is, of course, admitted that there are many reasons for this increase over which the chief clerk could not possibly have control, the question arises whether men properly trained and equipped for this responsible position could not, in some way, have prevented in part this large increase in overhead expense.

In discussing this question an efficiency expert, who has specialized in office management, said: "The trouble is that railroad clerks, as a result of their work, become machines that merely turn out the work for which they are set. Some one else does their thinking for them, and they are content to do the work laid out for them in the manner in which they are instructed to do it. Very often they are criticised for offering suggestions as to less expensive ways of doing the work, and for that reason permit themselves to become mere automatons. When a chief clerk is needed one of these men who has been taught not to think is promoted more as a matter of course than on account of his ability to supervise the clerical work of the office, and as a result he merely continues the practices of his predecessor."

It should be borne in mind that the above statement refers only to the clerical duties of the chief clerk, and does not take into account his many other necessary functions. As a matter of fact it is probably true that the chief clerk has duties of too varying a nature to do justice to all of them, and that he must slight some of them on account of the immediate importance of others. With the superintendent out on the line for, say, two weeks each month, and all the routine work of the office falling upon his shoulders, the chief clerk has not much time to see if a certain clerk is working at his maximum efficiency, or if a certain statement can be condensed or compiled in a less expensive manner.

The entire fault of the system lies in the fact that the chief clerk is not a clerk at all, but an assistant to the official under whom he serves. It would probably be better to class him as a "personal assistant" as he lacks the necessary authority to make him officially an assistant. What authority he has comes entirely as a matter of custom or precedent and, as in the case of all such authority, when it is attacked there is no rule or order upon which to justify it. It would seem, therefore, that the reasons for the lack of effectiveness of the chief clerk as a unit in a complex organization are, first, that his title does not truly designate his duties, and therefore does not give the position its proper place as an organization unit; second, there being no fixed order or rule for his official (or semi-official) conduct, his authority is not recognized sufficiently to give to his instructions their proper observance.

As a precedent in radical changes in railroad operating organization the best example is the Hine system of organization, or the "unit system," as it is usually termed. Using that as a basis, the best method of correcting the present system would seem to be to abolish the title of chief clerk in all positions except those in which it truly describes the duties of the office, to substitute a more appropriate title, and to see that all concerned are fully advised of the authority and duties of the man upon whom the title is bestowed.

As to title, "assistant to" seems to most fully describe the functions of the position. The circular putting the plan into effect could probably best be worded as follows:

"Effective January 1, 1916, Mr. John H. Jones is appointed Assistant to the Superintendent of the Central Division of the North & South Railroad.

"His duties will be assigned to him by the superintendent and he will represent the superintendent during his absence from headquarters. He is authorized to sign the superintendent's name to communications and official statements and when so affixed it will be respected as though affixed by the superintendent in person."

This should fix the position and authority of the chief clerk without question of a doubt, should permit him to do the things that he is able to do without fear of having his orders disregarded, and by extending the scope of the chief clerk's work permit of the superintendent's transferring to him many routine matters, thereby increasing the time available for more important matters.

TRAIN ACCIDENTS IN NOVEMBER[1]

The following is a list of the most notable train accidents that occurred on railways of the United States in the month of November, 1916:

Collisions

Date	Road	Place	Kind of Accident	Kind of Train	Kil'd	Inj'd
3.	Louisville & N.	Kelly.	rc	F. & F.	0	4
*5.	Lake Erie & W.	Fremont.	bc	F. & F.	2	3
*6.	Pennsylvania	New Portage J.	rc	F. & F.	7	3
7.	Pitts. C. C. & St. L.	Munhall.	xc	P. & F.	1	0
14.	Southern	Charlottesville.	xc	P. & F.	2	1
†15.	Great Northern	Minneapolis.	rc	F. & F.	2	0
23.	Chi. R. I. & P. / St. Louis & S. F.	Una, Mo.	bc	P. & F.	2	40
26.	Texas & P.	Strawn.	rc	P. & P.	2	3
30.	Southern	Elmwood.	bc	P. & F.	0	3

Derailments

Date	Road	Place	Cause of Derailment	Kind of Train	Kil'd	Inj'd
†4.	Norfolk So.	Zebulon.	.....	P.	4	70
7.	Pennsylvania	Portage.	b. truck	P. & F.	0	0
8.	Chicago R. I. & P.	Newman.	.....	P.	..	..
11.	Erie	Solon.	neg.	P.	0	7
12.	N. Y. N. H. & H.	Carolina.	b. rail	F.	0	0
12.	D. L. & W.	Henryville.	b. wheel	F.	1	0
13.	Ocilla Southern	Salem, Ga.	.....	P.	0	2
14.	D. L. & W.	Hainesburg.	boiler	F.	4	0
20.	Nashville C. & St. L.	Wauhatchie.	d. rail	P.	0	7
24.	Pennsylvania	Forrest, O.	neg.	P.	0	0
30.	K. C. Mex. & O.	Maryneal.	b. rail	P.	0	7

The trains in collision near Kelly, Ky., on the night of November 3, were southbound freights. The leading train was entering a side track. The conductor and the flagman of this train and the engineman and fireman of the other were injured.

The trains in collision near Fremont, Ohio, on the fifth were eastbound and westbound freights. Both engines and twelve cars were derailed. Some animals were killed, and a car of oil caught on fire. The fireman and a student brakeman on the eastbound train were killed and three other trainmen were slightly injured. The cause of the accident was dense fog and failure to properly protect front end of westbound train while backing into siding.

The train involved in the collision on the Pennsylvania Railroad at New Portage Junction, Pa., on the sixth was a freight consisting of one locomotive and sixty cars, all loaded with coal. The train became uncontrollable on a steep descending grade and, after running at high speed for about six miles, crashed into four locomotives standing on the main track. Seven trainmen were killed and three were injured. Over forty cars were demolished and the coal in some of them was set on fire, making it necessary to call fire engines from the nearest towns.

In the collision on the Pittsburgh, Cincinnati, Chicago & St. Louis, near Munhall, Pa., on the evening of the 7th, a freight train ran into the side of a passenger train. The engineman of the passenger train was fatally injured.

The train involved in the collision at Charlottesville, Va., on the 14th was a northbound passenger. It ran into freight cars which had run from a side track to the main line because of loosening of the brakes by persons unknown. Two employees were killed and one was injured.

The trains in collision at Minneapolis, Minn., on the 15th, were eastbound freights. A caboose and five cars were wrecked and two passengers (caretakers of freight) riding in the caboose were killed. The following train had passed an automatic block signal set against it.

The trains in collision at Una, Mo., on the evening of the 23rd, were southbound passenger train No. 23, of the St. Louis-San Francisco and a northbound freight of the Chicago, Rock Island & Pacific. The collision occurred on joint track used by these two roads. Both engines, two baggage cars and five freight cars were badly damaged. The engineman and fireman of the passenger train were killed, and about 40 passengers were injured, none, however, very seriously. The men in charge of the freight had overlooked the passenger train when they checked the train register at Leeds Junction.

The trains in collision near Strawn, Tex., on the 26th, were a westbound express passenger and a westbound accommodation, the local train running into the rear of the through train. One engineman and one fireman were killed, and two passengers and one trainman were injured. The leading train had stopped to take water.

The trains in collision near Elmwood, N. C., on the 30th were westbound passenger No. 15, and an eastbound freight. One engineman, one fireman and a mail clerk were injured. The freight was standing on the main track, when it should have entered the side track, the engineman having misread his watch, reading 6 a. m. when the true time was 7 a. m.

The train derailed near Zebulon, N. C., on the 4th, was northbound passenger No. 18. Two passenger cars were overturned. The conductor and three passengers were killed and 70 passengers were injured, most of the injuries being slight. The derailment was due to an unlocked switch.

The trains involved in the accident at Portage, Pa., on the Pennsylvania Railroad on the morning of the 7th, were a westbound freight, a westbound passenger and an eastbound freight train. The westbound freight, on track 4, was derailed by a broken truck, and a part of the wreck fouled track No. 3. The passenger train, express No. 9, on track 3, came along immediately after, and its engine and first two cars were derailed. The engine ran against the cars of a moving eastbound freight train, but without derailing any of the cars. There were no serious injuries to persons.

The train derailed on the Chicago, Rock Island & Pacific near Newman, Kan., on the 8th of November was the westbound Golden State Limited. Three coaches were ditched, and several passengers were injured.

The train derailed at Solon, Ohio, on the 11th, was eastbound passenger No. 624. The cause of the derailment was a misplaced facing point switch and the engine was overturned. A freight car on the side track was demolished. The engineman, fireman and five other employees were injured. The accident was caused by switch being set for siding and train 624 being given a call-on signal.

The train derailed near Carolina, R. I., on the 12th, was westbound first class train No. 27, not carrying passengers. Five steel express cars were ditched. The cause of the derailment was a broken rail.

The train derailed near Henryville, Pa., on the 12th, was an eastbound freight. Five cars were wrecked. The cause of the derailment was a broken wheel.

A locomotive without train, eastbound, on a parallel track, ran into the wreck and the runner of this engine was fatally injured.

The train derailed on the Ocilla Southern at Salem, Ga., on the 13th, was northbound passenger No. 10. Two coaches were overturned and two trainmen were injured.

[1]Abbreviations and marks used in Accident List:

rc, Rear collision——bc, Butting collision——xc, Other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc. ——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

The train derailed near Hainesburg, N. J., on the 14th, was an eastbound freight. The cause of the derailment was the explosion of the boiler of the locomotive. The four men in the cab of the engine were killed. The cause of the explosion of the boiler was low water.

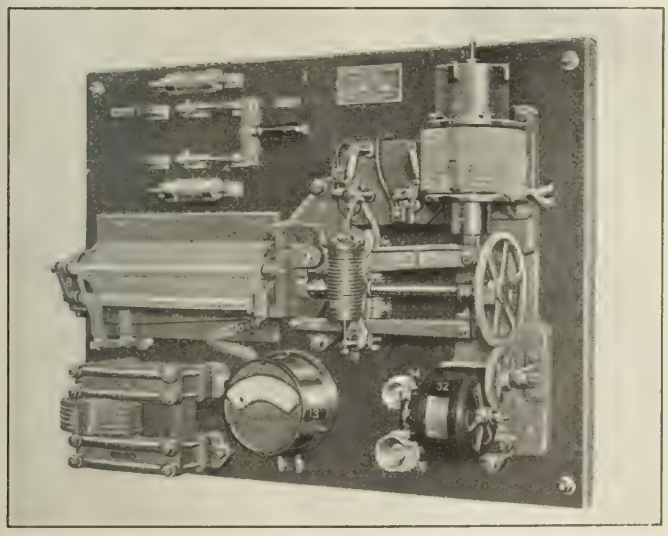
The train derailed on the Nashville, Chattanooga & St. Louis at Wauhatchie, Tenn., on the 20th, was the southbound Dixie flyer, No. 95. Three cars were overturned and four passengers, one employee and two mail clerks were slightly injured. The cause of the derailment was a worn outside rail at the reverse point of a curve of 5 deg. 45 min.; the danger from the weakness of the rail was augmented by irregularities in the gage of the track.

The train derailed at Forrest, Ohio, on the 24th, was eastbound passenger No. 136. The engine was derailed at a derailing switch approaching a crossing and was overturned, and knocked the side out of a building. The train had passed a distant and a home signal set against it. The engineman saw the distant signal but said that a home signal, 80 rods beyond the crossing, was mistaken by him for the home signal at the derail.

The train derailed on the Kansas City, Mexico & Orient, near Maryneal, Tex., on the 30th, was a southbound passenger, and two passenger cars were overturned. Five passengers and two employees were injured. The cause was a broken rail.

THE WILSON ARC WELDER

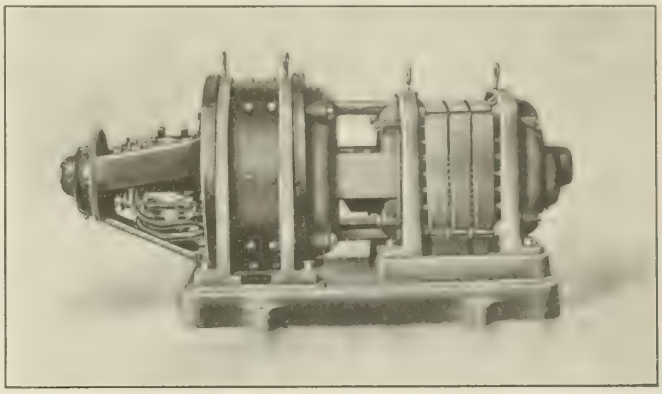
The Wilson system of electric welding was devoloped on a railroad which was one of the first to utilize electric welding. It was found, on this road, that while the most expert operators secured good results, it was the exception rather than the rule on some classes of work; it was decided after



Control Panel. The Current in Each Arc Circuit Is Controlled with One of These Panels

investigation that the trouble was due to the fact that the heat could not be properly controlled when using the ordinary type of welding outfit. The problem of designing a satisfactory machine was assigned to the railroad's chief electrical engineer and after a series of experiments a machine was produced which could be set to operate at a certain current value and would automatically keep within six per cent of that value as long as the arc was maintained. This equipment is now being placed on the market by the Wilson Welder & Metals Company, New York.

The Wilson electric welder consists essentially of a motor generator set, an automatic control panel, and a welding tool with a remote control switch attached. The generator is of the constant potential type, with interpoles and laminated field structure. The control panel performs a general function of maintaining a constant current in the welding circuit, regardless of variations in the resistance of the welding circuit. This is accomplished by the carbon pile rheostat (No. 5 in the illustration of the panel) the resistance of which is varied by a lever mechanism operated by the electro-magnetic coil 29. Both rheostat and coil are connected in series with the welding circuit, consequently the action of the coil on the lever is governed by the amount of current in the circuit; a decrease of current allows the magnet plunger to drop, com-



Four-Arc, 600-Ampere Capacity, Motor-Generator Set for Alternating Current

pressing the carbon pile, thereby decreasing the resistance of the circuit which brings the current back to normal value. The actual value of the current is dependent on the leverage of arm 17, and to change the current the leverage of this arm must be changed. This is accomplished by moving the mechanism attached to the rheostat to a different point on the lever arm. The adjustment is made by the motor operated lead screw 20 which is a distinguishing feature of this panel. The motor is operated by the remote control switch attached to the handle of the welding tool. There are two contacts on this switch, one for raising the current and one for decreasing the current; limit switches are provided on the panel to



Welding Tool or Electrode Holder with Distant Control Switch

prevent the motor overrunning its limit of travel in either direction.

Motor generator sets of various sizes can be furnished. The smallest machine will handle one arc and is rated at 150 amperes. The largest machine, rated at 1,200 amperes, will handle eight arcs at the same time. The arcs are operated in multiple, but a separate control panel must be used for each. The use of a separate control panel makes each operator en-

tirely independent of the other. A portable machine for field use is mounted on a gasolene motor truck while the shop type is mounted on a hand truck.

PROPOSED LEGISLATION AFFECTING RAILROADS

The following bills and resolutions affecting railroads have been introduced in Congress in addition to those summarized in last week's issue:

S. 7066. Amendment intended to be proposed by Mr. Sherman to S. 7066, to provide for the investigation of controversies affecting interstate commerce. To Committee on Interstate Commerce. Any court or judge to grant restraining orders or injunctions when an investigation of any controversy between employers and employees is pending, with or without notice, upon application of any party to such controversy showing from specific facts that immediate and irreparable injury, loss, or damage will result to applicant before notice can be served and hearing had thereon, and that there is no adequate remedy at law. Such restraining order or injunction to be continued in force so long as investigation of such controversy shall be pending. No order of such court shall prohibit any person from terminating any relation of employment or from seeking to perform any work. For proper cause shown temporary or permanent order or injunction may prohibit any person from attending at or near any premises concerning which an investigation is pending under provisions of the act for the purpose of interfering with the conduct of the business, or for the purpose of persuading any person to work or not to work, or from doing any act commonly known as picketing while such investigation is pending.

Act to supplement existing laws against unlawful restraints and monopolies, and for other purposes, approved October 15, 1914, and all parts thereof that may conflict with this act are modified or repealed so that same shall not apply to any controversy during the time that an investigation shall be pending under provisions of this act.

H. R. 18906, by Mr. Sterling, December 14. To Committee on Interstate and Foreign Commerce. To amend Federal law providing for mediation, conciliation and arbitration in controversies between certain employers and their employees. Adds four new sections. Provides that when controversy shall arise between employer and employee which can not be settled through mediation and conciliation and Board of Mediation and Conciliation is unable to induce parties to submit controversy to arbitration, said controversy shall be referred to a board of investigation, which shall consist of 11 members. Each of parties to controversy to have right to recommend four. These eight, with three other members, one of whom shall act as chairman of the board, shall be appointed by the President.

Board of Investigation shall ascertain the facts and circumstances, and report its findings and recommendation for the settlement of dispute.

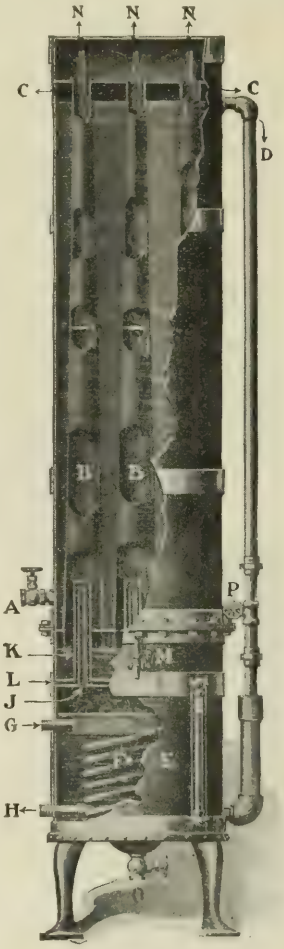
Pending efforts of the Board of Mediation and Conciliation to induce employer or employers and employees to submit to arbitration, and until investigation has been completed and report published, it shall be unlawful for employer or employers to declare or cause a lockout, or for the employees, acting in combination, to declare or cause a strike on account of such controversy.

H. J. Res. 323. By Mr. Adamson, December 16. To Committee on Interstate and Foreign Commerce. To extend the time for report to Congress by the Joint Committee under S. J. Res. 60 to January, 1918.

S. 7361, by Mr. Pomerene, December 15. To Committee on Interstate Commerce. To amend section twenty-one of the Pomerene Bills of Lading Act, approved August 29, 1916, as follows. Sec. 21. That when goods are loaded by a shipper carrier shall, on written request, count the packages of goods, if package freight, and ascertain the kind and quantity, if bulk freight, within a reasonable time, and shall not, in such cases, insert in the bill of lading or in any notice, receipt, contract, rule, regulation, or tariff "Shipper's weight load, and count," or other words of like purport. If so inserted, said words shall be treated as null and void.

A DRINKING WATER STILL

A machine for the production or pure drinking water is being introduced into the railway field under the name, Tripure system distillation, by the Railroad Water and Coal Handling Company, Chicago. It is of special application in those localities on railroads where supplies of potable water are not to be had, and combines the processes of distillation, precipitation and aeration in a single piece of apparatus, designed to obtain both purity and palatability of the water. It is also said to be economical in operation.



The Tripure Still

The process is best understood by reference to the accompanying illustration. Raw water enters at *A*, passes upwards through the cylindrical tank surrounding the condenser tubes *B* and serves as the cooling medium. It is raised at the same time to the temperature of 190 deg. Any solid matter in suspension in the raw water or thrown out of solution as a result of the increase in temperature is given an opportunity to precipitate in this tank while the vent *C* permits the escape of any gases evolved. From the top of the tank the water passes down the pipe *D* to the evaporator *E* where heat is supplied by means of the steam coil *F* with connections at *G* and *H*. The vapor from the water passes upward through the tubes *J* to the condenser tubes *B* where it is mixed with air entering through the tubes *K* which surround the tubes *J*, an arrangement which has the effect of drawing the air in and heating it by contact with the tubes *J*. The vapors which are aerated by contact with this air are condensed on the surfaces of the tubes *B* and collected in the distilled water chamber *M*. Any gases remaining escape through the vents *N*.

Aside from the purity attained by distillation, the water is said to be devoid of the flat dead taste so characteristic of ordinary distilled water.

PRUSSIAN BOYS FOR RAILROAD WORK.—According to press despatches, the government of Schleswig, Prussia, has proclaimed civil conscription of schoolboys. They will be used particularly for railroad work and for the loading and the unloading of trucks, of laborers for which there is a shortage.

Transportation Conference at Evansville, Ind.

Delegates Hear Addresses by A. P. Thom, E. B. Leigh, Clifford Thorne, W. G. Lee, Frank Trumbull and Others

THE Central States Conference on rail and water transportation took place at Evansville, Ind., on December 14 and 15. It was attended by approximately 500 delegates from Indiana and adjoining states. Henry C. Murphy, president of the Evansville Chamber of Commerce and chairman of the meeting, opened the conference with an address outlining its purpose and scope. The following remarks made by him are indicative of the present unhealthy condition of the American transportation system and the need of some concerted action looking toward a remedy:

"Within the past sixty days the significant announcement was published that 1,100 miles of new railways in China had been financed by American capital and would be constructed under American supervision. The work will require an expenditure of approximately $100,000,000. This has pregnant meaning when one considers the difficulty American railroads experience in obtaining capital needed for rehabilitation and development. With the stock of gold in this country standing at $2,750,000,000, an increase of $700,000,000 over a year ago, with $4,500,000,000 of actual money in circulation among our people, with business at such a peak that the railways are 108,000 cars short of the urgent demand, where could one find a man or group of men willing to finance and construct 1,100 miles of new railway in the United States?"

Resolutions were adopted at the conference favoring constructive action by Congress leading to the federal incorporation of carriers of interstate commerce, the enlargement and subdivision into various branches of the Interstate Commerce Commission to avoid conflicting functions, and to a sound and efficient governmental regulation rather than to government ownership of railroads.

The Government and the Railways

Alfred P. Thom, counsel of the Railway Executives' Advisory Committee, was the first speaker. He stated that existing railroad regulation does not adequately take note of the necessity to build up and make permanent a system of transportation facilities adequate to serve the commerce of the country in the most effective way. The panic of 1907 was not a panic of scarcity, but was brought on by the inability of communities to deal with one another because railroad facilities were inadequate. The car shortages of last spring and this fall may be explained by the lack of new mileage and needed terminals. A system has grown up by which the only means of financing railroads is through borrowed money, imposing fixed interest charges that must be paid regularly if bankruptcy is to be avoided, because the earning capacity of the railroads has not in late years been sufficient to make the purchase of stock attractive to the investor.

Notwithstanding the fact that about 85 per cent of the commerce of the country consists of interstate and foreign commerce and only 15 per cent of state commerce, every state has the power to determine the standard of efficiency of every railroad which serves it and also serves interstate commerce. In a time of car scarcity like the present the interest of all the states far transcends the right of interest of any single state, because the great bulk of their commerce crosses state lines. No state can submit to have the character of the regulation of its commerce controlled by the narrow or inadequate policies of another state

The solution of the transportation problem, suggested by Mr. Thom, was the same as that voiced by him before the Newlands Joint Committee on Interstate Commerce which has been fully reported in previous issues of the *Railway Age Gazette*.

The Real Owner of the Railroads—the Investor

John Muir, chairman of the Railway Investors' League, delivered an address on "The Real Owner of the Railroads —The Investor." He said in part:

Quietly, but with a steadiness which has accomplished marvelous results, there has been going on, for the past 10 years, with cumulative force, the persistent absorption of railway stocks and bonds of the leading railway systems of the country by the man of moderate means, the small investor. The result has been that, whereas in 1901 many leading railroads were owned by a few hundred or at most thousands of investors, now men (and women too) with moderate amounts of money who were impressed with the opportunity to secure liberal and permanent income are the chief owners.

The following figures are representative.

	Number of Shareholders	
	1901	1916
Atchison, Topeka & Santa Fe.	1,300	45,000
Pennsylvania	27,000	94,000
C., M. & St. P.	5,000	17,000
Gt. Northern	1,700	23,000
Baltimore & Ohio	3,200	27,000
Southern Pacific	1,500	33,000

Wall street has changed very much during the past 10 years.

Throughout the country, there is a great army of investors ready to supply money for the railroad development which the country so badly needs. If these investors can be convinced that capital invested in the railroads will be given proper consideration in the solving of all problems, that most pressing problem, the raising of the great amount of money needed for new construction and development, can be easily solved.

There is at present a conflict raging between two elements in the railroad transportation business. The great army of railroad brotherhoods have been forehanded. Upon small contributions from their wages and with skilful and astute leadership, they have built up a power and force which have enabled them to go before the highest authority in the land and demand and obtain a promise of increased pay upon threat, if not granted, of closing up the traffic of the country.

The course of the brotherhoods will not stand the test. The railroads, under present conditions, cannot stand for the demand of the brotherhoods and continue successful operation. If the brotherhoods had used the same influence and force with the same authority in Washington in presenting the needs of the railroads and gained for their employers what they *think* they have secured for themselves, the railroads would today be able to meet their demands.

And where in this controversy stand the 600,000 railway investors, who embody the great force that lies latent in the owners of the railroad property? Nobody ever hears a peep from them, and Congress and the commissions simply ignore them as if they were a negligible quantity. It is of supreme importance that the owners should be satisfied, because it is they who furnish the funds to develop the sections of country not now properly supplied with transportation facilities. It is the owners that Congress and the commissions ought to hear from, and the owners are as dumb as oysters and as powerless as jellyfish with no solidarity or means of expression.

The Railway Investors' League has been organized to

consolidate, for protective action, that immense power and influence possessed, but heretofore unused, by hundreds of thousands of unorganized investors. The league is neither anti-labor nor political. Its aim is to secure fair play alike from railroad managers, railroad workers, railroad regulatory bodies and political parties. It will oppose unfair tactics, whether attempted by federal or state government bodies, by railroad managements or railroad employees. It is "anti" nothing—save unjust practices from above or below, from without or within.

Relation of Shippers to Transportation Problem

E. B. Leigh, vice-president of the Railway Business Association and president of the Chicago Railway Equipment Co., spoke on the shippers and their true relation to the transportation problem. He said, in substance, that contrary to the general notion that industry consists of two fundamental divisions, namely, making and selling goods, there is a third element equally important—the transportation of products to the consumer. Shippers, he asserted, made the unhappy error of assuming that when they succeeded in reducing rates they were benefiting themselves. They completely overlook the fact that the stability of transportation rates, like the stability of commodity prices, is of vastly more importance to them as shippers than the level of rates themselves. Rates cannot remain stable unless they are equitable, for stability and equity are manifestly inseparable in any form of continued activity, and particularly where the activity comprises three such fundamental contributary elements as production, sales and distribution. He stated that if the three elements were combined under one ownership and management no executive would think of maintaining two of the elements on a sound economic basis and saddling an insufferable burden upon the third.

The purchasing power of the railways, Mr. Leigh asserted, was of such vast proportions as to exert potent influence in determining national prosperity or business depression. Mr. Leigh cited statistics prepared by the Brookmire Economic Service, St. Louis, Mo., which show that the resumption of heavy purchases of railway equipment generally precedes a period of business activity, whereas the cessation of heavy car buying is the forerunner of business depression. Manifestly the prosperity and, especially, the stability of the carriers is all-important to the shippers and the American public in general.

The present prosperity of the country is due largely to the manufacture of munitions incident to the war. Whether the inactivity which existed in 1914 will return when the war stops will depend upon the attitude of the country toward its transportation system. For years the railroads have not been doing their part in building up the country, but have been postponing what they could, patching up what they must, and all ceasing to grow.

In Mr. Leigh's mind three alternative remedies exist. One is to regulate individual rates with regard to their reasonableness and with regard to discrimination without considering the relation of total revenue to total expenses; the second is to ordain that rates shall be high enough to produce earnings out of which improvements and extensions and the development of territory not now served can come without the investment of new capital through stocks and bonds; the third is to lay down the rule that such a rate structure shall be permitted in every large region, that on the average all the roads traversing that region, and on an average over a period of years the earnings shall be sufficient to attract investments for addition and betterments to existing lines and for construction of new mileage.

Clifford Thorne on Regulation

Clifford Thorne, chairman of the Board of Railway Commissioners of Iowa, stated that through the work of the commissions in the various states rebates have been almost abolished, the abuse of the pass system has been largely eliminated, discrimination between shippers at the same point has been almost wholly removed, the safety and the comfort of the public and of railway employees are better cared for—mostly due to the voluntary action of the railroad companies, the mileage of American railways has almost doubled, the capital stock has increased faster than the mileage and dividends have increased faster than either, all under public regulation. As to service, the regulation of railroads has not yet been sufficiently active, but this is partly due to the fact that there has been conflict of interest as to prices, the railroads being willing to give any service for which the public is willing to pay. As to control of capitalization the federal government has accomplished nothing, but some of the states have made substantial progress.

He stated that there is too much business for the Interstate Commerce Commission to attend to. Regional commissions should be established with provisions for appeal in proper cases to the main commission. Where there is a conflict in rates established by a state authority and those made by the commission, the matter should be determined by a third party, either the courts or a special tribunal. He believed that the Interstate Commerce Commission should be given greater power over security issues to prevent fraud, and greater power over the distribution of cars to lessen the evils of car shortage. The commission should also be invested with greater authority over roadbeds and equipment of the railroads for the safety of the public and employees.

W. G. Lee on the Labor Problem

W. G. Lee, president of the Brotherhood of Railway Trainmen, stated that the brotherhoods were justified in making their demands for an eight-hour day because the hazards and responsibilities of railway service require that every transportation employee be at his best, and eight hours is long enough for any man to be under high physical tension. Mr. Lee took issue with President Wilson's proposition to enact a law similar to the Canadian Industrial Disputes Act, stating that the act was in disfavor with employees in Canada, and that it is neither necessary nor just to hold an employee in any service against his will. To do so would be enforced service, which is slavery in the strictest sense.

He expressed the hope that the railroads would agree on some form of adjustment that will work out fairly well and protect the interests of both sides to the question. Both sides, he said, are suspicious of the results of arbitration and are not in favor of continuing the present plan. They will have to agree on something that will in some degree appease the public demand that strikes must not occur on railways, or some one else will do it for them, and most likely in a way that they will not like.

Basis for Future Regulation

Frank Trumbull, chairman of the Railway Executives' Advisory Committee summarized the recommendations of the railways as made to the Newlands committee and said:

"It is perhaps proper to say at this time that the only sound way for future financing of American railways is by issues of stock; that is, to get more partners into the enterprise, instead of issuing more debt from year to year, particularly as each increase of debt makes subsequent borrowing more difficult.

"It is true that the last year has been the most prosperous in the history of American railroads, but whatever may be said about the capitalization of some individual roads, railway officials are willing to stand on the proposition that the railroads of the United States as a whole are not overcapitalized, and are, under any reasonable theory of valuation, worth more than the capital outstanding in the hands of the public.

"On this basis the return for the last fiscal year, after deducting operating expenses, taxes, hire of equipment, and rentals, was less than 6 per cent on the value of the property used by the public. What margin is there in this for the lean years that are sure to appear and reappear from time to time, or for the extension of facilities? Bear in mind that this is at a time when thousands of other industries are earning enormous profits and are therefore much more tempting to investors. Railroads, under private ownership, must compete with other people for new capital.

"Mr. Thelen also said that the expression that the railroads have '49 masters' may tickle the ear, but no railroad has so many. This seems to leave out of consideration the fact that any state may, by inharmonious regulation, disturb rate structures across the continent and can impose burdens upon the movement of commerce which may affect all railroads and all business. Four years ago the Interstate Commerce Commission, at a time of car shortage, exhorted the railroads to unite in some national system, and the whole tendency of regulation has necessarily been toward nationalization.

"Another witness before the joint committee, in advocating government ownership of the railroads, made the statement that $1,200,000,000 a year could be saved by government ownership and operation; whereas the history of government ownership of railroads throughout the world has been one of increased cost and in most instances reduced efficiency.

"Significant dissent from the advocacy of government ownership was made by William Jennings Bryan, who states his belief that private ownership under regulation should be maintained. We are glad to be able to agree with Mr. Bryan in this view, and in his further expression of a willingness to endorse a proposition that would give absolute stability to railroad stock by permitting this accumulation of a reasonable surplus out of which dividends could be paid in any bad year, so that any man who bought railroad stock could know that every year he would receive a return that paid the value of the money invested. 'I would like to see stock of a railroad,' said Mr. Bryan, 'as long as it is in private hands, made as substantial and as unvarying as the value of a government bond.' "

The other addresses delivered before the conference included: The Improvement of the Ohio River (illustrated by moving pictures), by Lansing H. Beach, colonel of the United States Army Corps of Engineers; the Mutual Interest of Shippers and Railways in the Transportation Problem, by J. M. Belleville, general freight agent, Pittsburgh Plate Glass Company; Car Shortage and the Cost of Living, by John E. Lathrop, director of the city planning department of the American City Bureau of New York; and Our Country's Welfare the Primal Object, by Frank P. Walsh, formerly chairman of the U. S. Commission on Industrial Relations.

At a banquet held at the Vendome hotel N. C. Kingsbury, vice-president of the American Telephone & Telegraph Company, delivered a toast on "Co-operation." He pointed out that we live in an era of specialization and economic interdependence. The great danger, he said, is that people specializing in one line of endeavor will not know enough or care enough about people specializing in other lines to understand their problems and difficulties and purposes and ideals and that our social body will become so broken up into sections that disintegration due to warring interests will undermine our civilization. Without the means of transportation the products raised by the farmer must either be consumed by him and those immediately dependent upon him or else be absolutely worthless. Likewise financial institutions are necessary to gather the people's money and to put that same money, still belonging to the people, back into the various complicated processes involved in supplying capital necessary for the harvesting, the transporting and the marketing of the product of the farm, of the factory or the professional man's office. Take away the machinery of exchange, take away the banks, the trust companies, the financial institutions, and crops will rot in the field and in the granaries.

Following Mr. Kingsbury's address a transcontinental telephone demonstration was made connecting Evansville with Washington, D. C., Boston, New York, Chicago, San Francisco and other cities. Messages over the telephone were received from Robert Lansing, secretary of state, Josephus Daniels, secretary of the navy, and Thomas Marshall, vice-president.

REBUILDING THE WORLD'S BUSIEST STATION IN WAR TIME

By Our Special European Correspondent

Every month the number of persons passing through the St. Lazare station at Paris equals that of the soldiers fighting on all the fronts. Every year the number more than totals the population of the world's dozen biggest cities. And now room is being made to handle more people.

The work of rebuilding the Gare St. Lazare, the world's busiest railway station, has gone right ahead during the war. To be sure, the work was interrupted in the early months of the war, and it is now not going forward as rapidly as it would under ordinary conditions, but it is going ahead fast enough to warrant the statement that if the war lasts another year the station will be practically completed before the war is over.

One of the curious facts about this station is that its traffic has not fallen far below that of peace times. However, its military passenger traffic has not compensated entirely for the loss of part of its huge suburban and long distance traffic, a comparatively greater proportion of the military traffic being taken by the Northern Railroad, which leads directly into the war zone, and which, therefore, is used to handle countless trains of the vast movements of troops and materials involved in the military operations.

Yet St. Lazare is still the liveliest of Paris stations, with its rails reaching right into the heart of fashionable and business Paris. Underneath the Place du Havre, in front of the station, the busiest tracks of the Paris subway and surface car systems converge.

The Paris of the present is not the dead city that we imagine it to be. It had its period of stagnation during the first year of the war, but has recovered from it. Today, in the early morning, at noon, and in the evening of every week day, vast crowds pass in and out of the station, or throng the rue St. Lazare and the rue du Havre, going to and from the boulevards, the big stores and the business offices. Even the automobiles have latterly come back in such numbers as to make foot travel dangerous. The only marked difference in the crowd is the greater number of women and the smaller number of young men. Nor does this crowd stay out late at night, owing to the shading of all street lights.

Otherwise this great traffic center's crowd is much as in peace times, so far as regards mere numbers. It pushes and scrambles along at a rapid rate in daylight hours, and the sole, unoccupied person is the bootblack whose stand is at the main street gate or entrance of the big station. Owing to the custom of French people of shining their shoes at home, this man, the only bootblack outside this wonderful station, has to eke out a living carrying messages and packages for travelers. Dozens and dozens of times I have passed him at his post on an aisle of safety under the street lamp, and not once have I seen him busy on the shoes of any of this stream flowing in or out of the station.

Railway men, tourist agents, travel experts and others look for this Paris crowd to double in size when the war ends, and that is doubtless one of the many reasons for

wishing to increase the facilities of the station now. Formerly its facilities were strained to the utmost in July, when the schools closed and families left the city, and at the end of September, when the schools reopened. The station before the war was handling 1,200 trains in and out daily, and on real busy days it handled 250,000 passengers. It is expected that an enormous amount of travel will come with the end of the war, due to the reshifting of business and population, and the readjustment of the country made necessary by the war.

The plans for rebuilding the St. Lazare station were formed six years ago. The station passed into the possession of the government when the Western Railway, of which it was the terminal, was taken over January 1, 1909, and made part of the State Railways system. This station was then sadly in need of enlargement and repair, it having been let deteriorate like every other part of the Western Railway. The private owners, knowing the state would take over the property, let the entire property go so long without repair that it became known as the worst operated road in the more important countries of Europe. Of the 1,138 bridges 745 were too weak to support heavy cars. At a time when the roads of Europe had begun to adopt heavy rails, 80 per cent of the tracks of this road were laid with old fashioned rails, often as light as 50 lb. to the yard. Since the government guaranteed the interest on the bonds and stock of the road, and was also by the law bound to lend money to improve the road in case earnings were insufficient, the road began to be improved on a large scale. More than 1,200 miles of new rails were laid, and in the more congested districts the roadbed was widened to accommodate three and four tracks. More than 200 bridges were re-enforced and 80 were rebuilt.

A part of the improvements was the reconstruction of the large passenger stations at Rouen, Dieppe, Chartres, Cherbourg, Le Mans, and naturally, at Paris.

The Gare St. Lazare at Paris had long been the storm center of the traveling public's complaints regarding the service of the Western system, because a large part of the working population of Paris lived in the suburbs and had to use its trains. The Paris clerk late at work always had a good and sufficient excuse for tardy arrival when he declared his train was late.

The first task, almost, of the new management was to begin the rearrangement of the St. Lazare station. Within two years Director Claveille, a man of the American railroad manager type, had the suburban trains running on time. In testimony of this fact he then became known by name to practically every suburbanite of Paris, and to this hour he enjoys extraordinary popularity in Paris.

But to accommodate the vast and growing traffic of the railway, the station had to be rebuilt, and rebuilt underground, there being no room to spread the tracks sideways, as the station had been plannd in the early days of railroading on the continent. Since then the city has grown along both sides of the uncovered trackways, some 30 ft. below street level, to such an extent that it would be inadvisable to tear down these buildings in order to spread the track space.

The plans as approved and now being carried out contemplate the electrification of the suburban trains, and the placing of them on tracks under those of the steam road. The work does not involve the tearing down of the central station building, which is a magnificent structure, remodeled in 1886-9 according to the plans of Lisch. The principal new work at present viisble from the outside has been done on the eastern end of the building at the corner of the rue d'Amsterdam. At this corner a new structure fitting into and harmonizing with the façade of the older building has been erected, while on the interior two new platforms have been added to the original 14, these platforms accommodating four new tracks. The 16 platforms serve 27 tracks, but there are also 4 other tracks for locomotives and other service only, making a total of 31.



The Gare St. Lazare

One of the advantages this station has always enjoyed, and which has made it possible to handle its traffic in the past, is the possession of a very large combination freight yard, roundhouse, repair shop and reserve station barely a mile from the St. Lazare station proper, and connected to it by all the main track lines, which, indeed cut through it on entering or leaving St. Lazare. Because of the existence of this ample secondary station, commonly called the "Gare aux Marchandises," or else the Batignolles station, the St. Lazare station has been greatly relieved. So soon as a train discharges its passengers and baggage, it may then proceed to the secondary station and leave the tracks free for other trains. Another advantage enjoyed by this first station of St. Lazare is that its secondary relief station, in its turn, is relieved by an immense freight and passenger car yard at Argenteuil, eight miles outside of Paris.

Coal Famine in Holland.—Owing to the difficulty of obtaining coal from England, Germany and Belgium, the Dutch railways may be obliged to curtail their services.

General News Department

A roundhouse of the New York Central at White Plains, N. Y., was destroyed by fire December 13; estimated loss, $25,000.

The Seaboard Air Line has bought two gasoline motor passenger cars. They are to be put in service between Savannah, Ga., and Columbia, S. C., 142 miles, and between Savannah and Jacksonville, Fla., 137 miles.

Leslie Craven, member of the firm of Griffith, Leiter & Allen, attorneys, Portland, Ore., has been appointed assistant counsel of the Western group of the Railroad Presidents' Conference Committee on Valuation, with office at Chicago.

G. W. W. Hanger, federal mediator, announces that the differences between the Nashville, Chattanooga & St. Louis and its trainmen, which had been thought to be tending toward a strike, have been satisfactorily settled. He thinks that there is a greatly improved state of feeling between employer and employees.

The Long Island Railroad has resolved that, beginning January 1, it will refuse permits allowing lap dogs to be carried in passenger cars. Passengers accompanied by dogs will be requested to place them in the baggage car. Dogs will not be carried on trains having no baggage car. Small dogs in baskets will still be permitted in passenger cars.

The Lehigh Valley has ordered 149 gasolene motor-driven cars for track repair gangs. These will be distributed over the whole system, and when they are added to the 183 cars of this sort now in use the last of the old hand-cars will be retired. The hand-cars, says the press agent, will go the way of the wooden coach and the hand-brake. The new cars carry 10 men, and can make 25 miles an hour.

In Texas the railroad commissioners have received numerous complaints from manufacturers and others concerning confiscation of coal by the railroads. The railroads, in reply to the questions of the commissioners, say that their situation has been "most desperate." A part of the trouble has been due to closing of certain mines at Thurber. Certain municipal water and light plants have, at times, been almost entirely out of fuel.

The campaign of T. J. Foley, general manager of the Illinois Central, against automobile grade crossing accidents, mentioned in our issue of December 8, has not only won widespread editorial commendation, but has directly resulted in remedial legislation. In Mississippi ordinances requiring motor-driven vehicles to come to a full stop before crossing railroad tracks have been passed in five towns, namely: Brookhaven, McComb, Jackson, Canton and Vaiden.

United States Civil Service Commission announces examinations, January 23, for senior structural engineer for the division of valuation, Interstate Commerce Commission; salaries $3,000 to $4,000. Appointments will be made principally for duty in the field, and there is now a vacancy in the southern district at $3,600 a year. Applicants must be between 30 and 60 years old. They must have thorough training, experience with railroad buildings and acquaintance with cost estimating.

The five-miles Connaught tunnel of the Canadian Pacific, through the Selkirk mountains, in British Columbia, has been opened for traffic. This marks the completion of the longest railway tunnel in the western hemisphere. In its construction a new record was set in tunnel driving, a novel and previously untried method being used, which involved the piercing of an auxiliary or pioneer heading entirely outside the tunnel proper. Descriptive articles of the methods used appeared in the *Railway Age Gazette* on December 11, 1914, and May 12, 1916.

The transportation committee of the National Shoe Wholesalers' Association has issued a bulletin giving the result of a vote of the members on several questions pertaining to the regulation of railroads. Sixty-three per cent of the members voting favored exclusive federal regulation; 80 per cent favored federal incorporation and federal regulation of security issues; 60 per cent favored a continuation of the taxing powers of the states, while 40 per cent were in favor of taxation being controlled by the federal government, the proceeds to be apportioned among the states; 52 per cent of the members were in favor of the states retaining their police powers, while 48 per cent were in favor of the federal government taking these over also.

The University of Illinois, through the Director of the Engineering Experiment Station, announces the terms on which applicants are appointed to the 15 research fellowships maintained by the university. One of these fellowships has been established under the patronage of the Illinois Gas Association. These fellowships, for each of which there is an annual stipend of $500, are open to graduates of approved American and foreign universities and technical schools. Appointments are made for two consecutive collegiate years. Nominations accompanied by assignments to special departments of the Engineering Experiment Station, are made from applications received by the director of the station each year not later than February 1. Preference is given those applicants who have had some practical engineering experience following their undergraduate work. Appointments are made in the spring and they take effect the first day of the following September.

The Atchison, Topeka & Santa Fe has prepared plans for the establishment of a new fruit and produce market at Archer avenue and North Blackwell street, Chicago. The proposition has been submitted to the sub-committee on local industries of the city council, and it is expected that the council will pass an ordinance vacating certain streets between Eighteenth and Twenty-second streets, and from Wentworth avenue to Stewart avenue. The Santa Fe proposes to erect an auction fruit house, about 800 ft. by 80 ft. and several stories high, a banana and office building about 600 ft. by 70 ft., a power house, a garage and necessary trackage facilities. The plans provide for the widening of North Blackwell street to 120 ft., from which a viaduct will be built to connect with the Eighteenth street viaduct. All other railroads will be given the privilege of using the terminal on the same basis with the Santa Fe.

The Pennsylvania Railroad has adopted a scheme, covering the whole of its territory, under which applications for work will be received by every one of the 1,500 stations agents on the lines, each becoming, in effect, an employment agent. An employment clearing house is to be established in the general manager's department at Philadelphia. The purpose of the new plan is to encourage the entrance into the service of a greater number of men who live in the neighborhood of the road. It will now be easy for anyone to make an application, and to ascertain what lines of service are open, and in what localities work for which he is fitted may be obtained. The agent will interview each applicant, learn his capabilities as fully as possible, and direct him to the nearest shop foreman, supervisor, trainmaster or road foreman of engines, who may want men. Each general superintendent will forward, once a week, to the general manager a list showing the number of vacancies on his grand division for shop laborers, car repairmen, car cleaners, engine cleaners, brakemen, firemen, freight handlers and trackmen.

Canadian Railways Being Sent to France

On a request from the British government the railways of Canada will undertake to supply from their own mileage 1,200 to 1,500 miles of track, including rails and other track material for immediate use in France. The transportation facilities behind the western front are not proving adequate to permit the Allies to take full advantage of the munitions and other supplies available.

Already 300 miles of Canadian Government Railways' sidings

have been taken up to be shipped. Next will follow the taking up of 220 miles of track in the mountain section between Edmonton, Alberta and the coast, where in some places the Canadian Northern and Grand Trunk Pacific are nearly parallel.

Teaching Telegraphy

The Buffalo, Rochester & Pittsburgh, in connection with the John A. Weber Memorial Training School, at Punxsutawney, Pa., has established a department for training telegraphers. The school will have telegraph and telephone instruments connected with the Buffalo, Rochester & Pittsburgh wires so that students will hear actual train orders transmitted.

The Court-of-Claims Mail-Pay Suit

The Supreme Court heard arguments at Washington on December 14 on the appeals of the Chicago & Alton and the Yazoo & Mississippi Valley from the decision of the court of claims sustaining the legality of an order issued by the postmaster general in 1907 requiring the use of the whole number of days in the period during which the mails are weighed as a divisor in obtaining the average daily weight, instead of making an allowance for Sundays. This order reduced the compensation paid to the railways for handling the mails by an amount estimated at over $40,000,000 from 1907 to 1916.

Tank Cars and Safety Appliance Rules

The Executive Committee of the Master Car Builders' Association has postponed the date at which the Tank Car Specifications for Class 3 and Class 4 Tank cars are to go into effect to May 1, 1917. It has also changed date from which cars not properly equipped with safety appliances shall not be interchanged, adding a second paragraph to Section *n* of Rule 3, of the Rules of Interchange to read: "After June 1, 1917, no foreign car will be accepted in interchange unless properly equipped with United States Safety Appliances or United States Safety Appliances, Standard." The law requiring the complete equipment of cars with the required appliances goes into effect July 1, 1917.

Railway Revenues and Expenses for September 1916

The net operating income of the railways of the United States for September, 1916, exceeded that for September, 1915, by $43 per mile, or 10.0 per cent, according to the bulletin of the Bureau of Railway Economics.

Total operating revenues, $324,954,301, exceeded those for September, 1915, by $37,786,828. Operating expenses, $203,235,394, were greater by $25,599,335. Net operating revenue, $121,718,907, made a gain of $12,187,493. Taxes, $13,744,466, increased by $1,878,577. Net operating income was $107,910,814, an increase of $10,313,031.

If spread over the mileage represented, operating revenues averaged $1,409 per mile, an increase of 12.6 per cent; operating expenses per mile, $881, were greater by 13.8 per cent; net operating revenue per mile, $528, increased 10.6 per cent; while net operating income per mile, $468, showed an increase of 10.0 per cent. Taxes per mile rose 15.3 per cent.

This summary covers 230,575 miles of operated line, or about 90 per cent of the steam railway mileage of the United States.

For the Eastern railways, operating revenues per mile exceeded those for September, 1915, by 12.1 per cent; operating expenses rose 18.0 per cent; net operating revenue increased 2.3 per cent, and taxes 18.8 per cent. Operating income per mile increased 0.6 per cent.

For the Southern railways, operating revenues per mile exceeded those for September, 1915, by 11.2 per cent; operating expenses rose 9.4 per cent; net operating revenue increased 14.8 per cent, and taxes 16.1 per cent. Operating income per mile increased 14.6 per cent.

For the Western railways, operating revenues per mile exceeded those for September, 1915, by 13.8 per cent; operating expenses rose 11.0 per cent; net operating revenue increased 18.0 per cent, and taxes 12.3 per cent. Operating income per mile increased 18.7 per cent.

The three months of the current fiscal year, compared with the corresponding period of the preceding year, show changes

REVENUES AND EXPENSES OF STEAM ROADS—SEPTEMBER, 1916.

Account	United States				Eastern District				Southern District				Western District			
	Amount, 1916	Per mile of line		Increase over 1915 Per cent	Amount, 1916	Per mile of line		Increase over 1915 Per cent	Amount, 1916	Per mile of line		Increase over 1915 Per cent	Amount, 1916	Per mile of line		Increase over 1915 Per cent
		1916	1915			1916	1915			1916	1915			1916	1915	
Total operating revenues	$324,954,301	$1,409	$1,251	12.6	$144,933,546	$2,451	$2,185	12.1	$43,848,059	$1,028	$925	11.2	$136,172,696	$1,057	$929	13.8
Freight	228,698,586	992	866	14.5	99,115,835	1,676	1,502	11.6	32,051,130	752	685	9.7	97,531,621	757	633	19.7
Passenger	66,586,472	289	272	6.3	30,597,513	517	466	11.0	8,602,066	202	176	14.9	27,386,893	213	214	d 0.5
Mail	5,074,075	22	22	d 1.1	1,848,525	31	32	d 2.7	730,491	17	15	13.1	2,495,059	19	20	d 3.3
Express	7,914,453	34	28	21.3	3,974,984	67	52	29.4	942,156	22	20	13.5	2,997,313	23	20	14.6
All other	16,680,715	72	63	14.5	9,396,689	160	133	19.2	1,522,216	35	29	21.7	5,761,810	45	42	6.5
Total operating expenses	203,235,394	881	774	13.8	95,338,959	1,612	1,366	18.0	28,807,321	676	618	9.4	79,089,114	614	553	11.0
Maintenance of way and structures	38,994,002	169	154	9.8	16,518,518	279	249	11.9	6,124,084	144	126	14.4	16,351,400	127	119	6.4
Maintenance of equipment	51,187,481	222	192	15.7	24,762,374	419	350	19.7	7,840,151	184	168	9.3	18,584,956	144	127	13.7
Traffic	5,220,451	23	21	5.7	2,046,882	35	31	11.9	976,874	23	20	12.2	2,196,695	17	17	d 1.8
Transportation	99,102,105	430	373	15.2	47,737,927	807	676	19.4	12,620,112	296	277	6.8	38,744,066	301	265	13.4
General	7,162,380	31	27	14.1	3,185,962	54	45	19.3	1,099,417	26	24	8.9	2,877,001	22	20	10.9
All other	1,568,975	6	7	3.8	1,087,296	18	15	23.9	146,683	3	2	43.0	334,996	3	5	d 36.6
Net operating revenue	121,718,907	528	477	10.6	49,594,587	839	819	2.3	15,040,738	352	307	14.8	57,083,582	443	376	18.0
Taxes	13,744,466	60	52	15.3	5,521,863	93	79	18.8	1,930,024	45	39	16.1	6,292,579	49	44	12.3
Uncollectible revenues	63,627	*	*	....	31,463	1	*	....	6,851	*	*	....	25,313	*	*	....
Operating income	107,910,814	468	425	10.0	44,041,261	745	740	0.6	13,103,863	307	268	14.6	50,765,690	394	332	18.7
Operating ratio—per cent—																
1916		62.5				65.8				65.7				58.1		
1915		61.9				62.5				66.8				59.5		
Average mileage represented—																
1916		230,575				59,141				42,639				128,796		
1915		229,435				59,059				42,129				128,248		

d Decrease. * Less than one dollar.

per mile of line as follows: Operating revenues increased 16.0 per cent, operating expenses increased 14.1 per cent, net operating revenue increased 19.2 per cent, taxes increased 13.6 per cent, and operating income increased 20.0 per cent.

Operating income per mile increased 12.1 per cent in the East, increased 22.7 per cent in the South, and increased 28.2 per cent in the West.

September operating income per mile was 10.0 per cent greater in 1916 than in 1915, 32.8 per cent greater than in 1914, 31.4 per cent greater than in 1913, and 20.8 per cent greater than in 1912.

Efficiency on the Brooklyn Rapid Transit

T. S. Williams, president of the Brooklyn Rapid Transit Company, operating elevated and surface railways in Brooklyn, N. Y., in his last circular to employees concerning efficiency, gives figures showing how, in spite of an increase in receipts, the net earnings have decreased because of increased cost for labor, taxes and supplies; and he issues a "call for volunteers" and proposes a joint efficiency campaign, to be participated in by all officers and employees. Employees are invited to sign a statement which in substance reads as below (*facsimile, reduced one-half-in height and width*):

Brooklyn Rapid Transit System
Joint Efficiency Campaign

SURFACE TRANSPORTATION DEPARTMENT

ENLISTMENT BLANK

I desire to enlist in the Joint Efficiency Campaign of the Men and Management of the Brooklyn Rapid Transit System.

I agree to read each Efficiency Bulletin once each day until the next one is issued.

I promise to do my part toward increasing the net earnings, by

Protecting the Company's Revenues
Performing Work Faithfully
Cutting Down the Accidents
Cutting out Waste
Using Power and Material Economically
Using Equipment Carefully
PLEASING THE PUBLIC

The term of my enlistment begins TODAY.

Increased Pay and Bonuses

The Kansas City Southern has made an increase of 10 per cent in the pay of employees whose compensation is $50 a month or less, and one of $5 a month for those who receive more than $50 and not more than $100. Men working by the hour will receive an increase of one cent an hour. The increase applies to all employees excepting those working under union contracts. It includes station agents and telegraphers. These increases date from December 1.

The Nashville, Chattanooga & St. Louis has granted a 10 per cent increase in wages to section foremen and laborers. This will add $75,000 annually to the company's expenditure for track labor.

The Delaware, Lackawanna & Western is to pay bonuses, ranging from 6 to 10 per cent, to employees whose pay is $2,000 or less yearly. It is said that about 7,000 employees will be benefited by this order.

The Erie is to pay, on December 31, to employees not receiving more than $100 a month—excepting those working under a contract agreement, and excepting, also, those who have been in the service of the company less than two years—the unionized employees—an extra month's wages. The number affected is said to be about 10,000.

A similar resolution has been adopted by the directors of the Southern Pacific Company, with certain limitations. It is said that the bonus will be 10 per cent of the annual pay, and will be payable, 5 per cent on January 1, and 5 per cent on July 1, 1917.

The Last of the "Farmers' Railroad"

The United States District Court for the Western district of Iowa, on December 9 wrote the last chapter in the financial tragedy of the Atlantic Southern Railroad, which has been a familiar feature in the newspapers of that region for about seven years past.

Robert Abeles, of St. Louis, was authorized to dismantle the road. It is 37 miles long. It was started by some farmers in 1910 with the idea, according to a local observer, that they could "show Jim Hill how to run a railroad." The track was laid and the owners essayed to do business, but early in 1911 creditors began to make trouble and a receivership soon followed.

A syndicate headed by Leslie M. Shaw, former Secretary of the Treasury, tried to float bonds in this country and abroad with which to get funds to make good on a bid on the property. But the second Balkan war came on, and after a long delay in the courts, Mr. Shaw gave it up. It fell to the lot of the largest lien-holder, Robert Abeles, to finally take the property over. After 18 months of effort to make the road pay expenses, the road was closed down at the end of 1914.

Since that time an order of the Iowa Railroad Commission that a portion of the property should be operated has been overruled by both the state and the federal courts, and the final steps are now about to be taken towards the final dissipation of this dream. W. Harding Davis, of St. Louis, Mo., is to sell the rails and other property, and the track will be torn up in January.

Transportation of Explosives Restricted

As a result of the disastrous explosion on Black Tom Island, Jersey City, last July (reported August 4, page 190), when property worth many millions was destroyed, the railroads delivering explosives in Jersey City have agreed to greatly restrict the movement of explosives in cars; and according to one estimate the present movement of 1,000 cars a month will be reduced to about 100 cars a month. The manufacturers sending munitions to Europe will ship by way of Canadian ports or through Boston, Philadelphia or Baltimore. Following the explosion, the city of Jersey City adopted an ordinance forbidding railroads to transport explosives of any kind within its limits; the railroads secured an injunction restraining the enforcement of the ordinance and argument on the question was only completed last week. The railroads won their case, and the city cannot enforce this ordinance; but the court imposed restrictions on the carriers, designed to minimize the danger; and the roads have notified their agents to accept no explosives for shipment through Jersey City, Communipaw, or Sterling Junction.

The New York Harbor Line Board, a federal body acting under the authority of the War Department, has issued new regulations for the transportation of explosives by lighters in New York harbor.

Valuation Progress

In a statement issued by the Presidents' Conference Committee on the Federal Valuation of the Railroads, attention is called to the fact that the notices of the so-called tentative valuations of the carriers which the Government is issuing cover only the reports of the Engineering, Land and Accounting sections of the Division of Valuation, but do not undertake to deduce therefrom the valuation of the property as a whole or as a going concern. The statement has been made that the Commission found a valuation of $8,865,636 for the New Orleans, Texas & Mexico, and this has been contrasted with $40,000,000 capitalization. The Government's estimate of the cost of reproduction covers only the railroad owned by the New Orleans, Texas & Mexico, whereas its capitalization includes an investment of $28,000,000 in the securities of three other railroads in Texas.

The director of valuation has issued the following instructions to the engineering board:

"You will not inventory materials and supplies, since this account will be entirely handled by the accounting section.

"You will inventory as a part of the property only that which

has been actually incorporated into and become a part of that property. For example, ties scattered along the track ready to be placed in the track will not be inventoried by you; and so with other materials intended for renewals and repairs.

"Account 47—Unapplied Construction Material and Supplies—has no application to a railroad which has been completed and placed in operation."

Some of the State Commissions have arranged to obtain through the Division of Valuation, by paying the carriers for the cost of blue printing, copies of the maps marked by the Land section of the Division of Valuation to show the zones and the Government classification as between carrier and non-carrier property.

Sand Drags at Keadby, England

In the approaches to a draw-bridge lately built at Keadby, Eng., on the Great Central, sand drags—otherwise known as sand tracks—have been provided in lieu of derailing switches or diverging tracks. Short lengths of track are laid in two narrow troughs filled with sand. If a train runs past the stop signal, the switch is set to turn the wheels into the troughs and its speed is soon dissipated. The drags are from 300 ft. to 600 ft. long, and at the outgoing end the rails are led back into the main track.

The Keadby bridge is of the Scherzer lift type, and is the largest of that type in Europe. It replaces a swing bridge which had been in use for 60 years. The new bridge is 53 ft. 6 in. wide, and carries a highway as well as the railway, a width of 29 ft. being occupied by the railway, and 24 ft. 3 in. by the roadway. There are two fixed river spans of 135 ft. each; the lifting span of 160 ft., a span of 40 ft. supporting the lift span when it is open, and finally another fixed span of 70 ft.

The steel work of the lift span weighs 987 tons and, with its counterweight, containing 1,800 tons of concrete, weighs 2,920 tons.

Electrification Progress on the St. Paul Road

The Chicago, Milwaukee & St. Paul added 76 miles to its electrified section of road on December 11, completing the electrification from Harlowton, Mont., to East Portal, at the east end of the St. Paul Pass tunnel, a total distance of 406 miles. A length of only 34 miles remains to be electrified, which includes 1.7 miles through the tunnel. The lining of the tunnel with concrete has been completed, and the bonding of rails and the construction of trolleys are under way. All of the power stations now have their full complement of motor generators, except that at East Portal, which will have three generators, one of which is yet to be installed, and that at Drexel, Mont., which will have two, one of which has not yet been set up. Both generators are expected to be installed within a week or two. It is hoped that the remaining stretch will be completed and ready for operation in the early part of January. The St. Paul has ordered 44 electric locomotives, 37 of which are now in use. One of these recently hauled a special train 339 miles. This train consisted of a baggage car and four business cars, and was occupied by L. W. Hill, chairman of the board and president; R. Budd, assistant to the president of the Great Northern; J. M. Hannaford, president, and George T. Slade, first vice-president of the Northern Pacific.

The run was from Alberton, Mont., to Harlowton. It is the longest ever made by any locomotive on the system. The engine received no special care en route, and after arriving at Harlowton was ready to return to its starting point without passing through a roundhouse or receiving any further attention.

Railway Engineering Association Nominations

The nominating committee of the American Railway Engineering Association has submitted the following nominations for officers of the association for the coming year. Ballots will be issued to members about February 15, 1917:

President: John G. Sullivan, chief engineer, Western lines, Canadian Pacific, Winnipeg, Canada.

Vice-president: Earl Stimson, engineer maintenance of way, Baltimore & Ohio, Baltimore, Md.

Treasurer: Geo. H. Bremner, district engineer, Interstate Commerce Commission, Division of Valuation, Chicago, Ill.

Secretary: E. H. Fritch, Chicago, Ill.

Directors (three to be elected): J. A. Atwood, chief engineer, Pittsburgh & Lake Erie, Pittsburgh, Pa.; Hadley Baldwin, assistant chief engineer, Cleveland, Cincinnati, Chicago & St. Louis, Cincinnati, Ohio; W. H. Courtenay, chief engineer, Louisville & Nashville, Louisville, Ky.; L. A. Downs, general superintendent, Illinois Central, New Orleans, La.; S. B. Fisher, engineering department, Missouri, Kansas & Texas, Parsons, Kan.; H. E. Hale, group engineer, Presidents' Conference Committee, New York City; John D. Isaacs, consulting engineer, Southern Pacific, New York City; E. H. Lee, vice-president and chief engineer, Chicago & Western Indiana, Chicago, Ill.; E. B. Temple, assistant chief engineer, Pennsylvania Railroad, Philadelphia, Pa.

Members of nominating committee (five to be elected): J. R. W. Ambrose, chief engineer, Toronto Terminals railway, Toronto, Ont., Canada; Geo. H. Burgess, chairman valuation committee, Delaware & Hudson, Albany, N. Y.; W. M. Dawley, assistant engineer, Erie, New York City; V. K. Hendricks, assistant chief engineer, St. Louis-San Francisco, St. Louis, Mo.; W. T. Dorrance, chief draftsman, New York, New Haven & Hartford, New Haven, Conn.; B. H. Mann, signal engineer, Missouri Pacific, St. Louis, Mo.; J. A. Peabody, signal engineer, Chicago & Northwestern, Chicago, Ill.; S. T. Wagner, chief engineer, Philadelphia & Reading, Philadelphia, Pa.; C. A. Wilson, consulting engineer, Cincinnati, Ohio; H. S. Wilgus, engineer maintenance of way, Pittsburgh, Shawmut & Northern, Angelica, N. Y.

Christmas on the B. R. & P.

The Buffalo, Rochester & Pittsburgh issues to its employees a Christmas leaflet in three colors, green, red and white. Signed by H. E. Huntington, general passenger agent, it bears the compliments of the season from his department, and reads in part as follows:

"Christmas"—What a wealth of tender, wondrous recollections the name arouses. It takes us back across the years . . .

"Christmas"—A celebration of the natal day of One upon the foundation of whose teachings has been builded all that is best in human intercourse today.

Throughout the hurry and struggle of the busy year we have accumulated—involuntarily, but nevertheless truly—the dust of selfishness, the grime of lack of consideration for others. . . . Christmas exists, primarily, in the heart—gifts, greetings and kindly actions are but its outward manifestations. Its origin was love, "For God so loved the World." To love is to serve, and in this we have the keynote of human service—the greatest work that man can do. . . . To know at the close of day that one has given something to this world of ours—what better could be said? . . . And he who serves his company, through it serves the world. In the Christmas season there will be more bundles to be kept out of the aisles, a greater possibility that some may be left behind. Our trainmen need no reminding of their duties in this regard. Accidents at any time are distressing, but vastly more so at Christmas time. Attention to details; a practicing of the little, everyday kindnesses which cost so little, yet mean so much; these are the things which lift us upward toward the goal of ultimate perfection which we seek.

Plans for Galveston Causeway Determined

The board of arbitration selected to determine the design which should be adopted for the extension of the Galveston Causeway, has submitted its report to F. Merritt, chief engineer of the Gulf, Colorado & Santa Fe, and chairman of the engineering committee of the interested parties, recommending the design submitted by the Concrete Steel Engineering Company, New York, with important modifications. Mr. Merritt says that it is expected that the structure will be built in accordance with these recommendations.

Following the destruction of a large part of the approaches at each end of the causeway by the storm in August, 1915, a committee of engineers was organized, consisting of representatives of the railroads, the interurban and the county, and several designs were prepared for the structure. A second committee consisting of Lincoln Bush, George F. Swain and A. N. Talbot was then organized to select from the different designs submitted, with the result noted above. The old causeway consisted of 28 70-ft. arches with a draw span in the center. Approximately 5,900 lineal ft. of the embankment approaches was washed out during the storm, while the causeway itself

was uninjured. The new structure will consist of arches with 60-ft. clear spans extending for the entire length of the approaches washed out. The arches will be supported on piers of solid concrete extending 10 ft. below mean low tide and supported on concrete piles. While only 2,100 ft. of free waterway was provided by the old causeway, the new plan provides for 6,000 ft. It is expected that work will be undertaken on this structure in the spring and that it will cost over $1,500,000 exclusive of tracks.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 20-22, 1917, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transporation Bldg., Chicago.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago. Next convention, March 19-22, 1917, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Blrg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Next annual meeting, January 16, 1917, Waldorf-Astoria Hotel, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August .

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

Blewett Lee, general solicitor of the Illinois Central, will address the Traffic Club of Chicago today on "The President's Labor Program."

The Baltimore & Ohio Railroad has placed an embargo against all westbound carload freight from connections west of Cumberland, Md., except perishables, live stock and foodstuffs for human consumption. The Great Northern, the Northern Pacific, the Chicago, Burlington & Quincy, and the Chicago, St. Paul, Minneapolis & Omaha have placed embargoes for an indefinite period on all freight destined to points east of Chicago and the Illinois-Indiana line, except perishable goods and live stock.

"The Dixie Limited" is the name of a new fast train between Chicago, Ill., and Jacksonville, Fla., that will be placed in service January 8. It will run from Chicago over the Chicago & Eastern Illinois to Evansville, Ind.; from Evansville to Nashville, Tenn., over the Louisville & Nashville; from Nashville to Atlanta, Ga., over the Nashville, Chattanooga & St. Louis; from Atlanta over the Central of Georgia to Macon; from Macon over the Georgia Southern & Florida to Tipton, Ga., and from Tipton over the Atlantic Coast Line to Jacksonville, Fla. This service will be in addition to the well-known "Dixie Flyer" which runs all the year round.

The South Dakota railroad commissioners have adopted a demurrage tariff identical with the one recently adopted by the Interstate Commerce Commission, and which has been adopted by several other states, as noticed elsewhere in this issue. It is to take effect on one day's notice, and to expire May 1. The Missouri Public Service Commission has adopted the following demurrage rates, effective December 26, and expiring May 1: One dollar a day for the first two days after 48 hours' free time; two dollars for the third day, three dollars for the fourth, four dollars for the fifth, and five dollars for the sixth and each succeeding day. The average agreement is to be allowable the same as in the interstate tariffs.

State Commissions Raise Demurrage Charges

In accordance with an agreement between shippers and carriers the State Public Utilities Commission of Illinois has issued an order making the demurrage rates recently adopted by the Interstate Commerce Commission applicable to all commodities transported in intra-state traffic. The order took effect on December 21, and will expire on May 1. The Public Service Commission of Washington, the Railroad Commission of Wisconsin, the Railroad Commission of Arkansas, the Public Utilities Commission of Idaho, and the Railroad Commission of Mississippi adopted the same tariff for application in their respective states. The orders are effective in Washington on December 13, in Arkansas and Wisconsin on December 18, and in Idaho on short notice following the filing of petitions by the railroads. The Public Service Commission of Oregon has fixed intra-state demurrage charges as follows, effective January 1: 48 hours free time; $2 a car for the first day or fraction thereof after the expiration of free time; $3 for the second day or fraction thereof; $4 for the third and each succeeding day or fraction thereof. When empty cars are placed on order and are not used but returned to the railroad, no free time will be allowed but demurrage will be charged from the first 7 a. m. after placing. The average agreement has also been revised to provide for two credits at $1 a credit for each car released within the first 24 hours of free time, while two debits will be charged against the shipper for the first 24 hours or fraction thereof that a car is detained beyond the free time, three debits for the second 24-hour period or fraction thereof, and four debits for the third 24-hour period or fraction thereof. Credits will not offset debits for any greater length of time than three days. For failure to deliver cars after the period allowed following notification, the carriers will be charged $2 a car for the first day, $3 for the second, $4 for the third day and each day or fraction thereof thereafter.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended until April 14, 1917, a tariff filed by the El Paso & Southwestern, increasing rates on coal from Dawson, N. M., to various points in Texas.

The commission has announced a hearing to be held in Chicago on January 29 before Examiner Disque on the tariffs filed by the railroads revising rates in Central Freight Association territory, which were suspended by the commission.

The commission has suspended until April 14 increased rates proposed by the Atchison, Topeka & Santa Fe, the Missouri Pacific and the St. Louis, Iron Mountain & Southern on cement from Iola, Kan., to points on the Chicago & North Western in Iowa.

The commission has issued an order requiring all common carriers to file with the commission on or before March 1, 1917, a memorandum of the tariffs still effective which name rates on multiple car lots or on certain quantities in excess of a single car lot. The commission instituted an investigation of this subject by an order entered June 21, 1916.

The commission has suspended until April 14 the proposed withdrawal of joint through rates on bituminous coal from mines located on the P. C. C. & St. L. and the Pittsburgh, Chartiers & Youghiogheny in Pennsylvania and West Virgina to various destinations on the Erie, the Lehigh Valley, the Deleware, Lackawanna & Western, the New York Central, and the Delaware & Hudson.

The commission has approved the voluntary postponement by the transcontinental railroads of the proposed increase of 10 cents per 100 lb. on canned goods, dried fruits, wine, beans, barley, canned salmon and asphalt from Pacific coast states eastward. The rates had been postponed until December 30 in order to enable the shippers to complete the shipment of 1916 output, but because of the delays caused by the car shortage it was decided to further suspend the rates.

PERSONNEL OF COMMISSIONS

David H. Crowley, announcement of whose appointment, effective December 5, as a member of the Michigan Railroad Commission was made in these columns last week, was born in Leslie, Mich., September 5, 1882. As a young man he worked with a section gang on the Michigan Central during his school vacations. In 1905 he graduated from the legal department of the University of Michigan at Ann Arbor, and at once took up the profession of law at Cheboygan, Mich. In 1908 he was elected prosecuting attorney, which office he held for four years. He was appointed assistant attorney general of Michigan in January, 1913, and the following year was assigned to the Michigan Railroad Commission as attorney. During the several years of his service as attorney with this body he participated for the State in the trials of the Ann Arbor and Pere Marquette two-cent passenger fare cases before the United States Courts. He succeeds Lawton T. Hemans, deceased.



D. H. Crowley

A. A. Betts, chief clerk to the assistant general freight and passenger agent of the Santa Fe, Prescott & Phoenix, a subsidiary of the Atchison, Topeka & Santa Fe, has been elected a member of the Arizona Corporation Commission, with headquarters at Phoenix, Ariz.

COURT NEWS

The Nebraska State Supreme Court recently declared unconstitutional a statute requiring railroads to transport livestock at an average speed of 18 miles an hour on main lines, and 14 miles an hour from local stations to division points, and on branch lines less than 125 miles long. The court held that a statute regulating the rate of speed of carriage of livestock was a proper exercise of the police power of a state only when it was reasonable and practical in its operation, and did not impose an undue burden upon the carrier, nor take away any of its constitutional rights. The evidence, in the cases here decided, established the fact that the appellant operates a single track railroad in Nebraska with several branch lines, and cannot comply with the speed statute as to westbound shipments without sending out special trains on branch lines to transport from one to four or five cars at a cost equal to double the rates allowed to be charged. It was also shown that on account of the ordinary incidents and vicissitudes of operating a long single track railroad, such as making up and inspecting trains at division points, waiting at meeting points for mail, passenger and other trains, waiting for stock from branch lines and delays occurring by reason of storms, washouts, wrecks and other unavoidable casualties, it is often impracticable to come within the statutory limit as to eastbound traffic.—Joseph H. Davidson v. C. & N. W., Steven E. Dexter v. C. & N. W., Ray H. McCormick v. C. & N. W. (decided December 9).

Wages of Discharged Employees

The Arkansas Supreme Court holds that, under the state statute fixing a penalty for failure to pay the wages of discharged employees, an employee is not entitled to the penalty in every case in which any wages are found to be due him, but only in case he made demand for payment which was refused.—Largent v. Arkansas Northwestern (Ark.), 188 S. W., 836.

Width of Right of Way

A right of way deed to a railroad company did not fix the width of the right of way. The Arkansas Supreme Court therefore holds that the company's occupancy includes, not only the land occupied by the track and by the pits from which earth was excavated for the embankment, but extends to the outer line of poles carrying a telegraph wire which is used in the operation of the railroad.—St. Louis, I. M. & S. v. Stevenson (Ark.), 188 S. W., 832.

Trespassing Pedestrians

The Kentucky Court of Appeals holds that if an injured pedestrian saw signboards warning against trespassing, and under such circumstances that a person of ordinary intelligence and prudence would understand them, and nevertheless went on the tracks, he was a trespasser, and the railroad was not liable for his injuries, unless those in charge of the engine and cars saw his peril in time to have prevented the injuries by the exercise of ordinary care.—Southern Ry. Co. in Kentucky v. Jones (Ky.), 188 S. W., 873.

Furnishing Cars—Course of Dealing

In an action for failure to furnish cars at a point 50 miles from the carrier's lines, the defendant contended that this agreement was so unusual that the plaintiff, as a prudent man, should have known that it was beyond the authority of the traveling freight agent who made it. The Kansas City Court of Appeals, however, held that evidence that the shipper had frequently requested cars at that point and had obtained them through the agent was sufficient to warrant the finding that the carrier, by a course of dealing, had led the shipper to believe that furnishing cars at that point was not unusual, and that the contract was not beyond the scope of the agent's authority.—Kissell v. P. F. W. & C. (Mo.), 188 S. W., 1118.

Safe Place to Work

An engineman stopped his locomotive, to make repairs, at a place where there was danger, at that time of year, because of ice and snow. He slipped on the ice and was injured. The Kentucky Court of Appeals holds that the railroad was not liable, since the injury was the proximate result of the engineman's act in choosing the unsafe place. If it could reasonably have been anticipated that injury would result, he, and not the railroad, should have anticipated such result.—Judd v. Southern (Ky.), 188 S. W., 880.

Limitation of Liability Provision Now Available in Action for Conversion

Under the Interstate Commerce Act as revised by the Carmack amendment, the St. Louis Court of Appeals holds that a bill of lading in accordance therewith, on an interstate fruit shipment, stipulating that the loss for which the company is liable shall be computed on the basis of the value of the property at the time and place of shipment, etc., limits the carrier's liability, even in suit for its conversion of the goods. Prior to these acts such provisions were regarded as of no avail in suits for conversion. The court followed Georgia F. & A. v. Blish Milling Co., 241 U. S., 190, where it was said that a different view would antagonize the plain policy of the act.—F. W. Brockman Com. Co. v. Missouri Pacific (Mo.), 188 S. W., 920.

Assumption of Risk

An assistant foreman of railroad carpenters was directed by the general foreman to select the necessary men to repair a bridge over railroad tracks. The assistant foreman removed the flooring of the bridge in sections extending only one half the width of the driveway, and replaced it so that at all times the bridge was open for travel. While at work, and directing those under him, a horse was frightened by an engine passing beneath the bridge, and becoming unmanageable, struck the assistant foreman, and knocked him through the open space, the fall killing him. The Pennsylvania Supreme Court holds that the assistant foreman assumed the risk of the injury, and no recovery could be had for his death.—Hunsinger v. Lehigh Valley (Pa.), 98 Atl., 655.

Proof of Conversion of Shipment

In an action of trover against a railroad for conversion of a carload of staves, the Supreme Judicial Court of Maine holds that testimony that the plaintiff bought the staves of B., had them loaded on a car for shipment, and that the carload was stopped or held up at shipping point by G. (who, the railroad alleged, was the owner of the staves), there being no other evidence in any way referring to the alleged conversion by the road, was insufficient showing thereof to sustain a verdict for the plaintiff. An action of trover cannot be maintained without proof that the defendant did some positive wrongful act with the intention either to appropriate the property to himself, to deprive the rightful owner of it, or to destroy it.—Durgain v. Maine Central (Me.), 98 Atl., 811.

Relief Fund Contract Held Valid

A relief society's membership was confined to the employees of one railroad, the Grand Trunk. The railroad contributed semi-annually a sum equal to the total assessments paid by members. In an action for $1,000 on a certificate of insurance the society put in evidence a by-law that half the sum insured for should be forfeited if the employee or his representative sued the railroad for damages, which had been done. The New Hampshire Supreme Court holds that the by-law is not void under section 7 of the federal employers' liability act, providing "that any contract, rule, regulation or device whatsoever, the purpose and intent of which shall be to enable any common carrier to exempt itself from any liability created by this act shall to that extent be void." That provision does not attempt to regulate contracts between an employee and an insurance company, and even if the contract be considered one with the railroad through the society as its agent, the contract is no more than an agreement by the railroad to pay an additional amount contributed by itself if suit is not brought. Judgment for $500 was entered.—Wilson v. Grand Trunk Ry. Ins. & Prov. Soc. (N. H.), 98 Atl., 478.

Evidence of Cause of Fire

In an action for damages for loss by fire, there was evidence to show that the fire which destroyed the plaintiff's mill and machinery became apparent in less than an hour after the passing of the train from the engine of which the plaintiff insisted sparks were emitted which caused the fire. But there was no evidence to show that the sparks were coming from the engine at the time it passed the building, or that it caused the fire, other than the following: that the wind was blowing in the direction of the mill from the track; that there was an accumulation of grass and other combustible matter on the right of way between the house which was burning and the track; that there was no fire in or near the mill on that day, or for several days prior to the fire, and that the fire began to burn on the side of the mill next to the track. The Georgia Supreme Court held that this was not enough to authorize the jury to find that the engine caused the fire by the emission of sparks, there being proof to show that the two engines which passed on the day of the fire and prior thereto were properly equipped with approved spark arresters, which evidence was uncontradicted.—Seaboard Air Line v. Jarrell (Ga.), 89 S. E., 718.

Absorption of Switching Charges

A rule of the Texas Railroad Commission provides that, on all competitive business originating at a junction point from which a line or lines could haul shipments to destination, and make delivery to consignees whose places of delivery are on or reached by such lines, the other line or lines, taking freight from such junction point to such destination for consignees whose places of delivery are so located, must absorb the switching charges necessary to making delivery. In other words, if the consignee's establishment is adjacent to any road, then all roads must deliver to him without making a charge for switching. In a suit to recover of the defendant railroad the excess over the maximum sum fixed by the order of the commission, which the plaintiff had been compelled to pay as switching charges to another railroad, and which the defendant had failed to absorb, the Texas Court of Civil Appeals holds that the defendant railroad was not required to absorb switching charges in excess of the minimum amount per car incurred in obtaining possession of the cars at the point of origin, over the spur track built by the plaintiff to another railroad, though the plaintiff had been compelled to pay a greater charge to the other railroad under its contract with it, approved by the commission.—White Rock Land & G. Co. v. International & Great Northern (Tex.), 188 S. W., 280.

Attempting to Board Moving Train

In an action for damages for death while attempting to board a moving train, it appeared that the deceased had traveled on the defendant's line about 24 miles from his home, and went to the station and applied to the agent for a return ticket. This the agent refused because the deceased seemed to be intoxicated. The man went away and returned to the station about the time the train started. As it started he attempted to board it, and after being prevented at several places by a porter, he got hold of a hand rail, and losing his grip, rolled from the platform under the train and was killed. The testimony conflicted as to whether he was intoxicated at the time. The carrier is not bound to accept one who is so intoxicated as to render it probable that he would be disagreeable or annoying, or would substantially interfere with the comfort of other passengers. An Illinois statute passed in 1911 makes it unlawful to drink any intoxicating liquor on a station platform, or in a station or in any car, and also makes a person liable to punishment for being intoxicated in any of these places. This statute has been held valid. No court has justified a person in boarding a moving train when warned not to do so by the men in charge. While there was some conflict in the testimony as to whether the deceased was intoxicated, all the testimony was to the effect that the company's employees refused to accept him as a passenger. The authorities all agree that a person cannot force his way upon a train against the will of the carrier, and thereby become a passenger. The Illinois Supreme Court decided in favor of

the road; that the relationship was not that of carrier and passenger. If any liability existed, it was because of the road's refusal to enter into that relationship; and recovery was not sought on that ground. Judgment for the plaintiff was reversed.—Todd v. L. & N. (Ill.), 113 N. E., 95.

Releases of Liability for Injuries

A railroad employee who had been injured in the eye by a sliver splitting off from a nail which his fellow servant was hammering executed a release of all liabilities to the railroad company in consideration of its promise to employ him further for one day and an order on the treasurer of the company for $1. In an action which he subsequently brought against the company for the loss of an eye, the Texas Court of Civil Appeals held that the release was executed through the employee did not work for the day or receive his dollar. By executing the release he did what he was obligated to do, leaving only an outstanding liability on the side of the company. Such releases are held to be valid. The fifth section of the federal employers' liability act does not apply to them. That section renders any contract void the purpose or intent of which is to "exempt" the carrier from liability created by the act. The court said that while the section is general in its terms, it evidently was the purpose of Congress to prohibit the carrier from entering into contracts with employees, previous to the injury, providing for its exemption from the consequences of its negligence. It could not be successfully contended that Congress intended to take away the right of the carrier to settle by contract for damages occasioned by its negligence, or which may be asserted unjustly by its employees.—Panhandle & Santa Fe v. Fitts (Tex.) 188 S. W. 528.

Assault by Conductor on Discharged Brakeman

A brakeman failed to stop a car kicked into a sidetrack and he was thereupon discharged by the conductor, who told him to go to the cab and get a lantern belonging to him and leave. As he started to go the conductor assaulted him. He brought suit against the company for $2,000 damages. Judgment for the company was affirmed by the Georgia Court of Appeals. The court said that the plaintiff had been discharged by the conductor, to whose orders and control he was subject, and the relation of master and servant no longer existed between the plaintiff and the railroad company when he was assaulted by the conductor without cause or provocation. A railroad would not be liable for wilful injury by one of its conductors not committed within the scope of its authority or in the furtherance of the business of the company upon a person not a passenger in an effort of the conductor to punish for what the conductor might consider an offense against him or the company previously committed. Georgia K. Co. v. Wood, 94 Ga., 124. The conductor was not at the time acting within the scope of his business, but wholly upon his individual responsibility, for the beating was inflicted not to compel the proper performance of any duty of the plaintiff to the company or to prevent any failure to perform his duty in the future, but was prompted solely by the personal feeling of irritation and anger excited in the mind of the conductor by the past conduct of one who was no longer connected with the company.—Smith v. S. A. L., 89, S. E., 490.

UNITED STATES SUPREME COURT

Indiana Headlight Case

In 1910 the Indiana Railroad Commission ordered all locomotives operated within the State to be equipped "with headlights of not less than 1,500 candle-power." The Vandalia sought to enjoin the enforcement of the order, on the ground that it was so vague, indefinite and uncertain in the description of the headlight required as to be meaningless and void. The State court held, following its previous decision in Chicago, Indianapolis & Louisville, 175 Ind., 630, 638, that the Railroad Commission itself, by virtue of the act of 1907 authorizing it to grant rehearings, had power to grant relief through a rehearing, and that without first resorting to that method of procedure the railroad was not entitled to have the order set aside by the courts. This judgment is now affirmed by the Supreme Court of the United States, as the railroad had been accorded a rehearing, but had abandoned it.—Vandalia v. Public Service Commission (decided December 11, 1916.)

Railroads Nee Not Furnish Tank Cars

The Supreme Court of the United States, as briefly reported last week, has affirmed the decree of the Federal District Court for the western district of Pennsylvania granting an injunction against an order of the Interstate Commerce Commission directing the Pennsylvania Railroad to desist from refusing to furnish oil tank cars (227 Fed. 911), holding that the commission was without authority to make the order.

The question in the case was, Had the commission the jurisdiction exercised by the order? It was not denied that the commission has power over the general equipment of a carrier, but it was denied that it has power to require "vehicles of a special type having no reference to the safety of transportation." The District Court based its judgment on the ground that "Federal legislation regulating commerce, in so far at least as it is contained in the act of 1887 and its amendments has, thus far, left carriers free to exercise their own judgment in the purchase, construction and equipment of their roads and in the selection of their rolling stock." It found "nothing in the law which confers upon the commission power to compel a carrier to acquire facilities it does not possess, or to acquire better facilities than those it possesses, not with the object of preventing discrimination and preferences, but in order that the shipper may have larger, better, and perhaps more economical facilities." The facts of the case, as stated by the commission, quoted by the Supreme Court, illustrate the condition of the carriers of the country:

"The bulk of the movement of refined oil is in tank cars owned by the shippers. In 1887 the Pennsylvania Railroad acquired 1,308 tank cars, some of which have subsequently been sold to independent refineries. Defendant now owns 499 tank cars, all that remain of those purchased in 1887, and 482 of which are furnished to the shippers of oil located on its lines. The other railroads east of the Mississippi River own, in the aggregate, only 303 tank cars. The privately owned tank cars east of the Mississippi aggregate about 27,700, and the total number of tank cars owned in the United States was given as approximately 40,000."

This was the situation of the railroad, not dissimilar to that of other railroads, not therefore created in deliberate fault, but in accommodation to conditions useful to shippers, advantageous to the railroad, beneficial to the public, as the commission had declared; and yet a change was suddenly required.

"Of course," the Supreme Court said, by Mr. Justice McKenna, "if there is a duty upon a carrier to furnish tank or other special cars upon request its enforcement cannot be arrested by the burden it imposes; but here again the thought obtrudes, which we have already expressed—it may be to a tiresome extent—that if Congress had intended such consequence with all that it implies of expense, directly and indirectly, it would not have left the intention to be evolved from obscure language, but would have put it in explicit declaration and with notice and time for accommodation to it.

"It is to be remembered that the tank car is both package and car; must have special mechanical means of loading and unloading. May these, too, be ordered? Are they not a 'method and manner of presenting, marking, packing and delivering property for transportation,' to use the language of Section 1, as amended?"

The railroad company, besides the contention of want of power in the commission to make the order, objected to it (1) in that it is defective because it requires the company to supply cars for movement over the lines of other carriers; and (2) that it is not administrative in character, but is uncertain, indefinite and unlawful. To this the court said: "The order requires the company to 'provide * * * * upon reasonable request and reasonable notice, at complainants' respective refineries, tank cars in sufficient number to transport complainants' normal shipments in interstate commerce.' What is a reasonable request or reasonable notice, and what are normal shipments? The order affords no answer and if the railroad company ventures, however honestly, any resistance to a request or notice not deemed reasonable or to shipments not deemed normal, it must exercise the right at the risk of a penalty of $5,000 a day against all of its responsible officers and agents. These considerations are very serious; but the view we have taken of the power of the commission to make the order, however definite and circumscribed it might have been made, renders it unnecessary to pass upon the contentions."—United States et al. v. Pennsylvania (decided December 11, 1916).

Railway Officers

Executive, Financial, Legal and Accounting

Edward M. Smart, attorney for the Chicago & North Western for the State of Wisconsin, has been appointed assistant general counsel, with office at Chicago, Ill. R. N. Van Doren will become attorney for Wisconsin suceeding Mr. Smart.

George C. Gahan, who has been appointed assistant general auditor of the Canadian Pacific, with headquarters at Montreal, Que., was born on December 28, 1874, at Montreal. He began railway work in April, 1890, with the Canadian Pacific, and served as a junior auditor of freight and telegraph accounts until October, 1891, and then was appointed junior auditor of disbursements. He remained in that position until August, 1896, and since that time has served consecutively as clerk, general bookkeeper, and chief clerk in the comptroller's and general auditor's office of the same road.

C. M. Kittle, whose election as vice-president of the Illinois Central and the Yazoo & Mississippi Valley has already been announced in our columns, was born at Elkins, W. Va., on October 9, 1878. He began railway work in April, 1895, as a station clerk on the West Virginia Central & Pittsburgh, now a part of the Western Maryland. He was later employed in station and yard service on the Atlantic Coast Line, the Queen & Crescent and the Baltimore & Ohio. He entered the station service of the Illinois Central on October 21, 1900. In the spring of 1901, he was assigned to work under the roadmaster on the Illinois division, and since that time has held various positions in the maintenance of way, mechanical, transportation and accounting departments. On October 1, 1910, he was appointed general freight claim agent, in charge of loss, damage and overcharge claims for both the Illinois Central and the Yazoo & Mississippi Valley. He was appointed assistant to the president of the same companies on July 1, 1912, and continued in that position until November 29, 1916, when he was elected vice-president.



C. M. Kittle

Paul M. Benedict, assistant to the president of the Chicago, Burlington & Quincy, with office at Chicago, Ill., has been elected also assistant secretary and assistant treasurer of this company. He was born July 3, 1885, and, after leaving high school, entered service with the Northern Steamship Company in 1903 as a clerk in the freight office. Some time later he entered the employ of the Chicago, Burlington & Quincy as a stenographer for the freight traffic manager, being soon promoted to the office of the first vice-president in this same capacity. He was then made secretary to the first vice-president, and shortly thereafter became chief clerk to the president. For several years he has been assistant to the president, and will continue to perform these duties in addition to those devolving upon him in connection with his new position.

Ernest Alexander, whose appointment as secretary of the Canadian Pacific, with headquarters at Montreal, Quebec, has already been announced in these columns, was born on December 8, 1862, at Yorkshire, England. He was educated at the Collegiate Institute, Hamilton, Ont., and began railway work in March, 1882, with the Grand Trunk at Hamilton, Ont. He served in the superintendent's office of that road until 1893, and since that time has been in the continuous service of the Canadian Pacific. From 1893 to 1899 he was private secretary to the president of the Canadian Pacific at Montreal, and then served in various positions in the office of the president. In 1908 he was appointed assistant treasurer of that road, and four years later became assistant secretary at Montreal, which position he held at the time of his recent appointment as secretary of the same road, as above noted.

Operating

R. C. Goodrich has been appointed trainmaster of the Atchison, Topeka & Santa Fe at Gallup, N. Mex., succeeding A. R. Woods.

A. E. Hutchison has been appointed assistant superintendent and S. V. Jay mechanical engineer of the Union Terminal Company at Dallas, Tex.

David T. Crawford, trainmaster of the Missouri Pacific, with office at Pittsburg, Kan., has been appointed superintendent of the Omaha (Neb.) terminals and the Omaha Belt Line.

F. M. Wooddall, trainmaster of the Atlanta, Birmingham & Atlantic at Manchester, Ga., has been appointed superintendent of the Birmingham division, with headquarters at Manchester, Ga

R. M Wilson, roadmaster on the Clinch Valley district of the Norfolk & Western, with headquarters at Bluefield, W. Va., has been appointed to the office of general yardmaster, with jurisdiction over the Tug Fork branch with headquarters at Wilcoe, W. Va., succeeding S. N. Worley, promoted.

H. B. Lautz, assistant to the general manager of the Atchison, Topeka & Santa Fe, with office at Topeka, Kansas, has been appointed acting division superintendent, with headquarters at Newton, Kansas, succeeding H. W. Sharp, granted an extended leave of absence on account of continued ill health. E. A. Goeldner, assistant to the general manager of the western lines, at Amarillo, Tex., will assume the duties of H. B. Lautz, at Topeka, temporarily.

James P. Carey, superintendent of the St. Joseph & Grand Island, with office at St. Joseph, Mo., the announcement of whose appointment as superintendent of the Kansas division of the Union Pacific, with headquarters at Kansas City, Mo., has previously been made in these columns, was born at Emerson, Iowa, in 1872. He entered railway service in 1887 as telegraph operator with the Union Pacific, and later he became stenographer to the superintendent of motive power and machinery. Subsequently he was train despatcher, chief despatcher and trainmaster for this same road. In October, 1916, while holding the position of assistant superintendent, he was appointed superintendent of the St. Joseph & Grand Island, and on December 1, 1916, was made superintendent of the Union Pacific, as noted above.

Traffic

C. P. Ross, of the engineering department of the Union Pacific, has been appointed industrial agent, with headquarters at Omaha, Nebr.

H. R. Higgins, commercial agent of the Southern Railway at San Francisco, Cal., has been appointed Pacific Coast agent, with same headquarters.

Walter S. Ayres, Chicago, Ill., has been appointed industrial commissioner of the New Orleans Great Northern, with headquarters at Chicago, Ill.

Norman W. Hall chief contracting freight agent of the Atchison, Topeka & Santa Fe, has been appointed general agent of the freight department, with office at San Francisco, Cal.

Edwin Brooker has been appointed traffic manager of the Pittsburgh, Lisbon & Western, with office at Lisbon, Ohio. The office of general freight and passenger agent has been abolished.

T. W. Proctor, general agent, freight department, of the Chicago, Milwaukee & St. Paul, at Chicago, has been appointed assistant general freight agent, with headquarters at St. Paul, Minn.

H. H. Swearingen has been appointed general agent of the Chicago, Burlington & Quincy, with office at San Francisco, Cal., in charge of the freight and passenger departments, succeeding W. D. Sanborn, deceased.

Howard H. Taggart, traveling passenger agent of the Baltimore & Ohio at Washington, D. C., has been appointed district passenger agent, with headquarters at Baltimore, Md., succeeding E. A. Walton. Effective January 1, 1917.

N. B. Wright, whose appointment as assistant freight traffic manager of the Central of Georgia, with headquarters at Savannah, Ga., has already been announced in these columns, was born on February 27, 1876, near Greensboro, Ga., and was educated in the grammar and high schools of Atlanta. He began railway work as a stenographer to the traveling freight agent of the Memphis & Charleston in August, 1896, and from January of the following year to October, 1898, served as stenographer to the general agent of the Norfolk & Western, at Atlanta, Ga. He was then, to December, 1905, traveling freight agent of the same road at Atlanta, and from December 1, 1905, to January 31, 1908, served as chief clerk in the general freight department of the Central of Georgia at Savannah. In February, 1908, he was promoted to assistant general freight agent at Savannah, remaining in that position until December 31, 1910. He was then appointed general freight agent, which position he held at the time of his recent appointment as assistant freight traffic manager of the same road.



N. B. Wright

George L. A. Thomson, district passenger agent of the Pennsylvania Lines West of Pittsburgh, with office at Chicago, Ill., has been appointed assistant general passenger agent, with headquarters at Cincinnati, Ohio, succeeding George W. Weedon, resigned to go into other business, effective January 1. Mr. Thomson was born on February 28, 1863, at Elora, Ont., Can., and began railway work in 1883 as secretary to the president of the Chicago, Indianapolis & Louisville. In 1884 he was appointed stenographer to the general passenger agent of the Jeffersonville, Madison & Indianapolis at Louisville, Ky. In 1885 he became stenographer and chief clerk to the assistant general passenger agent of the Pennsylvania, with headquarters at Indianapolis, Ind., being promoted to city passenger agent of the same company in 1888, with office at Louisville, Ky. From 1901 to 1904 he was chief clerk to the assistant general passenger agent at Chicago, Ill., and from 1904 to 1909 he was traveling passenger agent, with headquarters at St. Paul, Minn., after which he was appointed general agent of the passenger and freight departments at Winnipeg, Can. In 1910 he was made district passenger agent at Toledo, Ohio, and in 1912 was transferred to Chicago, Ill., in the same capacity. He now becomes, as noted above, assistant general passenger agent, with headquarters at Cincinnati, Ohio.



G. L. A. Thomson

L. L. Johnson has been appointed agricultural commissioner and industrial agent of the Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Tex.; R. M. Roberts has been given the same title and assigned to headquarters at San Francisco, Cal.

R. D. Jones, general agent of the Empire Line at Milwaukee, Wis., has been appointed general agent with office at Chicago, Ill., succeeding G. S. Savage, deceased; R. E. Youngs has been appointed agent at Milwaukee, Wis., succeeding R. D. Jones, and T. J. Schram has been appointed general agent at Omaha, Neb., succeeding R. E. Youngs.

J. W. Blount, division passenger agent of the Central of Georgia at Macon, Ga., has been appointed assistant general passenger agent, with headquarters at Savannah; W. W. Hackett, district passenger agent at Augusta, has been appointed division passenger agent, with headquarters at Macon, and Hoyt Ware has been appointed district passenger agent, with headquarters at Augusta.

W. F. Richardson, whose appointment as assistant general freight agent of the Baltimore & Ohio, with headquarters at Philadelphia, Pa., has been announced in these columns, was born at Cambridge, Mass. He began railway work in 1887, as a clerk with the Nickel Plate Fast Freight Line, and the same year entered also the service of the Fitchburg Fast Freight Line at Boston. The following year he became a clerk in the New England office of the Chicago, Rock Island & Pacific, and later served consecutively as chief clerk and New England traveling freight agent. In 1897 he was appointed soliciting agent of the Baltimore & Ohio, at Boston, Mass., and in May, 1907, was promoted to commercial freight agent at the same place, which position he held until his recent appointment as assistant general freight agent of the same road, as above noted.



W. F. Richardson

Engineering and Rolling Stock

William S. Murray, consulting engineer (electrical) of the New York, New Haven & Hartford, at New Haven, Conn., will leave the service of that road on December 31.

J. J. Lake, general car foreman of the Great Northern with office at St. Paul, Minn., has had his jurisdiction extended over the Watertown & Sioux Falls, a subsidiary recently acquired by the Great Northern.

J. R. W. Davis, engineer maintenance of way for the Great Northern, with office at St. Paul, Minn., has also been appointed engineer maintenance of way of the Watertown & Sioux Falls.

A. C. Deverell and R. D. Hawkins, superintendents of motive power for the Great Northern, with office at St. Paul, Minn., have had their jurisdiction extended over the line of the Watertown & Sioux Falls.

G. A. Bruce, general master mechanic of the eastern district, Great Northern, with office at St. Paul, Minn., has had his jurisdiction extended over the Watertown & Sioux Falls with the same headquarters.

George F. Blackie, engineer of roadway and track of the Nashville, Chattanooga & St. Louis at Nashville, Tenn., has been appointed assistant chief engineer. H. H. Trabue, formerly assistant chief engineer and real estate agent, now becomes real estate agent; Mr. Trabue will report direct to the president.

Edwin G. Foster, who has been appointed valuation engineer of the Buffalo, Rochester & Pittsburgh, with headquarters at

Rochester, N. Y., as has already been announced in these columns, was born on July 24, 1881, at Rochester, and was educated in Rochester Free Academy. He began railway work on January 9, 1902, with the Buffalo, Rochester & Pittsburgh, and the following year left that road to go with the Elliott & Baton Engineering & Mining Co., at Pittsburgh. In the spring of 1905 he returned to the service of the Buffalo, Rochester & Pittsburgh, and has been in the continuous service of that road ever since, consecutively as draftsman, squad boss and assistant engineer until his recent promotion to valuation engineer, with headquarters at Rochester.

Purchasing

W. A. Linn, assistant purchasing agent of the Chicago, Milwaukee & St. Paul, with office at Chicago, Ill., has been appointed purchasing agent, succeeding John T. Crocker, retired.

J. F. Pratt, general storekeeper of the Great Northern, with office at St. Paul, Minn., has had his jurisdiction extended over the Watertown & Sioux Falls, recently acquired by the former company.

Special

D. W. Morison, superintendent of the employment bureau of the Great Northern, has had his jurisdiction extended over the Watertown & Sioux Falls, recently acquired by the Great Northern.

OBITUARY

T. E. Calvert, chief engineer of the Chicago, Burlington & Quincy, died at his home in Lincoln, Nebr., on December 19, from a lesion of the heart. While sick only a short time he had never recovered entirely from a serious motor car accident at Douglas, Wyo., over a year ago. He was born at Newton Square, Pa., on September 10, 1849. After graduating from the Sheffield Scientific School of Yale University in 1870, he entered the service of the Chicago, Burlington & Quincy as an axeman at Plattsmouth, Nebr., on April 1, 1871. He was later promoted to assistant engineer, and in 1878 was made chief engineer of the lines west of the Missouri river, with headquarters at Lincoln, Nebr. In 1884 he was appointed general superintendent of these same lines. In 1904 he was made chief engineer of the Burlington system, with headquarters at Chicago, which position he has since held. Mr. Calvert has been identified with the development of a large part of the Burlington system, and with practically all of the lines west of the Missouri river. At the time he entered the employ of the road it owned but 26 miles of lines west of Omaha, while it now owns over 4,700 miles. At the time he became chief engineer of the lines west of the Missouri river, the extensions to Denver and to Billings, Mont., were under way, and the large mileage of branch lines has since been added. Since becoming chief engineer of the system he has had charge of all important improvement work, including the development of low grade lines from Savannah, Ill., south through the Illinois coal fields to Paducah, Ky., and from Billings, Mont., through the Big Horn Basin to Orin Junction, Wyoming, where connection was made with existing lines of the Burlington and the Colorado & Southern. He has also been in charge of the development of the terminal plans for the Burlington at Chicago, connected with the construction of the Union Station, which is now under way.



T. E. Calvert

Equipment and Supplies

LOCOMOTIVES

The Central Canagua (Cuba) has ordered 3 switching locomotives from the Baldwin Locomotive Works.

The Texas & Pacific has issued inquiries for 12 Santa Fé type, 7 Pacific type and 6 switching locomotives.

The British Government has ordered 40 Consolidation locomotives from the Canadian Locomotive Company.

The William Dederich Company, London, Eng., has ordered 24 light locomotives from the H. K. Porter Company for use in the Belgian Congo.

The Paris-Orleans Railway (France) has ordered 50 100-ton Mikado locomotives from the American Locomotive Company for delivery in November, 1917.

The French State Railways have ordered 100 80-ton Consolidation locomotives from the American Locomotive Company for delivery in January and February, 1918.

The St. Louis-San Francisco, reported in the *Railway Age Gazette* of December 8 as being in the market for 30 Santa Fe type locomotives, has ordered these locomotives from the Baldwin Locomotive Works.

The Tata Iron & Steel Company (India) has ordered 5 six-wheel switching locomotives from the American Locomotive Company. These locomotives will have 18 by 24 in. cylinders, 44-in. driving wheels and a total weight in working order of 109,000 lb.

The Wheeling & Lake Erie has ordered 10 superheater Mallet (2-6-6-2) type locomotives from the American Locomotive Company. These locomotives will have 25½ and 39 by 32 in. cylinders, 63-in. driving wheels and a total weight in working order of 435,000 lb.

The Union Miniere du Haut Katanga has ordered 5 six-coupled (2-6-2) saddle tank locomotives from the American Locomotive Company. These locomotives will have 15 by 20 in. cylinders, 37-in. driving wheels and a total weight in working order of 100,000 lb.

The Chicago, Burlington & Quincy, reported in the *Railway Age Gazette* of November 3 as inquiring for 20 Mikado and 10 Santa Fe type locomotives, placed orders with the Baldwin Locomotive Works, shortly after the inquiries were issued, for 25 Mikado and 10 Santa Fe type locomotives. This company has also since given an order to the Baldwin Locomotive Works for 15 Mikado locomotives.

The Philadelphia, Bethlehem & New England (Bethlehem Steel Corporation) has ordered 2 six-wheel and 2 eight-wheel switching locomotives from the American Locomotive Company. The six-wheel switching locomotives will have 21 by 26 in. cylinders, 50-in. driving wheels and a total weight in working order of 151,000 lb. The eight-wheel switching locomotives will have 22 by 28 in. cylinders, 51-in. driving wheels and a total weight in working order of 198,000 lb.

The Russian Government, reported in last week's issue as having ordered 331 locomotives, has now increased this to 350 engines divided as follows: American Locomotive Company, 150; Baldwin Locomotive Works, 150, and Canadian Locomotive Company, 50. Details concerning the first 40 engines ordered from the American Locomotive Company were given in the *Railway Age Gazette* of December 1. The 110 additional locomotives of that company's 150 will have 25 by 28 in. cylinders, 52-in. driving wheels, a total weight in working order of 202,000 lb. and like the others will be equipped with superheaters.

FREIGHT CARS

The Kansas City Southern is in the market for 96 tank car underframes.

The Northern Pacific is inquiring for 500 steel gondola and 500 refrigerator cars.

The Norfolk & Western will build 1,000 60-ton steel hopper cars in its Roanoke shops.

The Maine Central has issued inquiries for 50 produce, 200 rack and 50 hopper cars.

The Gulf Coast Lines have ordered 500 box cars from the American Car & Foundry Company.

The Birmingham Southern has ordered 20 70-ton flat cars from the Pressed Steel Car Company.

The New York Central has ordered 1,200 hopper cars from the American Car & Foundry Company.

The Carolina, Clinchfield & Ohio has ordered 5 caboose cars from the American Car & Foundry Company.

The Oliver Iron Mining Company has ordered 80 dump cars from the Western Wheeled Scraper Company.

The North American Refining Company has ordered 50 tank cars from the American Car & Foundry Company.

The Evans-Thwing Refining Company has ordered 140 40-ton tank cars from the American Car & Foundry Company.

The National Rosin Oil & Size Company has ordered 5 50-ton tank cars from the American Car & Foundry Company.

The White Eagle Petroleum Company has ordered 30 40-ton and 20 50-ton tank cars from the American Car & Foundry Company.

The Cudahy Refining Company is reported as having ordered 500 30-ton tank cars from the American Car & Foundry Company.

The Virginian, reported in the *Railway Age Gazette* of December 1 as inquiring for 50 gondola cars, has ordered 50 hopper cars from the Standard Steel Car Company.

The Pennsylvania Equipment Company, Philadelphia, Pa., is in the market for 10 to 20 second-hand 50-ton steel flat cars and about 25 50-ton drop bottom gondola cars.

The Wheeling & Lake Erie, reported in last week's issue as inquiring for 500 gondola and 500 hopper cars, has ordered the hopper cars from the Pressed Steel Car Company.

The Delaware, Lackawanna & Western has ordered 200 50-ton gondola cars from the Standard Steel Car Company and 300 40-ton gondola cars form the aBrney & Smith Car Company.

The Los Angeles & Salt Lake, reported in the *Railway Age Gazette* of December 8 as having placed an order for 1,000 50-ton general service cars, ordered these cars from the Western Steel Car & Foundry Company.

The Union Pacific, reported in the *Railway Age Gazette* of December 8 as being in the market for 2,500 refrigerator cars for the Pacific Fruit Express, has ordered the underframes for these cars from the Bettendorf Company.

The Russian Government, through J. P. Morgan & Co., has divided an order for 3,000 50-ton gondola cars equally between the Standard Steel Car Company and the American Car & Foundry Company. These contracts replace the order incorrectly reported a few months ago as given to the Bettendorf Company by Newman Erb, and over which a suit was recently filed.

Boston & Maine.—A news note says that extensive specifications have been drawn up for providing the Boston & Maine with additional coal and box cars, but that the submission of these specifications to car builders for their bids has been held up by the controlling interests in the road, in the hope that they will first be able to inaugurate the reorganization proposed for it. Despite the recent embargo, the Boston & Maine now has on its rails some 34,000 freight cars, or 10,000 in excess of the number it owns.

PASSENGER CARS

The Atlantic Coast Line has issued inquiries for 15 express and 5 mail and baggage cars.

The Delaware, Lackawanna & Western has issued inquiries for 10 60-ft. steel express cars.

The Chicago, Burlington & Quincy, reported in the *Railway Age Gazette* of December 1 as being in the market for 5 postal cars, has ordered these cars from the American Car & Foundry Company.

The Central of New Jersey, reported in last week's issue as having issued inquiries for 25 coaches and 10 passenger and baggage cars, has ordered 25 coaches and 6 combination cars from the Pullman Company.

IRON AND STEEL

The Chicago, Milwaukee & St. Paul has ordered 55,000 tons of steel rails and accessories for 1918 delivery. It is reported that most of the rails will be rolled by the Illinois Steel Company.

The Atchison, Topeka & Santa Fe has placed orders for approximately 95,000 tons of steel rails for 1918 delivery, about two-thirds of which went to the Colorado Fuel & Iron Company, and the balance to the Illinois Steel Company.

The Illinois Central has just placed orders for 55,000 tons of steel rail for 1918 delivery, 32,000 tons going to the Illinois Steel Company and 18,000 tons to the Tennessee Coal & Iron Company. It has also ordered 5,000 tons of rails for switches and frogs.

SIGNALING

The Central of Georgia proposes during 1917 to complete 143 miles of automatic block signaling as follows: Macon Junction to Hapeville, 93 miles, of which 4 miles is double track; Hapeville to Atlanta, 8 miles, double track; Terre Cotta to Fort Valley, 26 miles, single track; Vandiver to Weems, 16 miles, single track.

The New York Central plans to complete four large interlockings in 1917, as follows: at Carman, N. Y., 62 working levers; Hoffmans, N. Y., 69 working levers; Herkimer, 47; Rochester, Jay street, 24. All of these plants are electro-mechanical, with approach and route locking. Concrete trunking will be used; and at Carman the signal lamps will be electric.

Timber in Alaska.—The stand of timber on the two great national forests in Alaska is estimated by the forest service as 70,000,000,000 board feet, while the annual growth will, it is said, produce of pulp wood alone enough for the manufacture of 3,000 tons of wood pulp a day.

British Coal Abroad.—The exports of coal from the United Kingdom in the 10 months ended October 31, this year, were 32,741,158 tons, as compared with 36,944,758 tons in the first 10 months of 1915, and 52,060,846 tons in the first 10 months of 1914. These totals were increased to 35,150,172 tons, 38,830,606 tons and 54,523,993 tons by the addition of coke and patent fuel. The exports of bunker coal to October 31 were 10,960,984 tons, as compared with 11,745,472 tons and 16,037,409 tons. It will be seen that the coal exports have fallen off very decidedly when compared with 1914, and that a moderate further decline has occurred as compared with 1915.

A New Railway in Ecuador.—The Ecuadoran Congress has authorized the construction of a railroad from the city of Chone to Quito, passing through Santo Domingo de los Colorados. This road will connect Quito with the ports of Manta and Bahia de Caraquez on the central western coast of Ecuador, and a part of the import and export duties collected at these ports will be used for the construction of the road. Additional funds are provided by the assignment of a portion of the taxes now used for other public purposes, and the appropriation of certain sums formerly destined to other construction. For the immediate financing of this work the Government of Ecuador will endeavor to secure loans, to be guaranteed by the revenues mentioned in detail in the laws providing for the construction of both these railroads. Six per cent interest and one per cent amortization will be paid on a foreign loan, and as high as nine per cent interest, with one per cent amortization, on an internal loan.—*Commerce Report.*

Supply Trade News

Thornton E. Motley & Co., Inc., New York, have been appointed special railway sales agents for the Burke Electric Company, Erie, Pa.

A. S. Blagden has been elected president of the American Malleables Company in place of W. G. Pearce who has been elected chairman of the board.

J. L. Jackson, vice-president of the Duncan Lumber Company, Portland, Ore., has taken charge of the Chicago office of this company, succeeding I. W. Lincoln, resigned.

In response to a special request from the Russian-American Chamber of Commerce in Moscow, asking the American-Russian Chamber of Commerce in New York to send a special delegate to Russia to confer in regard to a number of important matters relative to Russian-American trade, E. C. Porter, executive secretary of the American-Russian Chamber of Commerce, will sail for Russia early in January and will remain in that country for two months, visiting the important industrial centers, including Petrograd, Moscow, Kieff, Charkoff, Odessa, and Tiflis.

S. B. Taylor, sales manager of the S K F Ball Bearing Company, Hartford, Conn., has been elected vice-president of the company, succeeding F. B. Kirkbride, who remains on the board of the company. Mr. Taylor will remain in charge of sales. G. A. Ungar, former representative of the company in Cleveland, Detroit and Pittsburgh, has been appointed technical manager and chief engineer, succeeding Uno Forsberg, who returns to Sweden after completing his work of creating the manufacturing organization of the S K F Ball Bearing Company in this country.

The Allegheny Steel Tank Car Company, incorporated under the laws of Pennsylvania, has been formed to manufacture steel tank cars at Warren, Pa., and has purchased the plant and equipment of the Allegheny Foundry Company. The plant is to be opened in the near future, with a payroll of about $100,000. The authorized capital stock is $100,000. H. D. Kopf, president of the Hammond Iron Works, of Warren, is president of the new corporation; J. A. Schofield, vice-president; G. L. Craft, secretary; and A. J. Hazeltine, treasurer. On the board, besides Messrs. Kopf, Craft and Hazeltine, are H. A. Logan and U. G. Lyons.

Westinghouse Electric to Spend $7,000,000

Between $5,000,000 and $7,000,000 will be spent in the construction and equipment of a new plant which the Westinghouse Electric & Manufacturing Company will locate on the Delaware river at Essington. The work will be put under way at once.

Stockholders of the company, on February 15, are to authorize the issue of $15,000,000 of new stock, to be sold at par, to provide capital for construction of the Essington plant, and working capital for the enlarged business.

Guy E. Tripp, chairman of the Westinghouse Electric & Manufacturing Company, in a statement to the stockholders last week, said:

"Improvements in the large steam electric generating units have led to great increases in central station capacity near manufacturing centers, and have made profitable the sale of electric current at rates which have so stimulated consumption as to create an enormous demand for industrial motors. The coal shortage of the last six months has emphasized the comparative handicap under which the small steam plant suffers, and can hardly fail to further accelerate the movement to substitute central station service for isolated plants.

"Increased attention is being directed toward hydro-electric developments, and pending legislation in Congress is designed to stimulate such construction. Coming activities in this direction should not be overlooked.

"In railroading virtually every class of heavy service is now performed successfully by electric power, and this field promises to be one of rapid expansion.

"Not only has the steam turbine virtually supplanted the reciprocating engine in electric power plants, but it has also invaded the field of ship propulsion to an extent which indicates a similar almost universal and abnormally rapid adoption, both by direct steam drive as well as by the electric drive, contemplated in the United States naval program.

"For the foregoing and other contributing causes, it is reasonable to expect that the present large volume of your company's regular business will not only be maintained, but will be materially increased.

"To provide the additional manufacturing facilities needed there has been purchased on the Delaware river, at Essington, Pa., just outside of Philadelphia, a tract of land having a deep water frontage, and large enough to accommodate an ultimate factory building several times as great as that of the East Pittsburgh works. It is planned to begin immediately the erection on this land of a new plant to cost between $5,000,000 and $7,000,000. The larger volume of business which these facilities will permit your company to conduct will also require additional cash working capital to an amount at least equal to the contemplated expenditure for plant."

Steel Corporation Wage Increases $33,000,000 in Year

Elbert H. Gary, chairman of the United States Steel Corporation, on Saturday last, made the following statement relative to the annual subscription by employees to the stock of the corporation and the annual distribution of bonuses:

"The United States Steel Corporation will, in accordance with the plan in force during the last thirteen years, offer to employees the opportunity to subscribe, during the month of January, for 35,000 shares of stock at a price somewhat below the market; and also will distribute the usual special compensation. The total amount of the latter has not yet been definitely determined, but it will be calculated on the basis heretofore fixed. A part will be paid in cash and the balance in preferred stock in the same proportions and on the same terms as last year. It is hoped distributions will be made to the smaller salaried men about Christmas and to the others about New Year's. Also many of the men in offices, particularly those not receiving special compensation above referred to, will receive increases in salaries to take effect January 1.

"As a rough estimate, it may be stated that the three wage increases, made February 1, May 1 and December 15 respectively, the increases in salaries from time to time, and the special compensation will aggregate for the year about $33,000,000."

TRADE PUBLICATIONS

Locomotive Appliances.—Bulletins No. 111 and No. 112, recently issued by the Economy Devices Corporation, deal respectively with the type B Universal valve chest, and the straight-way piston valve arrangement.

Hose—Electric Hoists.—Bulletins Nos. 129 and E-45, recently issued by the Chicago Pneumatic Tool Company, Chicago, deal respectively with hose, hose couplings and hose clamp tools, and with Duntly portable electric hoists.

Heavy Capacity Scale.—The Toledo Scale Company, Toledo, Ohio, has issued an eight-page leaflet describing the special features of the new Toledo automatic springless scale. It is an example of a technical exposition put in an interesting form, and is made clear by the clever use of well-selected explanatory drawings.

Air Compressors — Pneumatic Hammers. — Ingersoll-Rand Company, New York, has recently issued the following bulletins: Form 8,311, on "Little David" pneumatic riveting hammers, inside trigger pattern. These hammers are offered in six sizes, the dimensions and specifications of which are listed in the descriptive table in the catalogue. A very important feature of this tool is the rivet set retainer designed to meet the regulations and requirements of the safety appliance laws enacted in the various states. Form 3,130 on class ER-1 power driven single stage straight line air compressors. These machines are built in various sizes from 6 to 12 in. stroke, with a piston displacement capacity of 52 to 955 cu. ft. per minute, and are equipped with the Ingersoll Rogler type of air valve. Both catalogues are well illustrated.

Railway Construction

COLORADO, KANSAS & OKLAHOMA.—Preliminary surveys for this comapny have been made for a 135-mile extension from Scott City, Kansas, through Finney, Gray and Meade Counties in Kansas to Forgan, Okla., where it will connect with the Wichita Falls Southwestern. Ben L. Allen, chief engineer; W. C. Fordyce, president, Scott City, Kansas.

NORTHERN PACIFIC.—This company is planning to double track its line from Rice, Minn., to Little Falls, a distance of about 17 miles. No definite time has been set for the work to begin nor have any contracts as yet been awarded. A. G. Stevens, chief engineer, St. Paul, Minn.

ONEIDA & WESTERN.—Work is now under way on a 12-mile extension building from Hagemeyer, Tenn. The Cook Construction Company has the contract.

OCEAN SHORE.—This company, which operates a 38-mile line from San Francisco, Cal., to Tunitas, has projected an extension from Tunitas to Swanson, 26 miles.

QUEBEC CENTRAL.—Surveys are now being made for building an extension from Scotts, Que., to a connection with the Transcontinental Railway at Diamond Junction, 19.3 miles.

RAILWAY STRUCTURES

BALTIMORE, MD.—The contract for building the superstructure of the new Baltimore & Ohio pier at Locust Point, Baltimore, to cost $450,000, has been awarded to Edward Brady & Sons, Baltimore. This pier is to be used by a proposed $15,000,000 South American line of steamships. This pier will be one of the largest on the Atlantic Coast.

CLINTON, IA.—The Chicago & North Western has accepted the provisions of an ordinance by the city council, which permits this company to erect a new passenger station, two subways and a new freight depot at this point. It is estimated that the cost of this undertaking will be close to $500,000, and that it will require about three years to complete. Construction plans for another passenger station to be used jointly by the Chicago, Rock Island & Pacific, the Chicago, Burlington & Quincy, and the Chicago, Milwaukee & St. Paul are also under advisement. The Northwestern station will be connected with this second station by subways, giving the city the benefit of a Union Station.

LOUISVILLE, KY.—The Illinois Central is improving its mechanical facilities at this point, the work includes a 17-stall roundhouse with an 85-ft. turntable, to cost $56,000; a machine shop of brick and steel with tile roof, $20,000; a two-story lavatory building for enginemen and shopmen, $10,000; a one-story building of similar construction and purposes for car repairmen, $3,500; a paint shop and office for car repair foremen, $3,500; sanding facilities, including a sand drying house, a wet sand bin of nine carloads capacity and a dry sand bin of one carload capacity, $4,000, and a station and yard office building costing approximately $6,000. Joseph E. Nelson & Sons, Chicago, Ill., are erecting the roundhouse, including the drainage of the roundhouse, and the turntable pit, on a contract basis. All other buildings and work in connection therewith will be done on a cost plus percentage basis by this same firm. Other necessary heating and plumbing installations are being done by contract. Frank R. Judd, engineer of buildings, Chicago, Ill.

SAN FRANCISCO, CAL.—The construction of a 12-story office building for the Atchison, Topeka & Santa Fe, covering an area of 45 ft. by 91½ ft., is under way. The exterior of the first two stories will be of marble, with door and window frames of bronze. Above the third floor the construction will be of red brick, with ornamental features of terra cotta. The Santa Fe will occupy the first four floors and a portion of the basement, which will be used for files. The building is located on the corner of Second and Market streets.

Railway Financial News

CHICAGO & NORTH WESTERN.—This company is to offer to stockholders $15,251,000 of treasury stock. No date has as yet been set for the offering.

CHICAGO, ROCK ISLAND & PACIFIC.—The receiver has been authorized by the United States District Court to pay off out of current funds $2,500,000 receiver's certificates falling due January 3, 1917.

PITTSBURGH & WEST VIRGINIA.—This is the name of the new company which has taken over the Wabash Pittsburgh Terminal.

TEXAS & PACIFIC.—The New York Supreme Court has held that George J. Gould and the executors of the Gould estate will have to return to the Texas & Pacific treasury about $1,500,000 treasury notes which the Goulds had held under an attachment on the ground that the Texas & Pacific was a foreign corporation. The court holds that, since the Texas & Pacific is incorporated under federal laws and has its executive officers and its place of stockholders' meeting in New York, it is not a foreign corporation.

WABASH PITTSBURGH TERMINAL.—See Pittsburgh & West Virginia.

WESTERN MARYLAND.—This company has sold an issue of $6,400,000 equipment trust 5 per cent certificates to in part pay for the following equipment, which cost $7,500,000; 5,000 55-ton steel hopper cars, 25 all-steel passenger cars, and 10 Mallet locomotives.

EXTENSION OF RAILROAD IN COLUMBIA.—The firm of Pedro A. Lopez & Co., of Bogota, has made a contract with the Department of Public Works of the Colombian Government for the extension of the Ferrocarril del Noroeste (Northwestern Railroad) from Nemocon to Saboya, a distance of some 75 kilometers (47 miles), with an option on a contract to continue the construction on to San Gil, in the Department of Santander, about 140 kilometers farther.—*Commerce Report.*

PIG-IRON IN GERMANY.—The production of pig-iron within the German Customs Union during September, with 30 working days, amounted to 1,116,752 tons, against 1,145,239 tons in August, with 31 working days. The production per day, however, was slightly larger than during the previous month, the figures being respectively, 37,225 tons and 36,943 tons. There was no material difference in the production of the different kinds; the decrease was comparatively small in the Rhineland-Westphalia district. The aggregate production for the month of September during the last four years was as follows: 1913, 1,590,849 tons; 1914, 580,087 tons; 1915, 1,034,124 tons; 1916, 1,116,752 tons. The greatest reduction in output for any one month during the war, compared with the corresponding month in the last year of peace, comes within the first month after the declaration of war, August, 1914, with a decrease of 64 per cent.

CEYLON RAILWAYS.—The length of railway open for traffic in Ceylon at the close of September, 1915, was 692½ miles, as against 672 miles at the corresponding year of 1914. The increase was due to the opening of a section of a line to Chilaw. In the course of 1914-15 rolling stock was increased by 18 new passenger and 186 new goods vehicles, including a number of tank wagons. The total expenditure to the close of September, 1915, including additional accommodation and improvements, amounted to 7,858,452*l.* The Chilaw line was approaching completion in 1915, and it has been opened to Kochchikade for all descriptions of traffic. Steady progress was made with the Pelmadulla and Badulla extensions, especially on sections between Ratnapura and Dela and between Bandarawela and Ella. Work is in progress on Colombo station extension, and a large, broad-gage goods shed and connecting sidings have been brought into use. Earthwork is in hand on a main line duplication between Ragama and Veyangoda. A survey from Chilaw to Puttalam has been commenced, and a survey connecting the harbor line with the railway, via Mutwal, has been completed.

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Bonuses and Wage Increases to Employees

Among the most gratifying developments in the closing weeks of the year 1916 have been the distribution by many of the more prosperous railways of the country of substantial bonuses to certain large classes of their employees, and many voluntary increases in wages. In the aggregate this distribution and these increases of wages have amounted to several millions of dollars. The statements which have been issued in connection with them have set forth that they have been made because the companies have enjoyed a year of unusual prosperity, and because there has been an abnormal increase in the cost of living. In few cases has any part of the distribution been made to the employees in train service. The reasons are plain enough. In the first place, the managements believe that these classes of employees are being paid all that they are entitled to receive. In the second place, the year has been one of constant struggle between them and the companies, in which the men have made exorbitant demands, prepared to strike in spite of repeated offers of arbitration, and forced legislation through Congress which the managements regard as uncalled for, unjust and unduly burdensome. Even at the end of the year the differences with them remain unsettled, and the threat of a nation-wide strike has not been removed. The managements must, it would seem, be given universal commendation for having recognized in a substantial manner the efficient and loyal service of their other employees, and, as to those in train service, there must be few persons who, in the circumstances, will regard the discrimination against them as an unjust one.

The Increased Railroad Dividends

It has been the practice in the management of many railroads in United States to cut dividends in hard times and to restore them, or increase them, or pay an extra dividend in years of exceptional prosperity. The alternative to this would be to set up a specific "dividend fund" to which especially large appropriations could be made in prosperous years and on which the management could draw in hard times. The second method may be preferable, but the first is the one which has appealed to American financiers and investors. The speculative element in it is an attraction. It is to be expected, therefore, that so long as present methods prevail in a year of greatly increased gross and net earnings the dividend changes that will occur will be changes to a higher rate or extra dividends. If dividends are to be reduced in bad years, and at the same time railroad credit is to be maintained, and any future financing is to be done by the sale of stock, roads which are ably and conservatively managed, like the Louisville & Nashville, the Buffalo, Rochester & Pittsburgh, the Norfolk & Western, the Chicago, Milwaukee & St. Paul and the Union Pacific, must be expected to distribute to the owners some share of the increase in profits in an unusually prosperous year. As a matter of fact, however, only in the case of the Union Pacific and Norfolk & Western is there an extra distribution made representing extraordinarily large net earnings. The Louisville & Nashville, St. Paul, etc., have simply resumed this year rates of dividend which they had to cut in the hard times of 1914 and 1915. In almost every case of dividend changes on the larger roads the increases for this year have been sound and conservative. The only one that compares in the slightest degree with the extraordinary profits being reaped by industrial and manufacturing companies is the Pittsburgh & Lake Erie's extra dividend of 20 per cent.

Progress In the Valuation Work

Material progress has been made on the federal valuation of the railways during the past year. On January 1, 1916, approximately 45,000 miles of lines had been covered by the roadway and track parties and smaller mileages by the structural, telegraph and land forces. At the present time approximately 95,000 miles of lines have been inventoried by the roadway and track parties. Director Prouty has stated that the present organization will be able to maintain this progress and that he expects that the field work on the 260,000 miles of line in the United States will be completed by January 1, 1920. During the summer the first preliminary reports were completed and late in the year so-called tentative valuations

were served on the Atlanta, Birmingham & Atlantic, the Texas Midland, the New Orleans, Texas & Mexico and the Kansas City Southern, while others are understood to be practically completed on the properties of the Elgin, Joliet & Eastern, the Los Angeles & Salt Lake, and one or two other lines. The appearance of these reports gave the railways their first opportunity to ascertain the attitude which the government would take on many of the important questions. When the work was first undertaken they organized in order to extend the fullest co-operation to the federal employees with the expectation that the aim of the government would be to ascertain the fair value of the property. With the appearance of these reports there has been marked disappointment on the part of the railway men, for they now feel that the department of valuation is endeavoring to establish the lowest possible valuations and to force the roads to fight before the Interstate Commerce Commission or in the courts to establish the real value of their properties. While important progress has been made in inventorying the properties, new problems have arisen with reference to the other and larger aspects of this work which threaten serious consequences and are a source of deep concern to the railways at the present time, while the worth of the entire work is also being jeopardized.

Receiverships and Foreclosure

Two important roads were taken out of the hands of receivers in 1916 and two important roads went into receivership. Singular as it may appear at first glance, neither the character of the reorganizations under which the St. Louis & San Francisco and the Western Pacific were taken out of the hands of receivers, nor the causes which led to the receiverships of the Boston & Maine and the Texas & Pacific reflect conditions of railroad earnings or of railroad credit in the calendar year 1916. More significant really is the comparatively large number of small roads sold under foreclosure. The number of these sales shows that the securityholders and creditors of these roads are willing to accept conditions as they find them without hope of material improvement in the near future. The plan under which the St. Louis & San Francisco was reorganized was dated November 1, 1915, and the fact that it was not actually put into effect and the road taken over by the new company until the latter part of 1916 was because of technical opposition on the part of the Missouri railroad commission. The plan, therefore, is the expression of opinion of the bankers and large holders of securities as to what future conditions would be based on their outlook from 1915 and not from the outlook of 1916. The St. Louis & San Francisco, by the successful application of sound principles of railroading, had already laid the basis for a sound reorganization of its finances before the wave of industrial activity and large railroad earnings came. The Western Pacific's reorganization plan was dated December 15, 1915, and represents a drastic sacrifice on the part of securityholders recognizing that it will take considerable time to build up substantial net earnings and that in the meantime fixed charges must be very low. The fixed charges are at the rate of $1,000 per mile for the new company. The receivership of the Boston & Maine was due to the inability to harmonize conflicting interests of securityholders of the parent company and leased line companies, and conflicting state regulation in regard to a general plan for a sound reorganization of the property without receivership. The Texas & Pacific receivership was also due to the failure of conflicting interests identified with the financing of the property to get together. It will be the success of the reorganization plans which have not as yet gone as far as foreclosure sales which will reflect more truly the state of railroad credit in 1916 than do the receiverships and foreclosures taking place in that year.

THE FREIGHT CAR SITUATION

THE conditions surrounding the car equipment market during the past year have been very complicated. Never before have the railways been confronted by such a situation. With the sudden demand for raw materials by the munition manufacturers, the price of steel has soared very high. The price of lumber has increased but little, and what increase has occurred has been due to the advance in the cost of labor and materials used in its manufacture and more recently to the shortage of cars. Labor throughout the country has become much more expensive. All of these conditions have a material bearing on the cost of car construction and on the fact that the prices now paid are 75 per cent more than those paid under normal conditions. As much as $1,800 has been paid for box cars, and over $2,200 for refrigerators. A conservative estimate of the average prices being paid for all freight cars has been given as $1,500. This has placed a serious burden on the railroads, especially on account of the fact that they have had to buy large amounts of new equipment.

From 1901 to 1915, inclusive, there was a total of 2,623,425 cars ordered—an average of 174,895 cars per year. During the first seven years of this period the average was 205,361 cars per year, while for the following eight years the average was but 148,238. This shows that at the beginning of 1916 the roads were considerably short of their equipment requirements. To be sure, the increase in the capacity of cars has been responsible for some of this decrease in the number bought, but the small earnings of the railroads during the latter period are responsible for most of it.

With the railroads thus behind in the matter of equipment, they have been forced to increase their orders for cars this year notwithstanding the high prices. About twice as many cars were ordered the last half of 1916 as were ordered during the first half, November being the heaviest month for the past three years. (Detailed statistics regarding the equipment orders placed in 1916 are given in an article published elsewhere in this issue.) Needless to say, the orders have been restricted to provide for only those cars which were absolutely necessary, but still the orders placed for the year approach very nearly the 15-year average above referred to.

Of the total of about 165,000 cars ordered for use in the United States and Canada, the greatest increases over last year are in the composite and steel underframe type, both of which show gains much larger proportionately than the increase in the total number of cars ordered, while there is almost no increase in the number of all-steel cars ordered. Considering the conditions of the raw material markets, both as to prices and deliveries, it is not surprising that the tendency has been to use as little steel in car construction as possible, and the returns can in no way be considered as indicating a tendency toward wood construction on its own merits.

The number of cars of all-wood construction ordered during the year shows an increase of over 40 per cent as compared with the number ordered during 1915, but the total number of cars ordered shows an increase of over 50 per cent compared with 1915. Indeed it is remarkable that the increase in this type of construction was not larger and it seems apparent that it has been resorted to more where the necessity for immediate deliveries was the paramount consideration, rather than from considerations of price.

In addition to the embarrassment of high prices, the roads have been handicapped by long delivery. Six to nine months is the best that can be expected, and on tank cars a year to a year and a quarter is not uncommon. The unprecedented demand for oils and gasolene both for export and for domestic use, has created a demand for this latter class of

equipment, and is responsible for the large number of tank cars ordered this year. With peace negotiations between the warring nations taking a somewhat favorable aspect there is hope for better prices and better delivery within the next year.

A REVIEW OF BRIDGE CONSTRUCTION

AMONG structural engineers, 1916 will be remembered first of all as the year of the second Quebec bridge disaster. This unfortunate event over-shadows all other incidents of the year with respect to bridge construction. But for this accident, the year would have recorded a crowning event in cantilever bridge building, just as 1915 marked the closing of the great Hell Gate arch. The years 1915 and 1916 also bear a definite similarity in having witnessed unusual inactivity in the inception of new railway bridge projects. The large number of important structures in process of building during both of these years were nearly all projects which had been commenced before January 1, 1915. There is this difference, however:—inactivity in bridge work during 1915 was the result of the extremely low earnings of the railroads and the uncertainty regarding their future while the dearth of new bridge work this last year was caused primarily by the high price of structural steel.

The quotation for structural shapes at Pittsburgh was 1.15 cents in March, 1915; 2.25 in March, 1916; 2.75 in November and now averages about 3.15. The rise in the cost of plates has been even greater owing to the demand for plates in ship and car building. The above figures imply deliveries at the option of the mills. The prices on stock materials which must be depended upon for any work required in a limited time are still higher.

In spite of these conditions a number of large bridge projects were started during the year which embody features of considerable interest. The Union Pacific is renewing the superstructure of its bridge over the Missouri river at Omaha. The four 246-ft. river spans of this bridge were rolled into place simultaneously a week ago while their predecessors were slid out of the way onto falsework, a feat which has attracted much attention. At New London, Conn., the New York, New Haven & Hartford is dealing with a difficult foundation situation by means of open caissons which are being sunk to a depth far beyond the limit of pneumatic work. Another important structure is the new 2327-ft. viaduct and bridge over the Allegheny river at Black Run, which is being built by the Bessemer & Lake Erie, and which involves the use of 10,000 tons of steel. Some work has been done on the reconstruction of the Pennsylvania Lines bridge over the Ohio river at Louisville, but definite plans for the entire structure have not been completed.

Late in the fall the Kansas City Terminal let a contract for a viaduct and double deck bridge over the Kaw river at Kansas City, involving the use of 25,000 tons of steel; an important item in the terminal improvements long under way at that place. Two projects on which action is anticipated soon are the reconstruction of the Poughkeepsie bridge over the Hudson and the provision of a new superstructure for the Queen & Crescent over the Ohio river at Cincinnati, Ohio.

The most important structure opened to traffic during the past year was the Memphis bridge over the Mississippi river. It is of interest that two other structures over this important stream were also completed during the past year, the new Keokuk, Ia., and St. Paul, Minn., bridges. A fourth, the St. Louis municipal bridge, by which that city expects to provide additional rail connections, is now being supplied with the long delayed east approach viaduct. Among movable spans the new three-track single-leaf bascule span of the North Western at Chicago presented a number of features of interest.

Although the number of new projects is limited, work has been in progress during the year on several notable structures. Within the last thirty days the record 720-ft. pin-connected simple span of the Metropolis bridge over the Ohio river was swung clear of its falsework. The 1500-ft. riveted span of the Sciotoville, Ohio, river bridge, continuous over three supports, is now in progress of erection, but will not be completed until some time next year. The Hell Gate bridge is receiving the finishing touches. The Burlington is making definite progress on its new bridge over the Missouri river at Kansas City which includes an innovation in the use of heat-treated steel in some of the members.

While concrete construction embodies an amount of work no less in the aggregate than steelwork and includes many reinforced concrete structures for track elevation and concrete arch bridges, notably on the Pennsylvania railroad, it has not included any great undertakings proportionate to the larger steel structures mentioned above, nor which permit of comparison with the Lackawanna viaducts completed a year ago.

WILL THE RAILWAYS OR THE GOVERNMENT REGULATE CAR INTERCHANGE?

THE circular issued by the American Railway Association Commission on Car Service, in accordance with its announced intention of making public the names of roads that have failed to co-operate in its efforts to relieve the car shortage, indicates one of the reasons why the Interstate Commerce Commission felt called upon to recommend to Congress that it be given full jurisdiction over car service rules and all matters pertaining to car interchange.

The railroads as a whole can hardly be blamed for the abnormal conditions which have brought about the present serious shortage of transportation facilities. An unprecedented volume of business, caused by temporary circumstances, has succeeded two years during which traffic was at a low ebb as well as a longer period during which the earnings of the roads have not been sufficient to prepare against any such overdraft on their facilities. But, having gotten into such a condition that their inability to furnish adequate transportation facilities is seriously affecting the commerce of the country it behooves all roads to exert every possible effort toward relieving the situation.

In such emergencies wide differences of opinion often arise as to the course that ought to be pursued and much valuable time is wasted in wrangling about it. This was the case a year ago when the railroads sought an increase in the demurrage rates as an important means of promoting car efficiency and the increase was not allowed until too late to do any good. This year the commission very promptly came to the assistance of the roads by allowing the increased demurrage rates to go into effect on short notice in spite of opposition on the part of many shippers. The railroads themselves also reached a prompt agreement that it was necessary for them to adopt heroic measure and, through the American Railway Association, they appointed a committee to decide what measures were necessary and promised to support it. A majority of roads have done so but a great many have not; and because they have not they have taken an unfair advantage of those that have in good faith attempted to comply with the requests of the committee for the common good.

The Conference Committee on Car Efficiency and its successor, the Commission on Car Service, have not adopted extreme measures. It has not, so far, even attempted to enforce the rules which the roads had agreed upon providing penalties for the misuse of equipment and failure to return cars to the owning road, although it intends to do so as to cars other than box, automobile and furniture cars after January 1. It has, however, attempted to bring about a redistribution

of the equipment on a basis more nearly in accordance with ownership. Its principal requests have been for certain necessary information, for the prompt return of open top cars to the railroads owning them, for a concerted effort to send box cars to those territories where the shortage is most acute, for the return of refrigerator cars to their owners and for restrictions to prevent sending to the seaboard freight which cannot be disposed of with reasonable promptness on arrival.

These requests, as the circular points out, were formulated in the interest of the public as a whole and with the knowledge that some roads would be compelled to make sacrifices to comply with them, but some roads have not even taken the trouble to furnish the commission with the reports requested, and others have not complied with its requests to attend conferences with the commission; and while many roads have, even at the expense of their own earnings and their local business, endeavored earnestly to do their part toward improving the general situation throughout the country, some of the roads, which are named in the circular, have continued to regard only their own interests. The circular says that lines have hesitated to return the kind of equipment of which they have an excess unless their deficiencies in other equipment are at the same time relieved. This naturally does not make for much progress.

The circular says: "The commission is strongly of the view that if any road does not fully and promptly support the program outlined with respect to both open top and box cars such road places itself unfairly in a position of advantage as compared with other railways in the same territory complying with the instructions of the Commission on Car Service." It not only does that but it helps to bring public criticism and discredit upon all roads, including those that attempt to act in a public-spirited manner as well as the delinquents.

It is possible that if the railroads fail to co-operate among themselves in doing the proper thing to improve the conditions of car distribution the Interstate Commerce Commission will find a way to prevent a recurrence at least of some features of the present situation. It has already taken a hand in the situation by issuing an order to the roads to show cause at a hearing on Thursday of this week why orders carrying out the requests of the Commission on Car Service should not be enforced. The car service rules as formulated and administered by the roads themselves have been practically ignored in periods of shortage. If they were required to be filed with the Interstate Commerce Commission and published as tariffs some roads would object, but the rules would probably be enforced.

THE YEAR 1916 IN RAILWAY CONSTRUCTION WORK

THE more serious an illness is, the slower is the recovery of the patient. The railways have been suffering several years from an acute business depression, a disease which has been aggravated by numerous operations more or less unskillfully performed by the various state and federal commissions. As a result, a number of the patients have succumbed, and the vitality of the others has been reduced greatly. After lingering in a serious condition for months, improvement first became noticeable early in the fall of 1915 when they received nourishment in the form of increased earnings. This improvement has continued throughout the past year with the result that, although they have not yet fully recovered their former state of health, they are showing signs of increased strength in a number of ways and while not yet beyond the danger of a relapse, the outlook is now hopeful.

As one indication of their increased strength, the mileage of new lines completed in 1916, although still far below normal, shows an increase of more than 165 miles over that built in 1915, when the total fell to the lowest point since the Civil war. This increase, encouraging as it is, does not measure the full improvement which has taken place. Just as the decrease in the mileage of lines built lags behind the arrival of a depression owing to the finishing of work previously authorized and under way, so the mileage statistics during periods of improvement fall short of the work actually begun. A considerable mileage of lines in addition to those not reported as completed in the statistics on another page, is now under construction, while a larger amount has been definitely located and plans are now being made for its building during 1917. For example, the Northern Pacific has let contracts recently for a considerable mileage of new lines in the Northwest, the Santa Fe has authorized the construction of several long branch lines in Texas and Oklahoma, while within the last two weeks the Burlington has received authority from the Missouri Public Service Commission for the construction of the first section of its proposed low grade line across Missouri. These are typical of a large number of projects now being authorized which indicate that the coming year will be one of marked construction activity. It is true that conditions in the material and labor markets will add considerably to the cost of work and in some instances may delay completion but these obstacles are being discounted in large measure by the present general prosperity of the roads and the necessity of providing increased facilities.

As might be expected, the largest mileage of new lines built in 1916 was in the Western and Southern states, for it is in these sections that there is the greatest need for additional railways. There are still considerable areas in these parts of the country without adequate mileage, and their development will be possible only as business conditions justify the roads in committing themselves to such work. The fact that no new mileage is reported as having been built last year in 14 states is not necessarily an indication that they now have adequate transportation facilities, but is in many cases a reflection of the uncertainty which has attended railway investments in recent years.

The cessation of railway construction work has been particularly marked during the past few years in those Middle Western states which have been most active in the passage of two-cent fare laws and other legislation tending to restrict railway earnings or to increase their costs of operation. It is significant that no new lines have been built in Iowa, Missouri, Nebraska and South Dakota this year, while in Oklahoma and Texas only 23 and 11 miles, respectively, have been built.

The mileage of second and other multiple main tracks completed is considerably less than that of last year. At first glance this seems to be inconsistent with existing conditions, for the railways are now handling the heaviest business in their history, and in many instances are suffering from a lack of facilities. It should be remembered, however, that the increase in business is so recent that the managements have not had time since it came to build additional main tracks. Among the projects which have been held up for some time, but which are now being carried to completion are the construction of the last gaps in the second tracks of the Erie and the Baltimore & Ohio, between Chicago and the Atlantic seaboard.

The situation in Canada is particularly interesting at this time. In contrast with conditions in 1914 when the mileage of lines built reached 1,978, and exceeded that in the United States for the first time in history, the mileage built in 1915 fell to 718 miles, and that for 1916 has decreased still further to 290, less than half of that for the previous year and only 15 per cent of that built in 1914. If current reports are correct, an actual decrease in the miles of lines operated or

at least of tracks in service may be shown next year because of the proposed removal of rails for shipment to the war front in France. The natural explanation of the present almost entire cessation of construction activities is, of course, the war. This is without doubt an important cause, but it is not the sole cause. For several years, culminating with 1914, there had been excessive construction in Canada, as a result of which the railway facilities in common with other improvements were overbuilt to such an extent that Canada now has a much greater mileage of railways in proportion to its population than any other country. This condition, together with the business depression, would have brought about a marked decrease in railway construction, which in fact had already begun when the war commenced.

While conditions in Canada are unfavorable to further extensive railway development at present, and will undoubtedly continue to be so for some time after the conclusion of the war, the contrary condition exists in the United States. With the heavy traffic and more favorable attitude on the part of the public and most of the regulatory bodies the managements of the railways are most optimistic regarding the future and are authorizing long-deferred extension and improvement work. From present indications 1917 should be a year of marked activity in this field.

ELECTRICAL PROGRESS IN 1916

THE development of new electrical designs and systems during the past year has been held up, to a great extent, because of the tremendous demand for standard machines and apparatus. The keen competition between the electrical manufacturing companies which has always been the greatest incentive for the development of new and improved machinery has been practically eliminated, the manufacturers being badly rushed with orders for their regular standard products. Another reason for this lack of new developments in the electrical field is the rapid approach to a condition of complete standardization of apparatus. This is the result of closer co-operation between users of electrical devices, the manufacturers, the American Institute of Electrical Engineers, the National Electric Light Association and the other influential electrical societies.

In general, however, progress in electrical design and installation has been satisfactory. This is especially true of steam railroad electrification. The progress of the electrification of the Chicago, Milwaukee & St. Paul mountain division has been remarkably rapid. The initial order for the equipment for this installation was placed with the General Electric Company in September, 1914, and by December, 1915, the overhead construction and the 100,000-volt transmission line, which parallels the railroad company's tracks, had been completed for a distance of more than 200 miles. It was not until this year, however, that actual electric operation was started. At this writing not only is the construction actually completed on 406 miles of the 440 miles eventually to be electrified but electrical operation on this much of the electric zone is actually a fact; also 37 of the 44 electric locomotives which are ordered have been delivered and are now in use. This means that the electrical construction work, including catenaries, transmission lines, rail bonding, building of substations, etc., on 206 miles of line have actually been completed during 1916 and that electric operation has taken the place of steam operation on this part of the line during this year. The locomotives are equipped with the first direct current regenerative braking system ever installed on any locomotive and the railroad officers who are in close touch with the operation of this equipment report that this feature is a distinct success.

The next largest main line steam railroad electrification in importance to the Chicago, Milwaukee & St. Paul is the Elkhorn electrification on the Norfolk & Western. The original electrified zone consisted of 30 miles of main line to which have been added during 1916 a three-mile section on the Pocohantas branch. In addition, 15 route miles or approximately 50 single track miles are now under construction west of Vivian, the present western end of the electrified division. Part of the new work will be on the main line and part on the branches. It has also been decided to electrify about five additional miles on the Bluestone branch. With these additions, the total track mileage of electrified lines will be over 150 miles. New locomotives have also been ordered to provide for the increased mileage and traffic.

Work on the new electrified tunnel and terminal of the Canadian Northern entering Montreal, which has been held up on account of the European war, was resumed and partial shipment made of the 2,400-volt electric locomotives. The Butte, Anaconda & Pacific and the terminal division of the New York Central have each ordered additional electric locomotives. Work is proceeding on the Chestnut Hill suburban electrification of the Pennsylvania at Philadelphia. This improvement involves 12 route miles, or 25 track miles, part of which is on the main line.

In electric car lighting the general tendency is toward the underframe or body-hung type of axle generator and during 1916 practically every manufacturer of car lighting generator equipment has developed and placed on the market a generator of this type. A notable development in car lighting practice is the use of the steam headlight turbine as a source of power for lighting cars on suburban trains. The Baltimore & Ohio and the Chicago & North Western are the pioneers in the use of this method of car lighting but indications are that they will not be alone in the use of this system as its simplicity, economy and general adaptability have attracted wide-spread attention. Another factor which affects the progress of the art of car lighting is the development of the gas-filled lamp in small sizes for use in electric lighted cars. These lamps not only give a better quality of light than the ordinary vacuum type, but are about 25 per cent more efficient.

Broadly speaking the general tendency in the manufacture of electrical machinery for central stations is toward the large, efficient turbo-generators. The progress of the steam turbo-generator units has been so great during the last few years, and certainly during 1916, that the manufacture of 30,000 kw. units is a common occurrence and units of 75,000 and 100,000 kw. capacity are now being considered. A single unit turbine of 45,000 kw. capacity has been ordered by a large central station company. These large capacity turbines are of the horizontal type, the vertical type being a thing of the past. The development in efficiency of the steam turbine has been so great that the gas engine and Diesel engine, though they exceed it in theoretical performance, have been eliminated as commercial possibilities in large central station practice. The thermal efficiency given for the largest turbine is about 25 per cent, which is a remarkable performance for a steam unit. The water rate for the largest turbine is less than 12 lb. as compared to about 17½ lb. for the most efficient reciprocating unit. The cost of the turbine per kilowatt is approximately one-fifth that of the largest reciprocating unit.

When considering the progress in electrical development during the year from the railroad man's standpoint, it is impossible to overlook the remarkable advances in the art of wireless telephony. The year 1916 will be marked as the time when the human voice was first transmitted across the entire continent without the aid of wires, a most remarkable performance and one which is a monument to the perseverance and ingenuity of American engineers.

PROGRESS IN SIGNALING

THE length of railroad in the United States equipped with automatic block signals has increased during the past year about 1,800 miles, a figure which, in view of the circumstances, is encouraging. On our more prosperous railroads the signaling departments are second to no department in their vigor and enterprise, and the past year gives continued evidence of this fact. By reason of high and increasing costs, everybody's plans for new work have suffered, and many estimates for extensive new mileage of automatic block signals, postponed already for one or two years, have had to be postponed again until 1917; but the signal engineers keep their goal steadily in view, and they not only hold their own, but make progress. The mileage of new automatic signals now under construction (2,200) is considerably greater than the total completed in 1916 and further plans for 1917 aggregate 1,500 miles of road additional. The profitableness of block signaling often has to be demonstrated to incredulous directors over and over, before the money is forthcoming; and so it has to be recorded again today, as in past years, that the progress made, gratifying as it is, is still too much confined to the larger and more prosperous companies. Immediate financial considerations, rather than the broad view warranted by scientific demonstration and reliable experience, continue to rule, in far too many cases. As in 1914 and 1915, single-track lines have been the field of the most important extensions.

And with this salient feature of the situation—that the signal engineers make progress in spite of weighty obstacles—there is, this year, a small cloud on the horizon: manual block signaling has actually been discontinued on a considerable mileage. Besides this, the installation of automatics to supersede the manual system continues to affect this item; and the total length of road in the United States worked under the manual system is only 258 miles more than a year ago. This cloud is not a large one, for the roads in question continue to operate their more important lines under the space interval system. On those lines of thinner traffic, where the space interval has been abandoned it was more in the nature of a refinement; and in times of stress, refinements have to be sacrificed. It is to be remembered also that now, as for years past, our total manual mileage is not the significant figure that it might seem, for two reasons: first, that on many long lines the space interval as a rule is used only for passenger trains, and, secondly, because these lines have little interlocking, and the block system is not so entirely depended on as in the case of busier lines.

In connection with automatic signaling, the railroads of America—and also the people of America, if they could become interested in such technical details and realize their importance as elements in safe and rapid transportation—can congratulate themselves on constant improvement in the efficiency of the marvelous and delicate mechanisms which constitute the essential features of the system. Perhaps the most important development of the past year has been the increased attention to track-circuit relays of low resistance and batteries of higher voltage. Further elaborate tests, costly in labor and time, will still be necessary in this department.

In interlocking machinery the progress in the use of electric and pneumatic power for operating switches and signals, prominent in past years, continues to be a main feature. Power apparatus is costly, and hand-operated machines continue to be more economical for a large majority of all the plants, except the largest and busiest; but that the virtues of power apparatus are fully appreciated is shown by the increasing use of electric motors for working the signals (by current from primary batteries) in plants where the hand power levers are still retained for the switches.

On many roads the visible progress in interlocking during the past year has been comparatively small; has not represented the improvement that has been accomplished. This is because much labor and money have been expended in replacing machine parts, castings and other facilities which, in the preceding lean years, have been allowed to continue in service in below-standard condition.

Two improvements of a radical nature which have been notable in recent years—light signals and "position light" signals—have continued to make progress during 1916. The satisfactory results with light signals on the St. Paul road in the Rocky Mountains undoubtedly will tend to warrant a wider use of this type of signal. The position-light signal thus far flourishes on only one road, the Pennsylvania; but that one seems to be going forward in a way to justify the favorable conclusions formed a year ago.

A third radical improvement, the automatic stop, has made considerable progress during the past year. If we speak of visible progress, it is in only one direction—the development of speed-control apparatus on the New York Municipal Railway, Brooklyn, N. Y. The Miller system on the Chicago & Eastern Illinois has been improved in detail; and a half dozen of the more serious experimenters, in different parts of the country, are still at work; but their results thus far are "not for publication." The New York, New Haven & Hartford is keeping up its investigations. The railroad companies, as a whole, seem to have made little or no progress, and the American Railway Association had nothing to say at its last meeting. The automatic stop is a refinement of refinements, and everybody seems satisfied, in the strenuous circumstances now hampering all railroad operations, to let this refinement wait. The Brooklyn experiments, however, are reported as very successful, and the valuable knowledge derived from this experience, will in time inure to the benefit of all the railroads.

THE YEAR IN MAINTENANCE WORK

THE year now closing has been one which will long be remembered by those in the maintenance of way department. The two preceding years had shown reduced earnings with the consequent necessity of holding expenditures for maintenance down. Late in the summer of 1915, business began to improve very rapidly although this became evident too late in the season to enable the maintenance of way department to profit to any extent. With the continuing of heavy business throughout the winter it became evident very early in the spring that more liberal appropriations would be available. A general spirit of optimism prevailed, ambitious programs of improvement work were prepared and those in charge resurrected estimates for work which they had long desired to do but which previously had been considered financially impractical. As spring arrived a great deal of work was authorized and actually undertaken but it was only a short time until complaints began to arise regarding a shortage of labor. The same activity prevailed in the manufacturing industries and they required larger than normal forces. Also there was an actual shortage of men in the country. The result was that all railway work was seriously delayed and a considerable amount closed down or postponed to enable the forces available to concentrate on the remainder and continue it to completion.

This condition forced many of the railways to previously untried sources of labor. The greatest decrease in track labor was among the Italians, Austrians and other nationalities involved in the European war, large numbers of whom had been called home to fight. Their absence was not noticed during 1915, but when the demand for men increased, they could not be recalled. As a result many northern and eastern roads brought large numbers of negroes from the south on to their lines at wages previously unheard of by them. This at once created a stringency in the south where some roads were forced to raise wages from the previous standards

of $1 to $1.25 per day to figures considerably above this and others suffered a shortage of labor for the first time in their history. Another distinct movement of railway labor was that of considerable numbers of Mexicans as far east as New York City, although few had previously gone east of Chicago. This created a shortage of men on the southwestern roads which was overcome in part by the bringing of others from Mexico.

Even with these large transfers there existed a serious shortage in almost all parts of the country and wages rose rapidly, some roads paying as high as 25 cents per hour for track labor when the highest rates the preceding year seldom exceeded 17½ cents. The unrest among the men also resulted in the usual difficulties with strikes, particularly in the east, the Boston & Maine having 2,500 track men out at one time.

These conditions have focused increased attention on the housing of the employees with the result that a number of roads have built improved camp and car equipment for them, and have given more attention to their comfort in an endeavor to hold them in the service. One merited increase in wages was that in the salaries of section foremen, a long delayed but deserved recognition of an unusually faithful group of employees. The unusual labor conditions have resulted in the very peculiar situation that many of the roads were unable to spend the money authorized for current maintenance of way and improvement work, and have large unexpended appropriations in their accounts at the close of the year.

This handicap upon maintenance work was accentuated by heavy increases in the costs of almost all materials, and the impossibility of securing early deliveries at any price. For the first time since the formation of the United States Steel Corporation in 1901, the prices of rails were changed, being increased $5 in the spring and the same amount again late in November, so that they now cost $38 and $40 for Bessemer and open hearth, respectively. Previous to the first raise, the manufacturers gave notice of it and urged the roads to order their 1917 requirements early. As a result most of them ordered at that time, a full year in advance of delivery. In the fall the second increase in price was made without previous notice and only a few roads had placed further orders before it went into effect. Almost immediately after its announcement, the roads realized that the tonnage of unfilled orders on the books of the steel manufacturers was the largest in history and that if they desired any rails early in 1918 they must order promptly. As a result over 750,000 tons, or about 25 per cent of a normal year's requirements, were ordered during the first two weeks of December alone for delivery 15 to 18 months in the future. Other materials have risen more or less directly in proportion. Tie plates and track fastenings have increased in price while deliveries are similarly delayed. Bridge materials have advanced in cost, not directly because of congestion in the fabricating shops but because of the rising costs of the plain materials.

Thus while greatly increased sums have been available for maintenance work, it has been impossible to spend all that which was authorized, and of that spent a considerable amount has gone for increased costs of labor and materials, so that the expenditures do not reflect the amount of actual work done as compared with earlier years. However, even with these severe handicaps, the roads have been able to make material progress in taking up deferred maintenance and the properties are in better condition than a year ago.

An action of much importance just before the close of the year was the order of the Interstate Commerce Commission changing the fiscal year to end on December 31 instead of June 30. By this act, one of the most serious obstacles to the economical conduct of maintenance of way work has been removed. The effects should be far reaching, especially in such unusual times as those through which we are now passing.

A YEAR'S PROGRESS IN LOCOMOTIVE BUILDING

ONE of the striking features of the locomotive orders for 1915 was the fact that orders for practically 50 per cent of the year's total were placed after October 1, and notwithstanding the constant and rapid increase in the price of materials, the outlook for a big year's business during 1916 has been fulfilled. Since January 1, 1916, orders have been placed for almost 2,900 locomotives, an increase of more than 1,300 over the number ordered last year. This increase is only natural in the face of the large increases in the amount of traffic which has been moved during the past year and a half, the report of the chief inspector of the Division of Locomotive Inspection of the Interstate Commerce Commission for the fiscal year ending June 30, 1916, stating that there was an increase of 6,000 locomotives in service over the previous fiscal year.

While the increase in the prices of locomotives has not been as marked as that in the case of cars, a conservative estimate will show that locomotives ordered during the past year have cost from $5,000 to $20,000 each more than similar locomotives ordered during the year 1914, the average increase during that period being at least 50 per cent. A statement recently made public by the Buffalo, Rochester & Pittsburgh shows that the Mikado type locomotives purchased during 1914 were obtained at a price of $20,300, while those ordered during 1916 cost $33,900 each. A similar comparison of Mallet type locomotives shows an increase from $32,300 each to $51,500 each. In both cases the locomotives ordered during the two years are comparable, being of the same design and total weight and were ordered from the same builder. That still further increases in prices during the coming year may be expected is evident from an inspection of the conditions of the material market. A comparison of the prices of some of the materials entering into locomotive construction as quoted last week, with the quotations for one and two years ago are as follows:—

	December 21.	1 year ago.	2 years ago.
¼-in. boiler and flange steel, per lb.	$ .0365 to $ .0515	$ .0235	$ .0115
Steel forging billets, per ton.....	80.00	53.00	24.00
2¼-in. boiler tubes, per foot of length	.132	.097	.09
Pig iron, per ton.....	23.00 to 35.95	17.40 to 19.95	9.50 to 15.17

As the present prices, or higher, will be effective for locomotives ordered during the early part of 1917, while those of a year ago were probably effective on a large number of the early orders during the present year, there can be no doubt as to the trend of locomotive prices, at least for several months to come.

The types showing the greatest gains in the number ordered, as compared with last year, were the 2-10-2, the 4-6-2 and the 4-8-2 types, the increase in the number of these locomotives ordered being proportionately much greater than the increase in the total number of locomotives ordered. Although there was an increase in the number of Mikado type locomotives, this was so small in comparison with the increase in the total number of locomotives ordered that it seems evident that this type is losing, while the Santa Fe type is gaining favor for use in heavy freight service. Considering the success with which locomotives of the latter type have met in service and the ability to provide a flexible driving wheel base which has been made possible by the lateral-motion driving box, the wider application of the Santa Fe type seems assured.

In 1911 the first locomotives of the Mountain type were placed in passenger service on the Chesapeake & Ohio to facilitate the handling of passenger trains on heavy mountain grades without double heading. With the exception of 1912, each succeeding year has seen orders placed for a

few of these locomotives, the total number ordered up to the beginning of 1916 being 47. That this type of locomotive is rapidly establishing itself is indicated by the fact that during the current year orders have been placed for about 180 of these locomotives for passenger and fast freight service. Few locomotives of the Pacific type have been built with total weights over 300,000 lb. and tractive efforts exceeding 40,000 lb. Such locomotives with average axle loads as high as 67,000 or 68,000 lb. and tractive efforts approaching 50,000 lb. may be considered as constituting the limit of weight and tractive effort which can be reached with the Pacific type.

The average weight of the Mountain type locomotives, now in service or on order, exceeds 330,000 lb. and the possibility of increasing the hauling capacity with these locomotives is well indicated by the fact that they have been built to exert tractive efforts as high as 57,000 lb. with average axle loads slightly under 60,000 lb.

That the Mallet locomotive is giving a good account of itself is indicated by an increase of practically 100 in the number ordered this year as compared with those ordered during 1915. Orders for a considerable percentage of this number were placed by roads which are successfully using the Mallet locomotive in road service. The Virginian Railway has placed orders for ten 10-coupled locomotives to have a total weight of 670,000 lb. and exert a tractive effort of 147,000 lb., and it is also noteworthy that this road has ordered a Triplex locomotive similar to those which have been built for the Erie, but of slightly less total weight.

Superheaters were included on about 80 per cent and brick arches on about 70 per cent of the locomotives ordered this year. The tendency towards an increase in the degree of superheat has been especially marked during the last six months, increases in the number of units having been specified in many of the locomotives ordered during that time, as compared with similar locomotives built during the past two years.

Last year attention was called to the fact that economy and capacity increasing devices were applied to two existing locomotives for each new one so equipped. This ratio has practically been maintained during 1916, and considering the large increase in the number of locomotives ordered this year, considerable acceleration in the improvement of existing power is evident.

The constant increase in the size of locomotive boilers which has taken place during the last few years has led to the serious consideration of the effect of the constantly increasing tube lengths which have thereby been necessitated. It has now been well established that there is an economical limit, beyond which there is little to be gained from additional tube heating surface obtained by increasing the tube lengths. The result of this growing conviction has been reflected in the increase in the number of locomotives, the boilers of which have been built to include combustion chambers, there having resulted therefrom not only a more efficient distribution of the boiler heating surface, but improved combustion due to the increased firebox volume.

Probably the most far reaching development of recent years, not only in improved efficiency of combustion and boiler performance, but more particularly when considered from a broad economic standpoint, is the use of pulverized coal in locomotive service. This has been developed to a point where satisfactory results have been obtained in service, in about three years and its economic possibilities are such that in view of the constantly increasing price and commercial demand for coal, the next few years may see it well established as a regular feature in locomotive service.

That the number of stokers in service during the past year has increased fully 75 per cent is the natural sequence of the large number of the Mikado, Santa Fe and Mallet types which have been ordered during the year, most of these locomotives requiring a rate of firing to develop their full capacity well beyond the possibilities of hand-firing.

The use of heat-treated carbon and alloy steels for reciprocating parts, crank pins, axles, etc., has now become well established. Many of the problems of running gear design presented by the high power which must be transmitted from a single pair of cylinders in large single-unit locomotives have been greatly simplified by the availability of such material and the past year has seen its use extended to several additional railroads.

The lateral motion driving box for providing radial action to driving axles, which was first applied to 2-10-2 type locomotives built last year for the New York, Ontario & Western and the Erie, has been applied to more than 60 locomotives ordered during the past year.

One of the striking features of the locomotive market during the past year is the large number of orders for foreign locomotives which have been placed in this country. Until this year, with the exception of locomotives built for Russia, these engines have generally been built to the foreign designs and it is interesting to note that during the latter part of the present year orders have been received from France, Spain and Italy, which are being built to American designs.

A comparison of the number of locomotives of the various types ordered during 1915 and 1916 clearly indicates that there has been no decrease in the tendency toward constantly increasing power units. While the 2-10-2 type will undoubtedly retain its supremacy for several years in heavy road freight service, it is evident that the limit of its capacity will soon be reached and the difficulties in the way of increasing the size of simple cylinders beyond that required by the 10-coupled wheel base, indicates that but little more can be done in the development of single unit locomotives operated by a single pair of simple cylinders beyond the possibilities in the types now in existence. Although in general the Mallet locomotive has never been favorably considered as a road engine, it has been successfully used in road service for some time on a number of railroads and it offers possibilities for further development along that line.

THE PROPOSED STANDARD BOX CAR

THE question as to whether or not the railways of this country should have a standard box car has been more or less discussed for a long time. No definite action toward the introduction of such a car was taken until two or three years ago when several railway executives, chief among whom is E. P. Ripley, president of the Atchison, Topeka & Santa Fe, despairing of any decided action by the mechanical men, set the ball rolling and the American Railway Association, as a result, appointed a committee in May, 1914, to prepare designs for a standard car. Mr. Ripley is chairman of this committee and the actual design of the car is in the hands of a sub-committee of which George L. Wall is chairman.

The advisability of a standard box car may be considered from several angles. With the variety of car designs now in service, the money which is tied up in stock for repair parts runs into excessive amounts and it is this phase of the matter which was directly responsible for the action of the railroad executives referred to above. Unquestionably a standard car would result in a reduction in the repair parts necessary to be carried in stock, but there would be no very great immediate effect shown as the result of its adoption. In fact, it would be some years before the beneficial effects in this respect would be noticed. While some claim that the standardization of the complete car is unnecessary because of the small amount of repair work necessary on the car body, arguing that if the trucks, draft gear, door fixtures, etc., are standardized, the real purpose of a standard car will be realized, the fact remains that the standardization of the body construction will mean the elimination of the badly

designed and poorly constructed car which is cheap in first cost and expensive in upkeep.

A standard car would result in uniformity in strength and the elimination of the myriad ideas, many of them haphazard, which are in evidence today. It would so standardize the material from which the car is constructed as to permit of manufacturers buying in large quantities at reduced prices and, if they so desired, to manufacture and stock the cars in times of depression. Then there is the matter of separate dies for each order of cars; such expense would be avoided. The cheaply built car which is now such a trouble maker would be eliminated.

The committee which is working on the design for the standard car has practically completed designs for the 60,000-lb., the 80,000-lb. and the 100,000-lb. capacity cars. The 60,000-lb. capacity car is of the double-sheathed type; the 80,000-lb. capacity car may be built of the double-sheathed type, the steel frame, single-sheathed type or the all-steel type, and the 100,000-lb. capacity car is of the all-steel type. Sample cars of these three types will soon be built, the construction of some of them having been started. The committee has kept in mind throughout the desirability of producing a car which will give a maximum service with a minimum first cost. It has conscientiously endeavored to produce the best car with the least disturbance to business conditions and in many cases it has arranged for the use of patented devices on a royalty basis, this being necessitated by the impossibility of designing any satisfactory substitute. In practically every case, however, the requirements permit alternates so that the only changes which would be required in many of the patented articles would be to make them conform to the standard dimensions and clearances. Take, for example, the matter of roofs; a Z-bar side plate has been used in the designs throughout and while two types of roof are provided there is no reason why any of the present roofs could not be employed, provided only that they will fit between the Z-bar side plates. No attempt has been made to standardize the draft gear or coupler, this being left to the action of the Master Car Builders' Association. Practically the only limitation placed on the draft gear is because of the standard spacing of the center sills.

It will thus be seen that in its proposed plans the committee gives the choice of practically five different cars with the option of using alternates in some features of their design. This will detract, to some extent, from the chief reason for the standard car, increasing the amount of material to be carried in stock for repairs over that which would be required if a definite standard were adopted. Of course careful attention has been given the matter of interchangeability between the different types of cars, but the permitted use of alternates presents a problem. The present M. C. B. interchange rules require that in repairs to foreign cars "the work shall conform in detail to the original construction" (Rule 16) with a few exceptions. This would necessitate, therefore, each road carrying in stock a large number of the alternates with which to make such repairs or to follow the present practice of holding cars for shipment of parts from the owning roads. This, of course, is not desirable, nor is it believed necessary, except, possibly, in some few cases. The fact that the committee has approved these alternates indicates they will serve their purpose equally as well as the standard parts, and that the safe operation of the car is in no way jeopardized by their use. This being the case why not change this rule to permit the application of the A. R. A. Standard regardless of the original construction of the car?

It should be borne in mind by all those who object to a standard car because of its eliminating some particular device which they favor, that if the work of standardization is to be carried out so that the railways will get the greatest benefit from it in the future it has got to rise above the whims or ideas of any individual mechanical department or officer. Of course, there are some of the items which are not being dealt with by the committee which are either already standards of the Master Car Builders' Association or in all probability soon will be and following the logical lines they would be included in the standard car.

However it is arrived at, a standard car is not only desirable but essential to maximum economy. If such a car is not adopted by the railroads themselves they will, sooner or later, have standardization forced on them by the United States Government. The railroads would undoubtedly have to spend large sums in acquiring patents, etc., but such expenditures would be amply justified by future savings. There is no need of shutting off improvement or progress. Any changes that are necessary in the car after it is adopted should be taken care of by a competent board of engineers retained for that purpose by some such association as the American Railway Association and basing their changes and improvements on the actual results being obtained in service.

THE SWITCHMEN'S ARBITRATION AWARD

THE award of the board of arbitration in the wage controversy between the railways and those of their switchmen who are members of the Switchmen's Union must present some interesting questions to the members of the four train service brotherhoods who refused the repeated offers of the railways to submit their demands to arbitration. It will also present some problems to the railways, but at any rate the situation is much more satisfactory to both sides than that created by the Adamson law. Of course a decision of the board regarding the wages and hours of switching crews is by no means a criterion of what the same board might have decided as to trainmen in general, because on the whole the wages of men engaged in yard work are lower and their hours and conditions of employment are more arduous than those of other trainmen. It is, moreover, possible to work yards in eight hour shifts, while such a practice is impracticable in train service.

The award to the switchmen, while giving the men an increase in pay and establishing eight hours as the standard for a day's work and a day's pay, recognizes the impracticability of maintaining a rigid limitation of a day's work in railroad service, and, therefore, imposes no punitive rate for overtime. In practice, therefore, it will be up to the railway managements to decide whether to establish a real eight-hour day in yard service or to retain the present conditions and pay the higher wages. With a real eight-hour day the daily earnings of many of the men who now work long hours would be reduced in spite of their higher rates per hour, but this would, of course, require more men to perform the same service and the expenses of the railways will be greatly increased in any event. As it is feasible to operate yards on an eight-hour day basis, except in cases of emergency, and as it is the manifest intention of the award to place yard service on as near an eight-hour basis as possible, the railways should make a sincere effort to comply in good faith with this intent. To attempt to do less would tend to discredit seriously the principle of arbitration as a means of settling future controversies.

The award to the members of the Switchmen's Union raises an interesting question as to the effect it will have on the still greater number of yard employees who are members of the Brotherhood of Railroad Trainmen, and who voted to strike rather than to submit their similar demands to arbitration. It would hardly be feasible for the roads to pay different scales of wages to employees in the same terminal, yet if the B. R. T. yardmen should accept the basis granted to the Switchmen's Union it would undoubtedly raise some internal complications in the brotherhood.

Railway Situation at Close of Year 1916

Striking Resemblances to and Contrasts With Conditions Which Existed at the End of 1906. What of the Future?

THE calendar year 1916 affords a basis for both striking comparisons and striking contrasts with the year 1906, just ten years before. Throughout 1916, as throughout 1906, the traffic of the railways, and especially their freight traffic, has been the heaviest ever known. In consequence, in the year just closing, as in 1906, both total earnings and net earnings have broken all previous records. Now, as was also the case ten years ago, there is being experienced a "car shortage" of great magnitude, and a congestion of traffic of unprecedented severity. The exact size of the car shortage in the last months of 1906 is not known, as the first statistics on this subject are for 1907; but the statistics for the first month of 1907 clearly indicate what had been the situation in the immediate preceding months. On January 2, 1907, the net shortage of freight cars was over 85,000; on February 6 it had increased to almost 138,000; and it never entirely disappeared until the end of June. Never before up to the present time was there a net shortage which lasted even until the middle of December.

There was a small net shortage in March, 1916, and a net shortage began again in September which reached 115,000 in November, which was continued up to the present time, and which, from present indications, will last throughout the winter and into the spring. The situation from now on for some months will depend not only on the volume of traffic but also on the weather. If the traffic continues to be heavy and snow and extreme cold prevail, the situation may grow worse, as it did in the early part of 1907.

Some Contrasts With 1906

While in the respects mentioned the history of 1906 has been repeated in 1916, there are, as already intimated, some respects in which these two years present sharp contrasts to each other. The situation in 1906 was a result of normal and steady development which had been going on throughout the preceding decade. The situation in 1916, on the other hand, has been a result of a series of extremely irregular and to a large extent abnormal developments during the preceding ten years.

In every fiscal year from that ended on June 30, 1897, to that ended on June 30, 1907, there was an increase in the gross earnings per mile of the railways of the United States; and in every one of these except 1904 there was an increase in net earnings per mile. On the other hand, during the last ten years there have been frequent and wide fluctuations in both gross and net earnings. There were declines in gross earnings per mile in 1908, 1909, 1911, 1914 and 1915, and there were declines in net earnings per mile in 1908, 1911, 1912 and 1914. The present enormous traffic and earnings are the result of increases which for suddenness and magnitude are without a precedent in the history of the railways of this country, and probably without a precedent in the history of those of any country.

The Sudden Deluge of Traffic

There was hardly any sign of the impending change until October, 1915. Then traffic came with a rush, and every single month from that time to this has been for that particular month in the year a record breaker in point of gross earnings. Until during the present period average gross earnings for the railways as a whole in a single month of $1,150 were good, and there apparently was only one month, October, 1912, when average earnings per mile had exceeded $1,300.

Complete earnings figures for the calendar year 1916 are available for only the nine months from January to September, inclusive. The largest earnings in the year are usually made in October and November, and this, when the complete figures are available, probably will be shown to have been true of 1916, but average total earnings per mile per month for the nine months, January to September, inclusive, were this year $1,279; and in three of these months, May, June and July, more than $1,300 was earned while in August all previous records were broken, with total earnings averaging $1,418 and $1,409 per mile.

These figures regarding earnings ought alone to be sufficient to explain why there has been so large a shortage of cars and severe a congestion of traffic during the last five months. There are, however, numerous statistics regarding the comparative development of the railways in the years preceding the traffic congestion in 1906, and regarding their development in the years immediately preceding the sudden increase in business within the last fifteen months, which throw a great deal of additional light on the general situation.

The steady increases in traffic and earnings which began in 1897 culminated in 1906 and in the early part of 1907, and doubtless they were the cause of the large and rapid expansion of railway facilities which occurred during this period. The violent fluctuations of total earnings, and especially the downward tendency of net earnings in the decade prior to 1916 likewise caused the remarkable slowing down of railway development which the statistics show occurred during this decade.

In the five years ending with the calendar year 1906 there were almost 23,500 miles of new railway built in the United States, an average of almost 4,700 miles a year. On the other hand, during the five years ending with 1916 there were less than 10,000 miles built, or an average of less than 2,000 miles a year.

In the five years ending with 1906 the number of locomotives ordered by the railways of the United States was almost 22,400 or almost 4,500 per year. During the five years ending with 1916 the number ordered has been less than 14,000 or about 2,800 a year.

In the five years ending with 1906 the total number of freight cars ordered was almost 1,100,000, an average of over 218,000 a year. During the five years ending with 1916 the number ordered has been only about 740,000, or an average of about 148,000 a year. (The statistics regarding new mileage built and cars and locomotives ordered both in 1916 and in preceding years are given in detail in articles published elsewhere in this issue).

There are no statistics available regarding the miles of all track (as distinguished from the miles of line) which have been built year by year, but the statistics of the Interstate Commerce Commission show the increases which have occurred in mileage of all tracks operated in each fiscal year ended on June 30. Its statistics show that in the five years ended on June 30, 1906, the increase in the total mileage on all tracks in the United States was 51,731, an average of 10,346 miles a year, while in the four years ended on June 30, 1915, the increase was only 28,318 or an average of only 7,079 miles per year.

The foregoing statistics set forth in a striking and even startling manner, one of the most important facts to be considered in connection with the present situation of the railways. This is, that the car shortage and traffic congestion of 1906 came at the end of a decade of rapidly increas-

ing business and earnings during which there had been a great expansion of transportation facilities, while the car shortage and congestion of traffic in 1916 have followed immediately on the heels of a long period of depression in the railway business, during which the increase of facilities was relatively very small.

Causes of the Heavy Traffic

What is the cause of the present great volume of traffic? Most people attribute it largely to industrial and commercial conditions resulting from the war in Europe. If it is due entirely to conditions created by the war it will pass away with the war, and the only thing that can reasonably be asked of the railways is that with their present facilities they shall meantime handle the business as well as they can. But to reason thus is to disregard the most significant fact disclosed by the experience of the last fifteen months. This fact is the extent of the present *productive capacity* of the people and the industries of the United States. The war in Europe did not create this productive capacity. It existed already, and the war, so far as it has affected conditions, has merely caused it to be fully utilized. The end of the war will leave the productive capacity of our people and industry unimpaired and it will be but a comparatively short time until there will develop conditions which will cause it to be fully utilized again.

Productive Capacity Exceeds Railway Capacity

Not only have the developments of the last fifteen months disclosed the enormous productive capacity of the people and industry of this country, but they have also shown that when it is being fully utilized the facilities of the railways are not adequate to the demands which it causes to be made upon them. To sum up, then, the industry and commerce of the country grew rapidly throughout the ten years ending in 1907, and almost throughout that period the facilities of the railways were increased so rapidly that they proved adequate to the demands made upon them. At last, however, the traffic did catch up with the facilities, the result being the great car shortage of 1906-1907. The year 1916, unlike the year 1906, marks the beginning, not the approach of the end, of a period of industrial and commercial activity and growth. There will doubtless be a painful and violent readjustment after the war ends, but there will be another period of industrial expansion after the readjustment is passed.

Since our railway facilities have proved inadequate at the beginning of the present period of prosperity, will they not prove inadequate to the demands which will be made upon them as soon as the period of readjustment is over? And if they prove inadequate at the beginning of a period of prosperity, what kind of a situation will they cause to develop if industry steadily grows more active and traffic heavier, as it did for several years prior to 1906?

There seems to be only one rational answer to this question. No matter how favorable to a period of prolonged and great prosperity other conditions may be, progress in industry and commerce will be sharply arrested, and there will not be any long continuance of prosperity, if the facilities of transportation are not greatly increased. The net operating income of the railways during the year now closing has been unprecedented, probably averaging more than six per cent on the investment in road and equipment. In the past whenever it has averaged over five per cent there has resulted a largly increased investment in new facilities. In view of the large net earnings now being made the expenditures during 1916 for new mileage and trackage, for new equipment and other improvement have been relatively small. This has been largely due to the extremely high prices prevailing. But the new mileage built in 1916 is more than that built in 1915, the orders placed for freight cars have been the largest since 1912, and the orders for locomotives are the largest since 1913; and the prospects are for a substantial increase in new construction and in orders for equipment during the year 1917.

Increase in Facilities Follows Increase in Net Return

The need for an enlargement of railway facilities is so obvious that everybody must now see it. Furthermore, the only means by which it can be secured should be equally obvious. The increase of railway facilities follows an increase in the percentage of net return, as certainly as the day follows the night. As already shown, there was much activity in the five years 1902 to 1906 in the construction of new mileage and trackage, and in the purchase of new equipment, and in that period the average net operating income earned in the various fiscal years on the investment in the road and equipment of the railways follows: 1902, 5.04 per cent; 1903, 5.14 per cent; 1904, 4.79 per cent; 1905, 5.02 per cent; 1906, 5.39 per cent. In every year but one net return exceeded 5 per cent.

On the other hand, as has also been shown, there was a heavy decline in new construction and in orders for new equipment in the five years preceding 1916, and the following figures regarding the percentage of net operating income earned in the fiscal years of this period show why this was the cause: 1911, 4.77 per cent; 1912, 4.52 per cent; 1913, 4.87 per cent; 1914, 3.77 per cent; 1915, 3.96 per cent. In every one of these years net return was less than 5 per cent, and in two of these it was less than 4 per cent.

Some question has been raised repeatedly as to whether the condition of railway net earnings really has been the cause of the decline in new construction and in the acquisition of new equipment. For example, in the hearings before the Newlands committee at Washington some of the members of the committee have called attention to the fact that the stocks of many of the better managed and more prosperous railways have steadily sold above par, that their bonds also have commanded what seem to the questioners figures which indicate a good market for bonds, and it has been asked whether any cases can actually be cited where strong railway companies have sought and have failed to sell at good prices securities to raise money for improvements. Points of this kind having been raised, the *Railway Age Gazette* recently addressed a letter to the presidents of several of the leading railroads of the country, asking them to give specific examples of how the condition of earnings and of the money market during recent years has interfered with their raising money for extensions and improvements. There has not been time as yet for replies to all these inquiries to be received. Some have been received, however, and they contain significant information. One letter which has been received is from the president of an important and relatively strong, prosperous and conservatively managed railroad in the Northwest.. He says in part:

> "This company has been for some time and is now desirous of building about four hundred miles of extensions of its railroad in sections of the Northwest that are not at present adequately served by transportation facilities; but because of its inability to dispose of its securities, at a price that, as a business proposition, would warrant their sale, has been unable to make these much needed extensions.
>
> "Until within the past few years this company was able to dispose of its 4 per cent. bonds at approximately par and in common with other first class securities, these were considered by the purchasers to be a good investment; but in the last few years we have found it practically impossible to dispose of these bonds at a price that would meet the demands of an economical and proper administration of its financial affairs.
>
> "In 1915 in order to secure funds required for needed improvements and betterments, we were compelled to issue bonds drawing 5 per cent. and for improvements on our Chicago division we were unable to find purchasers for its bonds and were compelled to issue notes due in three years, bearing interest at 5 per cent. for that purpose."

Another letter which has been received is from the president of one of the greatest railway systems not only of the eastern part of the United States, but of the world, a system which has been managed with notable conservatism and

ability, and which has regularly paid substantial dividends. The president of this railroad says:

"Replying to your letter regarding cases where railroads had found it impracticable to do any new construction work because of their inability to get the public to invest in their securities, much depends upon how this question is put. Railroads cannot issue bonds and stock and throw them on the market to discover whether the public will take them or not. I know of no instance where any company with sound credit and good earnings had any difficulty in selling its securities to the public, provided the rate was satisfactory compared with others, but there have been very many cases where the railroads have discovered through consultation with investors and bankers that there was no market for railroad securities except on terms too onerous for the railroads to accept, and, further, because many railroads, including our own, suffered such a reduction in earnings that they were not warranted in offering securities to the public or proceeding with large items of construction work or large orders for equipment.

"For instance, in the case of (an important subsidiary property) I know that for a long period we had to defer selling bonds on more than one occasion, although the construction work was proceeding, because market conditions were not favorable. Its mortgage bonds would be guaranteed by (its owners) but in lieu of selling them, we temporarily authorized short term borrowing at lower interest rates. For the period 1908 to 1915, the general experience of most of the railroads was that they had not sufficient business or earnings to furnish a credit basis to make proper additions to their property and equipment, nor was there sufficient prospect of any increased traffic to justify proceeding with any great expenditure program. During this period, short term financing had to be resorted to because of the impossibility of selling capital stock on any basis, or mortgage bonds except on onerous conditions."

As also has been seen, the recent increase in gross and net earnings was followed immediately by an increase in expenditures for new construction, for improvements, and for equipment. The statistics regarding new construction, orders for equipment, etc., in 1916, which are published in this issue of the *Railway Age Gazette,* show clearly that the revival in the expansion of facilities already has begun. Past experience indicates that the continuance and intensification of this revival is absolutely dependent on the continued earning by all the railways of the country of a net operating income exceeding 5 per cent on their total investment in road and equipment; and in view of present conditions in the money markets of the world it is probable that past experience is not an entirely safe guide, and that the minimum average net operating income necessary in the past to cause a rapid expansion of railway facilities will not be sufficient in future. The average net operating income earned on investment in road and equipment in good years and in bad probably cannot, in view of past experience and of present financial conditions, with safety be allowed to fall below six per cent.

The Heart of the Railway Problem

This takes us to the very heart of the railway problem as it now presents itself to the railway managers and railway regulating authorities of this country. How is net operating income to be maintained? The railways are not seeking increases in rates. They are, however, putting forth strenuous efforts in other directions, having the purpose of keeping their net operating income on a sound basis. They are handling the present enormous volume of traffic as economically as practicable with present facilities. They are making a determined resistance to the attempt of the employees in train service to secure unreasonable advances in wages. The Railway Executive's Advisory Committee has been presenting testimony before the Newlands committee in support of a plan intended to reform the present system and policy of regulation, and the adoption of which would, it is believed, enable substantial economies to be effected in railway development and operation, while at the same time preventing rates from constantly being hammered down by the federal regulating authorities and those of 49 states.

What are the prospects for the success of this general program as we approach the new year 1917? Already some of the respects in which the present conditions contrast with those prevailing exactly ten years ago have been outlined. There is still another important respect in which the present situation differs sharply from that which existed at the end of 1906. Public sentiment has changed. At that time the railways were the objects of intense hostility on the part of the public. They were being attacked upon the ground that they were flagrantly discriminating between persons, concerns and communities, and that their rates in general were excessive. They were being denounced for the extreme congestion of traffic that prevailed. Then, as now, a great movement by certain classes of their employees was under way for large increases in wages, and public sympathy was on the side of the employees. The result, within a few months, was the largest crop of state laws for the reduction of freight and passenger rates and for penalizing the railways for not promptly furnishing all the cars that were ordered by shippers, that ever was passed in this or any other country. Furthermore, the movement of the employees for higher wages was very successful and the fiscal year ended on June 30, 1907, was marked by an aggregate increase in the compensation of employees exceeding $170,000,000. A few months later came the panic of October, 1907, and within six months instead of being troubled by a shortage of freight cars, the railways had a net surplus of them exceeding 413,000.

Public Sentiment Hostile in 1906, Friendly in 1916

While ten years ago at this time public sentiment was so hostile to the railways, and shippers and the press were universally denouncing them, at the present time public sentiment is not unfriendly to them, and business men and the press generally recognize the reasons for the existing congestion of traffic and make allowances accordingly. Instead of the states being ready to pour forth a flood of laws injurious to the railways, state legislation is on the defensive all along the line, and there are no indications that there will be great activity in the passage of state railway legislation this winter. Instead of public sentiment being favorable to the train service employees in their movement for higher wages, it appears to be opposed to them, and there is a strong demand for legislation which will make serious railway strikes improbable, if not actually impossible.

With public sentiment so friendly to the railways in spite of the large earnings they are now making, and in spite of the most acute congestion of traffic ever known there seems to be more ground for optimism regarding the future of the railways than there has been at any time in over a decade. It may be that there will be further large increases in the wages of many classes of employees, both organized and unorganized. In fact, the managements of many railways have recognized the claims of the unorganized employees by giving bonuses to many thousands of them this year. In most cases it has been expressly stated that this has been done because railway earnings are extraordinarily large, and because there has been a serious increase in the cost of living within the last year. If, however, the large earnings continue, and the cost of living does not decline, it will doubtless be necessary in one way or another to continue to reward many employees more highly than has been done in the past. Increases in wages mean, of course, increases in operating expenses. Besides, there have been extremely great advances in the prices of all kinds of equipment and supplies, which further add to operating expenses. In fact, both operating expenses and taxes already have begun to show heavy increases. In the latest month for which statistics are available—viz., September—the percentage of increase in operating expenses and taxes per mile for the entire country was greater than that of the increase in total earnings per mile, the increase in total earnings being 12.6 per cent, and the increase in expenses and taxes 14 per cent. This tendency on the eastern lines, where the congestion of traffic is greatest, was especially marked, the increase in total earnings per mile being 12 per cent, while the increase in expenses and taxes was 18 per cent. Because of the severe weather almost throughout December, the increase in total earnings probably will prove to be relatively less and the increase in total expenses relatively greater than for the rest of the year. Finally, all the legislation needed to make our system and policy of regulation what they should be will not be readily secured. In view, however, of the progress which has been made within recent years in improving the management of the railways, in

improving regulation, and in educating business opinion and public opinion regarding the railway situation, and in view of the large earnings the railways are now making without any serious complaint from any source that they are excessive, the outlook for greater prosperity for the railways and affiliated industries and for a large expansion of railway facilities during the next few years, seems promising.

DIVIDEND CHANGES

Without exception the changes in dividend rates in 1916 as compared with 1915 were increases. There were increases in the regular annual rate, or resumption of a regular annual rate suspended in 1914 or 1915, and in some cases extra dividends. The largest of these extra dividends was that declared by the Pittsburgh & Lake Erie of 20 per cent, reflecting the great earning power of this property in a time of unprecedented industrial and manufacturing activity.

In almost all cases the increase in annual rates was a resumption of a rate which had had to be lowered in 1914 or 1915. Thus the Walters roads—the Atlantic Coast Line; Nashville, Chattanooga & St. Louis, and Louisville & Nashville—all of which had cut dividends to meet the severe depression in the South, which began in 1914, resumed their old 7 per cent rate. The Buffalo, Rochester & Pittsburgh and the Illinois Central went back to a 6 per cent rate and the Chicago, Milwaukee & St. Paul to a 5 per cent rate.

Name of road	Declared in 1916	Declared in 1915	Present annual rate	Annual rate in 1915
Alabama Great Southern, pref.	7½[a]	6	6	6
Alabama Great Southern, com.	8 [a]	5	5	5
Atlantic Coast Line, com.	6	5	7	5
Buffalo & Susquehanna, com.	5	None[b]	5	None
Buffalo, Rochester & Pittsburgh, com.	5	4	6	4
Chesapeake & Ohio, stock	2	None	4	None
Chicago, Indianapolis & Louisville, com.	5⅛	None	None	—
Chicago, Milwaukee & St. Paul, com.	5	4½	5	4
Cincinnati, New Orleans & Texas Pacific, com.	12[c]	11[c]	6	6
Cincinnati Northern, stock	3	None	3	None
Cleveland, Cincinnati, Chicago & St. Louis, pref.	5	None	5	None
Cleveland, Cincinnati, Chicago & St. Louis, com.	5	None	5	None
Colorado & Southern, 1st pref.	2	None	4	None
Cripple Creek Central, com.	15[d]	4	6	4
Illinois Central, stock	5¼	5	6	5
Louisville & Nashville, stock	7	5	7	5
Maine Central, pref.	5[e]	—	—	—
Nashville, Chattanooga & St. Louis, stock	6½	5	7	5
New York, Chicago & St. Louis, 1st pref.	5	None	5	None
New York, Chicago & St. Louis, 2nd pref.	2½	None	None	—
New York, Ontario & Western, com.	3	None	4	None
Norfolk & Western, stock	7¾[f]	6	7	6
Pennsylvania Company, stock	8	6	8	6
Philadelphia, Baltimore & Washington, stock	6	4	8	4
Pittsburgh & Lake Erie, stock	20[g]	10	10	10
Pittsburgh, Cincinnati, Chicago & St. Louis, pref.	5	4	5	4
Pittsburgh, Cincinnati, Chicago & St. Louis, com.	5	2	5	2
St. Louis, Rocky Mountain & Pacific Vandalia, stock	6	None	—	None
Union Pacific	10	8	8	8
Vicksburg, Shreveport & Pacific, pref.	5	None	5	None

[a] An extra dividend of 1 per cent on the preferred and 2 per cent on the common was declared in May, 1916.
[b] In 1915 the new company had just been organized. The initial quarterly dividend of 1 per cent was declared in July, 1916.
[c] In 1915 extra semi-annual dividends of 2½ per cent were declared. In the last half of 1916 an extra dividend of 3½ per cent was declared.
[d] An extra dividend of 10 per cent was declared in February and the regular rate was raised from 4 to 6 per cent in September.
[e] In the latter part of 1915 the stockholders voted to retire $10,000,000 of the approximately $25,000,000 outstanding common stock and to issue in place thereof $3,000,000 5 per cent cumulative preferred stock and $7,000,000 first and refunding 50-year 4½ per cent bonds. The common stock has been paying regular dividends at the annual rate of 6 per cent.
[f] In April an extra dividend of 1 per cent was declared and the annual rate raised from 6 to 7 per cent.
[g] An extra dividend of 20 per cent was declared in July and stockholders were given the right to subscribe at par to a new issue of stock to the extent of 20 per cent of their holdings.

EXTENSION OF RAILWAY OPTION IN NICARAGUA.—The Niacaraguan Congress has authorized the President to extend to the Pacific Railway Co. another six-months' option on the construction and management of a railroad to the Atlantic coast of Nicaragua.—*Commerce Report.*

MILEAGE OF AMERICAN RAILROADS BLOCK SIGNALED

The mileage of railroads in the United States operated under the block system, on January 1, 1917, as shown in the large table printed herewith, is 99,885 miles, an increase of 2,076 miles over the total reported one year ago (December 31, 1915, page 1253). In *automatic* mileage, which is the more significant figure, the total now is 32,978 miles, or 1,818 miles above last year. In manual signaling, the increases are largely offset by discontinuances, and corrections of errors and also by sections where the manual is superseded by the automatic. A number of roads,—for example, the Atchison, Topeka & Santa Fe and the Chicago, Burlington & Quincy—omit the mileage (formerly included) of lines of other companies on which they have only trackage rights; while one or two others have discontinued the use of the block system (manual) on a considerable mileage of lines of comparatively light traffic.

The detailed comparison of the totals of the *Railway Age Gazette* tables for the five years last past is as follows:

Miles of Road Worked by the Block System

	Automatic		Manual		Total	
	Jan. 1	Increase over prev. year	Jan. 1	Increase over prev. year	Jan. 1	Increase over prev. year
1917	32,978	1,818	66,907	258	99,885	2,076
1916	31,160	1,471	66,649	8,206	97,809	9,677
1915	29,689	3,566	58,443	Decrease	88,132	943
1914	26,123	3,827	61,062	5,127	87,185	8,954
1913	22,296	1,961	55,935	Decrease	78,231	1,821

As has been explained in former statements, a number of roads exclude from their report of total mileage operated all those lines on which there is regularly in service only one locomotive and also lines on which only freight trains are run. Several prominent roads have long sections of line which are used exclusively for freight trains but which, being block signaled, are included in the total; while others have omitted the mileage of these lines from all columns.

The Panama Railroad is operated throughout by the block system, nearly all automatic.

Canada.—The block system is operated in Canada on 8,526 miles of road, of which 617 miles is automatic, as shown in the following table:

Lines in Canada Worked by the Block System.

	Miles of Road. Automatic	Manual	Total
Canadian Government (Intercolonial)	43	....	43
Canadian Government (Transcontinental)	..	6[1]	6
Canadian Pacific (Eastern)	222	4,535[2]	4,757
Canadian Pacific (Western)	36	18	54
Grand Trunk	5	3,350	3,355
Grand Trunk Pacific	4	....	4
Michigan Central	245	....	245
Toronto, Hamilton & Buffalo	62	....	62
	617	7,909	8,526

[1] Electric Train Staff.
[2] Includes 113 miles electric train staff.

WORK UNDER WAY AND CONTEMPLATED

In addition to the mileage of road block signaled, as reported above, railroads in the United States and Canada have under construction a considerable mileage of automatic signals, and there are a few notes of lines being equipped for operation by the manual system. A complete statement of this work, which will be published in the January issue of the "Railway Signal Engineer"*, will show 2,201 miles of automatic signals under construction, a figure which has probably been exceeded in very few instances in the past. In addition to this, the roads report 1,495 miles authorized or contemplated for the coming year; and this is likely to be increased by a considerable mileage on which estimates have been prepared and for which authorization will probably be secured early in the year. The same reports show non-

* Published in Chicago by the publisher of the *Railway Age Gazette.*

LENGTH OF RAILWAYS IN THE UNITED STATES WORKED BY THE BLOCK SYSTEM, JANUARY 1, 1917

Name of Road	Miles of Road: Automatic: Single track	Automatic: Two or more tracks	Automatic: Total	Non-Automatic: Single track	Non-Automatic: Two or more tracks	Non-Automatic: Total	Total both kinds	Total passenger lines operated	Percentage of total block signaled
Albany Southern †	...	...	...	27	16	43	43	43	100
Ann Arbor	...	...	...	1	...	1	1	294	...
Arizona & New Mexico †	1	...	1	...	...	...	1	110	...
Atchison, Topeka & Santa Fe (including Gulf, Col. & Santa Fe)	142	460	602	1,031	463	1,494	2,096	9,622	22
Atlanta & West Point	33	...	33	...	6	6	39	86	45
Atlantic Coast Line	11	316	327	75	6	81	408	3,844	11
Aurora, Elgin & Chicago	13	1	14	...	...	...	14	...	...
Baltimore & Ohio	40	445	485	1,929	703	2,632	3,117	3,117	100
Baltimore & Ohio Chicago Terminal	2	22	24	...	...	...	24	44	55
Baltimore & Ohio Southwestern	35	26	61	858	46	904	965	965	100
Cincinnati, Hamilton & Dayton	19	35	54	447	19	466	520	547	95
Staten Island	1	22	23	5	...	5	28	23	100
Baltimore, Chesapeake & Atlantic	...	...	...	87	...	87	87	87	100
Bangor & Aroostook	6	...	6	...	1	1	7	622	...
Bessemer & Lake Erie	...	...	...	64	131	195	195	191	100
Boston & Maine	550	625	1,175	...	...	...	1,175	2,213	53
Boston Elevated (Rapid Transit Lines)	...	18	18	...	...	...	18	18	100
Boston, Revere Beach & Lynn	...	14	14	...	...	...	14	14	100
Buffalo, Rochester & Pittsburgh	140	83	223	175	41	216	439	413	100
Butte, Anaconda & Pacific	8	...	8	...	...	...	8	48	...
Canadian Pacific	...	...	...	200	...	200	200	200	100
Carolina & North Western	...	...	...	2	...	2	2	133	...
Carolina, Clinchfield & Ohio	13	...	13	...	...	...	13	282	5
Central of Georgia	4	2	6	35	13	48	54	1,767	3
Central of New Jersey	41	201	242	...	...	...	242	460	52
Central Vermont	...	...	...	396	6	402	402	402	100
Cherrytree & Dixonville	...	...	...	31	...	31	31	31	100
Chesapeake & Ohio †	...	455	455	1,681	21	1,702	2,157	...	...
Chesapeake Beach	...	...	...	2	...	2	2	...	...
Chicago & Alton	411	187	598	99	37	136	734	1,025	72
Chicago & Eastern Illinois	68	154	222	171	33	204	426	872	49
Chicago & North Western	262	936	1,198	2,500	25	2,525	3,723	7,332	51
Chicago & Western Indiana	...	20	20	...	7	7	27	27	100
Chicago, Burlington & Quincy	236	214	450	7,795	735	8,530	8,980	9,243	97
Chicago Great Western	362	91	453	41	...	41	494	1,427	35
Chicago, Indianapolis & Louisville	339	...	339	...	...	...	339	578	59
Chicago Junction (freight line)	...	...	...	1	...	1	1	...	...
Chicago, Lake Shore & South Bend	56	...	56	...	...	...	56	...	...
Chicago, Milwaukee & St. Paul	366	952	1,318	3,183	35	3,218	4,536	8,487	53
Bellingham & Northern	...	...	...	55	...	55	55	55	100
Gallatin Valley	...	...	...	48	...	48	48	76	...
Idaho & Washington Northern †	...	...	...	111	...	111	111	111	100
Puget Sound & Wallapa Harbor	...	...	...	66	...	66	66	66	100
Tacoma & Eastern	...	...	...	76	...	76	76	87	...
White Sulphur Springs & Yellowstone Park	...	...	...	19	...	19	19	19	100
Chicago, Ottawa & Peoria	16	...	16	...	...	...	16	108	15
Chicago, Peoria & St. Louis	...	...	...	237	...	237	237	237	100
Chicago, Rock Island & Pacific	669	287	956	1,098	...	1,098	2,054	7,653	27
Chicago, Rock Island & Gulf	33	...	33	...	...	...	33	476	7
Chicago, St. Paul, Minneapolis & Omaha	23	173	196	629	...	629	825	1,673	49
Chicago, South Bend & Northern Indiana †	42	...	42	...	...	...	42	...	...
Southern Michigan	5	...	5	...	...	...	5	...	...
Chicago, Terre Haute & Southeastern	2	...	2	...	...	...	2	...	...
Cincinnati, Indianapolis & Western	99	...	99	282	...	282	381	381	100
Colorado Midland †	...	...	...	2	...	2	2	261	...
Columbia & Puget Sound †	10	9	19	...	...	...	19	51	37
Copper Range	...	...	...	79	...	79	79	77	100
Cornwall & Lebanon †	...	...	...	9	13	22	22	22	100
Cumberland & Pennsylvania	...	...	...	4	3	7	7	31	23
Cumberland Valley	7	56	63	105	...	105	168	164	100
Delaware & Hudson	187	247	434	...	35	35	469	802	58
Delaware, Lackawanna & Western	281	539	820	9	...	9	829	926	90
Denver & Salt Lake	...	...	...	22	...	22	22	254	9
Detroit, Monroe & Toledo Short Line	3	1	4	...	...	...	4	...	...
Duluth & Iron Range	...	17	17	...	...	...	17	204	...
Duluth & Northeastern	...	...	...	60	...	60	60	60	100
Durham & Southern	...	...	...	57	...	57	57	59	96
Eastern Kentucky	...	...	...	4	...	4	4	36	11
Elgin, Joliet & Eastern (freight line)	7	3	10	9	...	9	19	...	...
El Paso & Southwestern	213	...	213	...	...	...	213	1,023	21
Empire United (Electric)	40	6	46	...	...	...	46	...	...
Erie (including Subsidiary Lines)	64	916	980	568	168	736	1,716	2,168	79
Fort Dodge, Des Moines & Southern	16	...	16	...	...	...	16	...	...
Ft. Wayne & Northern Indiana †	51	...	51	...	...	...	51	...	...
Galveston, Houston & Henderson	1	...	1	...	...	...	1	...	...
Grand Trunk	2	99	101	867	215	1,082	1,183	1,183	100
Great Northern	189	343	532	288	...	288	820	7,305	11
Gulf, Florida & Alabama	...	...	...	143	...	143	143	154	93
Hocking Valley	...	2	2	281	...	281	283	283	100
Hudson & Manhattan	...	8	8	...	...	...	8	8	100
Huntingdon & Broad Top Mountain †	5	...	5	...	...	...	5	49	10
Illinois Central	370	631	1,001	9	...	9	1,010	4,526	23
Yazoo & Mississippi Valley	85	10	95	...	...	...	95	1,215	8
Illinois Traction	120	2	122	...	...	...	122	443	...
Indiana Railways & Light Co	12	...	12	...	...	...	12	...	...
Interborough (New York City)	...	7	7	...	...	...	7	...	...
Interstate P. S. Co. (Indiana)	22	...	22	...	...	...	22	...	...
Kansas City, Clay County & St. Joseph	72	...	72	...	...	...	72	72	100
Kansas City Terminal	...	13	13	...	...	...	13	13	100
Kentucky & Indiana Terminal	...	...	...	3	8	11	11	11	100
Kentwood & Eastern	...	...	...	3	...	3	3	30	10
Lackawanna & Wyoming Valley	...	...	...	1	2	3	3	23	...
Lehigh & Hudson River	73	...	73	...	...	...	73	73	100
Lehigh & New England	3	...	3	...	...	...	3	77	...
Lehigh Valley	71	521	592	611	48	659	1,251	1,218	100
Ligonier Valley	...	...	...	14	...	14	14	14	100
Long Island	1	117	118	188	15	203	321	361	...
Los Angeles & Salt Lake	4	...	4	...	...	...	4	1,147	...
Louisville & Nashville	386	153	539	85	47	132	671	4,762	14
Louisville & Nor. Ry. & Light	4	...	4	...	1	1	5	21	...
Maine Central	437	63	500	...	...	...	500	1,103	45
Portland Terminal	5	12	17	...	...	...	17	20	...
Maryland, Delaware & Virginia	...	...	...	77	...	77	77	77	100
Mineral Point & Northern	...	...	...	26	...	26	26	26	100
Minneapolis & St. Louis †	...	...	...	11	...	11	11	1,537	...
Minneapolis, St. Paul & Sault Ste. Marie †	...	...	...	1,406	12	1,418	1,418	3,485	...
Mississippi River & Bonne Terre	...	...	...	2	...	2	2	46	...

†No report received; figures repeated from last year.

LENGTH OF RAILWAYS IN THE UNITED STATES WORKED BY THE BLOCK SYSTEM, JANUARY 1, 1917 (Continued)

Name of Road	Miles of Road: Automatic: Single track	Automatic: Two or more tracks	Automatic: Total	Non-Automatic: Single track	Non-Automatic: Two or more tracks	Non-Automatic: Total	Total both kinds	Total passenger lines operated	Percentage of total block signaled
Missouri, Kansas & Texas	10	19	29	10	...	10	39	1,[illegible]	2
Missouri, K. & T. of Texas	92	9	101	...	...	...	101	1,632	6
Missouri Pacific	60	39	99	3,527	20	3,547	3,646	[illegible]	94
St. Louis, Iron Mountain & Southern	159	13	172	2,639	170	2,809	2,981	3,477	85
Mobile & Ohio	5	...	5	38	...	38	43	946	5
Monongahela	...	2	2	...	...	...	2	97	...
Monongahela Connecting (Freight)	...	...	...	1	4	5	5	...	...
Munising, Marquette & Southeastern	...	...	...	4	...	4	4	4	100
Nashville, Chattanooga & St. Louis	...	...	...	111	...	111	111	1,230	9
Nashville Terminals	...	2	2	4	...	4	6	...	...
Nevada Northern †	1	...	1	...	...	...	1	155	...
Newburgh & South Shore	...	...	...	...	5	5	5	...	...
New York & Long Branch	...	38	38	...	...	...	38	38	100
New York Central Lines:									
Boston & Albany	3	209	212	...	1	1	213	378	56
Cincinnati Northern	...	...	...	205	...	205	205	205	100
Cleveland, Cincinnati, Chicago & St. Louis	24	98	122	733	285	1,018	1,140	2,203	52
Kanawha & Michigan	2	...	2	2	...	2	4	164	...
Lake Erie & Western and Northern Ohio	48	9	57	815	...	815	872	872	100
Lake Erie & Pittsburgh	...	...	...	28	...	28	28	28	100
Michigan Central	...	272	272	872	19	891	1,163	1,163	100
New York Central, Eastern Lines	2	766	768	1,678	543	2,221	2,989	3,013	96
New York Central, Western Lines	28	574	602	1,318	63	1,381	1,983	1,998	99
Peoria & Eastern (included in C. C. C. & St. L.)	...	...	...	...	...	...	...	...	...
Pittsburgh & Lake Erie	...	163	163	...	...	...	163	166	98
Toledo & Ohio Central	...	5	5	382	1	383	388	391	99
Zanesville & Western	...	...	...	68	...	68	68	68	100
New York, Chicago & St. Louis	146	12	158	...	...	...	158	513	31
New York Consolidated (Brooklyn)	...	18	18	...	...	...	18	70	...
New York, New Haven & Harford	2	347	349	1,097	374	1,471	1,820	1,921	95
Central New England	...	37	37	...	34	34	71	295	24
New York, Ontario & Western	49	150	199	...	...	...	199	493	40
New York, Philadelphia & Norfolk †	...	9	9	33	70	103	112	112	100
Cape Charles †	...	...	...	9	...	9	9	9	100
New York State Railways †	72	5	77	...	...	...	77	...	...
New York, Westchester & Boston	...	18	18	...	...	...	18	18	100
Norfolk & Western	208	536	744	905	...	905	1,649	1,879	88
Northern Pacific	683	500	1,183	259	80	339	1,522	5,669	27
Northwestern Pacific	10	16	26	...	...	...	26	472	...
Oakland, Antioch & Eastern	82	...	82	...	...	...	82	99	83
Ogden, Logan & Idaho	11	...	11	...	...	...	11	...	...
Ohio Electric	5	...	5	...	...	...	5	...	...
Ohio River & Western	...	...	...	111	...	111	111	111	100
Pacific Electric	...	11	11	18	...	18	29	612	...
Pennsylvania (including all east of Pittsburgh)	3	730	733	2,944	948	3,892	4,625	4,625	100
Grand Rapids & Indiana	...	...	...	225	2	227	227	546	41
Pennsylvania Co. †	...	529	529	790	226	1,016	1,545	1,647	94
Pennsylvania Terminal (Louisville) †	...	...	...	2	1	3	3	3	100
Pittsburgh, C., C. & St. Louis †	...	40	40	730	611	1,341	1,381	1,415	98
Vandalia †	6	...	6	303	61	364	370	782	48
Peoria & Pekin Union	...	...	...	...	6	6	6	16	...
Pere Marquette	136	11	147	...	...	...	147	1,629	9
Philadelphia & Reading	41	519	560	319	64	383	943	1,352	70
Philadelphia Rapid Transit †	...	7	7	...	...	...	7	...	...
Piedmont & Northern †	1	3	4	126	...	126	130	130	100
Pittsburgh, Shawmut & Northern	1	...	1	...	...	...	1	...	...
Portland Railway, Light & Power	21	...	21	...	...	...	21	75	...
Puget Sound Electric	20	8	28	...	...	...	28	46	...
Quincy, Omaha & Kansas City, and Iowa & St. Louis	...	...	...	295	...	295	295	295	100
Queen & Crescent Route:									
Alabama & Vicksburg	79	...	79	...	...	...	79	139	54
Alabama Great Southern	242	47	289	7	...	7	296	296	100
Cincinnati, New Orleans & Texas Pacific	197	129	326	9	...	9	335	335	100
New Orleans & Northeastern	109	15	124	...	...	...	124	196	...
Richmond, Fredericksburg & Potomac	...	19	19	10	59	69	88	88	100
St. Louis & San Francisco	709	34	743	10	...	10	753	4,769	...
St. Louis Merchants' Bridge Terminal †	...	6	6	...	1	1	7	10	70
St. Louis Southwestern (less than 1 mile)	...	...	...	...	...	...	...	...	...
Southern Illinois & Missouri Bridge †	...	5	5	...	...	...	5	5	100
San Francisco-Oakland Terminal	2	4	6	...	...	...	6	...	...
Savannah Union Station	...	...	...	1	3	4	4	4	100
Seaboard Air Line †	...	...	...	303	10	313	313	2,828	11
Southern	6	541	547	1,653	62	1,715	2,262	6,869	...
Virginia & Southwestern †	...	...	...	2	...	2	2	204	...
Southern Pacific: †									
Galveston, H. & San Antonio	276	...	276	998	4	1,002	1,278	1,281	...
Houston & Shreveport	...	...	...	40	...	40	40	40	100
Houston & Texas Central	3	...	3	812	...	812	815	750	...
Houston, East & West Texas	3	...	3	188	...	188	191	191	100
Iberia & Vermilion	16	...	16	...	...	...	16	16	100
Lake Charles & Northern	...	...	...	45	...	45	45	45	100
Louisiana Western	103	...	103	93	...	93	196	...	...
Morgan's Louisiana & Texas	95	...	95	141	40	181	276	...	...
Texas & New Orleans	113	...	113	318	1	319	432	...	...
Southern Pacific—Pacific System	2,411	414	2,825	4,170	45	4,215	7,040	7,040	100
Spokane, Portland & Seattle	...	7	7	...	...	...	7	550	...
Oregon Electric	...	7	7	...	...	...	7	154	...
Spokane & I. E. (less than 1 mile)	...	...	...	...	...	...	...	...	...
United Railways	1	...	1	...	...	...	1	19	...
Terminal R. R. Association of St. Louis	...	6	6	...	1	1	7	13	...
Terre Haute, Ind. & Eastern Traction	61	...	61	3	...	3	64	383	...
Texas & Pacific	...	...	...	398	...	398	398	1,944	21
Tidewater Power Co.	...	...	...	6	...	6	6	...	...
Toledo, Peoria & W. (less than 1 mile)	...	...	...	...	...	...	...	...	...
Toledo, St. Louis & Western	...	...	...	188	...	188	188	448	42
Trans-Mississippi Terminal	4	3	7	...	...	...	7	...	...
Ulster & Delaware	24	...	24	...	...	...	24	130	18
Union (Pa.)	...	1	1	...	...	2	3	7	...
Union Pacific	699	827	1,526	11	...	11	1,537	3,592	40
Oregon Short Line	520	105	625	...	...	...	625	2,197	28
Oregon-Washington R. R. & N. Co.	615	28	643	1	...	1	644	2,021	32
Union Traction Company of Indiana	50	...	50	...	...	...	50	402	...
Virginia & Kentucky (less than 1 mile) †	...	...	...	...	...	...	...	...	...
Virginian †	...	...	...	13	...	13	13	484	...
Wabash	99	115	214	1,[illegible]	218	1,715	1,929	1,979	97
Wabash-Pittsburgh Terminal	3	4	7	...	...	...	7	60	...
Washington, Baltimore & Annapolis	14	...	14	...	...	...	14	52	26

†No report received; figures repeated from last year.

LENGTH OF RAILWAYS IN THE UNITED STATES WORKED BY THE BLOCK SYSTEM, JANUARY 1, 1917 (Continued)

Name of Road	Miles of Road: Automatic: Single track	Automatic: Two or more tracks	Automatic: Total	Non-Automatic: Single track	Non-Automatic: Two or more tracks	Non-Automatic: Total	Total both kinds	Total passenger lines operated	Percentage of total block signaled
Washington Southern †	...	6	6	...	26	26	32	32	100
Washington Terminal †	...	2	2	...	...	...	2	2	100
Washington Water Power Co.	22	...	22	...	...	...	22	22	100
Western Maryland	206	2	208	...	16	16	224	649	35
Western Pacific	11	...	11	...	...	...	11	941	12
Total	15,413	17,565	32,978	59,922	6,985	66,907	99,885	...	...

†No report received; figures repeated from last year.

automatic signals under construction on 290 miles of road.

The work under construction includes 1,604 miles of single-track and 596 of double-track, and that contemplated is made up of 780 miles of single-track and 715 of multiple-track. The following roads report the largest amounts of work:

Under Construction.	*Miles.*	*Contemplated.*	*Miles.*
Baltimore & Ohio	105.7	Baltimore & Ohio	119.8
Central of Georgia	143.4	Chicago, Burlington & Quincy	236.0
Chicago & North Western	178.0	Erie	166.2
Chicago, Milwaukee & St. Paul	396.5	Los Angeles & Salt Lake	117.0
Illinois Central	326.7	Norfolk & Western	112.7
Los Angeles & Salt Lake	138.0	Northern Pacific	216.0
Louisville & Nashville	165.0	Union Pacific	98.8
Michigan Central	95.8		
Southern	170.2		

The non-automatic signals reported under way are 44 miles on the Santa Fe, 121.9 miles on the Erie, 118 miles on the Texas & Pacific, and 5.5 miles on the Grand Trunk; and the Aurora, Elgin & Chicago and the New York, New Haven & Hartford report non-automatic signals contemplated.

Interlocking Work

The railroads of the United States and Canada have installed during the past year 98 interlocking plants, which number includes important additions and replacements as well as new plants. These were divided among the various types as follows: Mechanical, 41; electrical, 22; electro-mechanical, 23; electro-pneumatic, 9, and special, 3. As is the case with automatic block signals, the reports indicate a greater volume of interlocking work under construction on January 1, 1917, than was completed and placed in service during the past year. There are 119 plants on which work has been started, and 139 others authorized or contemplated for 1917. The division of these two classes among the various types is as follows: Mechanical, 101; electrical, 45; electro-mechanical, 45; electro-pneumatic, 66; and special, 1.

The most important individual projects completed include the following: An 80-lever electric plant on the Sante Fe at Los Angeles, Cal., an 80-lever electric on the Chicago & Alton at Pontiac, Ill., a 180-lever electric at Utica, N. Y., and a 56-lever electro-mechanical at Poughkeepsie, N. Y., on the New York Central, a 112-lever electric plant in the subway system of the New York Municipal, a 49-lever electro-mechanical in the Oakland Terminal of the San Francisco-Oakland Terminal Railways, a 120-lever electric in the Denver Union terminal, a 103-lever and a 71-lever electro-pneumatic plant in the Union Terminal at Dallas.

The following roads have important interlocking work under construction: Atchison, Topeka & Santa Fe, a 104-lever electric plant at Corwith, Ill., and a 92-lever electric at Dallas, Tex.; Boston & Albany, a 56-lever electric plant at Pittsfield, Mass.; the Illinois Central, a 67-lever electric at Pullman, Ill.; the Interborough Rapid Transit (New York), 15 plants including a 55-lever and a 51-lever electro-pneumatic; Lehigh Valley, a 104-lever electric at Buffalo, N. Y.; Missouri, Kansas & Texas, 11 mechanical and 1 electro-mechanical plants; the New York Central, a 68-lever electro-mechanical at Carman, N. Y., and a 72-lever electro-mechanical at Hoffman, N. Y.; the New York, New Haven & Hartford, a 53-lever electric at Stamford, Conn.; the Pennsylvania Railroad, 15 mechanical, 17 electro-mechanical and 1 electro-pneumatic, the latter, with 83 levers, located in Philadelphia; the Southern, a 72-lever electric at Charlottesville, Va.; and the Denver Union terminal, a 128-lever electric.

The important work reported contemplated by the various roads includes the following: An electro-mechanical plant of 56 levers at New London, Ohio, and a 56-lever electric at Cleveland, Ohio, on the Cleveland, Cincinnati, Chicago & St. Louis; a mechanical plant of 52 levers on the Detroit United Lines in Detroit Mich.; 36 plants on the Interborough Rapid Transit, the largest of which is a 51-lever electro-pneumatic on the White Plains Road line (New York City); a 56-lever electric interlocking on the Nashville, Chattanooga & St. Louis at Wauhatchie, Tenn., and 5 electro-pneumatic plants in the Nashille terminal of this road; 15 electric plants, 2 electro-pneumatic, and 1 mechanical, with a total of 579 levers on the New York Municipal; a mechanical plant of 80 levers on the New York, New Haven & Hartford, at New Haven, Conn.; and a 68-lever electric plant at McKee's Rocks, Pa., and a 104-lever electric plant at Neville, Pa., on the Pittsburgh & Lake Erie.

ARBITRATORS INCREASE SWITCHMEN'S PAY

The Federal Board of Arbitration, considering the demands of the Switchmen's Union of North America on 13 prominent roads for an increase of pay and the establishment of the eight-hour day, which has been sitting in New York City for many weeks past, filed its decision in the Federal Court December 23.

The principal feature of the award is an increase of five cents an hour for conductors and five cents an hour for helpers, from December 23, and running to December 23, 1917. The board grants the request for the eight-hour day, but allows only the regular rate for overtime; and expresses the opinion that the shortening of the actual work day is not practicable at the present time, except in a few instances.

The demand of the men, like that of the other trainmen in their recent negotiations, was for an eight-hour day with the same pay that has been received hitherto for ten hours; so that what the switchmen get is about half the demand; they will receive nine hours' pay for eight hours' work. The demand was for 47 cents an hour for helpers and 50 cents for switchmen; which was the same as asking, for eight hours, the same sum that is now paid for ten hours. The demand for rate and a half for overtime was rejected.

The roads involved in this arbitration are the New York Central, the Michigan Central, the Lehigh Valley, the Bessemer & Lake Erie, the New York, Chicago & St. Louis, the Delaware, Lackawanna & Western, the Texas & Pacific, the Chicago, Rock Island & Pacific, the Chicago & Eastern Illinois, the Baltimore & Ohio Chicago Terminal, the Minneapolis, St. Paul & Sault Ste Marie, the Chicago Great Western and the Peoria Terminal.

The arbitrators on behalf of the railroads were E. F. Potter, Minneapolis, St. Paul & Sault Ste. Marie, and T. W. Evans, New York Central. Those on behalf of the switchmen were

J. B. Connors and W. A. Titus, officers of their union; and the other two, named by the government conciliators, were Judge Charles B. Howry of Washington and Dr. Jeremiah W. Jenks of New York City. Public hearings were held for about three weeks in November and December.

The board prescribed the following rules:

"Overtime shall be paid pro rata on the basis of actual minutes worked.

"The pay of regular switchmen shall begin at the time required to report for duty, and end when relieved.

"Switchmen shall commence work and be relieved at designated points.

"Switching crews shall be paid at day rates for time worked between 6 a. m. and 6 p. m., and at night rates for time worked between 6 p. m. and 6 a. m.

"The present meal hour regulations shall apply to all crews assigned to shifts exceeding eight hours."

This arbitration directly involved about 3,700 yard conductors and brakemen. The total number of switchmen in all railroad yards throughout the country is about 50,000, the remainder being mostly members of the Brotherhood of Railroad Trainmen. The present yearly wages of yard conductors in Switchmen's Union yards vary from $1,100 to $1,500 and average $1,276. The brakemen's or helpers' wages run from $800 to $1,400 and average $980.

The award was signed by all six arbitrators; but the representatives of the union dissented from the 5 cents increase per hour, holding out for the increase demanded, and from the overtime pro rata award, holding out for time and a half. The railroad representatives dissented from the eight-hour day. The switchman who now works ten hours for $3.50 will receive $4 for the same ten hours' work. If his day is cut to eight hours, he receives $3.20.

Added to the formal award, and made a part of it, was a statement by Judge Howry and Dr. Jenks, in which they expressed the opinion that a general eight-hour day is not workable on railroads, and they say that in practice their award of the eight-hour day will leave in many cases to the switchmen a choice of more pay or more leisure and that the operation of their award will give the best of opportunities for study as to whether the workers really want shorter hours or more money.

This statement of Dr. Jenks and Judge Howry summarizes the facts of the situation in succinct fashion. It says, in part:

"Much emphasis has been laid upon the fact that the hours of work of the switchmen are often long. Although the standard workday on the railroads has been ten hours, frequently the men have worked from eleven to twelve, and sometimes even some hours longer.

"One of the reasons urged for the shorter workday is that men need more time to visit with their families, to take recreation, and to secure the other advantages of leisure. This argument, of course, applies to switchmen. A second argument is that the long hours result in physical exhaustion, often to a degree seriously injurious to health. The evidence shows clearly that, owing to the nature of the work, there are frequent opportunities for intervals of rest, and that the long hours testified to are due very largely, almost invariably, indeed, to delays caused by the interference of other trains and to similar reasons beyond the control of the railway managers or of the switchmen. During these delays the switchmen must usually be idle, so that long hours do not always imply excessive physical labor.

"Although it has seemed wise to award an eight-hour day as the standard minimum day, the overwhelming weight of testimony shows that the conditions of the various kinds of railway work are so different that only trial can determine just how far eight-hour shifts can be worked without prohibitory cost to the roads and undue disturbance of the work of their patrons. It seems to be clearly established that, under existing conditions, and probably even under conditions of traffic less strenuous than the present, it will not be possible to make the actual working eight-hour day effective in the case of more than a small percentage of the switching crews, not more than 10 per cent during the first year. While, therefore, it is urged that the eight-hour day be established, its introduction must be gradual. The percentage, therefore, of the switching crews that will be directly affected during the period of this award must of necessity be small. Most crews will work ten hours or more.

"The increase in pay imposes a heavy burden upon the railroads, which, owing to the interstate commerce law, they are unable to transfer to the shippers and thence to the public. Owing to the peculiar legal situation of the railways the board has thought that, since it is the duty of the properly constituted government authorities to protect the railway interests in this regard so far as is necessary, it has attempted to do justice as between the parties without giving any detailed consideration to the added cost to the railroads.

"The increase in wages has been most earnestly urged by the switchmen, on account of the increased cost of living, the hazards of the employment and the hardships of the work. These points, of course, have been all recognized in the award. While the full amount asked for has not been granted, a 5-cent increase to the former wages of all the switchmen is, by far, the largest given in any general switchmen's award, where the increase has usually been 1, 2, and 3 cents per hour, instead of 5 cents. This large increase has been given because the arbitrators recognized the validity of the arguments presented. Nevertheless, it seems just to the neutral arbitrators to present one or two other conditions which ought not to be overlooked.

"First, the railroads themselves have been subjected to greatly increased costs on account of the high prices of steel, coal and other articles of their consumption; and the enormous demands upon them, caused by the European war, have been so great that their work could not be most efficiently performed.

"Again, the conditions of the railroads are entirely different, in numerous respects, from those of other industries in which increases have been given to other workers. Many of such industries are munitions plants, steel works, and others whose profits have been stimulated by the war. Many of these, when the war closes, must go out of existence and their men will be thrown out of employment. Moreover, in many instances, those who continue business will be able to reduce the wages of their employees, judging from past experience.

"The railroads, on the contrary, will continue their force, so far as most of the switchmen are concerned. According to the testimony, all of the regular switchmen are retained, even when times are bad; and the history of the last few years shows that an increase once granted to railway employees remains.

"Again, in many lines of industry, where the workmen are under the immediate personal supervision of the employers and where the nature of the industry is such that, through careful time studies, some of the modern efficiency methods can be employed, it may be possible for people working eight hours, under a new system, so to increase their efficiency as to accomplish as much as they earlier accomplished in ten hours. While it has been testified that, with the hearty co-operation of switchmen and yardmaster, in one case the efficiency of the switchmen, on a test of the eight-hour system for a period of two months, was materially increased, it was not increased to the extent of the 25 per cent needed to cover the decrease in time, nor was there any guarantee that such increased efficiency would continue, had the system been regularly adopted. With the exception of this one experiment, made under most exceptional conditions, the testimony was unanimous to the effect that the efficiency of

increased, so that the added burden of the shorter hours would fall almost entirely upon the railroads.

"Taking all of these circumstances into consideration, the increase in rate has seemed, to the majority of the arbitrators, likely to serve the interests of the public."

THE TREND OF RAILWAY EARNINGS IN THE YEAR 1916

By Julius H. Parmelee
Statistician, Bureau of Railway Economics

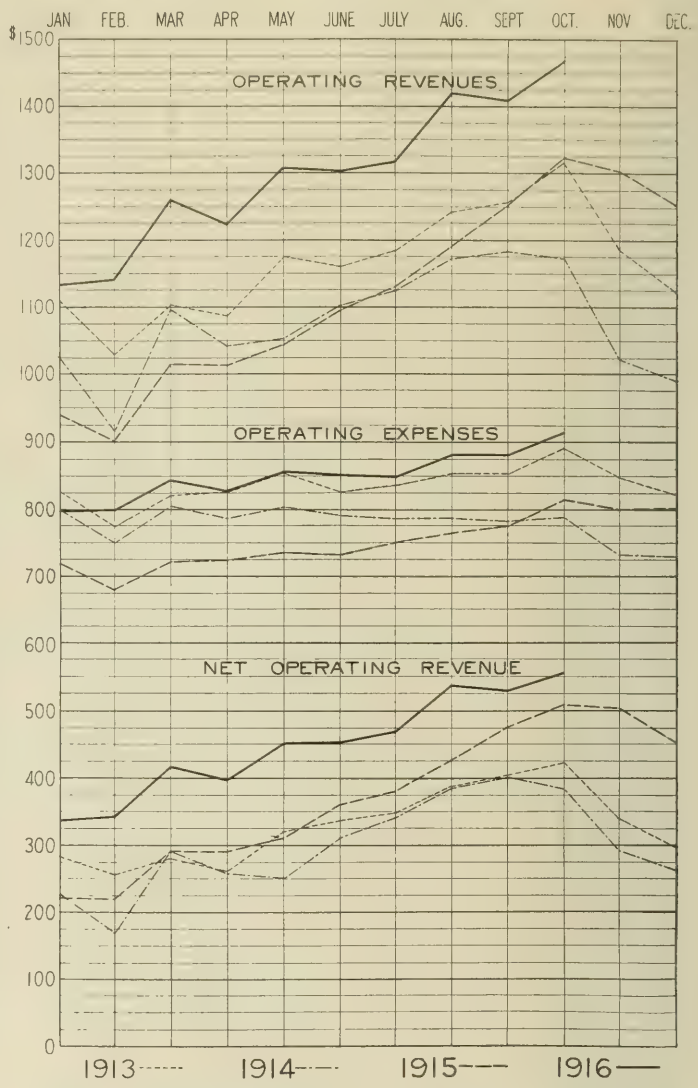
Nineteen sixteen was a record-breaker in the matter of railway earnings. Whether considered from the point of view of the fiscal year ended June 30, or of the calendar year now just closing, both the gross and the net revenues of the steam railways of the United States have been the largest in their history. For the fiscal year 1916 the gross revenues of steam roads having annual operating revenues above one million dollars amounted to $3,396,808,234. This was greater by half a billion dollars, or $508,000,000, than their revenues during the lean year of 1915. Compared with 1913, the last record or peak year, the revenues of 1916 showed an increase of more than a quarter billion dollars, or $261,000,000. Similarly, the net revenues of the million-dollar railways in 1916 was the greatest in history, amounting to $1,176,804,001. This was an increase of nearly a third of a billion, or $319,000,000 over 1915, and an increase of $233,000,000 over the previous record year of 1913. The million-dollar roads operate over 90 per cent of the total railway mileage, and earn over 95 per cent of the total railway revenues; their returns are therefore fully representative of railway operations as a whole.

Operating expenses in 1916 were also on the increase. They amounted to $2,220,004,233, which represents the greatest annual expenditures in the history of American railways, although only slightly greater than their expenses in 1914, which was the next largest year in the matter of expenses. The increase over 1915 was $189,000,000. That the railways were able in 1916 to keep their expenditures down to within a million dollars of those for 1914, although they were doing considerably more business, speaks well for the economy and efficiency with which the railway managers were handling their properties in 1916. In fact, when reduced to a per mile basis, the operating expenses in 1916 were actually less than in 1914. A large part of the economy, however, was exercised in the maintenance of way account. Maintenance of way expenses in 1916 were cut by $14,000,000, traffic and transportation expenses by $9,000,000, and general expenses by $4,000,000. There was an increase of $26,000,000 in maintenance of equipment.

While the business done by the railways in 1916, as measured in ton-miles and passenger-miles, was greater than ever before, the increase was most marked in the matter of freight. Ton-miles increased about 25 per cent over 1915, and passenger-miles about 6 per cent; freight traffic was appreciably greater in 1916 than in 1913, while passenger traffic was about the same as in the heavy years of 1913 and 1914.

Table I presents a statement of mileage, revenues, expenses, net revenue, taxes and operating income for the fiscal years 1913 to 1916, showing the amount and rate of increase or decrease per mile in 1916 as compared with each of the other years. From this table it develops that the railways earned $2,140 more per mile in 1916 than in 1915, or 16.9 per cent; that their expenses per mile were greater by $769 per mile, or 8.6 per cent; that their net revenue per mile increased 8.4 per cent; and that operating income per mile was greater by $1,321, or 41.7 per cent. Compared with the peak year of 1913, operating revenues in 1916 per mile increased 5.7 per cent, net revenue per mile increased 21.6 per cent, while operating income per mile was greater by 22.4 per cent. Taxes per mile were greater than in 1913 by 15.7 per cent.

Table II gives the revenues and expenses per mile, by months, for the calendar years 1913 to 1915, inclusive, and for the ten months of 1916 for which information is available at the present writing. The trend of operating revenues per mile, as set forth in this table, presents a most interesting



Comparative Chart of Earnings and Expenses per Mile of Line

picture of changes in the general business situation since the opening of the great war in Europe. War broke out at the beginning of August, 1914. American railways first began to feel the effects of war conditions in October, when there was a slight decrease in revenues per mile as compared with September, although normally a considerable increase in traffic would have been expected. This decrease in per mile earnings went on through November and December, 1914, and January and February, 1915, each month showing a decrease under the corresponding month of the previous year and a decided decrease as compared with the month just preceding. In March, 1915, there was an upturn, although not enough to bring revenues up to the level of 1914, and the improvement continued until July, when, for the first time, revenues per mile were slightly greater than in the corresponding month of 1914. The remaining months of the the switchmen on the shorter work day would be only slightly

calendar year 1915 showed continually mounting increases over the corresponding months of 1914. Bearing in mind this sharp distinction between the first six months and the second six months of 1915, we come now to a consideration of the monthly returns for the calendar year 1916. Revenues per mile for January, 1916, showed an increase of 20.7 per cent over 1915. The rate of increase ranged from 20 to 27 per cent during the first five months of 1916, fell slightly below 20 per cent in June, fell to 16.3 per cent in July, came back a little in August, dropped to 12.6 per cent in September, and to 11 per cent in October. In other words, while the latter months of 1916 showed appreciable increases over the corresponding months of 1915, the increase was at a decreasing rate from month to month. This was due in part to the fact, already mentioned, that the latter half of 1915 showed better results than the first half. Even so, however, the decided slackening of the pace in the latter months of 1916 is significant, and this in spite of the fact that the per mile revenues of August, September and October, 1916, were the largest of any three months in American railway history.

Operating expenses per mile showed a somewhat variable tendency during the calendar year 1916, but the general trend was upward. Railway managers were evidently doing their best to keep down expenses, in face of rising prices of material and increasing threats of wage advances. In spite of this, the rate of increase in expenses, which in January was only one-half as great as the rate of increase in revenues, gradually approached a level with the latter, until in September we find expenses increasing relatively faster than

TABLE I—REVENUES AND EXPENSES IN THE AGGREGATE AND PER MILE OF LINE OF STEAM ROADS HAVING ANNUAL OPERATING REVENUES OF $1,000,000 OR OVER: FISCAL YEARS ENDED JUNE 30, 1916, 1915, 1914 AND 1913

Item	1916 Amount	1916 Per mile of line	1915 Amount	1915 Per mile of line	1914 Amount	1914 Per mile of line	1913 Amount	1913 Per mile of line	Increase or decrease per mile of line 1916 over 1915 Amt.	1916 over 1915 Per cent	1915 over 1914 Amt.	1915 over 1914 Per cent	1914 over 1913 Amt.	1914 over 1913 Per cent
Miles of line operated (average)	229,229	...	227,826	...	225,478	...	223,547	...	...	...	...	...	...	...
Total operating revenues	$3,396,808,234	$14,818	$2,888,448,313	$12,678	$3,053,747,597	$13,543	$3,135,016,158	$14,024	$2,140	16.9	$1,275	9.4	$794	5.7
Total operating expenses	2,220,004,233	9,684	2,031,196,840	8,915	2,219,432,612	9,843	2,191,139,100	9,802	769	8.6	d159	d1.6	d118	d1.2
Net operating revenue	1,176,804,001	5,134	857,251,473	3,763	834,314,985	3,700	943,877,058	4,222	1,371	36.4	1,434	38.7	912	21.6
Taxes	146,754,477	640	134,610,132	591	136,612,209	606	123,655,189	553	49	8.4	34	5.7	87	15.7
Uncollectible railway revenue	807,720	4	650,655	3	.....	...	.....	...	1	...	4	...	4	...
Operating income	1,029,241,804	4,490	721,990,686	3,169	697,702,776	3,094	820,221,869	3,669	1,321	41.7	1,396	45.1	821	22.4

d Decrease.

TABLE II—MONTHLY REVENUES AND EXPENSES PER MILE OF LINE: 1913, 1914, 1915 AND 1916.

Month	Operating Revenues per Mile 1913	1914	1915	1916 Amount	1916 Per cent increase or decrease from 1915	Operating Expenses per Mile 1913	1914	1915	1916 Amount	1916 Per cent increase or decrease from 1915	Net Operating Revenue per Mile 1913	1914	1915	1916 Amount	1916 Per cent increase or decrease from 1915
January	$1,109	$1,026	$939	$1,133	20.7	$826	$799	$718	$797	11.1	$283	$227	$221	$336	51.9
February	1,031	918	900	1,140	26.8	774	750	680	800	17.7	257	169	220	340	54.8
March	1,103	1,097	1,015	1,260	24.1	822	805	722	844	16.8	281	292	293	416	41.9
April	1,087	1,043	1,013	1,223	20.8	826	786	724	827	14.3	261	257	289	396	37.0
May	1,175	1,053	1,044	1,307	25.2	855	803	735	857	16.6	320	250	309	450	45.6
June	1,160	1,102	1,094	1,302	19.0	826	791	732	851	16.2	334	311	362	451	24.6
July	1,183	1,124	1,130	1,315	16.3	836	785	750	848	13.1	347	340	380	467	22.7
August	1,241	1,171	1,190	1,418	19.1	853	786	764	882	15.4	387	385	426	536	25.8
September	1,257	1,182	1,251	1,409	12.6	853	781	774	881	13.8	403	401	477	528	10.6
October	1,314	1,171	1,323	1,468	11.0	891	787	815	913	12.0	423	384	508	555	9.2
November	1,186	1,023	1,303	...	...	848	732	800	...	...	338	292	503	...	...
December	1,122	990	1,253	...	...	824	728	802	...	...	298	262	451	...	...

TABLE III—MONTHLY REVENUES AND EXPENSES PER MILE OF LINE, JANUARY TO OCTOBER, 1916, BY DISTRICT

Month of—1916	Eastern District Operating Revenues Amt. per mile	Eastern District Operating Revenues Per Ct. Inc. or Dec. from 1915	Eastern District Operating Expenses Amt. per mile	Eastern District Operating Expenses Per Ct. Inc. or Dec. from 1915	Eastern District Net Operating Revenues Amt. per mile	Eastern District Net Operating Revenues Per Ct. Inc. or Dec. from 1915	Southern District Operating Revenues Amt. per mile	Southern District Operating Revenues Per Ct. Inc. or Dec. from 1915	Southern District Operating Expenses Amt. per mile	Southern District Operating Expenses Per Ct. Inc. or Dec. from 1915	Southern District Net Operating Revenues Amt. per mile	Southern District Net Operating Revenues Per Ct. Inc. or Dec. from 1915	Western District Operating Revenues Amt. per mile	Western District Operating Revenues Per Ct. Inc. or Dec. from 1915	Western District Operating Expenses Amt. per mile	Western District Operating Expenses Per Ct. Inc. or Dec. from 1915	Western District Net Operating Revenues Amt. per mile	Western District Net Operating Revenues Per Ct. Inc. or Dec. from 1915
January	$2,069	30.0	$1,460	13.7	$669	98.1	$959	20.5	$643	8.9	$316	53.8	$750	11.0	$542	9.1	$217	16.2
February	2,057	35.2	1,481	21.6	576	89.1	971	27.1	642	12.7	329	69.5	784	18.4	548	15.6	236	24.6
March	2,219	27.4	1,553	20.4	666	47.3	1,055	21.5	681	11.7	374	44.7	887	21.8	572	15.1	315	36.2
April	2,195	21.0	1,508	17.1	687	30.4	987	16.2	650	8.1	337	35.9	855	22.7	573	13.7	282	46.2
May	2,370	26.6	1,564	19.3	806	43.4	1,024	22.9	665	11.9	359	50.1	912	24.9	595	15.6	317	47.0
June	2,363	19.8	1,574	20.9	789	17.6	968	18.4	630	6.4	338	49.7	924	18.6	592	14.7	332	26.1
July	2,380	18.3	1,551	17.6	829	19.7	931	10.6	649	8.0	282	17.3	951	16.1	590	10.0	361	27.8
August	2,504	18.1	1,607	19.2	897	16.2	1,028	17.6	675	10.8	353	33.3	1,047	20.9	617	12.8	430	34.7
September	2,451	12.1	1,612	18.0	839	2.3	1,028	11.2	676	9.4	352	14.8	1,057	13.8	614	11.0	443	18.0
October	2,481	8.1	1,669	14.2	812	d 2.5	1,130	13.7	707	7.3	423	26.3	1,122	12.5	639	10.4	483	15.6

d Decrease.

revenues. The same is true of October. As in the case of the fiscal year 1916, such economies as were possible were made principally at the expense of maintenance of way, the rate of increase in this account being lower than the rates of increase in transportation and maintenance of equipment expenses, for all the later months of the year.

Net operating revenue shows a tendency similar to that of gross revenues, but with the variations somewhat exaggerated. From January to May the rate of increase in net revenue per mile, as compared with the corresponding months of 1915, ranged from 37 to 54 per cent. In June there was a sharp drop to 24.6 per cent, in September to 10.6 per cent and in October to 9.2 per cent, the last two being the lowest rates of increase since March, 1915. The cause of the falling rate of increase for the latter months of 1916 was in part the fact that the comparison was with a higher level of net earnings in the latter months of 1915, and in part the higher rate of increase in expenses than in gross revenues, described in the preceding paragraph.

Table III is devoted to the first ten months of the calendar year 1916, and shows the revenues, expenses and net revenue per mile for the eastern, southern and western districts. This table brings out the tendencies in the various sections of the country, tendencies that may be lost to view when the operations of the three districts are presented in combined form. The gross revenues per mile of the eastern railways from January to May were all greater by more than 20 per cent than for the corresponding months of 1915. In February the rate of increase was as high as 35 per cent. In June the rate of increase fell below 20 per cent for the first time, and continued to fall until in October it was only 8.1 per cent. Similarly, net revenue per mile from January to May showed a rate of increase ranging from a high level of 98 per cent, in January, to a low level of 30 per cent, in April. In June, however, there was a sharp break below 20 per cent, in September the rate of increase fell to 2.3 per cent, while in October there was an actual decrease of 2.5 per cent. This was the first month in which the eastern railways showed a decrease in net revenue per mile since January, 1915. The sharp break in net revenue in September and October was due primarily to the considerably greater rate of increase in expenses than in revenues. Among other factors, rising prices were beginning to manifest their influence.

The southern roads showed smaller rates of increase on the whole than in the East, but the increases were more nearly uniform. From January to June, gross revenues per mile ranged from 16 to 27 per cent higher than in 1915; in July the rate of increase dropped to 10.6 per cent, in September was 11.2 per cent, while in October there was a slight recovery to 13.7 per cent. Net revenue per mile remained well above the 1915 level until June, the rate of increase ranging from 69 per cent in February down to 36 per cent in April. The rate of increase broke sharply in July to 17.3 per cent; there was a recovery in August, another break to 14.8 per cent in September, and another recovery to 26.3 per cent in October. Operating expenses per mile were higher in all months than in 1915, but did not in any month increase faster than revenues. In fact, the record of the southern roads in the matter of holding down increases in their expenses is marked.

The western railways showed on the whole a more nearly uniform rate of increase in revenues than either the East or the South. The largest rate of increase during the ten months in gross revenues per mile was 24.9 per cent, in May, while the smallest was 11.0 per cent, in January. The rate of increase for October was 12.5 per cent, which was next to the lowest of any month during the year. The rate of increase in net revenue per mile remained fairly high through August, but there were sharp breaks to 18.0 per cent in September and 15.6 per cent in October. This last was the smallest rate of increase in the whole ten months. As in the South, the rate of increase in expenses per mile was lower throughout than the rate of increase in revenues, but the tendency during the later months of the year was for the upward curve in expenses to rise toward the same level as the upward curve in revenues.

The chart indicates the general results per mile, for the United States as a whole, for the years 1913 to 1916, inclusive. Operating revenues per mile rose almost steadily from January, 1916, to high-water mark in October. Operating expenses per mile showed a similar upward tendency, although the incline is less marked. Net revenue per mile also shows an almost constant increase. The general tendency of net revenue, as compared with 1915, was to show a relatively smaller rate of increase, so that the lines for 1915 and 1916, respectively, were closer together in September than in any preceding month, and in October were still closer.

We have seen how impressively both the fiscal and the calendar year 1916 have been record years, whether considered in the light of business handled or of money earned. To deny or minimize the prosperity of the railways in 1916 would be worse than futile. Two questions, however, present themselves, answers to which may furnish a background against which this relative prosperity of the roads may be more effectively viewed. In the first place, what do the tremendous railway earnings of 1916 mean when related to their even more tremendous investments; and secondly, what do the returns for 1916 augur for 1917 and the future?

As to the rate of return on railway investment, we have some recently issued statistics of Interstate Commerce Commission which throw light on the question. In its annual report to the present session of Congress the Commission included a table showing the investment of the railways in road and equipment and their operating income for a period of twenty-six years, the fiscal years 1891 to 1916, inclusive; also the annual rate of return on investment. The rate of return as computed by the Commission on the larger railways for 1916 was 6.35 per cent. Adjusting it to cover the smaller railways as well, the rate of return on investment in 1916 in found to be about 6.18 per cent, which is comparable with 4.09 per cent for 1915, 4.19 per cent for 1914, and 5.12 per cent for 1913. As a matter of fact, if the railway operating income for 1916 be adjusted so as to exclude net hire of equipment, joint facility, and miscellaneous rental payments, the rate of return would fall from 6.18 per cent to slightly under 6 per cent. Even in the record year 1916, therefore, the railways as a whole earned not more than six per cent on their investment, which does not seem an excessive rate of return.

As to the future, the answer depends largely on the gap between the rate of increase in revenues and in expenses, which we have seen was rapidly closing during the later months of 1916, notably in the East and quite appreciably in the West. Whether this gap will be still further reduced or even closed up in the near future, it is perhaps unwise to prophesy, but there seems to be a slackening in that part of the nation's business which is due directly to the war. Such a slackening, if it continues to develop, coupled with the relative crop failures of 1916, may tend to decrease the amount of certain kinds of traffic offered to the railways. On the other hand, the freight congestion of the past few months has dammed up the flow of considerable traffic that must be released gradually during 1917; furthermore, the generally prosperous business conditions of 1916 have set under way an expansion in the buying and selling of manufactured products, the momentum of which will carry well into 1917, almost regardless of the possible turn of events in Europe. It seems a safe prediction, therefore, that the railways will have their hands full in 1917, from an operating point of view, even if the unexpected should happen and the early cessation of fighting abroad should call for a considerable rearrangement in our economic life. New problems would arise under such a contingency, and a transitional

period would necessarily ensue; but business commitments already entered into would probably keep railway traffic at a high level for some months ahead. There seems a probability of but little slackening in railway traffic during 1917.

There is another side to the shield, however, in that the railways will find it extremely difficult in 1917 so to keep down expenditures as to maintain their net earnings level with those of the year just closing. The signs all point in this direction, as emphasized by the returns of the latter months of 1916. For one thing, the roads will be faced, on the first of January, with a new phase of railway regulation, which will make considerable additions to the cost of operation, with little or no compensating financial advantages. I refer, of course, to the eight-hour legislation of last September, which was made effective as of January 1, 1917. Whatever may be the outcome of the court proceedings and informal conferences now under way, there is little question that the railways will be faced with a considerably larger wage bill next year than in 1916. Furthermore, they are among the largest consumers of coal, iron and steel, ties and other lumber, oil and lubricants, stone, sand, etc., and the steadily increasing prices of materials are sure to make themselves felt in the near future even more decisively than in 1916. It may be, then, that the cautious attitude of many railway executives toward the future is not wholly the result of their psychological inability to grasp the reality of their present good fortune, but is due to well-defined expectations as to the relation of expenses to revenues in the near future. And the record of still future years, in the light of the almost overwhelming problems which the close of the war will eventually thrust upon the United States, is even less clearly defined to the mental vision of the railway manager today.

RECEIVERSHIPS AND FORECLOSURE SALES

From the high water mark of approximately 42,000 miles of railroad in the hands of receivers reached at one time during 1915, there is as of December 31, 1916, 34,559 miles of railroad still in receivers' hands. This is over 13 per cent of the total railroad mileage of the country in bankruptcy at the end of a year, which, measured by most of the standards of business activity, has been the most prosperous in the history of the United States. During 1915 the Wabash, operating 2,514 miles, was sold under foreclosure and taken over by a new company; so that with other readjustments in the calendar year 1915 there was at the beginning of 1916 38,661 miles of road in receivership. During 1916 the St. Louis & San Francisco, operating 4,749 miles of road, some of its subsidiaries operating about 1,000 miles more; the Western Pacific, operating 945 miles; the Atlanta, Birmingham & Atlantic, operating 638 miles, and various small roads, were taken out of the receivers' hands, but this was in part offset by the fact that the Boston & Maine and the Texas & Pacific both went into receivers' hands during 1916.

These two roads were the most important receiverships of 1916, and the causes leading to their bankruptcy are peculiar and are in the nature of something which could not be overcome even by better earnings and more prosperious general business conditions.

The Boston & Maine was forced into a temporary receivership by the failure of the legislatures of Massachusetts, Maine, New Hampshire and Vermont to act in accord to pass legislation which would permit of the reorganization of the Boston & Maine without receivership proceedings, on the one hand, and the failure of the stockholders of the leased lines to co-operate with the directors of the parent company in such a way as to present a united case to the politicians on the other hand. More than half of the mileage of the Boston & Maine is owned by other companies, from which the Boston & Maine leases the lines for operation, paying a rental either in the form of guaranteed dividends on stock of these lines, or on the basis of

FORECLOSURE SALES IN 1916

Name of company	Mileage	Funded debt outstanding	Stock outstanding
[a] Apalachicola Northern	...	.....	.....
[b] Arkansas Southeastern	...	.....	.....
Atlanta, Birmingham & Atlantic	638	$18,533,000	$35,000,000
Beaumont, Sour Lake & Western	119	2,057,825	85,000
Boca & Loyalton	45	412,000	1,200,000
Brownwood North & South	18	91,000	225,000
Catskill Mountain	20	292,600	89,000
Catskill & Tannersville	5	.....	80,000
Chicago, Anamosa & Northern	35	.....	400,000
Columbus & Southern	23	500,000	2,000,000
Crooked Creek Railroad & Coal Co.	18	116,500	112,500
Florida Railway	59	1,180,000	4,000,000
[b] Idaho Southern	...	.....	.....
Iowa & Omaha Short Line	12	.....	.....
Marietta, Columbus & Cleveland	49	255,000	250,000
[c] Muscatine, North & South	...	.....	.....
New Berlin & Winfield	8	33,800	30,000
[d] New Orleans, Fort Jackson & Grand Isle	60	.....	.....
Ohio & Kentucky	40	425,000	300,000
Ohio River & Columbus	24	500,000	501,000
Pittsburgh, Lisbon & Western	37	988,000	5,000,000
Quakertown & Delaware River	15	151,700	180,000
St. Louis & San Francisco	4,749	287,319,928	49,985,762
St. Louis, Brownsville & Mexico	518	12,179,506	500,000
St. Louis, San Francisco & Texas	244	1,188,000	804,000
South Dakota Central	103	820,000	2,130,900
Virginia & Kentucky	5	35,500	119,100
Wabash-Pittsburgh Terminal	63	50,401,834	10,000,000
Western Pacific	946	75,000,000	75,000,000
Wheeling & Lake Erie	512	23,000,000	36,980,400
Totals	8,355	$475,472,393	$227,972,662

[a] Taken out of receivership February 22, 1916, all floating debt having been paid off without any foreclosure proceedings.
[b] Discontinued.
[c] This road was reorganized and name changed to Muscatine, Burlington & Southern, October 1, 1916. No foreclosure.
[d] Went into receivership July 19, 1916, and was sold at foreclosure September 27, 1916.

RECEIVERSHIPS ESTABLISHED IN 1916

Name of company	Mileage	Funded debt outstanding	Stock outstanding
Boston & Maine	[illegible]	$[illegible]	$[illegible]
Connecticut River	55	4,744,000	[illegible]
Genesee Valley	25	3,800,000	[illegible]
Catskill Mountain	20	292,600	[illegible]
Catskill & Tannersville	5	.....	80,000
Nevada Short Line	12	.....	.....
Pine Bend & Northern	10	43,000	[illegible]
Tennessee & North Carolina	27	465,628	[illegible]
Texas & Pacific	2,944	[illegible]	[illegible]
Totals	4,439	$121,872,288	$ 86,287,401

SUMMARY OF RECEIVERSHIPS FOR 41 YEARS.

Year	No. of roads	Miles	Bonds and stocks
1876	42	6,662	$[illegible]
1877	38	3,637	[illegible]
1878	27	2,320	[illegible]
1879	12	1,102	39,367,000
1880	13	885	140,265,000
1881	5	110	3,742,000
1882	12	912	39,074,000
1883	11	1,990	[illegible]
1884	37	11,038	714,755,000
1885	44	8,836	[illegible]
1886	13	1,799	70,346,000
1887	9	1,046	[illegible]
1888	22	3,270	186,854,000
1889	22	3,803	99,664,000
1890	26	2,963	105,007,000
1891	26	2,159	84,479,000
1892	36	10,508	357,692,000
1893	74	29,340	1,781,046,000
1894	38	7,025	395,701,000
1895	31	4,089	369,075,000
1896	34	5,441	275,597,000
1897	18	1,537	[illegible]
1898	18	2,069	138,701,000
1899	10	1,019	52,285,000
1900	16	1,165	78,334,000
1901	4	73	1,627,000
1902	5	278	5,835,000
1903	9	229	18,803,000
1904	8	744	36,069,000
1905	10	3,593	176,321,000
1906	6	204	55,042,000
1907	7	317	13,585,000
1908	24	8,009	596,359,000
1909	5	859	[illegible]
1910	7	735	51,427,500
1911	5	2,606	[illegible]
1912	13	3,784	182,112,497
1913	17	9,020	[illegible]
1914	22	4,222	[illegible]
1915	12	20,143	[illegible]
1916	9	4,439	208,159,680

a percentage of earnings. The rentals in many cases were higher than net earning power in recent years would warrant. Notwithstanding this fact the parent company could not get along without its leased lines, and therefore made a liberal offer to leased line stockholders to exchange their stock for securities of the Boston & Maine bearing the same rate of interest, but in so doing taking over the title to these leased lines so that a united system of railroads under one ownership would result. If this plan had been carried through and the state legislatures had passed laws permitting other features of the plan to be worked out, the chances are that there would have been no Boston & Maine receivership. Since receivership has taken place, however, the management is wisely endeavoring to lay the foundation for a thoroughgoing organization.

The Texas & Pacific fell between the Goulds and the Missouri Pacific. The St. Louis, Iron Mountain & Southern, controlled by the Missouri Pacific, had lent money to the Texas & Pacific, as did also various bankers and the Gould estate. The St. Louis, Iron Mountain & Southern and its parent company—the Missouri Pacific—being in the hands of a receiver, pressure was brought to bear on the Texas & Pacific for payment of all short-term indebtedness. The Goulds apparently did not desire a receivership, but finally consented to one so that their own interests might be conserved by the courts along with the interests of the St. Louis, Iron Mountain & Southern.

Of the roads sold under foreclosure and taken over by reorganized companies it may be said in general that the reorganizations were more drastic and thoroughgoing than

RAILROADS IN THE HANDS OF RECEIVERS

Name of Road	Mileage	Date of receivership	Bonds of old company	Stock of old company	Total old company securities
Alabama, Tennessee & Northern	195	Nov. 22, 1915	$3,161,000	$6,328,000	$9,489,000
Birmingham, Columbus & St. Andrews	38	.....	250,000	4,500,000	4,750,000
Boston & Maine	2,298	Aug. 29, 1916	56,644,060	42,655,191	99,299,251
Connecticut River	88	Aug. 31, 1916	4,744,000	3,233,300	7,977,300
Vermont Valley	25	Aug. 31, 1916	3,800,000	1,000,000	4,800,000
Boyne City, Gaylord & Alpena	90	Nov. 19, 1913	150,000	501,200	651,200
Cape Girardeau Northern	104	April 14, 1914	1,500,000	110,000	1,610,000
Catskill Mountain	20	Jan., 1916	292,600	89,000	381,600
Catskill & Tannersville	5	Jan., 1916	.....	80,000	80,000
Chicago & Eastern Illinois	1,136	May 27, 1913	62,679,150	18,302,752	80,981,902
Chicago, Anamosa & Northern	35	Feb. 21, 1914	.....	400,000	400,000
Chicago, Peoria & St. Louis	255	July 31, 1914	4,850,000	4,000,000	8,850,000
Chicago, Rock Island & Pacific	7,653	April 20, 1915	234,801,000	74,359,723	309,160,723
Cincinnati, Bluffton & Chicago	53	Mar. 13, 1908	1,500,000	1,125,000	2,625,000
Cincinnati, Hamilton & Dayton	622	July 2, 1914	49,607,000	8,248,175	57,855,175
Clarksburg Northern	13	.....	454,000	260,000	714,000
Colorado Midland	338	Dec. 13, 1912	9,469,000	8,376,100	17,845,100
Crooked Creek Railroad & Coal Co.	18	July 22, 1915	116,500	112,500	229,000
Dansville & Mt. Morris	15	June 1894	150,000	50,000	200,000
Denver, Laramie & Northwestern	57	June 12, 1912	808,000	25,660,900	26,468,900
Elberton & Eastern	22	.....	300,000	200,000	500,000
Elkin & Allegheny	17	.....	480,000	476,300	956,300
Evansville & Indianapolis	146	.....	2,500,000	2,000,000	4,500,000
Florida, Alabama & Gulf	26	Feb. 27, 1914	500,000	150,000	650,000
Florida Railway	59	June 25, 1915	1,189,965	1,166,000	2,355,965
Ft. Smith & Western	250	Oct. 9, 1915	5,833,000	5,000,000	10,833,000
Georgia & Florida	320	Mar. 27, 1915	8,452,000	8,750,000	17,202,000
Gould Southwestern	18	April 14, 1914	.....	51,000	51,000
Greenville Northwestern	12	1915	.....	.....	.....
Houston & Brazos Valley	28	Nov., 1915	420,000	24,000	444,000
International & Great Northern	1,160	Aug. 11, 1914	26,347,000	4,822,000	31,169,000
Kansas City & Memphis	56	July 18, 1914	862,000	852,000	1,714,000
Leavenworth & Topeka	56	.....	250,000	50,000	300,000
Liberty White	50	Nov. 12, 1914	.....	300,000	300,000
Louisiana & North West	121	Aug. 23, 1913	2,250,000	2,300,000	4,550,000
Macon & Birmingham	97	Feb. 1, 1908	500,000	500,000	1,000,000
Marietta, Columbus & Cleveland	49	July 10, 1914	250,000	250,000	500,000
Missouri & North Arkansas	365	April 1, 1912	8,340,000	8,340,000	16,680,000
Missouri, Kansas & Texas	1,744	Sept. 27 1915	101,728,750	76,283,257	178,012,007
Missouri, Kansas & Texas of Texas	1,792	Sept. 27, 1915	35,638,054	10,152,500	45,790,554
Missouri, Oklahoma & Gulf	334	Dec. 12, 1912	9,300,347	8,474,000	17,774,347
Missouri Pacific	3,931	July, 1915	160,381,500	82,841,085	243,222,585
St. Louis, Iron Mountain & Southern	3,555	July, 1915	142,644,120	44,394,739	187,038,859
Nevada Short Line	12	Jan., 1916	.....	.....	.....
New Orleans, Mobile & Chicago*	403	Dec. 19, 1913	.....	.....	.....
Orangeburg Railway	17	.....	.....	.....	.....
Pacific & Idaho Northern	90	Sept. 4, 1915	2,646,911	2,929,800	5,576,711
Pere Marquette	2,249	April 5, 1912	72,412,942	26,327,210	98,740,152
Pine Bluff & Northern	10	Feb. 9, 1916	43,000	160,000	203,000
Pine Bluff, Sheridan & Southern	14	.....	92,000	1,505	93,505
Pittsburg, Shawmut & Northern	184	Aug. 1, 1905	14,491,600	15,000,000	29,491,600
Rome & Northern	23	Feb. 28, 1911	.....	1,000,000	1,000,000
St. Louis & Missouri Southern	8	.....	.....	.....	.....
St. Louis, El Reno & Western	42	Oct. 9, 1915	817,000	970,800	1,787,800
San Antonio, Fredericksburg & Northern	25	Oct. 28, 1914	153,352	30,000	183,352
San Antonio, Uvalde & Gulf	316	Aug., 1914	4,413,000	280,000	4,693,000
Sharpsville Railroad	21	Jan. 20, 1897	68,779	350,000	418,779
Tennessee & North Carolina	37	Sept. 14, 1916	465,628	306,100	771,728
Tennessee Central †	294	Dec. 31. 1912	12,232,900	7,941,450	20,174,350
Tennessee Railway	61	July 1, 1913	1,129,000	1,000,000	2,129,000
Texas & Pacific	1,944	Nov., 1916	55,883,000	38,763,810	94,646,810
Toledo, St. Louis & Western	451	Oct. 22, 1914	27,602,000	19,947,600	47,549,600
Trinity & Brazos Valley	315	June 16, 1914	8,760,000	304,000	9,064,000
Valdosta, Moultrie & Western ‡	42	Aug. 23, 1913	300,000	100,000	400,000
Virginia & Kentucky	3	Jan. 1, 1914	35,500	119,110	154,610
Wabash, Chester & Western	65	July 15, 1914	690,000	1,250,000	1,940,000
Watauga & Yadkin River	29	Nov. 12, 1914	.....	3,138,600	3,138,600
Wheeling & Lake Erie ¶	512	June 8, 1908	25,053,000	36,980,400	62,033,400
Wisconsin & Michigan	124	Jan. 15, 1912	3,518,245	1,488,200	5,006,445
Totals	34,559		$1,173,950,903	$615,157,307	$1,789,108,210

Note.—The total mileage of roads in the hands of receivers is as nearly accurate as correspondence with receivers and officers of the roads can get it. The figures for the total of bonds and stocks are only approximate, since in some cases information was refused on the ground that the courts were now in the process of determining disputed questions, or for some other reason.

Note.—The Wabash Pittsburgh Terminal is not included in the above list of roads in the hands of receivers because it was sold under foreclosure and unless something unforeseen prevents will be out of the hands of receivers before December 31, although some technical delay might occur which would make it necessary for the receiver to remain in charge for a day or so longer.

* The New Orleans, Mobile & Chicago will be taken over by the Gulf, Mobile & Northern, the new company organized to operate the property, on January 1, 1917.

† The Tennessee Central is to be sold February 15, 1917.

‡ The Valdosta, Moultrie & Western is to be sold January 20, 1917.

¶ The Wheeling & Lake Erie is shown also in the table showing foreclosure sales because it was sold under foreclosure, but up to December 31 the receiver has not turned the property over to a reorganized company.

those of 1896, the last period of widespread receivership and reorganization of railroads. The St. Louis & San Francisco had been immensely improved by the receivers both in physical condition and in organization, and the new company started operation with the receiver who had been in charge of operation as president. The Western Pacific, which was sold under foreclosure, had its securities drastically cut down. The new company starts operation with very low fixed charges, only about $1,000 per mile, but without as yet having developed any new source of traffic. It was lack of traffic which was the principal cause of the Western Pacific's receivership.

SUMMARY OF FORECLOSURE SALES IN 41 YEARS

Year	No. of roads	Miles	Bonds and stocks
1876	30	3,840	$217,848,000
1877	54	3,875	198,984,000
1878	48	3,906	311,631,000
1879	65	4,909	243,288,000
1880	31	3,775	263,882,000
1881	29	2,617	137,923,000
1882	16	867	65,426,000
1883	18	1,354	47,100,000
1884	15	710	23,504,000
1885	22	3,156	278,394,000
1886	45	7,687	374,109,000
1887	31	5,478	328,181,000
1888	19	1,596	64,555,000
1889	25	2,930	137,815,000
1890	29	3,825	182,495,000
1891	21	3,223	169,069,000
1892	28	1,922	95,898,000
1893	25	1,613	79,924,000
1894	42	5,643	318,999,000
1895	52	12,831	761,791,000
1896	58	13,730	1,150,377,000
1897	42	6,675	517,680,000
1898	47	6,054	252,910,000
1899	32	4,294	267,534,000
1900	24	3,477	190,374,000
1901	17	1,139	85,808,000
1902	20	693	39,788,000
1903	13	555	15,885,000
1904	13	524	28,266,000
1905	6	679	20,307,000
1906	8	262	10,400,000
1907	6	114	13,777,000
1908	3	138	2,547,000
1909	12	2,629	250,033,000
1910	17	1,100	93,660,109
1911	13	1,386	40,741,453
1912	12	661	25,910,990
1913	6	1,159	86,163,850
1914	9	1,470	83,189,500
1915	11	3,914	285,258,782
1916	26	8,355	703,444,855

TRAIN OPERATION ON THE EAST INDIAN RAILWAY

Until recently the traffic on the East Indian Railway has been handled without any officer corresponding to the American train despatcher, dependence being placed entirely on the station "masters" or agents, using block instruments on single-track lines. It has been found that under this system frequent unnecessary delays to freight trains on single-track resulted from the desire of the agents to avoid the necessity of explaining delays to passenger trains. It also resulted in long discussions by telephone or otherwise between adjacent stations when both wanted to send a train over the intermediate section, and occasionally differences of opinion arose between the agent and the train crew when the latter felt that they had a grievance in being unnecessarily detained.

In order to relieve this situation, a centralized control system has been installed in several instances. The movement of trains is placed under the control of an officer called a train controller who directs the station masters by telephone as to which train may be held and which sent forward. The system differs only slightly from that in use on many double-track lines in England where controllers or despatchers direct block operators as to the movements of trains. On the Indian railways the station masters direct the signalmen as to the throwing of switches and setting of signals.

On the single-track line between Allahabad and Tundla, a distance of 262.5 miles, traffic consists of 21 trains each way in 24 hours, freight trains having a length of about 1500 ft. with a possible load of 850 tons, and the passenger trains consisting in some cases of 12 coaches. This section is divided into four control districts, ranging in length from 57 miles to 86 miles, each in charge of a controller throughout the 24 hours, these men working in three shifts of eight hours each. In place of the train sheet in use by American despatchers, these Indian railway controllers make use of a plug board and a graphic sheet or chart. When a train enters the section, the controller takes a plug from the board and inserts it in a socket on the diagram corresponding to the terminal station. As it progresses from station to station its arrival and departure are reported by telephone to the controller who shifts the plug correspondingly. Each plug is marked with the number of the train it represents, and its color indicates the class of the train. A station is not permitted to accept or despatch a train without an order from the controller, but ordinary single-track block operation remains in force. When a train is to be side-tracked, the controller instructs the station as to which siding is to be used, and as long as the train remains on that siding, its plug on the controller's board is left at that point.

The permanent record of the movement of trains is made on a chart or printed form showing the list of stations in a column at the left, and having vertical rulings representing five-minute intervals for a period of eight hours and a horizontal line opposite each station. Different colored pencils are used for different classes of trains with which lines are drawn across this diagram, the intersections of these lines with the horizontal lines indicating the time at which each train passed the given stations. As each chart represents eight hours' work, the three charts each day form a complete record for the district superintendent. It was formerly necessary to require a report from each station daily, of the time of arrival and departure of each train.

The installation of this system has effected important operating economies. The number of trains operated has increased 5 to 10 per cent, as indicated by a number of monthly summaries, the increase in the number of through freight trains for these periods being 15 to 35 per cent. In spite of this increased number of trains, the average time on the road from these monthly records was decreased from 10 to 15 per cent. The cost of the installation on this 262.5 miles was $8,200, not including the line wires which were installed by the government telegraph department. The annual cost of operation, including rental on these line wires, is about $18,670 or $2.92 for each train operated over the district.

Trans-Andine Railroad of Chile.—The Department of Public Works of Valparaiso has again seriously taken under consideration the proposition of constructing the Chilian end of a new trans-Andine railway. The line, which official reports say will be built at the earliest possible moment, will connect the Argentine port of Bahia Blanca with Lebu and will cross the Andes in the foreign regions of Lonquimay. The Argentine end of the new transcontinental has been completed to within thirty kilometers of the Chilian frontier, where work was halted to await a like development on the western slope of the Andes. At present semi-weekly trains are running regularly between Buenos Ayres and Valparaiso over the existing transandine road, which crosses the great plateau through the Uspallata Pass, 12,000 feet above the level of the sea. The twice-a-week service, which was maintained before the great war, was discontinued until a fortnight ago, when it was resumed because traffic across the Panama Canal has created a profitable passenger service for the South American transcontinental.

Railway Construction Statistics for 1916

Total Mileage of New Lines Built in the United States Is Somewhat Greater Than of Last Year

DURING 1916, 1,098.41 miles of new lines were built in the United States. New second track amounted to 312.31 miles, with additional third, fourth and other main tracks to the extent of 31.06 miles. While the total mileage of new lines is considerably more than that of last year, it is still less than for any other year since 1864. The additional mileage of multiple tracks is less than for last year.

In Canada the mileage of new lines built is 290.04, with 7.09 miles of additional second track. This compares with 718 for last year and a maximum of 3,013 which was reached in 1913. An addition of 50 miles of completed line is reported for the government railway of the United States in Alaska, which, with the total of 34 miles reported last year, gives a total completed length of this road of 84 miles.

The figures of new construction by years in the United States, beginning with 1893, are as follows:

1893	3,024	1905	4,388
1894	1,760	1906	5,623
1895	1,420	1907	5,212
1896	1,692	1908	3,214
1897	2,109	1909	3,748
1898	3,265	1910	4,122
1899	4,569	1911	3,066
1900	4,894	1912	2,997
1901	5,368	1913	3,071
1902	6,026	1914	1,532
1903	5,652	1915	933
1904	3,832	1916	1,098

Reference to the tables of new mileage by states shows no new mileage reported by 14 states, while less than 3 miles of additional lines is reported for 4 more, and less than 10 miles of new line is reported for each of 5 states. In New England only 1 mile of new line was built and this was in Massachusetts. Montana leads with 99.36 miles, with Kansas second, with 96.31 miles, South Carolina third, with 91.76 miles and California fourth with 78.77 miles. These four states, with Oregon, Washington and Georgia contain nearly half of the new mileage built in the entire United States, while the three Pacific coast states have the highest record for a single group with a total of 200.22 miles.

In the southwestern and mountain states, with their great expanses of undeveloped territory, a total of only 9 states, excluding Montana, show an aggregate of only 73.01 miles of new line, of which not more than 23 miles was built in a single state. No new mileage was reported for either Nevada or Utah and less than two miles for New Mexico and for Colorado. In the north central group of states, Kansas shows additional mileage of 96.31 miles, Michigan 37 miles and North Dakota 36.94 miles. The remaining states in this group, 9 in all, produced 39 miles of new line.

The longest continuous line built during the year was the Charleston Southern (Seaboard Air Line) from Charleston to the Georgia state line, 88 miles. The next longest is the Chicago, Milwaukee & St. Paul's line from Great Falls, Mont., to Agawam, 66.07 miles. Almost one third of all the second track completed in the United States during 1916 is on the Southern in Virginia, North Carolina, South Carolina and Georgia, a total of 98.44 miles. The largest part of this is 55.14 miles in Virginia, giving this state the largest mileage of new second track built in the year, 82.69 miles. The second state in point of new second track is Illinois, with 36.15 miles.



Curves of United States and Canadian Construction Mileage.

Although railway activity, as judged by the number of miles of new and multiple track built, would seem very small, it does not represent accurately the actual amount of activity in railway construction for the reason that the roads are spending a continually larger proportion of their annual construction appropriations for additions and betterments not represented by additional mileage. Because of this, an in-

novation has been introduced in the construction report of the *Railway Age Gazette* this year in the form of a record of other important improvement work done by the railroads in this country.

A very large proportion of the expenditures falling under this classification has been devoted to grade separation in cities. In Chicago alone, the North Western, the Rock Island, the Illinois Central, the Chicago & Western Indiana, the Michigan Central, the New York Central and the St. Paul have all been actively engaged in work of this kind, which involves a total appropriation for these lines in excess of $15,000,000. Obviously the work under these large appropriations will not all be completed in a single year; consequently many items under this and other classifications will reappear in two or more reports. The Chicago, Milwaukee & St. Paul and the Chicago & North Western are also engaged in extensive track elevation work at Milwaukee. The Grand Trunk and the New York Central have similar work under way at Detroit and the cities of Indianapolis, Ind., Johnstown, Pa., and Columbus, Cleveland, Elyria and Fort Clinton, Ohio, have also committed the railroads to work of this kind. Grade revision work represented an unusually small proportion of the expenditures in 1916, although most of the double track projects reported involve grade improvement.

Engine terminals, shops and freight terminals form a very large portion of the improvement work done. Work was in progress during the year on three freight and engine terminals for the St. Paul, involving an expenditure of over $1,500,000. The Boston & Maine is spending $1,000,000 for a roundhouse and yards at Deerfield, Mass. The New York Central has work under way on yard extensions at West Albany, Utica, and Gardenville, N. Y., and is building shops at Elkhart, Ind., and Ashtabula, Ohio, while at Detroit preliminary work has been done by the same road on a freight yard and engine terminal to cost $5,000,000 ultimately. The Pennsylvania lines are also building a new classification yard at Indianapolis.

Large passenger terminals completed during the year include the Dallas, Tex., and the Macon, Ga., stations and the reconstructed Denver station. New passenger terminals for the Lackawanna and the Lehigh Valley are nearing completion at Buffalo. Preliminary construction work is also in progress on the new union station at Chicago.

Among miscellaneous projects for which no definite classifications can be given, may be mentioned the grain elevators completed by the Chicago & North Western at Chicago and Milwaukee, which, with the yards serving them, involve an expenditure of over $5,000,000. The Duluth & Iron Range is building an ore dock at Two Harbors, Minn., to cost $1,400,000. The Great Northern is making extensions to its snow sheds in the Cascade mountains which, with other improvement work in the same territory, will cost $1,500,000. The North Western has completed an office building at Chicago and the Illinois Central is now building another at the same place, each project involving an expenditure of about $500,000.

In Canada construction projects have been reduced to the minimum. The most important work completed during the year is the five-mile Connaught tunnel. Passenger stations were completed by the Canadian Pacific at North Toronto and at Quebec, and work is now in progress on the Toronto union station, while the new passenger and freight terminal of the Vancouver, Victoria & Eastern at Vancouver, B. C., is nearing completion.

The comparative amounts of various classes of new tracks built and other important improvement work under way during 1916 are shown below by states.

NEW TRACK BUILT IN 1916.

UNITED STATES—	No. Cos. building	Miles: First track	Second track	Third track	Fourth or more track	Total
Alabama	4	33.50	2.50	.....	.....	36.00
Alaska	1	50.00	.....	.....	.....	50.00
Arizona	1	8.50	.....	.....	.....	8.50
Arkansas	7	13.21	1.36	.....	.....	14.57
California	5	78.77	.....	.....	.....	78.77
Colorado	1	1.80	.....	.....	.....	1.80
Connecticut	..	.....	.55	8.72	5.02	14.29
Florida	5	44.05	.....	.....	.....	44.05
Georgia	3	52.50	26.06	.....	.....	78.56
Idaho	2	19.59	.....	.....	.....	19.59
Illinois	3	10.11	36.15	.25	.14	46.65
Indiana	..	.....	14.38	.....	.....	14.38
Kansas	3	96.31	.....	.....	.....	96.31
Kentucky	1	24.00	2.26	.....	.....	26.26
Louisiana	2	29.81	.....	.....	.....	29.81
Maryland	1	3.50	5.62	.....	.....	9.12
Massachusetts	1	1.00	.....	.....	.....	1.00
Michigan	3	37.00	19.31	.....	.....	56.31
Minnesota	2	10.20	14.90	.....	.....	25.10
Mississippi	4	36.90	19.00	.....	.....	55.90
Missouri	..	.....	3.00	.....	.....	3.00
Montana	3	99.36	.....	.....	.....	99.36
New Jersey	3	2.56	.89	.....	2.02	5.47
New Mexico	1	1.46	.....	.....	.....	1.46
New York	3	5.63	.68	6.17	4.32	16.80
North Carolina	3	23.00	6.50	.....	.....	29.50
North Dakota	2	36.94	.....	.....	.....	36.94
Ohio	2	7.10	25.75	2.06	1.76	36.67
Oklahoma	3	22.80	6.19	.....	.....	28.99
Oregon	4	65.80	1.75	.....	.....	67.55
Pennsylvania	10	43.16	6.20	.14	.46	49.96
South Carolina	2	91.76	12.20	.....	.....	103.96
South Dakota	..	.....	10.30	.....	.....	10.30
Tennessee	4	19.47	4.02	.....	.....	23.49
Texas	3	10.86	.....	.....	.....	10.86
Utah	..	.....	2.90	.....	.....	2.90
Virginia	3	14.58	82.69	.....	.....	97.27
Washington	5	55.65	.....	.....	.....	55.65
West Virginia	4	28.27	.....	.....	.....	28.27
Wisconsin	3	11.26	7.15	.....	.....	18.41
Wyoming	1	8.00	.....	.....	.....	8.00
Totals	108	1098.41	312.31	17.34	13.72	1441.78
Canada	11	290.04	7.90	.....	.....	297.94
Panama	1	40.00	.....	.....	.....	40.00

NEW TRACK BUILT IN 1915.

UNITED STATES—	No. Cos. building	Miles: First track	Second track	Third track	Fourth or more track	Total
Alabama	2	53.15	27.85	.....	.....	81.00
Alaska	1	34.80	.....	.....	.....	34.80
Arizona	2	50.00	.....	.....	.....	50.00
Arkansas	1	19.00	1.00	.....	.....	20.00
California	4	32.00	.....	.....	.....	32.00
Colorado	3	4.73	.....	.....	.....	4.73
Florida	6	38.65	.....	.....	.....	38.65
Georgia	5	31.64	.....	.....	.....	31.64
Idaho	..	.....	1.75	.....	.....	1.75
Illinois	4	6.90	24.78	.....	.....	31.68
Iowa	..	.....	3.43	.....	.....	3.43
Kansas	4	58.56	4.09	.....	.....	62.65
Kentucky	3	48.89	6.92	.....	.....	55.81
Maine	1	1.33	.....	.....	.....	1.33
Maryland	2	3.40	4.95	.....	.....	8.35
Massachusetts	2	2.00	.....	.....	.....	2.00
Michigan	2	18.50	1.00	.....	.....	19.50
Minnesota	4	46.76	28.18	.....	.....	74.94
Mississippi	1	3.50	13.25	.....	.....	16.75
Missouri	1	.16	3.85	.....	.....	4.01
Montana	1	8.51	.....	.....	.....	8.51
Nebraska	1	1.25	.....	.....	.....	1.25
Nevada	1	7.00	.....	.....	.....	7.00
New Jersey	1	.66	2.00	.....	.....	2.66
New Mexico	1	3.66	.....	.....	.....	3.66
New York	3	2.84	13.84	9.27	15.97	41.92
North Carolina	3	33.30	39.90	.....	.....	73.20
North Dakota	2	26.29	.....	.....	.....	26.29
Ohio	3	9.30	7.26	.....	.....	16.56
Oklahoma	3	34.74	.....	.....	.....	34.74
Oregon	4	82.70	.....	.....	.....	82.70
Pennsylvania	9	98.37	44.86	26.25	11.94	181.42
Rhode Island	..	.....	.....	.62	.65	1.27
South Carolina	..	.....	1.00	.....	.....	1.00
Tennessee	4	12.15	18.71	.....	.....	30.86
Texas	2	4.40	.50	.....	.....	4.90
Utah	1	14.95	7.76	.....	.....	22.71
Virginia	2	17.80	81.03	.....	.....	98.83
Washington	6	70.88	9.27	.....	.....	80.15
West Virginia	7	13.78	1.32	.....	.....	15.10
Wisconsin	1	29.32	7.78	.....	.....	37.10
Wyoming	1	7.37	.....	.....	.....	7.37
Totals	104	933.24	356.28	36.14	28.56	1,354.22
Canada	17	718.37	.84	.....	.....	719.21
Mexico	2	36.50	.....	.....	.....	36.50

UNITED STATES

ALABAMA

First Track	Miles	Miles
Chattahoochee Valley—McCulloch to Bleecker	11.00	
Dauphin Island Railway & Harbor Company—From Alabama Port	1.50	
Florida & Alabama—State Line to Whitney	14.00	
Washington & Choctaw—Not specified	7.00	33.50

ALABAMA (Continued)

Second Track

	Miles	Miles
Birmingham & Southeastern—From Wheatley	2.50	2.50

Other Important Work Under Construction.

Alabama Great Southern—Building second track between Fort Payne and Flanders, 20 miles.

Florida & Alabama—Building between Whittey and Givens, 1 mile.

ALASKA

First Track

	Miles	Miles
United States Government Railway—Between Birchwood and King and 10.4 miles south of Anchorage	50.00	50.00

Other Important Work Under Construction.

United States Government Railway—Building between Kern Creek and Big Rabbit Creek, 33 miles; west of Matanuska Junction to Susitna river crossing, 112 miles; between Nenana and Fairbanks, 56 miles.

ARIZONA

First Track

	Miles	Miles
Tucson, Cornelia & Gila Bend—Mile 35 to Ajo	8.50	8.50

ARKANSAS

First Track

	Miles	Miles
Arkansas & Memphis Railway Bridge & Terminal Company—State line to Briark	2.06	
Cairo, Truman & Southern—Not specified	1.50	
Combs, Cass & Eastern—Extension to Cass	3.50	
Ft. Smith, Subiaco & Eastern—At Dardanelle	0.15	
Gould Southwestern—Star City to Gould	1.50	
Pine Bluff & Northern—Cullor to Fletcher	2.00	
Yellville Rush & Mineral Belt—Summit to Yellville	2.50	13.21

Second Track

	Miles	Miles
Arkansas & Memphis Railway Bridge & Terminal Co.—State line to Briark	1.36	1.36

Other Important Work Under Construction

Chicago, Rock Island & Pacific—Raising grade of track above high water and increasing waterways, Briark to Hart, cost $163,000, 50 per cent completed.

Fort Smith, Subiaco & Eastern—Building between Scranton and Dardanelle, 26.3 miles.

Yellville, Rush & Mineral Belt—Building between Yellville and Rush, 12.4 miles.

CALIFORNIA

First Track

	Miles	Miles
California Southern—Mile post 14 to Blythe	28.43	
Hetch-Hetchy—Between Hetch-Hetchy Junction and Moccosin Creek	15.00	
Nevada-California-Oregon—Clio to Davies Mill	2.84	
Patterson & Western (Narrow Gage)—Between Patterson and Jones Station	23.60	
San Diego & Arizona—Campo west to international boundary	8.90	78.77

Other Important Work Under Construction

Colusa-Hamilton (So. Pac.)—Building between north of Glenn and Hamilton, 12.5 miles.

Hetch Hetchy—Grading completed for double track extension between Moccasin Creek and Hetch Hetchy Junction, 52.6 miles. Contractor, F. Rolandi, San Francisco.

Western Pacific—Relining tunnel, No. 35, cost $100,000, about completed; line change and filling bridge near Blairsden, cost $100,000, 55 per cent completed.

COLORADO

First Track

	Miles	Miles
Denver Union Terminal—At terminal	1.80	1.80

Other Important Work Under Construction

Denver Union Terminal Company—Passenger terminal at Denver, cost $849,000, completed.

CONNECTICUT

Second Track

	Miles	Miles
New York, New Haven & Hartford—At New Haven	0.55	0.55

Third Track

	Miles	Miles
New York, New Haven & Hartford—Groton to Midway, 2.65 miles; at New Haven, 0.57; Westbrook to Connecticut river, 5.5 miles; total	8.72	8.72

Fourth Track

	Miles	Miles
New York, New Haven & Hartford—Groton to Midway, 0.75 mile; at New Haven, 0.41 mile; Westbrook to Saybrook Jct., 3.86 miles; total	5.02	5.02

Other Important Work Under Construction

New York, New Haven & Hartford—Winthrop Cove relinement at New London, cost $275,000, to be completed February, 1917; Thames river bridge, New London, cost $2,500,000, 25 per cent completed; engine facilities at Danbury, cost $178,535, 35 per cent completed; extension to classification yard at Meriden Junction, cost $184,000, 50 per cent completed; improvements to bridge between Meriden Junction and Waterbury, cost $101,000, 20 per cent completed. Carried out relocation work on about 1.23 miles at New Haven.

FLORIDA

First Track

	Miles	Miles
Florida & Alabama—Not specified	1.00	
Florida East Coast—New Smyrna to Maytown	17.25	
Pelham & Havana—Darsey to Havana	5.60	
Seaboard Air Line—Baynard to Walinwa, 10 miles; extension of spur near Bartow, 0.2 mile; total	10.20	
South Florida & Gulf—South of Kenansville	10.00	44.05

Other Important Work Under Construction.

Atlantic Coast Line—Building between Sebring and Venus, 33 miles.

Gulf, Florida & Alabama—Coaling dock at Pensacola, cost $150,000, completed.

GEORGIA

First Track

	Miles	Miles
Americus, Hawkinsville & Eastern—In Sumter county	4.50	
Savannah & Northwestern—St. Clair to Georgia Junction	35.00	
Washington & Lincolnton—Washington to Lovelace	13.00	52.50

Second Track

	Miles	Miles
Southern Railway—Cornelia to Gainesville	24.60	
Western & Atlantic (N. C. & St. L.)—Hills Park to Bolton	1.46	26.06

Other Important Work Under Construction.

Macon Terminal Company—Union passenger station at Macon, cost $1,000,000, completed.

IDAHO.

First Track

	Miles	Miles
Intermountain Railway at Centerville	.53	
Oregon Short Line—Marshfield to Idahome	19.06	19.59

Other Important Work Under Construction.

Oregon-Washington Railroad & Navigation Co.—Building between Beaver and Ray-Jefferson Mill, 8.8 miles. Contractors, Twohy Bros., Portland, Ore.

ILLINOIS

First Track

	Miles	Miles
Alton & Southern—End of track to connection with Chicago, Peoria & St. Louis	5.60	
St. Louis, Iron Mountain & Southern—Depot to junction to top incline	.41	
Illinois Central—From Effingham mile 0 to mile 2:25—2.25 miles; mile 6 to mile 7.85—1.85; total	4.10*	10.11

Second Track

	Miles	Miles
Alton & Southern—Valley Junction northeasterly	1.00	
Chicago, Burlington & Quincy—Southboro to Keyesport, 11.26 miles; Centralia to Woodlawn, 11.97; Sesser to Ziegler Junction, 11.60 miles; total	34.83	
Paducah & Illinois—At Metropolis	0.32	36.15

Third Track

	Miles	Miles
Pennsylvania Company—Northwest and Central Systems—In Chicago	0.25	0.25

Fourth Track

	Miles	Miles
Pennsylvania Company—Northwest and Central Systems—In Chicago	0.14	0.14

* Relocation work takes the place of 4.3 of old line.

Other Important Construction Work

Chicago & Alton—Completed work on River Terminal at East St. Louis, December 1, costing $100.000.

Chicago & Eastern Illinois—New passenger station, rearrangement of freight yard and construction of subway at Danville, cost $257,000, 40 per cent completed; enlargement of shop facilities at Oaklawn, cost $123,000, 58 per cent completed.

Chicago & North Western—Reinforced concrete grain elevator and 17 miles of yard tracks at Chicago, cost $3,850,000, 30 per cent completed; reinforced concrete viaduct at Peoria, jointly with Minneapolis & St. Louis, Chicago, Burlington & Quincy and City of Peoria, cost $120,000, 60 per cent completed; elevation of main and yard tracks on 4 miles at Chicago, cost $1,500,000, 2 per cent completed; bridge at Geneva, cost $160,000, 25 per cent completed; bridge over north branch of Chicago river at Deering, cost $350.000, completed; general office and record building in Ravenswood, Chicago, cost $400.000, completed.

Chicago, Burlington & Quincy—Building bridge over Ohio river at Metropolis, 60 per cent completed; building second track between Steward Junction and Flaggs Center, 8 miles.

Chicago, Milwaukee & St. Paul—Track elevation, Chicago, 4.4 miles, cost $2,500,000, 75 per cent completed.

Chicago, Rock Island & Pacific—Chicago main line track elevation, cost $1,589,200, 70 per cent completed.

Chicago Union Station Company—Union passenger station at Chicago, cost $47,000,000, 5 per cent completed.

Cleveland, Cincinnati, Chicago & St. Louis—Building west of Harrisburg, 8.34 miles. Contractors, Head, Jones & Co., St. Louis, Mo. Rebuilding grain elevator at Sheldon, cost $220,000, completed.

Illinois Central—Reconstruction of Hyde Park subways, Chicago, cost $2,100,000, 25 per cent completed; office building, Dorchester avenue, Chicago, cost $650.000, 30 per cent completed; new freight facilities, East St. Louis, cost $150,000, 30 per cent completed; new mechanical facilities at Freeport, cost $130,000, completed.

Michigan Central—Grade separation and rearrangement of yard tracks at Kensington, cost $240,000, completed.

New York Central—Grade separation at Chicago, cost $7,000,000, 98 per cent completed.

Pennsylvania Lines West—Pennsylvania Company freight terminal at Polk street, Chicago, cost $4,360,000, 40 per cent completed.

Pittsburgh, Cincinnati, Chicago & St. Louis (P. L. W.)—Grade separation at Chicago, cost $4,567,000, 25 per cent completed; new engine house layout and shop facilities at Chicago, cost $373,520, 45 per cent completed.

INDIANA

Second Track

	Miles	Miles
Chicago & Eastern Illinois—At Clinton mile post 2 to mile post 5	2.88	
Chicago & Erie (Erie)—Clanricarde to Kouts, 5 miles; Hurlburt to Malones, 4 miles; Palmer to Winfield, 2.5 miles; total	11.50	14.38

Other Important Work Under Construction

Illinois Central—Elevation of tracks at Indianapolis, cost $136,900, 80 per cent completed.

Indianapolis Union Railway—Elevation of all tracks including train shed at Union station, Indianapolis, cost $5,000,000, 10 per cent completed.

Indianapolis & Frankfort (Vandalia)—Building between Bendavis and Frankfort, 41 miles. Contractors, Dunn-McCarthy Co., Chicago.

New York Central—New shops at Elkhart, cost $2,000,000, 10 per cent completed.

Pennsylvania Lines West—Pennsylvania Company building engine facilities at Fort Wayne, cost $150,000, 85 per cent completed.

Pittsburgh, Cincinnati, Chicago & St. Louis (P. L. W.)—Rearrangement and extension of yard and car repair facilities at Richmond, cost $530,000, 15 per cent completed; grade separation and track elevation at Indianapolis, cost $123,000, 40 per cent completed; joint freight terminal yard east of Belt Railway, Indianapolis; eastbound and westbound receiving and classification yards; roundhouse, coal wharf and double track connection, cost $1,726,096, 15 per cent completed; new inbound freight house and tracks at Pennsylvania street, Indianapolis, cost $1,331,004, 90 per cent completed.

Peoria & Eastern—Separation of grades in Indianapolis, cost $161,000, 20 per cent completed.

Toledo, St. Louis & Western—Bridge over Wabash river at Silverwood, City, cost $610,000, 10 per cent completed.

Vandalia—Grade reduction and additional facilities between Frankfort and Logansport, cost $565,000, 25 per cent completed; new classification yard and enlargement of present yard and engine house at Bicknell, cost $150,000, 95 per cent completed.

Iowa

Other Important Work Under Construction

Chicago & North Western—Freight house, office building and yard tracks, joint with Chicago, St. Paul, Minneapolis & Omaha at Sioux City, cost $180,000, completed.

Chicago, Milwaukee & St. Paul—New engine terminal and yard at North McGregor, cost $575,000, 35 per cent completed; new engine terminal at Atkins, cost $635,000, 10 per cent completed; new engine terminal at Sioux City, cost $610,000, 10 per cent completed.

Illinois Central—New Mechanical facilities, Waterloo, cost $171,000, completed.

Kansas

First Track	Miles	Miles
Anthony & Northern—Trousdale to Kinsley, 24 miles; Trousdale to Larned, 26 miles; total	50.00	
Missouri Pacific—At Durand, 0.19 mile; at Yates Center, 0.12; total	0.31	
Salina Northern—Between Lincoln and Osborn	46.00	96.31

Other Important Work Under Construction.

Anthony & Northern—Building from Larned to north line Pawnee county, 21 miles; grading contract let to F. M. Thompson, Larned.

Kentucky

First Track	Miles	Miles
Cumberland & Manchester—Barbourville to Manchester	24.00	24.00
Second Track		
Nashville, Chattanooga & St Louis—Paducah Union Depot to P. & I. Junction	0.77	
Paducah & Illinois—Between Paducah and Kentucky-Illinois state line	1.49	2.26

Other Important Work Under Construction

Chesapeake & Ohio—Engine terminal at Netherland, cost $105,000, 90 per cent completed.

Chesapeake & Ohio Northern—Building between Limeville and Waverly, Ohio, 26 miles, track laying in progress.

Illinois Central—New mechanical terminal, Louisville, cost $215,000, 20 per cent completed.

Louisville & Nashville—Improvements at DeCoursey yard, cost $429,986, 50 per cent completed; yard at Hazard, cost $109,630, 90 per cent completed.

Louisiana

First Track	Miles	Miles
Gulf, Sabine & Red River Ry. & Navigation Co.—Fields to Francis	29.00	
St. Louis, Iron Mountain & Southern—Ferriday to T. & P. connection	0.81	29.81

Other Important Work Under Construction

Morgan's Louisiana & Texas—New machine and erecting shop at Algiers, cost $236,000, 98 per cent completed

Ouachita & North Western—Building between Clarks and Standard, 10 miles.

Trans-Mississippi Terminal Company—Terminal improvements at New Orleans including a union passenger, team yard, inbound and outbound freight houses, cost $4,000,000, completed.

Maryland

First Track	Miles	Miles
Baltimore & Ohio—Hagerstown to Security	3.50	3.50
Second Track		
Western Maryland—Edgemont to Pen Mar, 3.52; North Junction to Bissell, 2.10 miles; total	5.62	5.62

Other Important Work Under Construction.

Baltimore & Ohio (Long Fork Railway)—Building from Alphoretta, Ky., to Weeksbury, 25.6 miles; contractors, Bates & Rogers, Chicago. New export pier at Curtis Bay, cost $2,500,000, 90 per cent completed.

Pennsylvania Railroad—Export coal facilities at Canton, Baltimore, including new yards, car dumper, vessel loaders and a reinforced concrete pier, completed.

Massachusetts

First Track	Miles	Miles
Fore River Railroad—At Quincy	1.00	1.00

Other Important Work Under Construction

Boston & Albany—Reinforced concrete arch in Newton, cost $110,000, 50 per cent completed.

Boston & Maine—Yard changes at Ayer, cost $185,000, 5 per cent completed; engine house facilities at East Deerfield, cost $513,000, 16 per cent completed, and extension of yard facilities cost $450,000, 4 per cent completed; freight yard at Lowell, cost $207,000, 3 per cent completed.

New York, New Haven & Hartford—Improvements at Dover street yard engine facilities, Boston, cost $130,350, 13.5 per cent completed.

Southern New England—Building from Palmer, Mass., to Providence, R. I., 75 miles.

Michigan

First Track	Miles	Miles
Boyne City, Gaylord & Alpena—Not specified	3.50	
Detroit, Bay City & Western—Peck to Port Huron	34.00	
East Jordan & Southern—Not specified	2.50	37.00
Second Track		
Chicago, Detroit & Canada Grand Trunk Junction (G. T.) Milwaukee Junction to point west of Baby	6.68	
Detroit, Grand Haven & Milwaukee (G. T.)—Milwaukee Junction to Royal Oak, 8.68 miles; through Pontiac, 2.86 miles; total	11.54	
Detroit Terminal—At Detroit	1.09	19.31

Other Important Work Under Construction

Chicago, Detroit & Canada Grand Trunk Junction (Grand Trunk)—Grade separation at Detroit, cost $350,000, 50 per cent completed; new yard midway between Mt. Olivet and Fraser, cost $370,000, 25 per cent completed.

Detroit Terminal Railroad—Building at Detroit 2.11 miles of first and second track; contractor for grading, W. E. Tench, Detroit.

New York Central—Grade separation at Detroit, cost $5,000,000, 22 per cent completed; River Rouge freight yard and engine terminal at Detroit, cost $5,000,000, 10 per cent completed.

Minnesota

First Track	Miles	Miles
Consolidated Vermillion & Extension Company—Burnside Lake (near Robinson) to Semer	5.75	
Duluth, Missabe & Northern—Hull-Rust Junction to Sheridan mine	4.45	10.20
Second Track		
Chicago, Milwaukee & St. Paul—Double track switch to Appleton, 13.1 miles; Junction switch to Ortonville, 1.8 miles; total	14.90	14.90

Other Important Work Under Construction

Chicago, Milwaukee & St. Paul—Track depression, 2.4 miles, at Minneapolis, cost $3,000,000, 96 per cent completed.

Chicago, St. Paul, Minneapolis & Omaha—Bridge over Mississippi river at St. Paul, cost $222,000, completed.

Duluth & Iron Range—Ore docks at Two Harbors, cost $1,400,000, 95 per cent completed; car repair shop at Two Harbors, cost $150,000, 90 per cent completed.

Great Northern—Yards at Northtown, cost $220,000, completed; shops and engine house at Ihlen, cost $170,000, and at Breckenridge, cost $100,000, completed.

Minneapolis & St. Louis—Freight terminal improvements at Minneapolis, cost $145,000, 65 per cent completed, and rebuilding Lake street viaduct, cost $135,000, 75 per cent completed.

Mississippi

First Track	Miles	Miles
Alabama & Mississippi—Between Dueitt and Evanston	19.00	
Batesville Southwestern—Crowden south	.70	
Jackson & Eastern—Union to Sebastopol	14.00	
Meridian & Memphis—At Meridian	3.20	36.90
Second Track		
Chicago, Burlington & Quincy—Forbes to Curzons	5.00	
Jackson & Eastern—Union to Sebastopol	14.00	19.00

Other Important Work Under Construction

Alabama & Vicksburg and Mobile & Ohio—Subway at Meridian, cost $115,000, 50 per cent completed.

Jackson & Eastern—Building between Meridian and A. T. & N. Ry., 27 miles.

Yazoo & Mississippi Valley—Big Black river bridge near Vicksburg, cost $152,000, 30 per cent completed; raising grade above high water on 8.6 miles of track between Yazoo river and Vicksburg, cost $168,000, 80 per cent completed.

Missouri

Second Track	Miles	Miles
Kansas City Terminal Railway—At Kansas City	3.00	3.00

Other Important Work Under Construction

Chicago, Burlington & Quincy—Building bridge over Missouri river at Kansas City to be opened early in 1917.

Kansas City Terminal Railway—Double track connecting line between Kansas City, Mo., and Kansas City, Kan., including bridge, 4.24 miles; work just started by American Bridge Co., Kansas City, Mo.

Kansas City Terminal Railway—Paseo viaduct, cost $146,000, completed.

St. Louis-San Francisco—River front improvements at Cape Girardeau, cost $237,000, 50 per cent completed; mechanical improvements at St. Louis, cost $118,000, 50 per cent completed.

Terminal Railroad Association of St. Louis—Harlem receiving and classification yard, cost $100,000, 30 per cent completed.

Montana

First Track	Miles	Miles
Chicago, Milwaukee & St. Paul—Great Falls to Agawam	66.70	
Great Falls & Teton County (Gt. Nor.)—Bynum to Pendroy	8.66	
Montana Eastern (Gt. Nor.)—Lambert to Richey	24.00	99.36

Other Important Work Under Construction

Chicago, Milwaukee & St. Paul—Building between Grass Range and Winnett, 23.50 miles; Big Blackfoot Railway, building between Big Blackfoot Junction and Clearwater, 22.50 miles.

Great Northern—Change of line at Paola, cost $175,000, 90 per cent completed; shop and engine house at Great Falls, cost $175,000, completed.

Montana Eastern (Gt. Nor.)—Building between Lewistown and Grass Range, 32 miles; contractors, A. Guthrie & Co., Inc., St. Paul, Minn.

Nebraska

Other Important Work Under Construction

Union Pacific—Reconstruction of Missouri river bridge at Omaha, cost $867,000, 35 per cent completed.

NEW JERSEY

First Track	Miles	Miles
Erie—Mile post, 3.25, to mile post, 4.87	1.62	
Lehigh Valley—Extension of Raritan branch	0.62	
West Jersey & Seashore (Penn. R. R.)—Not specified	0.32	2.56
Second Track		
West Jersey & Seashore (Penn. R. R.)—Not specified	0.89	.89
Fifth Track		
Central of New Jersey—Cranford to Westfield, 1.58 miles; at Aldene, 0.30 mile; total	1.88	1.88
Sixth Track		
Central of New Jersey—At Plainfield	0.14	0.14

Other Important Work Under Construction

Erie—Engine terminal at Croxton, cost $650,000, 50 per cent completed.

Lehigh Valley—Ore dock and approach channel, at Constable Hook, completed.

New York, Susquehanna & Western (Erie)—New terminal facilities at Undercliff Junction, cost $150,000, 40 per cent completed; terminal facilities at Undercliff, cost $725,000, 40 per cent completed.

Pennsylvania Railroad—Track elevation at Camden under way.

Philadelphia & Reading—Additional tracks and grade reduction between Glenmoore and Hopewell, cost $400,000, 20 per cent completed.

West Shore (N. Y. C.)—New piers and shop extension at Weehawken, cost $350,000, completed; new ice house, cost $150,000, 40 per cent completed.

NEW MEXICO

First Track	Miles	Miles
El Paso & Northeastern—Jarilla branch extension, 0.32 mile, relocated; end of Jarillo branch to point 1.14 miles beyond, 1.14 miles; total	1.46	1.46

NEW YORK

First Track	Miles	Miles
Cooperstown & Charlotte Valley (D. & H.)—At Cooperstown	0.31	
Lehigh-Buffalo Terminal Co. (L. V.)—At Buffalo	0.68	
New York Connecting—Port Morris to Woodside avenue	4.64	5.63
Second Track		
Lehigh-Buffalo Terminal Co. (L. V.)—At Buffalo	0.68	0.68
Third Track		
Boston & Albany—East Chatham to Chatham	2.14	
New York Central—Beacon to Chelsea	4.03	6.17
Fourth Track		
New York Central—Beacon to Chelsea	4.32	4.32

Other Important Work Under Construction

Baltimore & Ohio—Bulkhead, coal pier and new yard at Arlington, Staten Island, cost $1,200,000, 2 per cent completed.

Delaware, Lackawanna & Western—Terminal improvements at Buffalo including a new passenger station, Bush train shed, warehouse facilities and a concrete and steel viaduct over Main street, complete except viaducts and track system, cost with land $2,500,000; new coal dumper pier and yard at Erie street, Buffalo, completed.

Lehigh Valley—New engine house and tracks at Suspension Bridge nearing completion; new engine terminal and tracks at Manchester nearing completion; new coal car dumper plant at Tifft Farm, completed; new two-story Pier 44, East river, nearing completion; new Pier 8, North river, completed.

Lehigh-Buffalo Terminal Railway (L. V.)—Terminal improvements at Buffalo, including four-story passenger station, Bush train shed, new freight house and driveways, all completed with exception of train shed, which is about 85 per cent completed.

New York Central—Widening and extending Pier 17, New York, cost $180,000, completed; extension of yard at West Albany, cost $500,000, 40 per cent completed; additional tracks and signals at general passenger and freight terminal in Utica, cost $6,000,000, 80 per cent completed; new yard at Gardenville, cost $7,000,000, 25 per cent completed; general station improvements at Poughkeepsie, cost $3,600,000, 64 per cent completed.

NORTH CAROLINA

First Track	Miles	Miles
Linville River—Montezuma to Shulls Mills	14.00	
Madison County—Belva to Hickey's Fork	8.00	
Wautauga & Yadkin River—Darby west	1.00	23.00
Second Track		
Southern Railway—Rocky river to Concord	6.50	6.50

Other Important Work Under Construction

Hiawassee Valley—Grading finished from Andrews to Hainesville, 25 miles.

Madison County Railway—Building between Hickeys Fork and Allegheny, 3 miles; contractors, Patton Bros., Druid.

Norfolk & Western—Freight station and yard shops at Winston-Salem, cost $167,000, completed.

Seaboard Air Line—Grade revision between Hamlet, N. C., and Andrews, S. C., cost $300,000, also grade revision between Raleigh and Hamlet, cost $300,000.

Southern Railway—Building additional tracks in Pomona Yard, and engine facilities; work started on car repair facilities at Spencer.

Statesville Air Line—Building between Statesville and St. Airy, 62 miles, about 22 miles graded.

Watauga & Yadkin River—Building between point west of Darby and Rogers Mill, 7 miles, with company forces.

NORTH DAKOTA

First Track	Miles	Miles
Great Northern—Wildrose to Grenora	36.34	
Midland Continental—At Jamestown	0.60	36.94

Other Important Work Under Construction

Great Northern—Shop and engine house at Minot, cost $100,000, completed.

OHIO

First Track	Miles	Miles
Chesapeake & Ohio Northern—Sciotoville north towards Waverly	4.00	
Newburgh & South Shore—Campbell road to Harvard avenue, 1.2 miles; Harvard avenue to New York Central, 1.1 miles; East 42nd street to Harvard avenue, 0.8 mile; total	3.10	7.10
Second Track		
Cincinnati, Hamilton & Dayton—Miamisburg to South Dayton, 7.00 miles; Carlisle to Miamisburg, 5.00 miles; AX Cabin to Carlisle, 11.00 miles; total	23.00	
Lake Erie & Eastern—In Youngstown	2.75	25.75
Third Track		
Newburgh & South Shore—Independence road to East 42nd street	0.30	
Pittsburgh & Lake Erie—Lowellville to Lowellville Junction	1.76	2.06
Fourth Track		
Pittsburgh & Lake Erie—Lowellville to Lowellville Junction	1.76	1.76

Other Important Work Under Construction

Baltimore & Ohio—Second track and grade crossing elimination at Defiance, cost $530,000, 40 per cent completed.

Baltimore & Ohio Southwestern—Hopple street viaduct at Cincinnati, grading completed, cost $420,000.

Bessemer & Lake Erie—Enlargement of yard at Conneaut Harbor, 35 per cent completed.

Cleveland, Cincinnati, Chicago & St. Louis—Elevation of tracks at Columbus, cost $642,700, 25 per cent completed.

Dayton Union Railway Company—New bridge at Dayton, cost $304,000, 92 per cent completed.

Newburgh & South Shore—Locomotive repair shop at Cleveland, cost $115,000, 90 per cent completed.

New York Central—Ashtabula steel car shops, cost $1,000,000, 30 per cent completed; grade crossing elimination at Cleveland, cost $350,000, 20 per cent completed; Elyria grade separation, cost $1,500,000, 25 per cent completed; grade crossing elimination at Sandusky, cost $170,000, 5 per cent completed; Port Clinton cut-off, grade crossing elimination and change of line, cost $1,250,000, 20 per cent completed; engine terminal and car repair facilities at Air Line Junction yard at Toledo, cost $3,000,000, 90 per cent completed.

Pennsylvania Lines West—Pennsylvania Company, Northwest and Central Systems, relocation of line at Delaware, cost $600,000, 30 per cent completed; rebuilding bridge at Toledo, cost $500,000, completed; coal handling plant, etc., at Sandusky, cost $830,000, 95 per cent completed; grade reduction, Toledo division, at North Columbus, cost $170,000, 40 per cent completed; track elevation at Columbus, cost $125,000, 40 per cent completed; coal handling plant at Ashtabula, cost $170,000, 95 per cent completed; second track and grade reduction at Warren, cost $170,000, 17 per cent completed; freight yard at Stark, cost $251,000, completed; third and fourth tracks east and west of Alliance, cost $1,207,000, 40 per cent completed.

Pittsburgh, Cincinnati, Chicago & St. Louis (P. L. W.)—Track elevation and grade elimination at Cincinnati, cost $519,000, 50 per cent completed; additional yard facilities at Bradford, cost $351,500, 10 per cent completed.

Toledo, St. Louis & Western—Bridge over Maumee river at Grand Rapids, cost $100,000, 40 per cent completed.

Wheeling & Lake Erie—New freight terminal warehouse at Canton, cost $175,000, 80 per cent completed; building between Canton Yard and United Furnace Co., 4 miles.

OKLAHOMA

First Track	Miles	Miles
Midland Valley—Glenpool to Keifer	2.80	
Okmulgee Northern—Deep Fork to Okmulgee	11.00	
Sapulpa & Oil Field—Depew to Shamrock	9.00	22.80
Second Track		
St. Louis-San Francisco—Tulsa stock yards to Red Fork	6.19	6.19

Other Important Work Under Construction

Clinton & Oklahoma Western—Building from Strong City to Cheyenne, 7 miles.

St. Louis-San Francisco—Mechanical facilities at Oklahoma City, cost $180,000, 50 per cent completed; mechanical facilities at West Tulsa, cost $275,000, 40 per cent completed.

OREGON

First Track	Miles	Miles
Columbia & Nehalem River—Not specified	8.00	
Oregon-Washington Railroad & Navigation Co.—Riverside to Crane	33.50	
Valley & Siletz—Spauldings to Siletz Basin, 6 miles; Helmicks to Independence, 7 miles; total	13.00	
Willamette Pacific (So. Pac.)—North of Umpqua river to 10 miles south of Umpqua river	11.30	65.80
Second Track		
Oregon & California (So. Pac.)—In Eugene yard	1.75	1.75

Other Important Work Under Construction

Columbia & Nehalem River—Building from mile 26 to mile 30, 4 miles.

Oregon Washington Railroad & Navigation Company—Terminal facilities at The Dalles, cost $234,000, completed; terminal facilities at Rieth, cost $194,060, completed; lining peninsula tunnel between Portland and North Portland Junction, cost $450,000, 75 per cent completed.

PENNSYLVANIA

First Track	Miles	Miles
East Broad Top Railroad & Coal Company—Woodvale to Alvan	1.20	
Lake Erie, Franklin & Clarion—Alton Junction to mine	1.00	
Lehigh & New England—Palmerton Branch to New Jersey Zinc Co.	0.26	
Midland Pennsylvania—Millersburg to Gratz	15.00	
Pennsylvania Railroad—Not specified	4.55	
Philadelphia, Baltimore & Washington (Penn. R. R.)—Not specified	0.33	

Philadelphia, Bethlehem & New England—Not specified	0.30	
Pittsburg & Shawmut—Cadogan to Freeport	8.42	
Potato Creek—Norwich to West Branch	7.50	
Western Maryland Somerset Coal Ry.—Coal Junction to mine 123, 2.2 miles; with branch to mine 125, 2.4 miles; total	4.60	43.16

Second Track

Lehigh Valley—West end of Jeddo No. 4 to Ebervale	0.57	
Philadelphia & Reading—Between Silverton and Westwood	0.12	
Pennsylvania Railroad—Not specified	2.30	
Philadelphia, Baltimore & Washington (Penn. R. R.) Not specified	0.22	
Pittsburgh, Cincinnati, Chicago & St. Louis (P. L. W.)—On Burgetts Branch	0.63	
Pittsburgh & Lake Erie—Fayette City to E. Roscoe	2.36	6.20

Third Track

Pittsburgh & Lake Erie—Near Lowellville	0.14	0.14

Fourth Track

Pennsylvania Company—Northwest and Central Systems—At Lawrence Junction	0.32	
Pittsburgh & Lake Erie—Near Lowellville	0.14	0.46

Other Important Work Under Construction

Baltimore & Ohio—Addition to new freight house at Allegheny, cost $228,000, 2 per cent completed; separation of street and railway grades at Liberty avenue, Pittsburgh, cost $728,000, 95 per cent completed.

Bessemer & Lake Erie—New Alleghany river bridge at Black's Run, 20 per cent completed; K.-O. Junction yard, 5 miles north of Greenville, 47 per cent completed.

Cambria & Indiana—Building between Regan Junction and Nant-y-Glo, 8 miles; contractors, A. S. Anderson & Bro., Inc., Altoona.

Chartiers Southern—Line between Eighty-four and Marianna, 10.22, has grading, masonry and tunnel work completed, bridge superstructure and track laying deferred.

Cumberland Valley—North longitudinal half of double track concrete arch bridge over Susquehanna river at Harrisburg, cost $315,000, masonry completed, track laying 50 per cent completed. Projected and under construction. Second track from Newville to Oakville, 4.9 miles. Work, 75 per cent completed. Grades and alinement between these points are being revised.

East Broad Top Railroad—Mt. Union gravity yard, cost $110,000, 95 per cent completed.

Erie—Renewal of bridge over Susquehanna river just west of Susquehanna station, cost $171,398, 20 per cent completed.

Lehigh & New England—Terminal facilities including yard, shops and engine house at Pen Argyl, cost $650,000, 80 per cent completed.

Midland Pennsylvania—Building between Gratz and Gordon, 25 miles; contractor, Walter S. Aldrich, Audubon, New Jersey.

New York Central—Grade separation at Erie, cost $1,600,000, 10 per cent completed.

Pennsylvania Lines West—Building between Rochester and Kenwood, 4.40 miles.

Pennsylvania Railroad—Track elevation at Johnstown including a new passenger station, a new bridge over the Conemaugh river, retaining walls and elimination of grade crossings, cost with land $3,000,000, nearing completion.

Philadelphia & Reading—Bridge over trolley tracks, Susquehanna river and highway at Sunbury, cost $268,000, 70 per cent completed; bridge over Susquehanna river and avoidance of two grade crossings at Milton, cost $265,000, 70 per cent completed; opening streets in Philadelphia under tracks of Richmond branch and appurtenant work, cost $1,761,000, 10 per cent completed.

Pittsburgh, Cincinnati, Chicago & St. Louis (P. L. W.)—Building between Chester, W. Va., and Raccoon Creek, 1.76 miles in West Virginia and 10.9 miles in Pennsylvania; Ferguson & Edmondson Company, Pittsburgh, contractors for part of the work.

Valzinco Northern—Building from Sulphur Mines near Mineral, Louisa County to Valzinco, 10.5 miles.

Rhode Island

Other Important Work Under Construction

New York, New Haven & Hartford—Improvements to engine house facilities at Providence, cost $225,000, 40 per cent completed.

South Carolina

First Track	Miles	Miles
Atlantic Coast Line—Rumple to Park	3.76	
Charleston Southern (S. A. L.)—Charleston to Georgia state line	88.00	91.76

Second Track

Southern Railway—Hayne to Duncan	12.20	12.20

Other Important Work Under Construction.

Southern Railway—Work started on important improvements, including new engine terminal facilities and increased yard capacity at Hayne.

South Dakota

Second Track	Miles	Miles
Chicago, Milwaukee & St. Paul—Ortonville to Milbank	10.30	10.30

Tennessee

First Track	Miles	Miles
Arkansas & Memphis Railway Bridge & Terminal Co.—State line to Memphis	0.72	
Morgan & Fentress—Mantrin toward Jamestown	8.00	
Tennessee Railway—Rosedale to Indian Fork	2.75	19.47
Oneida & Western—River crossing to Christian	8.00	

Second Track

Arkansas & Memphis Railway, Bridge & Terminal Co.—State line to Memphis	0.73	
Morgan & Fentress—Not specified	1.19	
Nashville, Chattanooga & St. Louis—Tantallon to Sherwood	2.1	4.02

Other Important Work Under Construction

Arkansas & Memphis Bridge & Railway Terminal Co.—Building between Memphis and point in Arkansas, work being done by bridge company's forces.

Chicago, Rock Island & Pacific—Subway in Penn street, Memphis, cost $125,000, completed: bridge over Mississippi river and approaches at Memphis, cost $5,250,000, 99 per cent completed.

Illinois Central—Car repair shed, Nonconnah yard, Memphis, cost $150,000, completed.

Morgan & Fentress—Building from Obed Junction towards Jamestown, 10 miles.

Oneida & Western—Building extension of 12 miles from Hagmeyer; contractors, Cook Construction Co.

Union Railway—Freight terminals at Memphis, cost $150,000, 75 per cent completed.

Texas

First Track	Miles	Miles
Paris & Mt. Pleasant—At Mount Pleasant	.13	
Roby & Northern—Between Roby and North Roby	5.00	
Sugar Land—Rotchford to Anchor	5.73	10.86

Other Important Work Under Construction.

Union Terminal Company—Passenger facilities at Dallas including the station building and tracks, coach and engine facilities, double and single track connection with the Santa Fe, and a belt line, cost $5,125,000, completed.

Utah

Second Track	Miles	Miles
Oregon Short Line—Sugar factory to Logan	2.02	
Salt Lake, Garfield & Western—At Ewings	0.88	2.90

Other Important Work Under Construction.

Union Pacific—Building second track between Wahsatch and Emory, 15.22 miles.

Virginia

First Track	Miles	Miles
Big Sandy & Cumberland—Matney to Grundy	9.20	
Chesapeake & Ohio—Perriman Junction to Peniman	4.68	
Interstate Railroad—Exeder Junction to Exeder	.70	14.58

Second Track

Chesapeake & Ohio—Balcony Falls to Greenlee	3.40	
New York, Philadelphia & Norfolk—Hallwood to Tasley	13.10	
Norfolk & Western—Not specified	11.05	
Southern Railway—Orange to Charlottesville, 27.50 miles; mile post 156.9 to Amherst, 2.10 miles; Sycamore to Gretna, 3.39 miles; Whittles to Dry Fork, 9.20 miles; Dry Fork to Danville, 12.95 miles; total	55.14	82.69

Other Important Work Under Construction.

Southern Railway—Work started on terminal yard at Monroe; grading work let to Langhorne & Langhorne, Lynchburg, Va.; modern engine terminal facilities at Alexandria.

Washington

First Track	Miles	Miles
Bellingham & Northern—Goshen to Welcome	11.30	
Cowlitz, Chehalis & Cascade—Klaus to La Camas	9.30	
Northern Pacific—Grandview to Gibbon, 12.02 miles; Harrah to White Swan, 9.23 miles; total	21.25	
Oregon-Washington Railroad & Navigation Co.—Chamber's Prairie to Olympia	7.40	
Seattle, Port Angeles & Western (C. M. & St. P.)—Majestic to end of track	6.40	55.65

Other Important Work Under Construction

Great Northern—Snow sheds on west slope of Cascade mountains, cost $610,000, and on east slope, cost $415,000, completed; change of line at Embro, cost $200,000, also at Corea, cost $300,000, completed.

West Virginia

First Track	Miles	Miles
Chesapeake & Ohio—At Marshall 0.10 miles from mouth of Peter Cave Fork to mouth of Sulphur Spring branch, 2.00 miles; from mouth of Peter Cave Fork to Silush, 5.10 miles; on Left Hand Fork of Dingess Run branch in Lincoln county, 0.79 miles; from mouth of Beech Creek to end of line in Logan county, 1.56 miles; total	9.55	
Virginian—Stone Coal to Besoco, 6.4 miles; Sullivan to Fireco, 4.7 miles; total	11.10	
Western Maryland-Fairmont Helens Run Railway—Chieftom to Ida May, 4.85 miles, with branch to Carolina, 1.86 miles; total	6.71	
Williamsport, Nessle & Martinsburg—Snyder to Nessle	0.91	28.27

Other Important Work Under Construction.

Baltimore & Ohio—Improved freight facilities at Parkersburg, cost $265,000, 75 per cent completed.

Chesapeake & Ohio—Building between Seth and Jarrolds Valley, 13.3 miles, contractors Boxley Bros., Orange, Va.; Little Marsh Fork to Hazy Creek, 6.5 miles, Rowland Land Co. are handling grading; Pond Fork Railway, Madison to mouth of West Fork, 11.6 miles, contractors Board & Duffield, Charleston; Man to Gilbert Creek, 12.8 miles, contractors Ballard, Herring & Severs, Yancey Mills, Va.; Cow Creek to Conley Creek, 3 miles, Cole & Crane are handling grading.

Virginian Railway—Building Laurel Fork extension of Stone Coal Branch between Besoco and Princewick Mine, 2.84 miles; Piney Creek extension of Winding Gulf Branch between Pemberton and Sullivan, 2.80 miles; Lampkin Branch Spur, between Fireco and Leckie Coal Co. Mine, 1.34 miles.

Western Maryland (Fairmont Bingamon Railway)—Building between Hutchinson and Wyatt, 8.42 miles, contractors, Miller Construction Co., Lock Haven, Pa.

Williamsport, Nessle & Martinsburg—Building between Nessle and Dodd, 3 miles, with company forces.

WISCONSIN

First Track	Miles	Miles
Chicago, St. Paul, Minneapolis & Omaha—Cut off on Hankinal branch	5.89*	
Ill. Iowa & Northeastern—Not specified	1.00	
Wisconsin & Northern—Shawano, south	4.37	11.26
Second Track		
Chicago, Burlington & Quincy—Bagley to Wisconsin river	7.15	7.15

*Relocated line.

Other Important Work Under Construction

Chicago & North Western—Elevation of 15 miles of main and yard tracks at Milwaukee, cost $1,200,000, 85 per cent completed; reinforced concrete grain elevator and 5 miles of yard tracks at Milwaukee, cost $920,000, completed; extension of ore docks, 1 and 2 at Ashland, cost $320,000, completed; 12 miles of yard tracks at Ashland, cost $1,340,000, 10 per cent completed.

Chicago, Burlington & Quincy—Building second track between Little and Bluff Siding, 17 miles.

Chicago, Milwaukee & St. Paul—Track elevation at Milwaukee, 1.4 miles, cost $1,500,000, 90 per cent completed; elevator at E. Milwaukee, cost $275,000, 40 per cent completed.

Ettrick & Northern—Building between Blair and Ettrick, 10.20 miles, contractors Matchell & Raichle, Ettrick.

Great Northern—Yards at Superior, cost $100,000, completed.

Interstate Transfer—Building between South Itasca and Wisconsin Point, 4.80 miles, contractors Ord Co., Duluth, Minn.

Waushara Railroad—Building between Red Granite and Poy Sippe, 8.1 miles, grading finished on 45 per cent.

WYOMING

First Track	Miles	Miles
Wyoming Railway—Watt to Healy	8.00	8.00

Other Important Work Under Construction.

Wyoming Railway—Building between Healy and Buffalo, 4.5 miles, contractors Watt Bros. Construction Co., Buffalo, Wyo.

CANADA

First Track	Miles	Miles
Bay Shore & West St. John (Can. Pac.) New Brunswick—Not specified	0.75	
Canadian Pacific (Western Lines)—Pakowki, Alta, to Manyberries, 10.4 miles; Stony Creek to Cambie, 10.5 miles; total	20.90	
Canadian Northern (Western Lines)—In Alberta completing line to Alliance	3.20	
Edmonton, Dunvegan & British Columbia—On main line, 21 miles; Edmonton, Dunvegan Graid Pairie branch, 50 miles; Alberta Great Waterways, 40 miles; Central Canada, Peace River branch, 5 miles; total	116.00	116.00
Grand Trunk Pacific Branch Lines Company—In Saskatchewan, Moose Jaw-Northwest mile 67 to mile 70-3.00 miles; from Regina-Moose Jaw branch at mile 46 to elevator at Moose Jaw, 2.65 miles; total	5.65	
Hudson Bay Railway—In Manitoba	90.00	90.00
Kettle Valley—West of Penticon, B. C.	1.70	
Pacific Great Eastern—Clinton, B. C., to Horse Lake Summit	37.00	
Quebec Central in Province of Quebec—Not specified	0.35	
Toronto, Hamilton & Buffalo—Dunnville, Ont., to Port Maitland	5.00	
Vancouver, Victoria & Eastern (Gt. Nor.)—Kilgard, B. C., to Cannor, 9.32 miles; at Hope, 0.17 mile; total	9.49	290.04
Second Track		
Canadian Pacific—Between Stony Creek and Cambie	7.90	7.90

Other Important Work Under Construction

Canadian Pacific—Work carried out on new station at Quebec and rearrangement of yard at cost of $300,000, also on North Toronto station, at cost of $150,000.

Canadian Pacific—Replacement line 18.6 miles long through the Selkirk mountains, British Columbia, double tracked, including a double track tunnel 5 miles long at Rogers Pass, nearing completion.

Canadian Government Railways—New terminal facilities at Halifax, cost $3,000,000, 85 per cent completed; grain elevator and tracks at St. John, cost $500,000, 5 per cent completed; Prince Edward Island car ferry with terminals, cost $600,000, 20 per cent completed; grain elevator at Transcona, cost $500,000, 5 per cent completed.

Canadian Northern (Western Lines)—Building from Hanna, Alta., southeast, 60 miles, contractor W. J. Connor, Winnipeg, Man.; from Dunblane, Sask., 35 miles and on Thunder Hill Branch, 46 miles, contract let to Western Canada Construction Co., Winnipeg; from Oliver, Alta., north 100 miles, contractor D. F. McArthur, Edmonton, Alta.

Grand Trunk Pacific Branch Lines, Prince Albert Branch—Building from mile 87.4 to mile 111.66, 24.26 miles, grade resurfaced for track laying.

Michigan Central—Roundhouse, coaling plant, etc., at Montrose, Ont., cost $250,000, completed.

St. John & Quebec—Building from Gagetown, N. S., to Westfield, 45 miles, contractors Nova Scotia Construction Co., Halifax.

Toronto Terminal Railway—Union station at Toronto, Ontario, including track and harbor changes, estimated cost $12,000,000. Substructure and steel frame of station building completed.

Vancouver, Victoria & Eastern—Passenger and freight terminal at Vancouver, B. C., cost $500,000, 75 per cent completed.

PANAMA

First Track	Miles	Miles
Chiriqui Railroad—Between Port of Pedregal and Boquete and on branch connecting Potrerillos and La Concepcion	40.00	40.00

Other Important Work Under Construction

Panama Railroad—Dock 7, at Christobal, cost $1,440,000, completed.

ROADS THAT HAVE FAILED TO CO-OPERATE WITH CAR SERVICE COMMISSION

Following its announced intention of using publicity, if necessary, to force some railroads to obey the instructions issued by the Commission on Car Service to relieve the car shortage, the American Railway Association, through the Commission on Car Service, on December 22 made public the following statement, copies of which were sent to all carriers and commercial bodies and to the newspapers:

"To All Members of the American Railway Association:

"The Commission on Car Service, sitting in Washington in daily consultation with the Interstate Commerce Commission, in an effort to relieve the car shortage existing in certain parts of the country, has made four important requests upon the railroads.

"These requests, enumerated below, were formulated in the interest of the public as a whole, and with the knowledge that some roads would be compelled to make sacrifices to comply with them. It was thought, however, that it was absolutely necessary that the railroads themselves should take drastic action, if they were to make any progress in relieving the situation.

"The requests issued by the Commission on Car Service as instructions to all railroads of the country follow:

"1. Request of November 23, 1916, that all railways should at once return to car owners all open top freight cars, either loaded or empty.

"2. Request of November 29, 1916, that all railways which had on their lines more box cars than they owned should, regardless of local requirements, immediately move such excess of cars, loaded or empty, toward the railroad companies which have less than their ownership of cars. A statement of car location as of November 1 was published at that time.

3. Request of December 1, 1916, that railways should deliver to their western and southern connections certain designated percentages of box cars, either loaded or empty, in excess of the number received from those connections.

4. Under date of November 25, a circular was issued, requesting all railroads to send location statements of foreign and system cars on their line, making certain separation reports to be made as of the 1st, 8th, 15th and 23rd of each month.

"These requests have met with generous and prompt response on the part of a number of roads, but some of the lines have shown much less progress in complying with them than they should; this is shown by the reports received to date by the Commission on Car Service. In general, the excess of open top equipment is located on western lines and the excess of box cars on eastern lines. It is apparent that both classes of lines have been reluctant to return the kind of equipment of which they have an excess unless their deficiencies in other equipment are at the same time relieved It is equally apparent that if both classes of roads will give their full co-operation in complying with the request of the Commission on Car Service all lines will be mutually benefited.

"The commission is strongly of the view that if any road does not fully and promptly support the program outlined with respect to both open top and box cars such road places itself unfairly in a position of advantage as compared with other railways in the same territory complying with the instructions of the Commission on Car Service. For this reason the Commission on Car Service now makes such deductions as are possible from the reports received, and draws attention to the lines which apparently are not doing everything possible to return excess equipment to deficiency lines, in the hope that these lines will at once show a marked improvement in their performance.

Open Top Equipment

"The only statistics available to the Commission on Car Service from which may be deduced the effect of the request to return open top cars to owners are the 'Percentage of gondola, coal and coke cars on line to total owned,' as reported by the various roads. In studying these figures it must be remembered that roads receiving and not originating coal shipments have on their lines in normal times an excess over cars owned, while roads originating coal traffic normally hold less than their ownership. Regardless of this condition roads having an excess of coal car equipment should have materially reduced such excess following the request of November 23 made by the Commission on Car Service. Comparing the reports of December 8 with those of December 1, November 23 and November 15, the following lines, having an excess above ownership, have not shown the desired improvement in percentage of coal cars on line to total owned:

Road	Nov. 15	Nov. 23	Dec. 1	Dec. 8
Group 1.				
Boston & Albany	151.82	143.40	132.84	159.89
Central Vermont	208.74	199.02	188.34	222.82
New York, New Haven & Hartford.	140.87	148.81	156.96	151.51
Rutland Railroad	84.39	93.87	86.80	104.83
Group 2.				
Erie	117.03	115.35	120.16	119.02
New York Central	110.76	118.40	110.18	111.15
Philadelphia & Reading	113.78	118.93	114.26	116.15
Group 3.				
Ann Arbor	144.59	125.93	142.52	132.15
Chicago, Indianapolis & Louisville.	93.15	104.63	....	110.58
Cincinnati, Hamilton & Dayton...	186.11	187.97	167.65	181.18
Cleveland, Cincinnati, Chicago & St. Louis	100.60	100.20	113.27	112.96
New York, Chicago & St. Louis..	110.89	106.40	108.01	113.14
Pere Marquette	213.44	189.51	186.11	198.61
Wheeling & Lake Erie	131.81	....	122.65	125.57
Group 4.				
Atlantic Coast Line	237.32	226.46	219.21	228.66
Seaboard Air Line	109.89	112.43	118.15	114.24
Group 5.				
New Orleans & Northeastern	85.77	108.24	138.47	141.12
Group 6.				
Chicago Great Western	146.89	....	144.01	178.48
Great Northern	179.47	174.45	172.42	173.46
Group 7.				
Union Pacific (Inc. O. S. L. and O.-W.)	131.23	132.43	136.59	129.62
Group 8.				
Missouri Pacific	108.46	104.75	104.01	112.82
St. Louis Southwestern	153.07	145.03	143.22	145.16
Group 9.				
Fort Worth & Denver City	264.53	248.77	228.08	252.71
Texas & Pacific	196.33	204.91	196.11	194.79
Group 10.				
Southern Pacific (Inc. Sunset-Central)	....	....	212.43	211.70
Western Pacific	577.33	582.67	637.33	652.00
Group 11.				
Canadian Govt. Rys. (Intercolonial).	182.96	205.40	204.74	225.85
Grand Trunk	170.28	166.77	166.68	161.23

Box Cars

"The location statistics of box cars available to the Commission on Car Service are supplemented by reports of box cars interchanged with Northern and Eastern and with Southern and Western connections. These interchange reports of box cars for the first eight days in December are overdue in the case of all railways excepting the following, and attention is especially drawn to the negligence in this respect of all other lines. In listing the roads sending these reports the percentage of box cars on line to total owned, according to their last report, is given for each line, as well as the percentage of box cars delivered to southern and western connections in excess of those received:

Road.	Per Cent of Box Cars on Line to Total Owned Dec. 8.	Excess of Deliverise, Per Cent
Group 1.		
Boston & Albany	114.94	— 5.58*
Boston & Maine	158.51	37.21
Central Vermont	99.48	3.06
Maine Central	121.58	6.70
New York, New Haven & Hartford	98.53	24.99
Rutland	72.87	24.67
Group 2.		
Central Railroad of New Jersey	116.99	11.55
Lehigh Valley	123.18	— 14.35*
New York Central	133.91	4.07
Central New England	75.35	17.18
Delaware, Lackawanna & Western	105.83	20.48
Pennsylvania (Inc. Penna. Co.)	141.02	16.66
Philadelphia & Reading	187.39	1.10
Western Maryland	405.48	97.36
Union R. R.	....	18.32
Group 3.		
Michigan Central	115.59	4.25
Wabash	140.49	2.74
Toledo & Ohio Central	162.23	— 5.80*
Lake Erie & Western	71.36	— 13.14*
Pittsburgh & Lake Erie	87.54	19.19
Vandalia	141.14	10.48
Group 4.		
Carolina, Clinchfield & Ohio Ry	72.79	63.68
Coal & Coke	91.50	.....
Southern	92.29	13.07
Group 5.		
Atlanta & West Point	92.76	20.17
Central of Georgia	80.66	6.30
Illinois Central	65.18	4.11
Nashville, Chattanooga & St. Louis	53.74	7.13
Group 6.		
Chicago & Alton	83.53	— 2.71*
Chicago & Eastern Illinois	83.51	— 11.89*
Chicago, Burlington & Quincy	77.46	3.40
Chicago, St. Paul, Minneapolis & Omaha.	93.16	2.20
Northern Pacific	95.92	13.56
Toledo, Peoria & Western	84.92	30.28
Group 7.		
Union Pacific (Inc. O. S. L.—O. W. R. R. & N.)	70.79	7.44
Group 8.		
Colorado & Southern	50.85	1.26

* Receipts were in excess of deliveries.

"It is clearly apparent from the above that the following railways having an excess of box car equipment have not complied with the request of the Commission on Car Service to deliver a designated excess of box cars to southern and westerns connections above the number of box cars received from such connections:

"Boston & Albany,
"Maine Central,
"Lehigh Valley,
"Philadelphia & Reading,
"New York Central,
"Michigan Central,
"Wabash,
"Toledo & Ohio Central.

"The following additional railways, which are delinquent in sending in their reports of box cars interchanged with connections, are not satisfactorily reducing the excess of box car equipment on line as compared with number owned, according to reports made to the Commission on Car Service:

Road.	Nov. 15	Nov. 23	Dec. 1	Dec. 8
Group 2.				
Baltimore & Ohio	123.54	123.72	124.69	129.33
Erie	117.77	116.58	121.65	122.47
Long Island	690.97	633.15	644.75	695.40
New York, Ontario & Western	214.86	210.71	215.85	202.19
New York, Philadelphia & Norfolk.	119.05	131.28	141.08	140.07
Group 3.				
Ann Arbor	97.07	91.29	111.40	117.65
Grand Rapids & Ind	128.80	125.73	139.75	145.78
New York, Chicago & St. Louis..	117.78	121.98	135.96	126.70
Pere Marquette	121.72	119.31	119.86	117.38
Wheeling & Lake Erie	288.79	....	305.44	291.34
Group 4.				
Chesapeake & Ohio	146.91	141.92	144.69	181.38
Norfolk Southern	93.66	97.57	109.64	111.93
Seaboard Air Line	107.93	99.33	103.66	108.06
Group 5.				
Florida East Coast	136.22	140.99	142.04	161.96
Group 6.				
Duluth, South Shore & Atlantic	138.24	121.46	131.65	124.70
Group 8.				
Kansas City Southern	116.49	94.89	112.04	113.40
Group 9.				
International & Great Northern	223.43	218.66	234.15	204.76
Group 11.				
Can. Govt. Rys. (Intercolonial)	101.49	108.69	113.23	117.33

Location Reports

"Reports overdue from the following railroads have failed to reach the commission:

"Delaware & Hudson, report of box cars for December

8, and all reports for all dates as to open cars.
"Louisville & Nashville, all reports for December 8.
"Chicago, Milwaukee & St. Paul, all reports for December 8, and also reports for all dates as to the separation of box and open cars.
"Chicago and North Western, all reports for December 8.
"M. K. & T., all reports for December 8.
"El Paso & Southwestern, all reports for all dates as to the separation of box and open cars.
"Chicago Belt, all reports for all dates.
"Chicago, Rock Island & Gulf, all reports for all dates.
"Midland Valley, all reports for all dates.
"Spokane, Portland & Seattle, all reports for December 8.
"Canadian Northern, all reports for all dates.
"Grand Trunk Pacific, all reports for all dates."

Penalties to Be Imposed for Car Diversion

At a meeting of the commission on December 21 the commission authorized an issuance of a circular calling attention to the per diem rules and stating that under the authority given the commission by these rules it had suspended the diversion penalty, so far as box cars are concerned, until March 1. The penalty had previously been suspended until January 1 so that on January 1 the diversion penalty will become effective on all cars except box, furniture and automobile cars. The circular quotes per diem rules 19 and 3, empowering the commission to institute proceedings against members for violation of rules and to impose penalties of $5 and $10 per car for diversion. The circular stated that the commission proposed to exercise its authority under these rules and asked for the earnest co-operation of all railways. The extension of the date as to box cars will permit the continuance of the plan for equalizing box cars between roads having an excess and those having a deficiency.

A telegram was received from President Smith of the New York Central stating that this road had on its line thousands of cars for western and southern roads which were being delayed because those roads would not accept them. Telegrams were sent at once to the presidents of those roads.

I. C. C. Proposes Drastic Order

Following the issuance of its circular, the Interstate Commerce Commission on December 22 issued an order, notifying the railroads to appear at a hearing at Washington on December 28 and show cause why an order should not be issued requiring roads to return to their owners, without diversion or misuse, all foreign open top cars and all railroad-owned or controlled refrigerator, heater, ventilated and insulated cars, after being unloaded at destination, and all other foreign freight cars in accordance with Car Service Rules 1, 2, 3 and 4, "or to effect a relocation of such cars in accordance with such other rules as may be found reasonable and be prescribed."

The conference between the Commission on Car Service, traffic officers of the railways and representatives of the shippers, held at Washington on December 20 and 21 to discuss rules proposed by the railways to prevent abuses of the reconsigning privilege, failed to reach any agreement. The shippers objected strenuously to a set of rules proposed by the roads and to a modification of the original proposal submitted on December 21. It was decided that the roads should submit another proposal to the Interstate Commerce Commission, to be drafted at a meeting in Chicago on December 28 and to be submitted by the commission to the shippers, in the hope of reaching a compromise.

German Women to Fire Locomotives.—According to press despatches, the Saxon State railways are now proposing to employ women in the place of signalmen, pointsmen and locomotive stokers, as well as in the loading and unloading of goods trains.

POWDERED COAL FOR STATIONARY BOILER PLANTS*

By C. W. Corning
Chief Smoke Inspector, Chicago & North Western

An experimental installation for burning powdered fuel in stationary boilers was made on a 463-horsepower Sterling type boiler at the Olyphant, Pa., power plant of the Hudson Coal Company. The installation was made to determine whether or not the smaller sizes of anthracite coal, such as Birdseye and slush, could be used in a pulverized form, thus providing a use for relatively low grade and waste fuel, and at the same time providing an automatically fired boiler with the opportunity, thereby, to increase the boiler capacity. During a continuous run of one week, ending August 16, 1916, an average of 603 horsepower, or 130 per cent of the rating, was obtained with an average boiler pressure of 141 lb. The average water evaporation per pound of coal from and at 212 deg. was 8.7 lb., and the average CO_2 in the flue gases was 10.1 per cent. This performance was obtained with pulverized anthracite Birdseye, which averages from 0.5 per cent to one per cent in moisture; 7 per cent in volatile; 76 per cent in fixed carbon; 16 per cent in ash; 1 per cent in sulphur, and about 12,000 B.t.u. The ash, frequently goes as high as 22 per cent, with a corresponding reduction in the fixed carbon and the heat value.

The following figures, taken from a daily report covering a 24-hour run at this same plant, show what can be accomplished by the use of anthracite slush. This fuel runs from 30 per cent to 45 per cent in ash, and from 7 per cent to 8 per cent in volatile matter:

Boiler rating	108 per cent
Evaporation from and at 212 deg. F.	7.4 lb.
CO_2 in flue gases:	
Maximum	17 per cent
Minimum	15.8 per cent
Average	16.5 per cent
Pressure of air at the feeder fan discharge.	7 in. (water)
Vacuum at the burner .....0.25 in. to	0.5 in. (water)
Vacuum in combustion chamber	0.16 in. (water)
Vacuum in breeching uptake	0.27 in. (water)
Temperature of flue gases:	
Maximum	610 deg. F.
Minimum	430 deg. F.
Average	475 deg. F.

On a 48-hour continuous test of the boiler at about 170 per cent of its rating, the evaporation with pulverized anthracite Birdseye averaged as high as 9.3 lb. of water per pound of coal from and at 212 deg. F., and the analysis of the flue gases averaged 16.6 per cent in CO_2. From a comparison of the results of pulverized fuel burning boiler with the hand-fired boiler of the same type in using Birdseye fuel, it has been found that using the fuel in the pulverized form about 8½ lb. of water can be evaporated per pound of coal, whereas when fired on grates about 6 lb. of water will be evaporated per pound of coal, showing an increase of about 40 per cent in efficiency for the pulverized fuel.

In none of the tests or operations has there been any more accumulation of soot or ash than obtains with hand-firing, and the amount of slag collected in the slag-pans averages from 4 cu. ft. to 5 cu. ft. for each 24 hr. The operation of the boiler with pulverized fuel gives no trouble when the coal feeder and dampers, after being set for a certain rating of the boiler, say 135 per cent, remain unchanged day in and day out.

Canal Companies Demand War Bonus.—After the Irish railway companies come the canal companies to ask the government to pay the war bonus to their men. The rates of canal companies are governed by the competitive railroad rates and cannot, therefore, readily be raised. The companies complain that much of the heavy traffic hitherto sent by rail now goes by canal, and that therefore they have a claim on the government.—*The Engineer, London.*

*Taken from a paper presented at the St. Louis convention of the Smoke Prevention Association.

Cars and Locomotives Ordered in 1916

High Prices and Poor Deliveries Characterize Year. Domestic and Foreign Purchases Total $550,000,000

IN the 12 months of 1916 the railways, private car lines and other users of cars and locomotives in the United States and Canada placed orders for 2,891 locomotives, 165,324 freight cars and 2,540 passenger cars. In the same period orders were received from foreign countries by builders in the United States and Canada for 2,983 locomotives and 34,214 freight cars, making totals respectively of no less than 4,974 locomotives and 199,538 cars. In view of the exceptionally high prices at which all this equipment has been sold this means that 1916 has been undoubtedly the busiest year in the history of the car and locomotive business. Consider domestic orders alone: about 2,900 locomotives at $30,000 each, which, if anything, is rather low, $87,000,000; about 165,500 freight cars at $1,500 each, $247,500,000, and 2,500 passenger cars at $18,000 each, $45,000,000, making a very conservative figure of $379,500,000. It is not so easy to estimate the total for foreign orders but the value is at least $170,500,000, making a total for both foreign and domestic car and locomotive business of $550,000,000 or well over $10,000,000 a week.

TABLE I—THE ORDERS IN 1916

	Locomotives	Freight Cars	Passenger Cars
Domestic	2,891	165,324	2,540
Foreign	2,983	34,214	109
Total	4,974	199,538	2,649

TABLE II. DOMESTIC ORDERS SINCE 1901.

Year.	Locomotives.	Freight Cars.	Passenger Cars.	Year.	Locomotives.	Freight Cars.	Passenger Cars.
1901	4,340	193,439	2,879	1909	3,350	189,360	4,514
1902	4,665	195,248	3,459	1910	3,787	141,024	3,881
1903	3,283	108,936	2,310	1911	2,850	133,117	2,623
1904	2,538	136,561	2,213	1912	4,515	234,758	3,642
1905	6,265	341,315	3,289	1913	3,467	146,732	3,179
1906	5,642	310,315	3,402	1914	1,265	80,264	2,002
1907	3,482	151,711	1,791	1915	1,612	109,792	3,101
1908	1,182	62,669	1,319	1916	2,891	165,324	2,540

The outstanding feature in this year's buying has been the prices paid. Freight and passenger cars have actually advanced from 75 to 80 per cent over what they were a year ago; they are now almost three times what they were two years ago at this time. As it happened, however, over one-half the freight car contracts were closed since October 1 or when prices were at their highest. This paper has commented on this in its editorial columns and has noted that this improper way of doing business resulted because the railways were unable to foresee how prosperous this country would become. For months and months they withheld buying only to be compelled finally to make their purchases when it appeared that the rise in prices was never going to stop.

The increase in locomotive prices has been spectacular enough but the rise has not been quite so great as in the case of freight cars. Locomotive buying has been somewhat steadier except for a few of the summer months with the exceptions that there has been a tremendous amount of foreign buying since October 1. The output of the locomotive plants is now pretty well contracted for until 1918. The Baldwin Locomotive Works has an order from the Frisco for 30 Santa Fe locomotives to be delivered in June, July and August, 1917. A New York Central order for 250 locomotives given to the American Locomotive Company and Lima Locomotive Works, as reported in the *Railway Age Gazette* of September 22, will be delivered about November, 1917; the American Locomotive Company has an order for 50 locomotives from the Paris-Orleans Railway of France also down for delivery next November, and one for 100 locomotives from the French State Railways designated to be filled in January and February, 1918.

These facts are of special interest, incidentally, for they mean that the car and locomotive plants and equipment specialty manufacturers are fast getting on a peace basis.

TABLE III—CLASSIFICATION OF LOCOMOTIVES ORDERED 1911-1916.

	1916	1915	1914	1913	1912	1911
Mikado	754	562	333	796	[illegible]	[illegible]
Switching	730	221	201	638	821	443
Consolidation	63	194	166	853	885	577
Mallet	218	120	59	77	168	117
Pacific	378	102	174	566	594	486
Santa Fe	335	75	63	...	...	...
Ten-wheel	40	39	48	255	364	238
Mogul	28	13	24	47	61	127
Mountain or Mohawk	182	9	12	24	..	2
Atlantic	2	1	34	46	5	9
American	1	1	19	8	8	27
Electric	32	69	59	94	75	133
Other	238	168	73	103	52	466
Total	2,983	1,573	1,265	3,467	4,515	2,850

TABLE IV. OUTPUT, 1899-1916.

Year	Locomotives	Freight Cars	Passenger Cars
1899	2,475	119,886	1,305
1900	3,153	115,631	1,630
1901	3,384	136,950	2,055
1902	4,070	162,599	1,948
1903	5,152	153,195	2,007
1904	3,441	60,806	2,144
1905*	5,491	165,155	2,551
1906*	6,952	240,503	3,167
1907*	7,362	284,188	5,457
1908*	3,849	76,555	1,716
1909*	2,887	93,570	2,849
1910	4,755	180,945	4,412
1911†	3,530	77,161	1,946
1912†	4,915	152,429	3,060
1913†	5,332	207,684	3,296
1914†	2,235	104,541	3,691
1915†	2,088	74,112	1,949
1916†	2,975	135,051	1,830

* Includes Canadian output.
† Includes Canadian output and equipment built in railroad shops.

TABLE A.—CLASSIFICATION OF FREIGHT CARS ORDERED DURING 1916.

	All Steel a	All Steel frame and steel underframe c	Steel underframe b	Composite underframe d	Wood f	Not specified	Total	Draft Gear: Spring m	Draft Gear: Friction n	Draft Gear: Not specified
Box	1,560	12,261	24,256	12,650	6,416	5,450	62,593	18,985	25,819	17,789
Refrigerator	....	.....	3,191	100	1,168	2,515	6,974	2,662	1,297	3,015
Hopper, including ore	30,940	.....	750	...	760	3,926	36,376	6,073	20,977	9,326
Gondola	7,829	4,007	5,648	3,500	3	9,063	30,050	10,350	10,125	9,575
Coal (not otherwise specified)	560	.....	.....	...	75	1,000	1,635	...	575	1,060
Stock	....	800	3,260	500	875	1,360	6,745	1,615	2,950	2,180
Flat	2,313	.....	.....	73	681	125	3,192	218	1,358	1,616
Tank	13,637	.....	.....	...	6	...	13,643	12	13,320	311
Caboose	7	145	218	106	15	51	642	290	83	269
Miscellaneous or not specified	361	900	169	9	317	1,273	3,474	607	846	2,026
Total	57,207	18,113	37,492	17,038	10,[illegible]	[illegible]	169,384	40,897	77,350	47,167

It is well known and a matter of record that many, if not most, of these plants have been working on large ammunition contracts. While many of them have undoubtedly realized large profits on this business, it is a source of gratification that the prosperity of these companies will henceforth be on a more stable basis.

It will further be a reason for pride that the car and locomotive plants now busy on the manufacture of railway equipment for England, France and Russia will be among the first to help those countries in the work of reconstruction after the war.

How the Information Is Compiled

The tables on the following pages are detailed lists of the locomotives, freight cars and passenger cars ordered by the railways, private car lines and industrial companies in the United States and Canada and also of the orders for equipment for export. A great effort has been made to make these lists as complete as possible. It will be found, however, that the orders do not add up to as great amounts as the totals given in Tables I, II, III, and A. In addition to the orders concerning which data is given, orders were also placed (as reported by the equipment builders) for 118 locomotives and 151 tank, 22 logging, 4 dump, 15 hopper, 15 flat, 150 coal, 200 stock and 193 other cars on domestic orders, and 2 tank, 20 dump, 2 stock, 209 cane, 145 box, 35 flat, 586 gondola and 4,073 other freight cars and 44 passenger cars on foreign orders concerning which it was impossible to obtain detailed information. Although, even with this, there may be some omissions of both domestic and foreign orders, it is likely that these omissions are very few and, under any condition, the results are sufficiently accurate to meet the general purpose for which these statistics are prepared, namely, to show the character and extent of the purchases of motive power and rolling stock this year as compared with preceding years.

The information given herewith is compiled from official sources. The *Railway Age Gazette* in answer to its inquiries has received communications from practically all of the railroads and private car lines in the United States and Canada. In the case of foreign orders and where no replies were received from railways in this country, the details were taken from the weekly records or from the reports of builders. The readers of the *Railway Age Gazette* might be very much surprised if they could understand how great is the degree of co-operation that is given in compiling these figures by the railroads and builders of cars and locomotives.

Locomotives Ordered

The striking feature about the orders for locomotives this year is that the foreign orders are about equal to domestic orders, this resulting because very large purchases were made in this country by England, France and Russia. As far as the domestic orders are concerned, it is to be noticed as shown in Table III, that there has been a very strong tendency toward the purchase of Santa Fe and Mountain or Mohawk type locomotives. The purchases of Santa Fe locomotives total 325, as compared with 75 in 1915 and 63 in 1914. The Mountain or Mohawk type locomotives ordered total 182, as compared with orders for 47 locomotives of this kind in the five years from 1911 to 1915. The New York Central and the Southern both ordered a large number of these locomotives, the New York Central's total being no less than 139. The switching and Mallet type locomotives also show fairly large increases over former years, but the Consolidation and electric show very considerable decreases. Of the total of 2,891 locomotives ordered 2,355 are specified as being equipped with superheaters and 2,233 with brick arches. Special valve gears have been specified for 738 locomotives, including 616 Baker and 122 Southern. In addition to that 718 locomotives will be equipped with stokers; 564 Street, 71 Duplex, 45 Hanna, 25 Crawford and 13 Standard.

Freight Cars Ordered

The total of freight cars ordered shows, as may be seen from Table II, a very considerable increase over 1915 and is over twice as large as the total for 1914. In fact the total is the best with the exception of 1912 since 1906. As far as prices are concerned, however, it has been one of the best years in the history of the business. The outstanding feature in this year's totals, as shown in Table A, is the reversion to all-wood or composite underframe cars. Only 1,560 all-steel box cars are reported as against a total of 11,005 in 1915. This, of course, is partly due to the absence of large Pennsylvania orders for all-steel box cars, but even taking that into consideration it shows very strikingly with the increase of composite underframe box cars from 1,225 to 12,560, and in all-wood cars from 601 to 6,416 from 1915 to 1916, the effect of the exceedingly high prices and poor deliveries of steel.

Passenger Cars Ordered

There has been no such reversion to wooden cars as has been noted in the case of freight cars. This is the best possible evidence that the all-steel passenger car has come to stay, and this for the reason that the prices of passenger cars have advanced in even greater proportion than has been the case with freight cars. Practically the only wooden cars ordered were some ordered for Canadian roads. Practically all the cars have been specified as being equipped with electric lighting. The *Railway Age Gazette* this year has made an effort to ascertain what kind of batteries have been used with the axle generator equipment. The results have not been as satisfactory as might be wished, but of 716 cars concerning which data is given as to storage batteries for lighting equipment 370 have been specified as using lead acid and 346 as using nickel alkaline batteries.

Equipment Built

During 1916 there have been built in the car and locomotive plants and railroad shops 4,075 locomotives, 135,001 freight cars and 1,839 passenger cars, a considerable increase over last year's low figures of 2,085 locomotives, 74,112 freight cars and 1,949 passenger cars. This year's totals, however better they may be than 1915's figures, do not begin to express the roal prosperity of the business for the reasons (1) that so large a proportion of the orders were placed in the last three months of the year, (2) because they do not indicate the high prices and (3) because, as previously noted, they cannot show the munitions orders. Of the 4,075 locomotives built, 2,708 were for domestic and 1,367 for foreign companies. Of the 135,001 freight cars, 113,692 were for domestic and 21,309 for export business, and of the total 56,053 are specified as being of all-steel construction, 59,636 as having steel underframes, 8,849 as being of wood and the remainder are not specified. Of the 1,839 passenger cars, 1,769 were for domestic use and 70 for export. Of the total, 1,600 are specified as being of all-steel construction, 200 as having steel underframes and 39 as being of wood.

It will be noted that foreign orders play an important part in the builders' activities. Some companies, particularly those in Canada, almost specialized on foreign orders. As was the case last year, also, a number of American companies confined themselves almost entirely to repair work.

FREIGHT CARS ORDERED IN 1916

Purchaser	No.	Kind	Capacity	Builder
Aetna Explosives Co.	an 50	Tank	100,000	Gen'l Am.
Ajax Gasoline Co.	an 10	Tank		Am. C. & F.
Alabama & Vicksburg	bn 113	Box	60,000	Am. C. & F.
	bn 12	Gondola	80,000	Am. C. & F.
Alabama Great Southern	dm 695	Box	60,000	Am. C. & F.
	dm 100	Auto	60,000	Am. C. & F.
Algoma Cent. & Hudson Bay	f 2	Caboose		Co. shops
Algoma Eastern	am 125	Otis Ore	100,000	Can. C. & F.
Am. Refrig. Tran. Co.	bm 30	Refrig.	60,000	Am. C. & F.
American Rolling Mill Co.	an 20	Gondola	100,000	Press. Steel
American Steel & Wire Co.	an 30	Tank	50,000	Gen'l Am.
	an 55	Tank	100,000	Gen'l Am.

Items marked with an asterisk in these tables are not included in the totals.

Purchaser	No.	Kind	Capacity	Builder
Anaconda Copper Mining Co..	an 7	Tank	100,000	Gen'l Am.
	an 3	Tank	60,000	Gen'l Am.
	20	Flat	60,000	Press. Steel
	a 10	Gondola	600,000	Press. Steel
Ashland Coal & Iron.....	a 10	Flat	100,000	Gen'l Am.
Atchison, Topeka & Santa Fe.	bn 1000	Stock	80,000	Has. & Bar.
	an 500	Tank	80,000	Press. Steel
Atlanta & West Point.....	fm 53	Box	60.000	Co. shops
	fm 11	Auto	60,000	Co. shops
	fn 10	Box	60,000	Co. shops
	fm 13	Flat	60,000	Co. shops
	fm 10	Flat	80,000	Co. shops
Atlantic Coast Line.....	bn 500	Box	60,000	Bar. & Smith
	an 300	Flat	80,000	Bar. & Smith
	bn 25	Rodg. Bal.	100,000	Am. C. & F.
	bn 1200	Box	60,000	Bar. & Smith
	an 500	Flat	80,000	Bar. & Smith
	cn 100	Stock	80,000	Std. Steel
	a 200	Flat	60,000	Co. shops
Baltimore & Ohio.....	an 1000	Hopper	110,000	Am. C. & F.
	an 2000	Hopper	110,000	Cambria Stl.
	dn 1000	Box	80,000	Has. & Bark.
	dn 2000	Box	80,000	Mt. Vernon
	bn 480	Box	80,000	Am. C. & F.
	dn 350	Box	80,000	Ryan
	b 20	Box		Co. shops
	b 500	Refrig.		Co. shops
Barrett Company	an 10	Tank	10,000	Am. C. & F.
Berlin Mills Co.....	1	General Sec.		Press. Steel
Bessemer & Lake Erie.....	cn 500	Gondola	100,000	Ralston
	an 500	Hopper	100,000	Am. C. & F.
	an 750	Hopper	100,000	Press. Steel
	an 750	Hopper	100,000	Std. Steel
Bethlehem Steel Corp.....	100	Gondola		Press. Steel
	50	Hopper		Press. Steel
	30	Coke		Press. Steel
Bingham & Garfield.....	an 150	Ore	120.000	Press. Steel
	an 25	Con'trate	120,000	Press. Steel
	an 25	Con'trate	120,000	Std. Steel
	an 3	Tank	100,000	Am. C. & F.
	f 7	Flat		Co. shops
	f 2	Caboose		Co. shops
	f 1	Box		Co. shops
Birmingham Southern	20	Flat	140,000	Press. Steel
Boston Elevated	am 2	Flat	45,000	J. G. Brill
	an 2	Work	45,000	J. G. Brill
Boyne City, Gaylord & Alpena	f 35			Co. shops
Brier Hill Steel Co.....	20	Coke		Press. Steel
Brooklyn A. R. Co.....	fm 15	Cinder	80,000	Mt. Vernon
Bureau of Mines.....	a 3	Rescue		Am. C. & F.
Butler Co. Oil Ref. Co.....	an 10	Tank	8,250	Pa. Tank
Butte, Anaconda & Pacific....	an 300	Hopper	100,000	Press. Steel
	b 2			Co. shops
	f 3			Co. shops
Butterworth, Judson	an 10	Tank	100,000	Pa. Tank
Cambria & Indiana.....	am 1000	Hopper	100,000	Cambria
Can. Gov't Rys. (Intercol. Div.)	am 10	Snow Plows		Can. C. & F.
Can. Gov't Ry. (Transcon. Div.)	cm 500	Box	100,000	Can. C. & F.
	am 10	Snow Plow		Can. C. & F.
	fm 200	Box	60,000	Can. C. & F.
	fm 100	Refrig.	60,000	Can. C. & F.
	cm 500	Box	100,000	Eastern
Calumet & Arizona Min. Co..	an 26	Tank		Gen'l Am.
California Dispatch Line.....	an 5	Tank	80,000	Gen'l Am.
Cabin Creek Ref. Co.....	an 50	Tank	60,000	Am. C. & F.
	an 150	Tank	80,000	Am. C. & F.
Canadian Northern.....	50	Caboose		Co. shops
	6	Tank		Kennicott
	3	Snow Plow		Co. shops
Canadian Pacific	bm 811	Refrig.	60,000	Co. shops
	bgm 1170	Box	80,000	Co. shops
	bn 184	Furn.&auto.	80,000	Co. shops
	am 20	Otis Ore.	100,000	Can. C. & F.
Cananea Cons. Copper Co....	a 10	N. g. dump	60,000	Am. C. & F.
Canton R. R.....	an 1	Air Dump.	100,000	West. Wh.
Carnegie Steel Co.....	160	Gondola		Press. Steel
	42	Hopper		Press. Steel
	an 10	Tank	10,670	Pa. Tank
	an 159	Hopper	140,000	Ralston
Carolina, Clinchfield & Ohio...	an 500	Hopper	100,000	Press. Steel
	bn 5	Caboose		Am. C. & F.
Central of Georgia.....	bn 50	Stock	80,000	Co. shops
	bn 50	Box	80,000	Co. shops
Central of New Jersey.....	a 2			Co. shops
	d 9			Co. shops
	f 5			Co. shops
Central Vermont	bm 2	Box	60,000	Co. shops
	fm 1	Flat	60,000	Co. shops
	fm 3	Snow Plows		Co. shops
	fm 1	Caboose		Co. shops
Cherry River Boom & Lbr. Co.	a 24	Logging	60,000	Am. C. & F.
	a 24	Logging	60,000	Am. C. & F.
	a 24	Logging	60,000	Am. C. & F.
	a 48	Logging	60,000	Am. C. & F.
Chesapeake & Ohio.....	an 2000	Hopper	140,000	Press. Steel
	an 1000	Hopper	100,000	Std. Steel
	an 500	Hopper	100,000	Press. Steel
	an 500	Hopper	100,000	Ralston
	dm 1000	Box bod	60,000	Central Loco.
	b 46	Caboose		Co. shops
Chicago & Alton.....	dm 500	Gondola	80.000	Has. & Bar.
	dn 200	Auto.	80,000	Has. & Bar.
Chicago & No. West.....	cn 500	Stock	60,000	West. Steel
	cn 1000	Auto.	80,000	West. Steel
	fn 1000	Box	60,000	Am. C. & F.
	dn 1000	Box	60,000	Am. C. & F.
	an 500	Ore	100,000	Pullman
	cn 1000	Gondola	100,000	Pullman
	500	Underframes		Am. C. & F.
Chicago, Burlington & Quincy.	*500	Auto.	80,000	Am. C. & F.
	am 1500	Gen'l Ser.	100,000	West. Steel
	cm 2000	Box	80,000	Has. & Bark.
	am 100	Dump	20 yd.	West Whld.
	dm 100	Stock	60,000	Co. shops

Purchaser	No.	Kind	Capacity	Builder
Chic., Bur. & Quincy (con.)..	dm 200	Stock	60,000	Co. shops
	bm 25	Way	30 ft.	Co. shops
	am 1	Scale Test		Am. C. & F.
	an 2	Dump	20 yds.	West. Whld.
	b 1	Box		Co. shops
	a 3	Flat		Co. shops
Chic., Lake Shore & So. Bend.	c 7	Gondola	100,000	West. Steel
	2	Flat	100,000	West. Steel
	c 9	Box	80,000	West. Steel
Chicago, Milwaukee & St. Paul	bn 1066	Box	80,000	Co. shops
	bn 250	Auto.	80,000	Co. shops
	fm 750	Ore	140,000	Co. shops
	fn 225	Logging	80,000	Co. shops
	dn 1000	Gondola	100,000	Co. shops
	an 120	Flat	100,000	Bettendorf
Chicago, St. P., M. & Omaha..	dn 500	Box	60,000	Am. C. & F.
	c 200	Stock	60,000	Bar. & Smith
Cin., New Orleans & Tex. Pac.	dm 1402	Box	60,000	Mt. Vernon
	dm 200	Auto.	60,000	Mt. Vernon
	*500	Steel ctr. sills		Mt. Vernon
	*600	Underframes		Mt. Vernon
Clark Car Co.....	500	Dump		Cambria
Cleveland, Cin., Chic. & St. L.	1000	Coal		Std. Steel
	*33	Underframes		Am. C. & F.
Coal & Coke.....	2			Co. shops
Colorado Midland	b 1			Co. shops
	f 21			Co. shops
Columbia Chemical Co.....	3	Dump	80,000	Am. C. & F.
Commercial Car Line.....	an 25	Tank	100,000	Chic. Steel
	an 50	Tank	100,000	Am. C. & F.
	an 20	Tank	80,000	Am. C. & F.
Constantin Refining Co.....	an 3	Tank	8,250	Pa. Tank Car
Continental Refining Co.....	an 1	Tank	100,000	Pa. Tank
Cooper's Creek Chem. Co.....	6	Hopper		Press. Steel
Corrigan, McKenney & Co....	an 750	Tank	10,000	Am. C. & F.
Cosden & Co.....	an 100	Tank	8,000	Am. C. & F.
	an 25	Tank	6,000	Am. C. & F.
Crescent Tank Line.....	an 125	Tank	80,000	Gen'l Am.
Crew Levick Co.....	an 25	Tank	100,000	Pa. Tank
	an 10	Tank	60,000	Pa. Tank
Cudahy Ref. Co.....	an 500	Tank	8,000	Pa. Tank
	an 150	Tank	60,000	Am. C. & F.
	an 250	Tank	80,000	Am. C. & F.
Cumberland Valley	an 7	Caboose		P. R.R.shops
	an 100	Hopper	140,000	P. R.R.shops
Cushing Refining Co.....	an 40	Tank	80,000	Am. C. & F.
Danville & Western.....	dm 100	Box	60,000	Am. C. & F.
Darling & Co.....	an 5	Tank	8,250	Pa. Tank
Davis Chemical Co.....	an 10	Tank	100.000	Am. C. & F.
Delaware & Hudson.....	*1,000	Underframes		Am. C. & F.
	b 20			Co. shops
Del., Lackawanna & Western..	bn 500	Box	80,000	Am. C. & F.
	an 500	Hopper	100,000	Press. Steel
	an 55	Hopper	150,000	Press. Steel
Delray Connecting	cn 1500	Box	80,000	Pullman
Denver & Rio Grande.....	cn 500	Ballast	100,000	Rodger Bal.
	b 1			Co. shops
Denver & Salt Lake.....	fn 400	Auto.	80,000	Am. C. & F.
Detroit, Toledo & Ironton.....	fn 75	Box	60,000	Co. shops
	fn 37	Refrig.	80,000	Co. shops
	fn 75	Coal	80,000	Co. shops
	14	Flat bod		Am. C. & F.
Detroit United	10	Gondola		Press. Steel
Diamond Alkali Co.....	an 10	Tank	10,000	Am. C. & F.
Diamond Gasoline Corp.....	an 30	Gondola	140,000	Ralston
Donora Southern	a 100	Flat	60,000	Am. C. & F.
Duluth & Iron Range.....	f 6			Co. shops
Duluth & Northern Minnesota.	fn 200	Box	80,000	Has. & Bar.
Duluth, South Shore & Atlantic	fn 200	Flat	80,000	Has. & Bar.
	fn 10	Refrig.	60,000	Has. & Bar.
Duluth, Winnipeg & Pacific...	f 750	Box	80,000	Has. & Bar.
Du Pont, E. I., & Co.....	an 5	Tank	10,670	Pa. Tank
	an 5	Tank	10,670	Pa. Tank
	an 4	Tank	10,670	Pa. Tank
	14	Powder		Am. C. & F.
	32	N. G. flat		Am. C. & F.
East Broad Top.....	a 60	Coal	70,000	Co. shops
East Jersey R. R. & Term....	an 22	Tank	80,000	Am. C. & F.
East Tenn. & West. No. C....	fm 20	Box	50,000	Co. shops
	fm 10	Hopper	50,000	Co. shops
	fm 30	Flat	50,000	Co. shops
Economy Oil & Ref. Co.....	an 10	Tank	100,000	Am. C. & F.
Elgin, Joliet & Eastern.....	f 20	Way		Co. shops
Erie	an 1000	Hopper	100,000	Std. Steel
	cn 1000	Box	80,000	Std. Steel
	cn 1000	Box	80,000	Am. C. & F.
Evans-Thwing Refining Co....	an 140	Tank	80,000	Am. C. & F.
	an 60	Tank	100,000	Am. C. & F.
Federal Refrig. Despatch.....	b 1			Co. shops
Fort Smith & Western.....	fm 1	Spreader	80,000	Co. shops
Franklin, Ben, Coal Co.....	4	Hopper		Press. Steel
Freedom Oil Works Co.....	an 10	Tank	80,000	Am. C. & F.
Fruit Growers Express.....	bn 500	Fruit	60,000	Co. shops
Gal., Harris. & San Antonio...	b 2	Box	100,000	Ralston
	b 100	Stock	80,000	Ralston
	an 1	Tank	100,000	Am. C. & F.
Gal., Houston & Henderson...	f 1			Co. shops
Garden City Western.....	15	Gen'l Ser.		Am. C. & F.
Gasoline Corp.	an 50	Tank		Gen'l Am.
Georgia R. R.....	f 63			Co. shops
Georgia & Florida.....	f 1	Stock	60,000	Co. shops
	f 1	Flat	60,000	Co. shops
	f 1	Spreader	60,000	Co. shops
Germania Ref. Co.....	an 6	Tank	8,250	Pa. Tank
	an 4	Tank	4,500	Pa. Tank
Gillespie, L. C. & Sons.....	an 16	Tank		Am. C. & F.
Goodman Lumber Co.....	20	Flat		
Grand Rapids & Indiana.....	an 200	Box	100,000	P.R.R. shops
Great Northern	fm 500	Refrig.	60,000	Has. & Bar.
	fm 1000	Box	80,000	West. Steel
	fm 500	Auto.	80,000	Has. & Bar.
	fm 500	Refrig.	60,000	Has. & Bar.
	fm 250	Stock	40,000	Co. shops
	fm 250	Stock	60,000	Co. shops

Purchaser	No.	Kind	Capacity	Builder
Great West. Oil Ref.	an 10	Tank	100,000	Am. C. & F.
Gulf & Ship Island	fm 1	Caboose		Co. shops
	fm 3	Flat	60,000	Co. shops
	dm 70	Flat	80,000	Co. shops
	dm 3	Box	80,000	Co. shops
	dm 35	Box	60,000	Co. shops
Gulf Refining Co.	an 100	Tank	8,000	Gen'l Am.
	an 100	Tank	8,000	Pa. Tank Car
Havenbeck Wallace	fm 3	Flat	60,000	Mt. Vernon
	fm 1	Stock	60,000	Mt. Vernon
Harrison Bros. & Co.	an 1	Tank	100,000	Pa. Tank
Harrison Bros. & Co.	an 16	Tank	100,000	Am. C. & F.
Hegeler Zinc Co.	an 16	Tank	60,000	Gen'l Am.
Hercules Powder Co.	an 8	Tank	100,000	Am. C. & F.
Hercules Powder Co.	60	Solv. rec.		Am. C. & F.
	40	Solv. rec.		Am. C. & F.
Hocking Valley	b 12	Cabin		Co. shops
Houston & Texas Central	b 150	Stock	80,000	Ralston
	an 2	Tank	100,000	Am. C. & F.
Illinois Central	fm 300	Stock	80,000	Am. C. & F.
	bm 500	Refrig.	80,000	Has. & Bar.
	cm 400	Rodger bal.	100,000	Am. C. & F.
	bm 1000	Gondola	100,000	Pullman
	bm 1000	Gondola	100,000	Has. & Bar.
Illinois Oil Co.	an 10	Tank	5,000	Chicago Steel
	an 8	Tank	6,000	Chicago Steel
Illinois Traction Co.	60	Hopper	100,000	Am. C. & F.
	40	Gondola	80,000	Am. C. & F.
Illinois Traction Co.	f 101	Box	80,000	Am. C. & F.
Independent Ref. Co.	an 15	Tank	80,000	Am. C. & F.
Intermountain	fm 20	Log	80,000	Twohy Bros.
International & Gt. Northern	f 23			Co. shops
International Ref. Co.	an 50	Tank	10,650	Pa. Tank
International Refining Co.	an 25	Tank	10,100	Gen. Am.
	an 30	Tank	8,255	Pa. Tank
Interstate Tank Car Corp.	an 25	Tank	8,000	Am. C. & F.
	an 75	Tank	8,000	Chicago Steel
Island Petroleum Co.	an 15	Tank	80,000	Press. Steel
Kanita Ref. Co.	an 50	Tank	8,000	Pa. Tank
Kansas City Refining Co.	an 10	Tank	100,000	Am. C. & F.
	an 5	Tank	80,000	Am. C. & F.
Keith Car Co.	an 100	Tank	100,000	Am. C. & F.
	an 23	Tank	80,000	Am. C. & F.
Kingan Refrigerator Line	dn 75	Refrig.	60,000	Am. C. & F.
	dn 25	Refrig.		Am. C. & F.
Koppers, H. Co.	an 2	Tank	8,250	Pa. Tank
La Belle Iron Works	an 20	Hopper	100,000	Ralston
Lackawanna Steel Co.	an 700	Hopper	100,000	Std. Steel
	an 700	Hopper	100,000	Am. C. & F.
	an 300	Gondola	100,000	Std. Steel
	an 10	Flat	100,000	Std. Steel
	1	Gravel		Std. Steel
	1000	Box		Has. & Bark.
Lake County Gravel Co.	an 50	Hopper	100,000	Std. Steel
Lake Erie & Western	an 1	Tank	100,000	Al'gh'y Fdy.
Lake Erie, Franklin & Clarion	bgm 500	Auto.	80,000	Std. Steel
Lake Terminal	bgn 500	Auto.	80,000	Pullman
Lehigh Valley	bgm 500	Auto.	80,000	Am. C. & F.
	an 8			Co. shops
	1	Snow Plow.		Russell Car
Liquids Despatch Line	an 30	Tank	10,000	Gen'l Am.
	an 2	Tank	7,120	Gen'l Am.
	an 10	Tank	10,212	Chicago Steel
	an 8	Tank	9,928	O. F. Jordan
Live Poultry Transit Co.	an 100	Poultry	60,000	Has. & Bar.
Live Poultry Transit Co.	b 10			Co. shops
Long Island	15	Refrig.		Std. Steel
Lorain Steel Co.	an 8	Hopper	100,000	Press. Steel
Los Angeles & Salt Lake	an 200	Auto.	100,000	Pullman
	1000	Gen'l ser.	100,000	West. Steel
	500	Gen'l ser.	100,000	West. Steel
Louisiana & Northwest	f 3			Co. shops
Louisiana Oil Refining Co.	an 15	Tank	80,000	Gen'l Am.
	an 10	Tank	80,000	Chicago Steel
Louisiana Western	a 125	Flat	100,000	Ralston
	a 250	Flat bod.	100,000	Ralston
Louisville & Nashville	an 1000	Gondola	100,000	Press. Steel
	an 500	Hopper	100,000	Press. Steel
	dn 1000	Gondola	100,000	Mt. Vernon
	bn 200	Box	80,000	Co. shops
	bn 1000	Vent	80,000	Co. shops
	bn 150	Refrig.	80,000	Co. shops
	bn 300	Auto.	80,000	Co. shops
	bn 100	Furniture	100,000	Co. shops
	bn 100	Stock	80,000	Co. shops
	bn 400	Gondola	100,000	Co. shops
	bn 100	L. S. Gond.	100,000	Co. shops
	bn 750	Gondola	100,000	Co. shops
	dn 1000	Gondola	100,000	Co. shops
	*200	Underframes		Am. C. & F.
	*1,005	Underframes		Mt. Vernon
	*750	Underframes		Mt. Vernon
Lutcher & Moore Lumber Co.	f 100	Logging		Am. C. & F.
McCabe Chemical Co.	am 12	Tank	100,000	Am. C. & F.
McCloud River	f 63			Co. shops
McPherson, John J.	an 10	Tank	100,000	Am. C. & F.
Marcell, L. L.	an 10	Tank	80,000	Am. C. & F.
Marcel Tank Line	an 60	Tank	8,000	Am. C. & F.
	an 40	Tank	10,000	Am. C. & F.
Marion Extract Co.	an 10	Tank	80,000	Am. C. & F.
Mather Horse & Stock Car Co.	dm 100	Stock	60,000	Am. C. & F.
Mather Stock Car Co.	100	Stock		Co. shops
Michigan Ry.	b 10	Box	60,000	Std. Steel
	a 10	Box	50,000	St. Louis
Michigan Central	b 2,000	Box	80,000	Am. C. & F.
Michigan Central	cn 1250	Box	80,000	Bar. & Smith
Michigan Central	*50	Underframes		Am. C. & F.
Midco Gasoline Co.	an 50	Tank	10,670	Pa. Tank
Midvale Chem. Co.	an 2	Tank	100,000	Pa. Tank
Miller Pet. Ref. Co.	an 5	Tank	100,000	Am. C. & F.
	an 10	Tank	80,000	Am. C. & F.
Milwaukee Coke & Gas Co.	a 300	Hopper	140,000	Press. Steel
	a 300	Gen'l Ser.	100,000	Am. C. & F.
Mil. Refrig. Trans.	bm 100	Refrig.	60,000	Co. shops
	fm 21	Refrig.	60,000	Co. shops
Mineral Range	an 100	Rock	100,000	Am. C. & F.

Purchaser	No.	Kind	Capacity	Builder
Minneapolis & St. Louis	1000	Box		Am. C. & F.
	bm 500	Gondola	100,000	Has. & Bar.
M., St. P. & Sault Ste. Marie	an 250	Ore	100,000	Has. & Bar.
	fn 200	Auto.	80,000	Has. & Bar.
	fn 800	Box	80,000	Has. & Bar.
Missouri & No. Arkansas	f 19	Stock		Co. shops
	f 21	Box		Co. shops
Mo., Kansas & Texas	bn 1500	Gondola	100,000	Am. C. & F.
	bn 1000	Stock	80,000	Am. C. & F.
Missouri Pacific	cm 2500	Gen'l Ser.	100,000	Am. C. & F.
Missouri Pacific	*555	Underframes		Mt. Vernon
Mobile & Ohio	dm 1000	Vent.	60,000	Am. C. & F.
Montour R. R.	an 400	Gondola	80,000	Std. Steel
Morris & Co. Tank Line	an 50	Tank	80,000	Chicago Steel
Morris & Co. Refrig. Line	bn 400	Refrig.	60,000	Has. & Bar.
Muskogee Ref. Co.	an 50	Tank	8,000	Pa. Tank
Muskogee Ref. Co.	an 41	Tank	8,000	Pa. Tank
Nashville, Chattanooga & St. L.	1	Dynamometer		Burr Co.
National Refining Co.	60	Tank	8,000	Am. C. & F.
National Ref. Co.	*75	Underframes		Am. C. & F.
National Rosin Oil & Size Co.	an 5	Tank	100,000	Am. C. & F.
New Jersey Zinc Co.	an 6	Tank	100,000	Am. C. & F.
New Jersey Zinc Co.	10	Gen'l Ser.		Press. Steel
New Orleans & No. Eastern	bn 412	Box	60,000	Mt. Vernon
	bn 87	Box	60,000	Am. C. & F.
	bn 69	Gondola	80,000	Am. C. & F.
New York Central	b 1000	Box	80,000	Am. C. & F.
	1000	Gondola		Std. Steel
	b 1000	Box	80,000	Am. C. & F.
	b 1000	Box		Press. Steel
	a 2000	Hopper	100,000	Am. C. & F.
	b 1000	Box	80,000	Am. C. & F.
	2000	Gondola		Std. Steel
	2000	Gondola	140,000	Std. Steel
	750	Stock		M. D. T. Co.
New York Central	cm 750	Box	80,000	Ralston
New York Central	1200	Hopper		Am. C. & F.
N. Y., N. H. & Hartford	an 500	Coal	100,000	Std. Steel
	b 50	Caboose		Co. shops
N. Y., Ontario & Western	cm 20	Caboose		Co. shops
	am 2	Air dump.	80,000	Kil. & Jac.
New York, Ont. & Western	100	Gondola	80,000	Am. C. & F.
N. Y., Phila. & Norfolk	50	Box	100,000	Am. C. & F.
New York Chic. & St. Louis	bm 1000	Box	80,000	Am. C. & F.
	bm 500	Auto.	80,000	West. Steel
	bm 500	Auto.	80,000	West. Steel
	bm 750	Hopper	110,000	Std. Steel
N. Y., Susquehanna & West	an 500	Hopper	80,000	Std. Steel
Norfolk & Western	cn 65	Cabin		Co. shops
Norfolk & Western	1000	Gondola		Co. shops
	1000	Box		Mt. Vernon
No. American Ref. Co.	an 25	Tank	100,000	Am. C. & F.
Norfolk Southern	250			Co. shops
North American Refining Co.	an 50	Tank		Am. C. & F.
No. Car Tanning Extract Co.	an 10	Tank	100,000	Am. C. & F.
Northern Pacific	fm 250	Box	60,000	Co. shops
	fm 715	Box	80,000	Co. shops
	fm 35	Transfer	80,000	Co. shops
	anm 350	Ore	100,000	Press. Steel
	1000	Box		West. Steel
	500	Auto		West. Steel
Northwestern Pacific	am 50	Gondola	100,000	Has. & Bark.
	bm 100	Box	100,000	Ralston
	am 50	Flat	100,000	Ralston
	bm 60	Stock	80,000	Ralston
	fm 3	Caboose		Mt. Vernon
	25	Box		Co. shops
Ogden, Logan & Idaho	b 10	Box	50,000	Cinti Car
Ohio Electric	25	Dump	140,000	Magor
Oliver Iron Mining Co.	a 20	Air dump.	140,000	Magor
	25	Dump	140,000	Or. Art. Kop.
	80	Dump		West. Whld.
Osage Gasoline Co.	an 20	Tank	100,000	Am. C. & F.
Pacific Electric	b 1	Box	100,000	Has. & Bark.
Pan American Ref. Co.	an 50	Tank	8,000	Pa. Tank
Panhandle Ref. Co.	an 13	Tank	80,000	Am. C. & F.
	an 12	Tank	100,000	Am. C. & F.
Parker Amusement Co., C. W.	f 1			Co. shops
Peerless Tank Line	an 15	Tank		Gen'l Am.
	an 60	Tank		Am. C. & F.
Pennsylvania R. R.	a 3000	Hopper		Cambria
	an 2000	Hopper		Ralston
	a 1000	Box		Co. shops
Pennsylvania Lines West	bn 1000	Auto.	100,000	Pa. R. R.
	bn 6	Dump		Std. Steel
	3	Scale Test.	80,000	Pa. R. R.
	b 100	Cabin		Co. shops
Pennsylvania Salt Mfg. Co.	an 4	Tank	100,000	Pa. Tank
Pennsylvania Tank Line	an 2000	Tank	8,250	Pa. Tank
	an 150	Tank	10,650	Pa. Tank
Pensacola Tar & Turpentine	an 1	Tank	8,000	Pa. Tank
Phelps, Dodge & Co.	6	Ore		Press. Steel
Philadelphia & Reading	an 500	Hopper	110,000	Press. Steel
	an 500	Hopper	110,000	Std. Steel
	am 500	Hopper	110,000	Std. Steel
	am 500	Hopper	110,000	Press. Steel
	am 1000	Hopper	110,000	Cambria Stl.
	cm 10	Caboose		Co. shops
Pierce Oil Corp.	an 90	Tank	10,000	Am. C. & F.
	a 26	Tank	6,000	Pa. Tank
	an 125	Tank	100,000	Am. C. & F.
	an 75	Tank	80,000	Am. C. & F.
	an 10	Tank	60,000	Am. C. & F.
Pittsburgh & Shawmut	am 250	Hopper	100,000	Am. C. & F.
	bm 100	Gondola	100,000	Am. C. & F.
	bm 5	Caboose		Rs'll C. S. P.
	am 6	Platform	100,000	Am. C. & F.
Pittsburgh Oil Refining Co.	an 20	Tank	8,000	Pa. Tank
	an 15	Tank	8,000	Am. C. & F.
Pittsburgh Plate Glass Co.	12	Hopper		Press. Steel
Pittsburgh Steel Co.	40	Ore	100,000	Std. Steel
Ponca Refining Co.	an 40	Tank	80,000	Am. C. & F.
	an 1	Tank	8,250	Pa. Tank
Pressed Steel Car Co.	100	Gondola		Co. shops
Producers' Refining Co.	an 50	Tank	80,000	Am. C. & F.
	an 40	Tank	100,000	Am. C. & F.

Purchaser	No.	Kind	Capacity	Builder
Producers Refining Co.	an 40	Tank	80,000	Am. C. & F.
Prudential Oil Corp.	an 15	Tank	60,000	Am. C. & F.
	an 25	Tank	80,000	Am. C. & F.
	an 10	Tank	100,000	Am. C. & F.
Quebec Central	fm 100	Box	60,000	Can. C. & F.
Raritan River	bn 15	Gondola	100,000	Press. Steel
Riverside Oil Co.	an 6	Tank	8,000	Am. C. & F.
	an 10	Tank	8,000	Gen'l Am.
	a 5	Tank	8,000	Co. shops
Robinson Clay Products Co.	2	Ore		West. Steel
Robinson Shows	fm 5	Flat	60,000	Mt. Vernon
	fm 3	Stock	60,000	Mt. Vernon
Roxana Petroleum Co.	an 25	Tank	80,000	Am. C. & F.
	an 25	Tank	100,000	Am. C. & F.
	an 25	Tank	80,000	Am. C. & F.
Rutland	1	Snow Plow		R. C. & S. P.
St. L., B. & Mex.	500	Box		Am. C. & F.
Sapulpa Refining Co.	an 160	Tank	8,000	Gen'l Am.
	an 40	Tank	10,000	Gen'l Am.
Schock Refining Co.	an 75	Tank	8,000	Std. Car Con.
Seaboard Air Line	cm 50	Caboose		Std. Steel
Semet-Solvay Co.	an 75	Tank	10,000	Gen'l Am.
Solvay Process Co.	2	Gen'l Ser.		Bettendorf
	15	Gen'l Ser.		Press. Steel
Southern	dm 1335	Box	60,000	Lenoir
	dm 1223	Box	60,000	Lenoir
	dm 500	Auto.	60,000	Lenoir
	am 1012	Gondola	100,000	Press. Steel
	am 500	Gondola	100,000	Mt. Vernon
	am 1313	Gondola	100,000	Press. Steel
	bm 200	Stock	80,000	Lenoir
	dm 200	Caboose	60,000	Lenoir
Sligo & Eastern	10	Flat		Am. C. & F.
	1	Caboose		Am. C. & F.
Snyder, C. U., & Co.	an 50	Tank	100,000	Am. C. & F.
	an 50	Tank	100,000	Am. C. & F.
Southern Oil Corp.	an 20	Tank	8,100	Gen'l Am.
Southern Pacific	b 500	Box	100,000	Ralston
	a 475	Flat	100,000	Ralston
	a 25	Flat bod.	100,000	Ralston
	b 450	Stock	80,000	Ralston
	b 501	Auto.	100,000	Ralston
	b 999	Box	100,000	Has. & Bark.
	a 200	Gondola	100,000	Has. & Bark.
	a 300	Tank	100,000	Am. C. & F.
Sparks Shows	fm 1	Flat	60,000	Mt. Vernon
	fm 1	Stock	60,000	Mt. Vernon
Standard Car Equip. Co.	an 400	Tank		Pa. Tank
Stoddard Oil Co.	40	Tank	80,000	Am. C. & F.
Street's Company	210	Stock		Co. shops
Sumpter Valley	f 30	Flat		Co. shops
Stoddard Oil Co.	f 5	Box		Co. shops
Swift & Co.	an 14	Tank	80,000	Am. C. & F.
	*110	Underframes		Am. C. & F.
Temiskaming & Northern Ont.	dn 6	Van		Preston
Texas & New Orleans	b 298	Box	100,000	Ralston
	b 100	Auto.	100,000	Ralston
Texas & Pacific	bn 100	Ballast	100,000	Am. C. & F.
	1	Weed burner		Co. shops
Tex., Okla. & Eastern	f 15			Co. shops
Thwing, F. H.	an 20	Tank	80,000	Am. C. & F.
Tucson, Cornelia & Gila Bend.	an 26	Tank	6,000	Gen'l Am.
	cn 2	Box	80,000	M'Guire Cm.
	dn 3	Flat	100,000	M'Guire Cm.
Union Carbide Co.	4	Hopper		Press. Steel
Union R. R.	1250	Hopper	140,000	Press. Steel
	an 750	Hopper	1,000	Ralston
Union Pacific	bn 1500	Box	100,000	Am. C. & F.
	bn 1000	Auto.	100,000	Ralston
	1,800	Refrig.		Am. C. & F.
	700	Refrig.		Co. shops
	200	Box		Seattle C.&F.
	200	Box		Twohy Bros.
	an 100	Tank		Gen'l Am.
Union Tank Line	an 1000	Tank	6,500	Std. Steel
	an 1000	Tank	8,000	Am. C. & F.
	an 500	Tank	6,500	Press. Steel
	an 500	Tank	6,500	Std. Steel
	an 1000	Tank	6,500	Am. C. & F.
	an 250	Tank	6,500	Co. shops
U. S. Aluminum Co.	12	Flat		Std. Steel
U. S. Government	am 2	Flat	100,000	Mt. Vernon
U. S. Navy	fm 2	Flat	60,000	Bar & Smith
	am 3	Hopper	80,000	Mt. Vernon
Utah Copper Co.	150	Ore		Press. Steel
Vandalia	an 150	Box	100,000	Pa. R. R.
	an 150	Gondola	100,000	Has. & Bark.
Vicksburg, Shreve. & Pacific.	bn 100	Box	60,000	Am. C. & F.
Virginia Tank Car Corp.	an 25	Tank	80,000	Am. C. & F.
Virginian	cn 250	Box	80,000	Std. Steel
	an 1	Gondola	240,000	Cambria
	an 1	Gondola	240,000	Press. Steel
	an 1	Gondola	240,000	Std. Steel
	an 1	Gondola	240,000	Va. Bridge
	50	Hopper		Std. Steel

Purchaser	No.	Kind	Capacity	Builder
Vizard Gilhean	an 15	Tank	8,000	Pa. Tank
Wabash	c 1000	Box bod.		Am. C. & F.
	c 1000	Box		Am. C. & F.
	300	Stock bod.		Am. C. & F.
Wabash Pittsburgh Terminal	bn 200	Gondola	110,000	Press. Steel
	an 175	Gondola	100,000	Press. Steel
	an 375	Gondola	100,000	Press. Steel
	am 1000	Hopper	100,000	Press. Steel
Wade, Cleaver & Wade	a 15	Flat	60,000	Mt. Vernon
Warner, Quinlan Asphalt Co.	an 5	Tank	60,000	Am. C. & F.
	an 7	Tank	80,000	Am. C. & F.
	an 20	Tank	100,000	Am. C. & F.
Waveross & Southern	f 1			Co. shops
Western Maryland	an 2000	Hopper	105,000	Pullman
Western Ohio	lm 4	Box	60,000	Bar. & Smith
Western Pacific	bm 800	Box	80,000	Mt. Vernon
	bm 200	Vent.	80,000	Mt. Vernon
	bm 159	Stock	80,000	Mt. Vernon
	f 6	Caboose		Co. shops
	d 100	Stock		Co. shops
Wheeling & Lake Erie	500	Hopper		Press. Steel
	500	Gondola		Std. Steel
	500	Hopper		Press. Steel
	500	Gondola		Std. Steel
	b 3	Caboose		Co. shops
White Eagle Petroleum Co.	an 60	Tank	80,000	Am. C. & F.
	an 40	Tank	100,000	Am. C. & F.
	an 50	Tank	8,000g	Pa. Tank
Wichita Ind. Oil & Ref. Co.	an 10	Tank		Am. C. & F.
Wilhoit Refining Co.	an 10	Tank	100,000	Am. C. & F.
Wilson Car Lines	bn 100	Refrig.	60,000	Has. & Bark.
	an 25	Tank	80,000	Gen'l Am.
	bm 100	Refrig.	60,000	Mil. Refrig.
Wisconsin Lbr. Co.	25	Logging	50,000	Am. C. & F.
Wood, Alan, Iron & Stl. Co.	a 100	Hopper	100,000	Am. C. & F.

ORDERS FROM FOREIGN RAILWAYS

Beth. Chile Iron Mines Co. (Chile)	25	Ore		Press. Steel
Central Adelaida	100	Cane	60,000	Am. C. & F.
Central Australia (Cuba)	50	Cane		Am. C. & F.
Central Canoga	100	Cane		Am. C. & F.
Central Palma (Cuba)	100	Cane	50,000	Am. C. & F.
Cerro de Pasco	a 20	Hopper	80,000	Am. C. & F.
	a 15	Hopper	80,000	Am. C. & F.
Chinese Government Rys.	a 75	Gondola	60,000	Am. C. & F.
	a 75	Gondola	60,000	Am. C. & F.
Cuba R. R.	400	Flat		Am. C. & F.
	425	Cane		Am. C. & F.
	350	Box		Am. C. & F.
	30	Tank		Am. C. & F.
	10	Tank		Am. C. & F.
	9	Refrig.		Am. C. & F.
Cuba Northern	25	Flat		Am. C. & F.
	75	Box		Am. C. & F.
French State Railways	5000			Std. Steel
	2000			Can. C. & F.
	4000		36,000	National
	cm 1000	Gondola	20 M. tons	Eastern
	a 500			Std. Steel
Grace, W. R., & Co. (Chile)	an 10	Tank	66,100	Am. C. & F.
Guantanamo & Western (Cuba)	b 25	Box	80,000	Am. C. & F.
	a 25	Cane	60,000	Am. C. & F.
Havana Central	300	Flat	40,000	Press. Steel
	200	Box	60,000	Press. Steel
	140	Flat	60,000	Std. Steel
	100	Cane	30,000	Am. C. & F.
	10	Hopper		Press. Steel
	b 100	Flat	50,000	Am. C. & F.
	50	N. g. box	30,000	Am. C. & F.
	50	N. g. flat		Am. C. & F.
	50	Flat	60,000	Std. Steel
	150	Box	60,000	Std. Steel
	10	Caboose	60,000	Std. Steel
	50	Underframes		Am. C. & F.
Italian State Rys.	3000	Gondola		Am. C. & F.
Marine St. Forg. Co. (France)	25	Gen'l ser.		Press. Steel
Miranda Sugar Co. (Cuba)	80	Cane		Am. C. & F.
Paris-Lyons-Med. (France)	500	Gondola		Press. Steel
	1000	Gondola		Press. Steel
Paris-Orleans (France)	cm 2000	Box	20 M. tons	Eastern
	am 100	Gond.	40 M. tons	Eastern
Russian Government	1000	Gondola	100,000	Std. Steel
	2000	Gondola	100,000	
	155	Gondola		Am. C. & F.
	3500	Pond		Eastern
Spanish-Am. Iron Co. (Cuba)	a 100	Ore	140,000	Am. C. & F.
Tientsin-Pekin (China)	50	Box		Press. Steel

a Indicates all-steel cars.
b Indicates steel underframe cars.
c Indicates steel frame cars.
d Indicates composite underframe cars.
f Indicates all-wood cars.
g Indicates steel end cars.
m Indicates spring draft gear.
n Indicates friction draft gear.

PASSENGER CARS ORDERED IN 1916

Purchaser	No.	Kind	Builder
Alabama Great Southern	axL 8	Coaches	Pullman
	axL 3	Bagg. & exp.	Pullman
	axL 2	Dining	Pullman
Arizona Copper Co.	f 3	Ng. coaches	Am. C. & F.
Arizona Eastern	ax 2	Bagg. & mail	Pullman
	ax 3	Coaches	Pullman
	ax 2	Pass. & bagg.	Pullman
Arms Palace Horse Car Co.	b 20	Horse	Bar. & Smith
Atchison, Topeka & Santa Fe	ax 10	Jim Crow	Pullman
	ax 25	Baggage	Pullman
Atlantic Coast Line	axN 10	Coaches	Pullman
	axN 6	Express	Pullman
	axN 4	Mail & bagg.	Pullman
	axN 2	Pass. & bagg.	Pullman
	ax 1	Dining	Pullman
Baltimore & Ohio	axN 65	Coach	Pullman
	axN 7	Bagg. & mail	Pullman
Baltimore & Ohio, con.	axN 3	Postal	Pullman
	axN 15	Pass. & bagg.	Pullman
	axN 10	Horse exp.	Pullman
	axy 1	Private	Pullman
Boston & Maine	axL 6	Baggage	Laconia
	axL 2	Bagg. & mail	Laconia
	6	Postal	Osg.-Brad'y
Boston Elevated	ax 42	Elevated	Press. Steel
Cambria & Indiana	axN 1	Stor. battery	Ry. St. Bat.
Can. Gov't Rys. (Inter. Div.)	b 4	Baggage	Co. shops
	b 2	Postal	Co. shops
Can. Gov't Rys. (Trans. Div.)	fx 3	Baggage	Preston

a Indicates all-steel cars.
b Indicates steel underframe cars.
d Indicates composite underframe cars.
f Indicates all-wood cars.
x Indicates electric lighting.
y Indicates gas lighting.
w Indicates oil lighting.
E Cars for electric operation.
L Lead acid batteries.
N Nickel alkaline batteries.

Purchaser	No.	Kind	Builder
Canadian Northern	fx 40	Colonist	Can. C. & F.
	fx 9	Colonist	Crossen
	fx 6	Tourist	Crossen
	fx 3	Baggage	Preston
	fx 5	Baggage	Crossen
	ax 15	Baggage	National
	ax 5	Mail	Preston
	ax 7	Colonist	Crossen
	ax 7	First class	Can. C. & F.
	ax 5	First class	National
	ax 7	Dining	Can. C. & F.
	ax 7	Tourist	Can. C. & F.
	ax 11	Sleeping	Can. C. & F.
	bx 7	Compartment obs.	Can. C. & F.
	bx 2	Compartm't sleep.	Can. C. & F.
	bx 6	Second class	Can. C. & F.
Canadian Pacific	ay 6	Mail	Co. shops
	ay 12	Bagg. & exp.	Co. shops
	ay 7	Baggage	Co. shops
	b 100	Exp. ref.	Co. shops
	axy 1	Private	Pullman
Central of Georgia	axN 6	Sleeping	Pullman
	11	Passenger	Am. C. & F.
Central of New Jersey	ax 25	Coaches	Pullman
	ax 6	Pass. & bagg.	Pullman
	ax 5	Bagg. & exp.	Pullman
	ax 1	Official	Pullman
	ax 2	Cafe	Pullman
Central Vermont	ax 2	Mail	Osg.-Brad'y
Chattahoochee Valley	ax 1	Stor. battery	Ry. St. Bat.
Chesapeake & Ohio	ax 16	Coaches	Pullman
	ax 12	Express	Pullman
	ax 4	Parlor	Pullman
	ax 1	Dining	Pullman
Chicago & Eastern Ill.	axL 8	Baggage	Pullman
Chicago & North Western	aw 24	Coaches	Am. C. & F.
	ay 15	Smoking	Am. C. & F.
	ay 10	Baggage	Am. C. & F.
	ay 3	Postal	Am. C. & F.
	ay 1	Bagg. & mail.	Am. C. & F.
	aw 4	Bagg. & mail.	Am. C. & F.
Chicago Great Western	axN 1	Postal	Am. C. & F.
	axN 2	Dining	Pullman
	ay 5	Baggage	Pullman
Cincinnati, Ind. & Western	ax 3	Coaches	Am. C. & F.
	ax 1	Dining	Am. C. & F.
	ax 3	Pass. & bagg.	Am. C. & F.
	ax 2	Postal	Am. C. & F.
Cin., New Orleans & Tex. Pac.	axL 12	Coaches	Pullman
	axL 3	Pass. & bagg.	Pullman
	axL 6	Bagg. & exp.	Pullman
	axL 1	Dining	Pullman
Cleve., Cin., Chic. & St. L.	ax 20	Coaches	Bar. & Smith
	ax 5	Pass. & bagg.	Std. Steel
	ax 10	Bagg. & mail.	Am. C. & F.
	ax 15	Baggage	Pullman
Delaware & Hudson	ax 1	Private	Pullman
	ax 3	Bagg. & mail.	Pullman
Delaware, Lackawanna & West.	axL 45	Coaches	Pullman
	axL 10	Combination	Pullman
	axN 1	Business	Pullman
Duke, J. B.	ax 1	Private	Pullman
Duluth, Missabe & Northern	axL 1	Business	Pullman
Eaton, Sir John	ax 1	Private	Pullman
El Paso & Southwestern	axL 1	Bagg. & mail.	Pullman
	axL 4	Bagg. & exp.	Pullman
	axL 2	Coaches	Pullman
	axL 1	Business	Pullman
Erie	axL 7	Coaches	Press. Steel
	axL 1	Combination	Press. Steel
	axL 2	Dining	Bar. & Smith
	by 50	Express	Osg.-Brad'y
Fairburn & Atlanta	axN 3	Stor. battery	Ry. St. Bat.
Flagler, Mrs. H. N.	ax 1	Private	Pullman
Florida East Coast	ax 8	Coaches	Pullman
	ax 3	Baggage	Pullman
	ax 3	Express	Pullman
Gal., Harris. & San Antonio	ay 10	Baggage	Pullman
	ay 12	Bagg. & mail.	Pullman
	ax 15	Coaches	Pullman
Grand Rapids & Indiana	ax 3	Pass. & bagg.	Press. Steel
Great Northern	ax 15	Postal	Press. Steel
Green Bay & Western	b 1	Coach	Am. C. & F.
Huntington, H. E.	axy 1	Private	Pullman
Illinois Central	axN 3	Bagg. & mail.	Am. C. & F.
	axN 6	Bagg. & mail.	Am. C. & F.
	axN 1	Postal	Am. C. & F.
	axN 4	Buffet-bagg.	Pullman
	axN 10	Dining	Pullman
	axN 7	Chair	Pullman
	axN 39	Coaches	Pullman
	axN 6	Compartment	Pullman
	axN 18	Baggage	Pullman
	axN 3	Office	Pullman
International & Gt. Northern	axy 4	Bagg. & mail.	Am. C. & F.
	ax 5	Coaches	Am. C. & F.
	ax 2	Dining	Am. C. & F.
Lakeside & Marblehead	a 1	Gaso. Mech. Drive	McKeen
Lehigh Valley	axN 2	Dining	Pullman
	axN 1	Private	Pullman
	axN 25	Bagg. & exp.	Pullman
Long Island	ax 4	Passenger	Am. C. & F.
	axE 15	Coaches	Press. Steel
	axE 45	Trailer	Press. Steel
	a 1	Club	Am. C. & F.
Louisville & Nashville	axL 4	Bagg. & mail.	Am. C. & F.
	axL 4	Baggage	Am. C. & F.
	axL 6	Coaches	Am. C. & F.
Louis., Hend. & St. Louis	bx 1	Parlor	Am. C. & F.
McLean	axy 1	Private	Pullman
Maine Central	axN 1	Postal	Pullman
	axN 1	Baggage	Pullman
	axN 1	Express	Pullman
	axN 2	Coaches	Pullman
	axN 1	Smoking	Pullman
Memphis & Rugby	fxN 1	Stor. battery	Ry. St. Bat.
Michigan Central	ax 20	Coaches	Std. Steel
	ax 5	Pass. & bagg.	Std. Steel
	ax 15	Baggage	Am. C. & F.
	ax 10	Baggage	Pullman
Midland Valley	a 1	Gaso. Mech. Drive	McKeen
Mississippi R. & Bonne Terre	ax 1	Bagg. & mail.	Am. C. & F.
	ax 2	Coaches	Am. C. & F.
Missouri, Kansas & Texas	ax 10	Baggage	Am. C. & F.
	ax 5	Baggage	Am. C. & F.
	ax 4	Dining	Am. C. & F.
	ax 2	Postal	Am. C. & F.
	ax 10	Baggage	Am. C. & F.
Missouri Pacific	axL 5	Pass. & bagg.	Am. C. & F.
	axL 5	Coach & mail.	Am. C. & F.
	axL 6	Dining	Am. C. & F.
Nash., Chatt. & St. Louis	ay 1	Bagg. & mail.	Am. C. & F.
	axN 2	Postal	Am. C. & F.
New York Central	ax 5	Coaches	Bar. & Smith
	ax 50	Coaches	Press. Steel
	ax 35	Coaches	Std. Steel
	ax 10	Pass. & bagg.	Std. Steel
	ax 20	Bagg. & mail.	Am. C. & F.
	ax 80	Baggage	Am. C. & F.
	ax 1	Private	Pullman
	ax 3	Dining	Co. shops
	axE 12	Multiple-unit	Std. Steel
	ax 25	Baggage	Pullman
New York Consolidated	axE 200	Subway	Am. C. & F.
N. Y., N. H. & H.	axL 65	Coaches	Osg.-Brad'y
	axL 35	Baggage	Osg.-Brad'y
	axL 4	Dining	Pullman
	axL 1	Private	Pullman
	c 25	Milk	Osg.-Brad'y
New York, Phil. & Norfolk	ax 2	Coaches	Press. Steel
Norfolk & Western	axL 1	Officers	Pullman
	ax 8	Pass. & bagg.	Har. & Holl.
	ax 14	Bagg. & mail.	Har. & Holl.
	ax 19	Bagg. & exp.	Har. & Holl.
	ax 29	Coaches	Har. & Holl.
(Of these 70 cars, 20 will have lead acid and 50 nickel alkaline batteries.)			
Ohio River & Western	fw 2	Bagg. & mail.	Am. C. & F.
Parker Amusement Co., C. W.	f 1		Co. shops
	b 1		Co. shops
Pennsylvania R. R.	ax 50	Coaches	Co. shops
	ax 20	Pass. & bagg.	Co. shops
	ax 5	Baggage	Co. shops
Pennsylvania Lines West	ax 10	Bagg. mail & exp.	Pullman
Philadelphia & Reading	axL 3	Baggage	Co. shops
	axN 2	Cafe	Co. shops
	ax 2	Cafe	Pullman
Pittsburgh & Lake Erie	ax 10	Coaches	Press. Steel
Pullman Co.	ax 293	Sleeping	Pullman
	ax 2	Parlor & exp.	Pullman
	ax 24	Parlor	Pullman
	ax 3	Private	Pullman
Quebec Central	fxL 1	Bagg. & mail.	Co. shops
Ringling, John	ax 1	Private	Pullman
St. Louis-San Francisco	ax 3	Chair	Am. C. & F.
	ax 1	Coach	Am. C. & F.
Schwab, Charles M.	ax 1	Private	Pullman
Seaboard Air Line	axN 15	Express	Press. Steel
	axN 2	Obs. dining	Pullman
	axN 3	Dining	Pullman
	ax 2	Gas-elec.	Gen'l Elec.
Southern	axL 25	Coaches	Pullman
	axL 10	Pass. & bagg.	Pullman
	axL 10	Mail & bagg.	Pullman
	axL 10	Bagg. & exp.	Pullman
	axL 5	Club	Pullman
Southern Pacific	ay 6	Bagg. & mail.	Pullman
Southern Utah	a 1	Gaso. Mech. Drive	McKeen
Texas & Pacific	axN 8	Mail & bagg.	Am. C. & F.
Towson & Cockeysville	fxN 1	Stor. battery	Ry. St. Bat.
Union Pacific	ay 5	Bagg. & mail.	Pullman
	axy 1	Private	Pullman
	a 1	Gaso. Mech. Drive	McKeen
	a 1	Gaso. Mech. Drive	McKeen
Unit Car Company	ax 1	Pass., bagg. & mail	Laconia
Wabash	ax 12	Postal	Am. C. & F.
Western Maryland	axL 15	Coaches	Pullman
	axL 2	Pass. & bagg.	Pullman
	axL 2	Cafe-Parlor	Pullman
	axL 6	Baggage	Pullman

ORDERS FROM FOREIGN RAILWAYS

Am. R. R. of Porto Rico	6	First class	Am. C. & F.
Chile State Rys. (So. America)	fx 24	Passenger	Osg.-Brad'y
Cuba Co.	bx 6	Second class	Am. C. & F.
	bx 1	First class	Am. C. & F.
	bx 1	First & obs.	Am. C. & F.
	bx 2	Bagg. & exp.	Am. C. & F.
	bx 2	Mail, bagg. & exp.	Am. C. & F.
	bx 4	Second class	Am. C. & F.
	bx 2	Sleeping	Am. C. & F.
Havana Central	3	Coaches	Wason
	5	Bagg. & mail.	Wason
	f 5	Coaches	Am. C. & F.
	f 2	Pass. & bagg.	Am. C. & F.
Iquique Tramways	fxN 1	Stor. battery	Ry. St. Bat.
Norte de Cuba	a 1	Gaso. Mech. Drive	McKeen

a Indicates all-steel cars.
b Indicates steel underframe cars.
d Indicates composite underframe cars.
f Indicates all-wood cars.
x Indicates electric lighting.
y Indicates gas lighting.
w Indicates oil lighting.
E Cars for electric operation.
L Lead acid batteries.
N Nickel alkaline batteries.

LOCOMOTIVES ORDERED IN 1916

Purchaser	No.	Cylinders	Weight	Type	Super-heater	Brick arch	Valve gear	Automatic stoker	Builder
Alabama Great Southern	2	27 x 28	315,500	4-8-2	Yes	Yes	Southern	.....	Baldwin
	6	27 x 30	285,000	2-8-2	Yes	Yes	Southern	.....	Lima
	4	24 x 28	208,700	0-8-0	Yes	No	Southern	.....	Lima
Alabama Co.	1	19 x 26	122,000	0-6-0	No	Yes	.....	.....	Baldwin
Alexandria & Western	1	16 x 24	90,000	2-6-0	No	Yes	.....	.....	Baldwin
Algoma Eastern	2	22 x 28	191,500	2-8-0	Yes	Yes	Walschaert	.....	Canadian
Aluminum Co. of America	1	22 x 28	203,000	0-8-0	Yes	Yes	.....	.....	American
American Car & Foundry Co	1	18 x 24	100,000	0-6-0	No	Yes	.....	.....	Baldwin
American Manganese Steel Co	1	.....	58,000	0-4-0	...	...	.....	.....	American
American Rolling Mill Co	2	21 x 26	140,000	0-6-0	No	Yes	Stephenson	.....	Baldwin
	2	16 x 24	94,000	0-4-0	No	No	Richardson	.....	American
American Sheet & Tin Plate Co	1	19 x 26	120,700	0-6-0	No	Yes	.....	.....	Baldwin
American Steel & Wire Co	1	10 x 16	37,100	0-4-0	No	No	.....	.....	Baldwin
Ann Arbor	3	27 x 30	265,000	2-8-2	Yes	Yes	Baker	.....	American
Arizona Eastern R. R. Co	2	25 x 28	.....	4-6-2	Yes	...	.....	.....	Lima
	2	26 x 28	.....	2-8-2	Yes	...	.....	.....	Lima
Arizona Lumber & Timber Co	1	20 x 28	174,000	2-8-2	No	No	.....	.....	Baldwin
	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Asbestos & Asbestic Co	1	13 x16	60,000	0-6-0	No	No	.....	.....	Canadian
Ashland Coal & Iron	1	22 x 28	204,000	2-8-0	Yes	Yes	.....	.....	American
Ashland, Odanah & Marengo	1	17 x 24	116,800	2-6-2	No	Yes	.....	.....	Baldwin
Atchison, Topeka & Santa Fe	28	25 x 32	292,400	2-8-2	Yes	Yes	Baker	Street	Baldwin
Atlanta, Birmingham & Atlantic	3	27 x 30	316,000	2-10-2	Yes	Yes	Baker	.....	Baldwin
Atlantic Coast Line	10	22 x 28	227,300	4-6-2	Yes	Yes	Walschaert	.....	Baldwin
	2	19 x 24	129,550	0-6-0	Yes	Yes	Southern	.....	Baldwin
	20	23 x 28	252,000	4-6-2	Yes	Yes	Walschaert	.....	Baldwin
	5	20 x 24	133,500	0-6-0	Yes	Yes	Walschaert	.....	Baldwin
Atlas Export & Trading Co	1	9 x 14	29,000	0-4-0	...	...	.....	.....	Lima
Babcock & Wilcox Co	1	18 x 24	147,500	2-6-2	No	Yes	.....	.....	Baldwin
Baker Co., R. D	1	2-6 x 10	26,000	Shay	...	...	.....	.....	Lima
Baltimore & Ohio	50	26 x 32	281,900	2-8-2	Yes	Yes	Baker	Street	Baldwin
	10	22 x 26	178,500	2-6-0	Yes	Yes	Baker	.....	Lima
	30	.....	.....	Mallet	Yes	Yes	.....	Street	Baldwin
	10	.....	.....	4-6-2	Yes	Yes	.....	.....	Baldwin
Bangor & Aroostook	1	23 x 30	208,000	2-8-0	Yes	Yes	Baker	.....	American
Barfield Lumber Co	1	13 x 22	76,400	2-6-2	No	No	.....	.....	Baldwin
Bell, A. E	1	12 x 18	60,800	2-6-2	No	No	.....	.....	Baldwin
Bessemer & Lake Erie	20	30 x 32	404,250	2-10-2	Yes	Yes	Baker	Street	Baldwin
Bethlehem Steel Co	2	22 x 28	196,000	0-8-0	...	...	.....	.....	American
	4	17 x 20	92,400	0-4-0	No	No	.....	.....	Baldwin
	2	21 x 26	143,700	0-6-0	No	Yes	.....	.....	Baldwin
	2	21 x 26	150,000	0-6-0	No	Yes	.....	.....	Baldwin
	1	19 x 26	122,000	0-6-0	No	Yes	.....	.....	Baldwin
	6	21 x 26	150,000	0-6-0	No	Yes	.....	.....	Baldwin
Big Creek Logging Co	1	3-11 x 12	90,000	Shay	...	...	.....	.....	Lima
Bingham & Garfield	2	26 & 41 x 28	457,000	0-8-8-0	Yes	Yes	Walschaert	.....	American
	2	22 x 26	169,700	0-6-0	Yes	No	Walschaert	.....	Baldwin
	4	21 x 24	156,000	0-6-0	Yes	No	.....	.....	Baldwin
Birdsboro Stone Co	1	21 x 26	138,400	0-6-0	No	Yes	.....	.....	Baldwin
Birmingham Southern	4	28 x 32	353,000	2-10-2	Yes	Yes	.....	.....	American
	2	22 x 26	160,000	0-6-0	Yes	...	.....	.....	American
Bloedel-Donovan Lumber Co	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Blount-Decker Lumber Co	1	15 x 24	94,000	2-6-2	No	No	.....	.....	Baldwin
Boston & Maine	23	20 x 26	148,000	0-6-0	Yes	Yes	Baker	.....	American
	2	25 x 30	230,000	0-8-0	Yes	Yes	Baker	.....	American
	25	24 x 30	210,000	2-8-0	Yes	Yes	Walschaert	.....	American
	10	22 x 28	235,000	4-6-2	Yes	Yes	Walschaert	.....	American
	2	.....	.....	Electric	...	...	.....	.....	Westinghouse
Buffalo Creek	3	21 x 28	211,000	0-8-0	Yes	Yes	Walschaert	.....	American
Buffalo, Rochester & Pittsburgh	10	26½ x 30	278,000	2-8-2	Yes	Yes	Walschaert	Street	American
	5	23½ & 37 x 32	429,000	2-6-6-2	Yes	Yes	Walschaert	Street	American
Bush Terminal Co	1	18 x 24	102,000	0-4-0	No	No	.....	.....	Baldwin
	1	.....	120,000	4-0-4	Electric switch		.....	.....	Gen. Electric
Butler Bros.	1	19 x 26	122,500	0-6-0	No	Yes	.....	.....	Baldwin
Butte, Anaconda & Pacific	6	.....	164,000	Elec. frght.	...	...	.....	.....	Gen. Electric
C. & O. Lumber Co	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Cal. State Board of Harbor Comm	1	20 x 24	145,200	0-6-0	No	No	.....	.....	Baldwin
Calumet & Arizona Mining Co	4	19 x 26	133,000	0-6-0	Yes	...	.....	.....	American
Calumet, Hammond & Southeastern	3	19 x 24	123,000	0-6-0	No	Yes	.....	.....	Baldwin
Cambria & Indiana	2	22 x 28	231,550	2-8-2	Yes	Yes	Walschaert	.....	Lima
Campbell Bros. Lumber Co	1	3-10 x 12	84,000	Shay	...	...	.....	.....	Lima
Canadian Government Rys. (Intercolonial Div.)	10	26 x 32	324,000	2-10-2	Yes	Yes	Walschaert	.....	Montreal
Canadian Government Rys. (Transcont. Div.)	*30	27 x 30	283,000	2-8-2	Yes	Yes	Walschaert	.....	Canadian
	1	.....	.....	Snow plow	...	...	.....	.....	American
Canadian Northern	*1	.....	.....	Snow plow	...	...	.....	.....	American
Canadian Northern Ry. System	6	.....	.....	Electric	...	...	.....	.....	Can. Gen. El. Co.
Canton	1	21 x 28	162,000	0-6-0	No	Yes	Southern	.....	Baldwin
Carnegie Steel Co	1	13 x 16	56,000	0-4-0	No	No	.....	.....	Baldwin
	4	22 x 28	176,000	0-6-0	Yes	Yes	.....	.....	Baldwin
	3	22 x 28	173,000	0-6-0	No	No	.....	.....	Baldwin
Carney Mill Co., W. M	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Central of New Jersey	10	.....	.....	4-6-0	...	...	.....	.....	Baldwin
Central R. R. of New Jersey	10	24 x 30	234,000	0-8-0	No	No	Walschaert	.....	American
	3	24 x 30	234,000	0-8-0	No	No	Walschaert	.....	Company shops
Central Steel Co	2	21 x 26	158,000	0-6-0	...	...	.....	.....	American
Chemical Lime Co	1	8 x 14	21,000	0-4-0	No	No	.....	.....	Baldwin
Cherry River Boom & Lumber Co	1	16 x 24	93,000	2-6-0	No	No	.....	.....	Baldwin
	1	3-14½ x 15	180,000	Shay	...	...	.....	.....	Lima
Chicago & Northwestern	18	25 x 28	260,000	4-6-2	Yes	Yes	Baker	.....	American
	6	22 x 26	299,000	4-6-2	Yes	Yes	Baker	.....	American
	50	27 x 32	302,000	2-8-2	Yes	Yes	Baker	.....	American
	43	18 x 24	140,500	0-6-0	Yes	Yes	Baker	.....	American
	25	21 x 28	171,000	0-6-0	Yes	Yes	Baker	.....	American
Chesapeake & Ohio	25	22 & 35 x 32	434,000	2-6-6-2	Yes	Yes	Walschaert	Duplex	American
	25	22 & 35 x 32	434,000	2-6-6-2	Yes	Yes	Walschaert	Duplex	American
Chicago & Calumet River	1	20 x 26	129,000	0-6-0	...	...	.....	.....	American
Chicago, Burlington & Quincy	15	27 x 30	266,500	2-8-2	Yes	Yes	Walschaert	.....	Baldwin
	25	28 x 32	315,400	2-8-2	Yes	Yes	Walschaert	Street	Baldwin
	10	30 x 32	367,850	2-10-2	Yes	Yes	Walschaert	Street	Baldwin
Chicago Great Western	10	21 x 26	155,000	0-6-0	Yes	Yes	Walschaert	.....	Baldwin
	3	25 x 28	259,400	4-6-2	Yes	Yes	Walschaert	.....	Baldwin
	7	30 x 32	347,400	2-10-2	Yes	Yes	Walschaert	.....	Baldwin
Chic., Indianapolis & Louisv. (Monon Route)	3	26 x 28	290,000	4-6-2	Yes	Yes	Walschaert	.....	American
	3	28 x 30	350,000	2-10-2	Yes	Yes	Walschaert	.....	American
Chicago Junction	10	20 x 26	150,000	0-6-0	Yes	Yes	.....	.....	American
Chicago River & Indiana	1	20 x 26	148,000	0-6-0	Yes	Yes	.....	.....	American
Chicago, St. Paul, Minneapolis & Omaha	2	25 x 28	260,000	4-6-2	Yes	Yes	Baker	.....	American
	10	27 x 32	302,000	2-8-2	Yes	No	Baker	.....	American
	9	21 x 28	171,000	0-6-0	Yes	No	Baker	.....	American
	2	27 x 32	342,000	2-10-2	No	No	Walschaert	.....	Baldwin
Chicago Short Line	1	21 x 26	141,000	0-6-0	No	Yes	.....	.....	Baldwin
Cincinnati, New Orleans & Texas Pacific	5	27 x 28	315,500	4-8-2	Yes	Yes	Southern	.....	Baldwin
	4	24 x 28	208,700	0-8-0	Yes	No	Southern	.....	Lima

Purchaser	No.	Cylinders	Weight	Type	Super-heater	Brick arch	Valve gear	Automatic stoker	Builder
Clear Lake Lumber Co.	1	20½ x 28	160,500	2-8-2	Yes	No	.....	.....	Baldwin
Cleveland, Cin., Chicago & St. L.	5	.....	273,000	4-6-2	Yes	Yes	.....	.....	American
Coal & Coke	2	23 x 28	199,800	2-8-0	No	Yes	Baker	.....	Baldwin
Columbia & Nehalem River	1	18 x 24	141,150	2-8-0	No	Yes	.....	.....	Baldwin
	1	17 x 24	117,800	2-6-2	No	No	.....	.....	Baldwin
Copper River & No. West.	1	20 x 28	195,000	2-8-2	Yes	...	.....	.....	American
Cowell Lime & Cement Co., Henry	1	12 x 16	48,800	0-4-0	No	No	.....	.....	Baldwin
Cornwall	1	21 x 26	139,000	0-6-0	No	Yes	.....	.....	Baldwin
Cornwall Ore Bank Co.	1	22 x 26	150,000	0-6-0	No	No	.....	.....	Baldwin
Cramp & Sons Ship Bldg. Co., Wm.	1	14 x 22	67,000	0-4-0	No	No	.....	.....	Baldwin
Croft Lumber Co.	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Danaher Lumber Co.	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Davis Supply Co.	2	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Deemer Mfg. Co.	1	3-11 x 12	100,000	Shay	...	...	.....	.....	Lima
Deer Island Logging Co.	1	17 x 24	118,000	2-6-2	No	No	.....	.....	Baldwin
Delaware, Lackawanna & Western	5	25 x 28	312,000	4-6-2	Yes	Yes	Baker	.....	American
	10	22 x 28	208,000	0-8-0	Yes	Yes	Baker	.....	Company shops
	7	25 x 28	295,000	4-6-2	Yes	Yes	Baker	.....	American
	10	28 x 30	321,000	2-8-2	Yes	Yes	Baker	.....	American
Delray Connecting R. R.	2	22 x 28	208,000	0-8-0	Yes	Yes	Walschaert	.....	American
Denver & Rio Grande	10	31 x 32	420,000	2-10-2	Yes	Yes	Baker	Street	American
Denver & Salt Lake	5	21 & 33½ x 32	361,000	2-6-6-0	Yes	Yes	Walschaert	.....	American
	2	26 x 30	305,000	2-8-2	Yes	Yes	Walschaert	.....	American
Detroit Terminal	3	21 x 28	172,000	0-6-0	Yes	...	.....	.....	American
	3	21 x 28	173,000	0-6-0	Yes	...	.....	.....	American
Detroit, Toledo & Ironton	2	25 x 30	250,000	2-8-2	Yes	Yes	Baker	.....	American
Donora Southern	1	22 x 26	163,000	0-6-0	Yes	No	Stephenson	.....	Baldwin
Duluth, Missabe & Northern	4	24 x 28	220,000	0-8-0	Yes	Yes	Walschaert	.....	Baldwin
	2	26 & 40 x 32	470,000	2-8-8-2	Yes	Yes	Walschaert	Street	Baldwin
Duluth, Winnipeg & Pac.	10	24 x 32	240,000	2-8-0	Yes	Yes	.....	.....	American
East Broad Top	1	20 x 24	163,000	4-6-2	Yes	No	Walschaert	.....	Baldwin
East Jersey R. R. & Terminal Co.	1	19 x 24	127,700	0-8-0	No	No	.....	.....	Baldwin
East Oregon Lumber Co.	1	18 x 24	139,000	2-8-2	No	No	.....	.....	Baldwin
East Tennessee & Western North Carolina	1	16 x 22	98,800	4-6-0	No	No	Walschaert	.....	Baldwin
El Paso & Southwestern	5	29 x 30	321,000	2-8-2	Yes	Yes	Baker	Street	American
	10	27 x 28	312,000	4-6-2	Yes	Yes	Walschaert	.....	American
Erie	10	31 x 32	417,200	2-10-2	Yes	Yes	Baker	Hanna	Baldwin
	3	31 x 32	417,200	2-10-2	Yes	Yes	Baker	Hanna	Lima
	10	31 x 32	401,000	2-10-2	Yes	Yes	Baker	Street	American
	15	31 x 32	401,000	2-10-2	Yes	Yes	Baker	Street	American
	2	7¾ x 12	44,000	0-4-0	(Gasoline switch)		.....	.....	Baldwin
	10	27 x 28	284,810	4-6-2	Yes	Yes	Baker	.....	American
	3	20 x 26	148,100	0-6-0	Yes	Yes	Baker	.....	Company shops
Escanaba & Lake Superior	1	19 x 26	142,500	4-6-0	Yes	Yes	Walschaert	.....	Baldwin
Eureka Nevada	1	.....	.....	2-6-2	...	...	.....	.....	Porter
Evansville Suburban & Newburgh	1	17 x 24	106,100	2-6-0	No	No	.....	.....	Baldwin
Fairport, Painesville & Eastern	1	.....	.....	0-6-0	Yes	Yes	.....	.....	Baldwin
Finkbine Lumber Co.	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Flagstaff Lumber Mfg. Co.	1	19 x 24	123,500	2-8-0	No	No	.....	.....	Baldwin
Florida East Coast	10	22 x 26	204,000	4-6-2	Yes	...	.....	.....	American
	2	20 x 26	146,000	0-6-0	Yes	...	.....	.....	American
Fort Smith & Western	3	22 x 28	200,300	2-8-2	Yes	Yes	Southern	.....	Baldwin
Galveston, Harrisburg & San Antonio	10	26 x 28	.....	2-8-2	Yes	...	.....	.....	American
General Chemical Co.	1	22 x 26	156,700	0-6-0	No	Yes	.....	.....	.....
General Refractories Co.	1	12 x 16	46,000	0-4-0	No	No	.....	.....	Baldwin
	2	19 x 26	.....	4-6-0	No	Yes	Stephenson	.....	American
Golden State Portland Cement Co.	1	3-8 x 10	56,000	Shay	...	...	.....	.....	Lima
Goodman Lumber Co.	1	3-10 x 10	72,000	Shay	...	...	.....	.....	Lima
Granby Mining & Smelting Co.	1	8 x 12	17,000	0-4-0	No	No	.....	.....	Baldwin
Grand Rapids	1	.....	.....	Electric	...	...	.....	.....	Company shops
Great Lakes Stone & Lime Co.	1	12 x 18	53,000	0-4-0	No	No	.....	.....	Baldwin
Great Northern	25	28 x 32	306,000	2-8-2	Yes	No	Walschaert.	Street	Baldwin
	50	28 x 32	306,000	2-8-2	Yes	...	Walschaert	Street	Baldwin
Green Bay & Western	1	19 x 26	139,000	2-6-0	Yes	Yes	.....	.....	American
Gulf States Steel Co.	1	19 x 26	120,000	0-6-0	No	Yes	.....	.....	Baldwin
Guthrie, A., & Co., Inc.	1	20 x 26	135,000	0-6-0	No	No	.....	.....	Baldwin
	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Hardaway Contracting Co.	1	17 x 24	113,200	0-6-0	No	No	.....	.....	Baldwin
Henderson Land & Lumber Co.	1	3-10 x 12	84,000	Shay	...	...	.....	.....	Lima
Hocking Valley	5	22 & 35 x 32	428,000	2-6-6-2	Yes	Yes	Walschaert	Street	American
Holston River Lumber Co.	1	3 12 x 15	140,000	Shay	...	...	.....	.....	Lima
Holston Valley Lumber Co.	1	3 12 x 15	140,000	Shay	...	...	.....	.....	Lima
Houston & Texas Central	10	26 x 28	.....	2-8-2	Yes	...	.....	.....	American
Humbird Lumber Co.	1	20½ x 28	177,400	2-8-2	Yes	Yes	.....	.....	Baldwin
Hume-Bennett Lumber Co.	1	3-8 x 12	64,000	Shay	...	...	.....	.....	Lima
Hutchinson Lumber Co.	1	2-8 x 12	40,000	Shay	...	...	.....	.....	Lima
Illinois Central	20	26 x 28	278,000	4-6-2	Yes	Yes	Walschaert	.....	American
Illinois Northern	1	.....	.....	Switch	...	...	.....	.....	Baldwin
Illinois Terminal	1	20 x 24	121,000	2-6-0	No	No	.....	.....	Baldwin
Illinois Traction Sys.	6	.....	120,000	Freight elec. equips. only			.....	.....	Gen. Electric
Indiana Harbor Belt	20	25 x 32	294,000	2-8-2	Yes	Yes	.....	.....	American
	10	25 x 30	240,000	0-8-0	Yes	Yes	Baker	.....	American
Industrial Lumber Co.	1	16 x 24	107,600	2-6-2	No	No	.....	.....	Baldwin
Ingersoll-Rand Co.	1	18 x 24	119,450	0-6-0	No	Yes	.....	.....	Baldwin
Inland Steel Co.	1	21 x 26	154,400	0-6-0	No	Yes	.....	.....	Baldwin
	2	.....	.....	.....	...	...	.....	.....	Vulcan
Intermountain Railway	2	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Interstate	1	20 x 26	181,000	4-4-2	No	Yes	Southern	.....	Baldwin
Interurban Ry. Co.	1	.....	120,000	Electric	...	...	.....	.....	McGuire Cum'gs
Jacksonville, Fla., Port Comm.	1	19 x 26	123,500	0-6-0	No	No	.....	.....	Baldwin
Jonesboro, Lake City & Eastern	2	18 x 24	111,850	2-6-0	Yes	No	Walschaert	.....	Baldwin
Kaiser, J. H., Lumber Co.	1	3-10 x 12	84,000	Shay	...	...	.....	.....	Lima
Kelley Island Lime & Trans Co.	1	2-8 x 12	40,000	Shay	...	...	.....	.....	Lima
	1	2-8 x 12	40,000	Shay	...	...	.....	.....	Lima
	7	3-8 x 8	48,000	Shay	...	...	.....	.....	Lima
Korber, Wm., & Co.	1	3-8 x 10	56,000	Shay	...	...	.....	.....	Lima
Kress, F. J., Box Co.	1	3-8 x 10	56,000	Shay	...	...	.....	.....	Lima
La Belle Iron Works	1	19 x 26	116,100	0-6-0	No	Yes	.....	.....	Baldwin
Lackawanna Iron & Steel Co.	1	18 x 24	103,500	0-6-0	No	Yes	.....	.....	Baldwin
Lackawanna Steel Co.	1	17 x 20	100,000	0-4-0	No	No	.....	.....	Vulcan
Laclede Gas Light Co.	1	18 x 24	106,000	0-6-0	...	...	.....	.....	American
Lake Terminal	3	25 x 30	225,100	0-8-0	No	Yes	Walschaert	.....	Baldwin
	1	25 x 30	225,600	0-8-0	Yes	Yes	Walschaert	.....	Baldwin
Lehigh Valley	20	27 x 30	325,200	2-8-2	Yes	Yes	Walschaert	Street	Baldwin
	30	27 x 28	302,000	4-6-2	Yes	Yes	Wal. and Baker	Street	Baldwin
	40	29 x 32	374,000	2-10-2	Yes	Yes	Wal. and Baker	Street	Baldwin
	15	21 x 28	173,500	Switch	No	No	.....	.....	Baldwin
Ligonier Valley	1	21 x 28	178,000	2-8-0	No	Yes	.....	.....	Baldwin
Lightsey Bros., Inc.	1	12 x 16	55,000	2-6-2	No	No	.....	.....	Baldwin
Little River Lumber Co.	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Long Island	4	23 x 28	195,000	0-8-0	Yes	...	.....	.....	American
	6	21 x 26	178,000	4-6-0	Yes	Yes	.....	.....	American

Purchaser	No.	Cylinders	Weight	Type	Superheater	Brick arch	Valve gear	Automatic stoker	Builder
Lorain Steel Co.	1	21 x 26	141,000	0-6-0	No	Yes	.....	.....	Baldwin
Louisiana & Arkansas	2	22 x 28	194,000	4-6-0	Yes	No	Southern	.....	Baldwin
Louisiana & Pacific	1	19 x 24	133,400	2-8-0	No	No	Walschaert	.....	Baldwin
Louisville & Nashville	12	27 x 30	302,000	2-8-2	Yes	Yes	Walschaert	.....	Company shops
	4	23½ x 30	218,000	0-8-0	Yes	Yes	Walschaert	.....	Company shops
Lyon Lumber Co.	1	12 x 18	62,000	2-6-2	No	No	.....	.....	Baldwin
Lyon Pine Co.	1	12 x 18	62,000	2-6-2	No	No	.....	.....	Baldwin
McCoy Loggie Timber Co.	1	3-13½ x 15	160,000	Shay	...	...	.....	.....	Lima
McKeesport Connecting	2	22 x 28	162,500	0-6-0	No	No	.....	.....	Baldwin
McNeal & Lloyd	1	2-6 x 10	26,000	Shay	...	...	.....	.....	Lima
Maine Central	2	21 x 28	165,000	0-6-0	Yes	Yes	Walschaert	.....	American
	6	26½ x 30	275,000	2-8-2	Yes	Yes	Walschaert	.....	American
	2	21 x 28	166,000	0-6-0	Yes	Yes	.....	.....	American
	3	25 x 28	260,000	4-6-2	...	...	.....	.....	American
	4	26½ x 30	275,000	2-8-2	...	...	.....	.....	American
	2	21 x 28	166,000	0-6-0	...	...	.....	.....	American
Mandle Clay Mining Co.	1	9 x 14	29,480	0-4-0	No	No	.....	.....	Baldwin
Marble Cliff Quarries Co.	1	3-10 x 10	72,000	Shay	...	...	.....	.....	Lima
Mardez Lumber Co.	1	15 x 20	82,050	2-6-0	No	No	.....	.....	Baldwin
Mark Mfg. Co.	3	14 x 22	81,000	0-4-0	No	No	.....	.....	Baldwin
	1	21 x 26	158,000	0-6-0	Yes	Yes	.....	.....	Baldwin
	1	21 x 26	158,000	0-6-0	Yes	Yes	.....	.....	Baldwin
Marsch, John	6	16 x 24	83,750	0-6-0	No	Yes	.....	.....	Baldwin
Mellen Lumber Co.	1	16 x 24	100,900	2-6-2	No	Yes	.....	.....	Baldwin
Michigan Alkali Co.	1	19 x 24	115,000	0-6-0	No	Yes	.....	.....	Baldwin
Michigan Central	5	.....	273,000	4-6-2	Yes	Yes	.....	.....	Baldwin
	2	26 & 40 x 28	466,000	0-8-8-0	Yes	Yes	.....	.....	American
Midland Valley	2	22 x 28	200,500	2-8-2	Yes	Yes	Southern	.....	American
Minden Coal Co.	1	9 x 14	25,200	0-4-0	No	No	.....	.....	Baldwin
Mineral Range	2	24 x 30	224,500	2-8-0	Yes	Yes	Walschaert	.....	Baldwin
Minneapolis & St. Louis	10	21 x 28	172,000	0-6-0	Yes	Yes	Baker	.....	American
Minn., Anoka & Cayuna Elec.	1	.....	.....	Electric	...	...	.....	.....	American
Minnesota, Dakota & Western	1	20 x 26	151,000	2-8-0	No	No	Baker	.....	Mt. Vernon Car'g'e
Minnesota Steel Co.	1	19 x 22	124,000	0-6-0	Yes	Yes	.....	.....	Baldwin
	1	23 x 28	203,000	0-8-0	...	...	.....	.....	Baldwin
Minnesota Transfer	2	24 x 28	208,000	0-8-0	Yes	No	Southern	No. Am.	American
Mississippi Eastern	1	19 x 26	135,500	4-6-0	No	Yes	.....	.....	Lima
Mississippi River & Bonne Terre	2	21 x 26	189,000	4-6-2	Yes	No	Walschaert	.....	Baldwin
	2	.....	.....	4-6-0	...	...	.....	.....	Baldwin
Missouri, Kansas & Texas	1	9 x 14	28,700	0-4-0	No	No	Stephenson	.....	American
	5	25 x 28	272,000	4-6-2	Yes	Yes	Baker	.....	American
	5	25 x 28	272,000	4-6-2	Yes	Yes	Walschaert	.....	American
Missouri Pacific	14	30 x 32	370,000	2-10-2	Yes	Yes	Walschaert	Street	American
Moltz, Jerome	1	3-11 x 12	100,000	Shay	No	No	.....	.....	Lima
Monongahela Connecting	8	21 x 26	152,000	....	...	...	Walschaert	.....	Porter
	1	23 x 28	195,000	0-8-0	Yes	Yes	Walschaert	.....	Porter
Montour	8	27 x 32	297,000	2-8-2	Yes	Yes	Baker	.....	American
National Slag Co.	2	20 x 26	157,000	0-6-0	No	Yes	.....	.....	Baldwin
Neame, Carson & Southern	1	3-12 x 15	113,000	Shay	No	No	Stephenson	.....	Lima
Nekooska & Edwards Paper Co.	1	.....	.....	....	...	...	.....	.....	Davenport
Nettleton-Bruce Logging Co.	1	3-11 x 12	100,000	Shay	...	...	.....	.....	Lima
Nevada Consolidated Copper Co.	2	19 x 26	162,000	0-6-2	Yes	No	.....	.....	Baldwin
	2	.....	.....	0-6-2	...	...	.....	.....	Baldwin
Nevada Northern	1	21 x 30	200,000	2-8-0	Yes	Yes	.....	.....	American
	1	21 x 26	176,000	2-8-0	Yes	Yes	.....	.....	Baldwin
Newburgh & South Shore	2	23 x 26	185,500	2-6-0	Yes	Yes	Walschaert	.....	Baldwin
New Jersey Zinc Co.	1	21 x 26	146,000	0-6-0	No	No	Walschaert	.....	Baldwin
Newton Falls Paper Co.	1	3-12 x 12	120,000	Shay	...	...	.....	.....	Lima
New York Central	10	23½ x 26	273,000	4-6-2	Yes	Yes	.....	.....	American
	5	21½ & 34 x 32	354,000	2-6-6-2	Yes	Yes	.....	.....	American
	55	28 x 28	343,000	4-8-2	Yes	Yes	.....	.....	American
	45	23½ x 30	213,000	0-8-0	Yes	Yes	.....	.....	American
	70	25 x 32	283,100	2-8-2	Yes	Yes	.....	.....	Lima
	50	25 x 30	215,000	0-8-0	Yes	Yes	.....	.....	Lima
	60	23½ x 37	215,000	0-8-0	Yes	Yes	.....	.....	Lima
	55	28 x 28	343,000	4-8-2	Yes	Yes	.....	.....	Lima
	25	23½ x 30	280,000	0-8-0	Yes	Yes	.....	.....	Lima
	10	.....	250,000	4-4-4-4	Elec.	Pass.	.....	.....	Gen. Electric
	25	21½ & 34 x 32	354,000	2-6-6-2	Yes	Yes	.....	.....	American
	1	26 & 40 x 28	466,000	0-8-8-0	Yes	Yes	.....	.....	American
	29	.....	345,000	4-8-2	Yes	Yes	.....	.....	American
	25	.....	240,000	0-8-0	Yes	Yes	.....	.....	American
New York, Chicago & St. Louis	10	21 x 28	173,500	0-6-0	Yes	Yes	Walschaert	.....	American
	10	25 x 32	284,000	2-8-2	Yes	Yes	Baker	.....	Lima
	10	21 x 28	173,500	0-6-0	Yes	Yes	Walschaert	.....	Lima
	25	25 x 32	284,000	2-8-2	Yes	Yes	Walschaert	.....	American
New York, New Haven & Hartford	50	26 x 28	266,000	4-6-2	Yes	Yes	Baker	.....	American
Norfolk & Portsmouth Belt Line	1	20 x 24	135,000	0-6-0	No	Yes	.....	.....	Baldwin
Norfolk & Western	5	22 & 35 x 32	412,000	2-8-8-2	Yes	Yes	Baker	Hanna	American
	5	22 & 35 x 32	412,000	2-8-8-2	Yes	Yes	Baker	Standard	American
	10	22 & 35 x 32	412,000	2-8-8-2	Yes	Yes	Baker	Street	American
	4	29 x 28	347,000	4-8-2	Yes	Yes	Baker	Standard	Company shops
	4	29 x 28	347,000	4-8-2	Yes	Yes	Baker	Standard	Company shops
	1	.....	.....	Mallet	Yes	...	.....	Duplex	Company shops
Oklahoma Portland Cement Co.	1	3-11 x 12	100,000	Shay	...	...	.....	.....	Lima
Oneida & Western	1	19 x 26	142,000	2-8-0	No	Yes	.....	.....	Baldwin
Oregon Short Line	1	.....	.....	Snow plow	...	...	.....	.....	American
Orenstein-Arthur Koppel Co.	1	3-8 x 8	48,000	Shay	...	...	.....	.....	Lima
Pacific Commercial Co.	1	3-8 x 10	56,000	Shay	...	...	.....	.....	Lima
Pacific Light & Power Co.	2	3-11 x 12	120,000	Shay	...	...	.....	.....	Lima
Palmer, George, Lumber Co.	1	3-15 x 17	200,000	Shay	...	...	.....	.....	Lima
Patterson & Western	1	2-7 x 12	36,000	Shay	...	...	.....	.....	Lima
	1	2-7 x 12	36,000	Shay	...	...	.....	.....	Lima
Paxson, J. W., Co.	2	.....	.....	0-4-0	...	...	.....	.....	Baldwin
Peninsular	1	20½ x 28	179,100	2-8-2	No	Yes	.....	.....	Baldwin
Pennsylvania	75	27 x 30	314,200	2-8-2	Yes	Yes	.....	.....	Baldwin
	45	.....	.....	2-8-2	Yes	Yes	.....	.....	Company shops
	50	.....	.....	0-6-0	Yes	Yes	.....	.....	Company shops
	10	.....	.....	0-4-0	Yes	Yes	.....	.....	Company shops
Pennsylvania Lines West of Pittsburgh	25	27 x 30	323,500	2-8-2	Yes	Yes	Walschaert	Crawford	Baldwin
	25	27 x 30	323,500	2-8-2	Yes	Yes	Walschaert	.....	Lima
Pennsylvania Steel Co.	1	19 x 26	122,000	0-6-0	No	Yes	.....	.....	Baldwin
	2	19 x 26	122,000	0-6-0	No	Yes	.....	.....	Baldwin
Peytona Lumber Co.	1	3-10 x 12	84,000	Shay	...	...	.....	.....	Lima
Philadelphia & Reading	5	25 x 28	273,600	4-6-2	Yes	No	Walschaert	.....	Company shops
	10	23 x 28	177,000	0-6-0	No	No	Walschaert	.....	Company shops
	20	24 x 32	334,400	2-8-2	Yes	No	Walschaert	Street	Baldwin
	6	26 & 40 x 32	478,000	2-8-8-2	Yes	No	Walschaert	Street	Baldwin
Philadelphia, Bethlehem & New England	2	21 x 26	151,000	0-6-0	...	...	.....	.....	American
	2	22 x 28	198,000	0-8-0	...	...	.....	.....	American
Philadelphia Electric Co.	1	16 x 24	98,500	0-4-0	No	Yes	.....	.....	Baldwin
Phoenix Logging Co.	1	3-12 x 12	120,000	Shay	...	...	.....	.....	Lima
Pioneer Lumber Co.	1	3-10 x 12	84,000	Shay	...	...	.....	.....	Lima
Pittsburgh & Lake Erie	10	.....	319,000	2-8-2	Yes	Yes	.....	.....	American

Purchaser	No.	Cylinders	Weight	Type	Super-heater	Brick arch	Valve gear	Automatic stoker	Builder
Pittsburgh Steel Company	1	21 x 26	176,500	0-6-0	No	No	Stephenson	.....	American
	1	14 x 22	80,000	0-4-0	No	No	Stephenson	.....	American
Puget Sound Mills & Timber Co	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Pullman Co.	1	.....	.....	0-4-0	...	...	.....	.....	American
Quebec Central	2	20 x 26	164,000	4-6-0	Yes	No	Stephenson	.....	C. P. Ry.
Rapid City, Black Hills & Western	1	16 x 24	109,100	2-6-2	No	No	.....	.....	Baldwin
Raritan River	1	20 x 24	164,700	2-8-2	No	Yes	.....	.....	Baldwin
	1	20 x 26	172,000	4-6-2	No	Yes	.....	.....	Baldwin
Republic Iron & Steel Co.	2	22 x 26	173,300	2-6-0	No	Yes	.....	.....	Baldwin
River Terminal Ry. Co.	2	21 x 26	147,000	0-6-0	No	Yes	.....	.....	Baldwin
	2	21 x 26	148,000	0-6-0	Yes	Yes	.....	.....	Baldwin
	6	.....	.....	.....	...	...	.....	.....	Baldwin
Roebling's, John A., Sons Co.	1	.....	.....	Switch	...	...	.....	.....	Baldwin
Roscoe, Snyder & Pacific	1	18 x 24	126,000	4-6-0	Yes	No	.....	.....	Baldwin
St. Louis-San Francisco	10	26½ x 28	296,000	4-6-2	Yes	Yes	Baker	Street	Baldwin
	30	29 x 30	386,000	2-10-2	Yes	Yes	Walschaert	Street	Baldwin
	30	29 x 30	386,000	2-10-2	Yes	Yes	.....	.....	Baldwin
St. Louis Southwestern	8	22 x 28	209,500	4-6-0	Yes	Yes	Baker	.....	Baldwin
	12	25 x 30	234,000	2-8-0	Yes	Yes	Baker	.....	Baldwin
St. Paul & Tacoma Lumber Co.	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
St. Paul Bridge & Terminal	1	20 x 26	154,000	2-6-0	...	...	.....	.....	American
	2	20 x 26	154,000	2-6-0	...	...	.....	.....	American
Sandy River & Rangeley Lakes	1	12 x 16	75,750	4-4-2	No	Yes	.....	.....	Baldwin
Seaboard Air Line	5	27 x 28	316,000	4-8-2	Yes	Yes	Walschaert	.....	American
Semet-Solvay Co.	2	14 x 22	76,000	0-4-0	No	No	.....	.....	American
Sessions Foundry Co., Inc.	1	14 x 22	86,500	2-4-2	No	No	.....	.....	Baldwin
Sewell Valley	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Shevlin-Hixon Co.	1	18 x 24	139,000	2-8-2	No	No	.....	.....	Baldwin
Sierra Ry. of California	1	18 x 22	118,850	2-8-0	Yes	No	.....	.....	Baldwin
Sioux City Terminal	1	19 x 24	117,000	0-6-0	...	...	.....	.....	American
Sligo Furnace Co.	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Sloss-Sheffield Steel & Iron Co.	7	9 x 14	24,000	0-4-0	No	No	.....	.....	Baldwin
Smith, W. T., & Co.	1	2-6 x 10	26,000	Shay	...	...	.....	.....	Lima
Smoot Lumber Co.	1	3-8 x 10	56,000	Shay	...	...	.....	.....	Lima
Snoqualmie Falls Lumber Co.	2	18 x 24	140,800	2-8-2	No	Yes	.....	.....	Baldwin
Solvay Process Co.	3	21 x 26	156,000	0-6-0	Yes	Yes	Walschaert	.....	American
Sound Timber Co.	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Southern	30	28 x 32	370,000	2-10-2	Yes	Yes	Southern	Street	Baldwin
	15	27 x 28	315,500	4-8-2	Yes	Yes	Southern	.....	Baldwin
	25	28 x 32	370,000	2-10-2	Yes	Yes	Southern	Street	Baldwin
	8	27 x 28	315,500	4-8-2	Yes	Yes	Southern	.....	Baldwin
	12	25 & 39 x 30	400,000	2-8-8-2	Yes	Yes	Southern	Street	Baldwin
Southern Pacific Company	*10	10,000 gal. Semi-Cylindrical		Tenders only		...	.....	.....	Lima
Southern Utah	1	.....	.....	"McKeen"	Mallet"	motor car	.....	.....	McKeen
Standard Car Construction Co.	1	16 x 24	98,500	0-4-0	No	Yes	.....	.....	Baldwin
Standard Oil Co. (N. J.)	1	9 x 14	28,250	0-4-0	No	No	.....	.....	Baldwin
Standard Oil Co.	1	9 x 14	28,250	0-4-0	No	No	.....	.....	Baldwin
	1	9 x 14	27,500	0-4-0	No	No	.....	.....	Baldwin
	1	21 x 26	154,000	0-6-0	...	...	.....	.....	American
Standard Steel Works Co.	1	19 x 24	109,000	0-6-0	No	Yes	.....	.....	Baldwin
Sugarland Ry.	2	17 x 24	112,150	4-6-0	No	No	Walschaert	.....	Baldwin
Sumter Lumber Co.	1	3-10 x 12	84,000	Shay	...	...	.....	.....	Lima
Sun Co.	1	19 x 24	124,000	0-6-0	No	Yes	.....	.....	Baldwin
Spice Run Lumber Co.	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Susquehanna & New York	1	23 x 28	211,500	2-8-0	Yes	Yes	Walschaert	.....	Baldwin
Temiskaming & Northern Ontario	5	25 x 30	258,900	2-8-2	Yes	Yes	Walschaert	.....	Canadian
	1	25 x 30	258,900	2-8-2	Yes	Yes	Young	.....	Canadian
Tennessee, Alabama & Georgia	2	18 x 26	139,800	4-6-0	No	Yes	Walschaert	.....	Baldwin
Terminal R. R. Association of St. Louis	11	22½ x 30	205,000	0-6-0	Yes	Yes	Baker	.....	American
	1	22½ x 30	205,000	0-6-0	Yes	Yes	Young	.....	American
Texas & Pacific	8	28 x 32	328,500	2-10-2	Yes	Yes	Southern	.....	Baldwin
Texas, Oklahoma & Eastern R. R. Co.	1	16 x 24	115,000	2-6-2	Yes	Yes	Walschaert	.....	American
	1	16 x 24	110,000	2-6-2	Yes	Yes	Walschaert	.....	Baldwin
Tidewater Oil Co.	1	19 x 24	127,700	0-6-0	No	No	.....	.....	Baldwin
Tuckerton	1	19 x 26	138,000	4-6-0	No	Yes	.....	.....	Baldwin
Tucson, Cornelia & Gila Bend	1	19 x 26	165,000	2-6-0	Yes	No	.....	.....	American
	1	19 x 26	165,000	2-6-0	...	No	.....	.....	American
Turkey Foot Lumber Co.	1	3-12 x 15	140,000	Shay	...	...	.....	.....	Lima
Tuscarora Valley	1	13 x 18	60,600	4-4-0	No	Yes	.....	.....	Baldwin
Union	2	22 x 28	173,000	0-6-0	No	No	.....	.....	Baldwin
Union Cypress Co.	1	16 x 24	104,000	4-6-0	No	No	.....	.....	Baldwin
Union Pacific System	16	29½ x 30	377,000	2-10-2	Yes	Yes	Walschaert	Street	Baldwin
	20	26 x 28	286,000	2-8-2	Yes	Yes	Walschaert	.....	Baldwin
	10	21 x 26	156,000	0-6-0	Yes	No	.....	.....	Baldwin
Union Pacific	3	.....	.....	2-8-8-0	...	...	.....	.....	Baldwin
U. S. Metals Refining Co.	1	8 x 12	20,500	0-4-0	No	No	.....	.....	Baldwin
United Steel Co.	1	17 x 24	120,000	0-6-0	...	...	.....	.....	Lima
	1	17 x 24	98,000	0-4-0	...	...	.....	.....	Lima
Verde Tunnel & Smelter	1	21 x 26	160,000	0-6-0	Yes	...	.....	.....	American
Virginian	1	34 & 34 & 34 x 32	844,000	2-8-8-8-2	Yes	Yes	Baker	Street	Baldwin
	10	.....	.....	2-10-10-0	...	...	.....	.....	American
Wabash	25	29 x 32	380,000	2-10-2	Yes	Yes	Walschaert	Duplex	American
Warren Lumber Co.	1	3-11 x 12	100,000	Shay	...	...	.....	.....	Lima
Wawa Commercial Co.	1	2-7 x 12	36,000	Shay	...	...	.....	.....	Lima
Wayne County Commissioners	1	2-6 x 10	26,000	Shay	...	...	.....	.....	Lima
	1	2-6 x 10	26,000	Shay	...	...	.....	.....	Lima
Wessel, Duval Co.	3	3-8 x 12	64,000	Shay	...	...	.....	.....	Lima
West End Coal Co.	1	18 x 24	163,500	2-6-2	No	No	.....	.....	Baldwin
West Lumber Co.	1	16 x 24	100,700	2-6-2	No	Yes	.....	.....	Baldwin
West Penn Power Co.	1	20 x 26	148,000	0-6-0	No	Yes	.....	.....	Baldwin
West Virginia Northern	1	21 x 24	152,000	2-8-0	No	No	.....	.....	Baldwin
Western Cooperage Co.	1	3-11 x 12	100,000	Shay	...	...	.....	.....	Lima
Western Maryland	10	26 & 40 x 30	495,000	2-8-8-2	Yes	Yes	Baker	Duplex	Lima
Western Pacific	5	23½ & 37 x 32	429,000	2-6-6-2	Yes	Yes	Walschaert	.....	American
Westinghouse Elect. & Mfg. Co.	1	19 x 24	119,000	0-6-0	No	Yes	.....	.....	Baldwin
Westinghouse Machine Co.	1	18 x 24	103,000	0-4-0	No	Yes	.....	.....	Baldwin
Wheeling & Lake Erie	10	25½ & 39 x 32	435,000	2-6-6-2	Yes	Yes	Baker	Street	American
	10	25½ & 39 x 32	435,000	2-6-6-2	Yes	Yes	Baker	Duplex	American
Wheeling Steel & Iron Co.	1	19 x 24	131,000	0-6-0	No	Yes	.....	.....	Baldwin
Whitaker-Glessner Co.	2	17 x 24	88,000	0-6-0	...	...	.....	.....	Lima
Wilderness Lumber Co.	1	3-10 x 10	72,000	Shay	...	...	.....	.....	Lima
Wilwin Co., Ltd.	1	12 x 18	55,400	2-4-2	No	No	.....	.....	Baldwin
Wood, Alan, Iron & Steel Co.	1	9 x 14	24,000	0-4-0	No	No	.....	.....	Baldwin
Worth Bros. Co.	2	22 x 26	159,000	0-6-0	No	No	.....	.....	Baldwin
	2	14 x 16	58,000	0-4-0	No	No	.....	.....	Baldwin
	1	22 x 26	160,000	0-6-0	No	No	.....	.....	Baldwin
Yawkee-Bissell Lumber Co.	1	3-10 x 12	84,000	Shay	...	...	.....	.....	Lima
Yellow Pine Mining Co.	1	2-8 x 12	40,000	Shay	...	...	.....	.....	Lima
Yosemite Valley	1	19 x 28	143,000	2-6-0	No	No	.....	.....	Baldwin
Youngstown Sheet & Tube Co.	2	17 x 20	109,000	0-4-0	No	No	.....	.....	Baldwin

ORDERS FROM FOREIGN RAILWAYS

Purchaser	No.	Cylinders	Weight	Type	Stoker	Feed Water Heater	Superheater	Builder
Allain, Maurice (Brazil)	1	9 x 14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Alto Cedro Sugar Co. (Cuba)	1	12 x 18	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Amsinck, G., & Co., Inc. (Peru)	1	9 x 14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Anaconda Copper Mining Co. (for Chile)	1	17 x [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	1	16 & 25 x 20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	1	17 x [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Balfour, Williamson & Co. (Chile)	1	17 x 16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Banes R. R. (Cuba)	1	16 x 20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benitez Sugar Co. (Porto Rico)	1	9 x 14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Borneo Co.	2	10 x 16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Braden Copper Co. (Chile)	3	3-10 x 12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	2	3-11 x 12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	2	11 x 16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
British Government	20	14 x 22	76,000	[illegible]	No	No	[illegible]	[illegible]
	40	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	100	9 x 14	36,000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
British War Office	45	9 x 12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	350	9 x 12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	100	9 x 12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	50	14 x 22	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
C. de F. de Lourenco Marques (Africa)	3	21½ x 24	186,000	[illegible]	Yes	Yes	[illegible]	[illegible]
C. de F. de Madagascar	4	280 & 425 x 500 mm.	70,500	[illegible]	No	No	[illegible]	[illegible]
	2	280 & 425 x 500 mm.	70,500	[illegible]	No	No	[illegible]	[illegible]
Canton-Hankow Ry. (China)	2	17 x [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	4	21 x 26	159,000	[illegible]	No	No	[illegible]	[illegible]
	4	22 x 26	160,000	[illegible]	Yes	No	[illegible]	[illegible]
Carbones De La Nueva	1	7 x 12	17,000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Carmichael, R. S., & Co. (France)	1	Gasolene	18,000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Carrillo & Co. (Ecuador)	1	8 x 12	16,500	[illegible]	No	No	[illegible]	Baldwin
Cayey Sugar Co. (Porto Rico)	1	Gasolene	7,000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Central Australia (Cuba)	1	17 x 20	88,000	2-6-0	No	Yes	[illegible]	[illegible]
Central Azucarero del Zulia (Venezuela)	2	9 x 14	28,000	2-4-0	No	No	[illegible]	[illegible]
Central Cabaiguan (Cuba)	1	17 x 24	98,500	2-8-0	No	Yes	[illegible]	[illegible]
Central Cambalache	2	24 x 30	26,000	Shay	[illegible]	[illegible]	[illegible]	[illegible]
Central Cunagua (Cuba)	3	18 x 24	[illegible]	4-6-0	Yes	[illegible]	[illegible]	[illegible]
Central Ceiba (Venezuela)	1	7 x 12	16,000	0-4-0	No	No	[illegible]	[illegible]
Central Confluente (Cuba)	1	12 x 16	48,000	2-8-0	No	No	[illegible]	[illegible]
Central Eureka, Inc. (Porto Rico)	1	5 x 10	9,700	0-4-0	No	No	[illegible]	[illegible]
Central Fe (Cuba)	1	13 x 18	61,000	0-6-2	No	No	[illegible]	[illegible]
Central Los Canos (Porto Rico)	1	5 x 10	95,000	0-4-0	No	No	[illegible]	Baldwin
Central Loteria (Cuba)	1	12 x 16	45,000	2-6-0	No	Yes	[illegible]	Baldwin
Central Meron Sugar Co. (Cuba)	1	18 x 22	122,000	2-8-0	No	No	[illegible]	Baldwin
Central Narcissa (Cuba)	1	16 x 20	94,000	2-8-0	No	Yes	[illegible]	Baldwin
Central of Brazil	2	18 x 22	117,000	2-8-0	No	No	[illegible]	[illegible]
	2	21½ x 28	207,000	4-6-2	Yes	[illegible]	[illegible]	[illegible]
	12	21½ x 28	175,000	4-6-2	Yes	[illegible]	[illegible]	[illegible]
	15	21½ x 26	163,000	2-8-0	Yes	[illegible]	[illegible]	[illegible]
	3	20 & 32 x 26	280,000	0-8-8-0	Yes	[illegible]	[illegible]	[illegible]
Central Palma (Cuba)	1	14 x 24	76,000	2-4-0	No	No	[illegible]	Baldwin
Central Porfuerza (Cuba)	1	16 x 24	94,000	2-6-0	Yes	Yes	[illegible]	Baldwin
Central Providencia (Cuba)	1	20 x 24	133,200	2-8-0	Yes	Yes	[illegible]	Baldwin
Central Reforma (Cuba)	1	12 x 16	39,000	2-6-0	No	Yes	[illegible]	Baldwin
Central Rosa Maria (Cuba)	1	18 x 24	111,000	2-6-0	No	Yes	[illegible]	Baldwin
Central San Agustin (Cuba)	1	9 x 16	34,000	0-6-2	No	No	[illegible]	Baldwin
	1	17 x 24	102,000	2-8-0	No	Yes	[illegible]	Baldwin
Central San Antonio (Cuba)	1	14 x 20	73,000	2-8-0	No	No	[illegible]	Baldwin
Central San Jose (Cuba)	1	12 x 18	46,000	2-6-0	No	No	[illegible]	Baldwin
	1	15 x 20	80,000	2-8-0	No	No	[illegible]	Baldwin
	1	15 x 20	[illegible]	2-8-0	No	[illegible]	[illegible]	[illegible]
Central San Lino (Cuba)	1	14 x 20	69,000	2-8-0	No	Yes	[illegible]	Baldwin
Central San Ramon (Cuba)	1	9 x 14	36,000	2-4-2	No	No	[illegible]	Baldwin
Central Soledad (Cuba)	2	12 x 18	46,000	2-6-0	No	No	[illegible]	Baldwin
Central Union (Cuba)	1	13 x 20	84,000	2-4-4	No	Yes	[illegible]	Baldwin
	1	19 x 24	123,000	2-6-0	No	Yes	[illegible]	Baldwin
Cerro de Pasco	2	21 x 28	160,000	2-8-0	[illegible]	[illegible]	[illegible]	[illegible]
Chaparra Sugar Co. (Cuba)	2	15 x 20	74,000	2-6-0	No	Yes	[illegible]	Baldwin
Chile Exploration Co.	1	18 x 24	[illegible]	2-6-2	No	No	[illegible]	Baldwin
Cie Francaise des Metaux de St. Denis (France)	1	8 x 14	26,000	0-4-0	No	No	[illegible]	Baldwin
	1	11 x 16	[illegible]	0-6-0	No	[illegible]	[illegible]	Baldwin
Coates & Tweed	4	19 x 26	111,000	0-6-0	[illegible]	[illegible]	[illegible]	[illegible]
Colombian Northern Ry.	1	14 x 18	74,000	2-8-0	Yes	Yes	[illegible]	Baldwin
Compagnia Espana Colonisation	6	[illegible]	105,000	4-6-2	Yes	[illegible]	[illegible]	[illegible]
Compania Gen. de Asfaltos y Cementos Asland	1	9 x 14	35,000	[illegible]	[illegible]	[illegible]	[illegible]	American
Consuelo Estate (San Dom.)	2	12 x 16	45,500	2-6-0	Yes	No	[illegible]	Baldwin
Cuba Company	3	18 x 24	112,000	0-6-0	[illegible]	[illegible]	[illegible]	[illegible]
Cuba R. R.	25	20 x 26	153,000	2-8-0	Yes	[illegible]	[illegible]	[illegible]
Cuban-American Sugar Co.	1	3-8 x 10	56,000	Shay	[illegible]	[illegible]	[illegible]	Lima
Cuban Central	7	18 x 24	126,000	2-8-0	Yes	[illegible]	[illegible]	[illegible]
Cupey Sugar Co. (Cuba)	1	18 x 24	110,000	2-6-0	No	Yes	[illegible]	Baldwin
Darjeeling Himalayan Ry. (India)	3	11 x 14	[illegible]	0-4-0	No	[illegible]	[illegible]	Baldwin
Dederich, Wm., Co. (for Belgian Congo)	24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Dorn & Co., R. J.	1	[illegible]	21,000	0-6-0	[illegible]	[illegible]	[illegible]	[illegible]
Egyptian State Rys.	24	10 x 14	35,000	0-6-0	[illegible]	[illegible]	[illegible]	[illegible]
F. C. Cantabrico (Spain)	2	16 x 20	111,000	2-6-2	No	Yes	[illegible]	Baldwin
F. C. de la Robla (Spain)	2	17 x [illegible]	[illegible]	2-8-0	No	Yes	[illegible]	Baldwin
F. C. del Norte de Cuba	4	19 x 26	137,000	2-8-0	Yes	Yes	[illegible]	Baldwin
Ferrocarril Central Dominicano	1	3-10 x 12	84,000	Shay	[illegible]	[illegible]	[illegible]	Lima
Finland State Rys.	20	20 x 28	138,000	2-8-0	Yes	[illegible]	[illegible]	[illegible]
Francisco Sugar Co. (Cuba)	1	17 x [illegible]	100,000	2-8-0	No	No	[illegible]	Baldwin
France, Republic of	12	9 x 12	29,000	0-6-0	No	No	[illegible]	Baldwin
	100	175 x 240 mm.	12,790 k.	Pacific	No	No	[illegible]	Baldwin
French Government	80	175 x 240 mm.	12,790 k.	Pacific	No	No	[illegible]	Baldwin
	50	13 x 16	60,000	2-6-2	No	No	[illegible]	Baldwin
French Government (for Morocco)	5	9 x 12	35,000	2-6-0	No	No	[illegible]	Baldwin
French State Railways	100	23 x 26	161,000	2-8-0	[illegible]	[illegible]	[illegible]	[illegible]
French War Office	4	15 x 16	44,000	0-6-0	[illegible]	[illegible]	[illegible]	Baldwin
	3	15 x 16	44,000	0-6-0	[illegible]	[illegible]	[illegible]	Baldwin
	1	15 x 16	44,000	0-6-0	[illegible]	[illegible]	[illegible]	Baldwin
Fuji Minobu Ry. (Japan)	2	13 x [illegible]	[illegible]	2-6-2	No	[illegible]	[illegible]	Baldwin
Grace, W. R., & Co.	2	11 x 16	41,000	0-6-0	[illegible]	[illegible]	[illegible]	[illegible]
Grace, W. R., & Co. (for Chile)	1	11 x 16	[illegible]	0-6-0	No	No	[illegible]	Baldwin
Guanica Centrale (Porto Rico)	1	14 x 20	64,000	0-6-0	[illegible]	[illegible]	[illegible]	[illegible]
Guanica Centrale (Santo Domingo)	1	14 x [illegible]	80,000	2-8-0	No	Yes	[illegible]	Baldwin
	2	14 x [illegible]	80,000	2-8-0	No	Yes	[illegible]	Baldwin
	5	14 x [illegible]	80,000	2-8-0	No	Yes	[illegible]	Baldwin
Guantanamo & Western (Cuba)	3	20 x 24	136,000	2-8-0	Yes	Yes	[illegible]	Baldwin
Hagemeyer & Brunn (Africa)	2	15 x 20	[illegible]	4-6-2	No	[illegible]	[illegible]	Baldwin
Handelsvereeniging "Amsterdam" (Java)	3	10 x 14	34,000	0-6-2	No	No	[illegible]	Baldwin
Havana Central R. R. (Cuba)	3	13 x 18	90,000	2-8-0	No	No	[illegible]	Baldwin
Hermstoltz Co. (Brazil)	2	16 x 16	37,000	0-6-0	[illegible]	[illegible]	[illegible]	American
	1	11 x 16	39,000	0-6-0	[illegible]	[illegible]	[illegible]	American
Hershey Cuban R. R. (Cuba)	1	17 x 20	80,000	2-6-0	No	Yes	[illegible]	Baldwin
Honolulu Sugar Co. (Hawaii)	1	11 x 16	45,000	0-6-2	No	No	[illegible]	Baldwin

Purchaser	No.	Cylinders	Weight	Type	Super-heater	Brick arch	Valve gear	Automatic stoker	Builder
Hermanero Central Corp. (Cuba)	1	13 x 12	29,000	0-4-0	(Fireless)		.....	.....	Baldwin
Hutchinson Sugar Plantation Co. (Hawaii)	1	8 x 12	.....	0-4-2	No	No	.....	.....	Baldwin
Intl. Eng. & Trading Co. (Russia)	2	7 x 12	17,600	0-4-0	No	No	.....	.....	Baldwin
Italian State Rys.	40	21¼ x 27½	147,000	2-8-0	Yes	...	.....	.....	American
	60	21¼ x 27½	146,000	2-8-0	Yes	...	.....	.....	American
Java State Rys.	8	17½ & 28 x 24	200,500	2-8-0	Yes	...	.....	.....	American
Kaeleku Sugar Co. (Hawaii)	1	7 x 10	18,000	0-4-2	No	No	.....	.....	Baldwin
Kanaketa Mill Co. (Hawaii)	1	10 x 16	37,000	0-6-2	No	No	.....	.....	Baldwin
Krajewski Pesant Corp. of Cuba	1	14 x 22	70,000	2-6-0	...	...	.....	.....	Baldwin
Lautaro Nitrate Co., Ltd. (Chile)	1	11 x 14	38,000	0-8-0	No	No	.....	.....	American
Manati Sugar Co. (Cuba)	4	16 x 20	90,000	2-8-0	No	No	.....	.....	Baldwin
	1	14½ & 22 x 20	139,000	2-6-6-2	No	No	.....	.....	Baldwin
Maui Agricultural Co. (Hawaii)	1	14 x 18	56,000	2-6-0	No	No	.....	.....	Baldwin
Mayari R. R. (Cuba)	3	22 x 28	.....	2-8-2	No	Yes	.....	.....	Baldwin
Mexican Petroleum Corp.	1	Gasolene	44,000	0-4-0	...	...	.....	.....	Baldwin
Minas y F. C. de Utrillas (Spain)	2	16 & 25 x 22	.....	0-6-6-0	No	...	.....	.....	Baldwin
Mogyana Ry. (Brazil)	3	17½ x 20	118,000	4-6-2	Yes	...	.....	.....	Baldwin
Mosle Bros. (Cuba)	1	20 x24	133,200	2-8-0	Yes	Yes	.....	.....	American
Nesttun Osbanen (Norway)	1	11 x 12	.....	0-8-0	No	...	.....	.....	Baldwin
Nippon Seikosho Ry.	1	13 x 18	58,000	0-4-0	...	...	.....	.....	Baldwin
Northern Ry. of Spain	15	.....	194,000	2-8-2	Yes	...	.....	.....	American
Norwegian Hydro Co.	1	14.17 x 19.69	79,300	0-6-0	No	Yes	.....	.....	American
	1	22.05 x 23.62	142,380	2-8-2	Yes	Yes	.....	.....	Baldwin
Norwegian State Rys.	5	14.17 x 19.69	79,300	0-6-0	No	Yes	.....	.....	Baldwin
	5	20.66 x 23.62	142,380	2-6-2	Yes	Yes	.....	.....	Baldwin
	2	20 x 24	143,300	0-10-0	Yes	Yes	.....	.....	Baldwin
	1	22.5 x 25.2	145,500	2-8-0	Yes	Yes	.....	.....	Baldwin
	1	14.76 x 18.11	52,400	2-6-0	Yes	Yes	.....	.....	Baldwin
	3	22.05 x 23.62	149,800	2-8-2	Yes	Yes	.....	.....	Baldwin
Norwegian Trunk R. R.	2	20.66 x 23.62	142,380	2-6-2	Yes	Yes	.....	.....	Baldwin
	1	23 x 25.2	189,500	2-8-2	Yes	Yes	.....	.....	Baldwin
Oahu Sugar Co., Ltd. (Hawaii)	1	12 x 16	55,000	0-6-2	No	No	.....	.....	Baldwin
Orleans Ry. (France)	50	597 x 711 mm	200,000	2-8-2	Yes	...	.....	.....	American
Oving, H. E., Jr. (Java)	1	10 x 14	34,000	0-8-0	No	No	.....	.....	Baldwin
	1	8½ x 12	26,400	0-8-0	No	No	.....	.....	Baldwin
	1	10 x 14	34,000	0-8-0	No	No	.....	.....	Baldwin
	1	10 x 14	34,000	0-8-0	No	No	.....	.....	Baldwin
Paris, Lyons & Mediterranean (France)	140	20 1/16 x 25 9/16	210,000	2-8-2	Yes	Yes	.....	.....	Baldwin
	...	28¾ x 27 9/16	.....	....	...	...	.....	.....	Baldwin
Paris-Orleans Ry. (France)	50	23½ x 28	200,000	2-8-2	...	...	.....	.....	American
Paulista Ry. (Brazil)	4	23 x 26	220,000	4-6-2	Yes	...	.....	.....	American
Pekin-Hankow Ry. (China)	10	22 x 26	166,000	2-8-0	Yes	...	.....	.....	American
Pekin-Kalgan Ry. (China)	4	20 x 28	186,000	2-8-2	Yes	...	.....	.....	American
Peking-Mukden Ry. (China)	2	.....	.....	2-8-2	...	...	.....	.....	Baldwin
Plazuela Sugar Co.	1	3-10 x 10	72,000	Shay	...	...	.....	.....	Lima
Porcella, Vicini & Co., Inc. (San Dom.)	2	8 x 14	23,000	2-6-0	No	No	.....	.....	Baldwin
	1	10 x 16	36,600	2-6-0	No	No	.....	.....	Baldwin
	1	.....	.....	2-4-0	...	...	.....	.....	Baldwin
Putiloff Works (Russia)	12	10½ x 16	28,500	0-4-0	No	No	.....	.....	Baldwin
Quelimane Ry. (Port. Ea. Africa)	1	11 x 16	38,000	2-6-0	...	...	.....	.....	American
	1	13 x 18	53,000	2-6-0	...	...	.....	.....	American
	2	13 x 18	53,000	2-6-0	...	...	.....	.....	American
	1	13 x 18	53,000	2-6-0	...	...	.....	.....	American
Quisqueya Plantation (Santo Domingo)	1	11 x 16	35,800	2-4-0	No	No	.....	.....	Baldwin
	1	11 x 16	35,800	2-4-0	No	No	.....	.....	Baldwin
Ramirez, Domingo (Cuba)	1	10 x 16	31,200	2-4-0	No	No	.....	.....	Baldwin
Rhodesia Rys.	6	23 x 24	172,000	4-8-2	...	...	.....	.....	American
Rio Cauto Sugar Co., Inc. (Cuba)	1	14 x 20	62,000	2-6-0	No	No	.....	.....	Baldwin
Rosco Trading Co., Inc. (Ecuador)	1	5 x 10	10,000	0-4-0	No	No	.....	.....	Baldwin
Russian Government	350	.....	14,000	Gasoline	...	...	.....	.....	Baldwin
	9	11 x 16	37,000	2-6-0	...	...	.....	.....	American
	40	25 x 28	197,000	2-10-0	Yes	Yes	.....	.....	American
	110	25 x 28	202,000	2-10-0	Yes	Yes	.....	.....	American
	41	25 x 28	192,000	2-10-0	Yes	Yes	.....	.....	Canadian
	9	.....	.....	2-10-0	Yes	Yes	.....	.....	Canadian
	350	Gasolene	14,000	0-6-0	...	...	.....	.....	Baldwin
	6	25 x 28	197,000	2-10-0	Yes	Yes	.....	.....	American
	70	.....	45,000	0-6-0	...	...	.....	.....	American
	150	25 x 28	.....	2-10-0	Yes	Yes	.....	.....	Baldwin
San Carlos Milling Co., Ltd. (Philippines)	1	9 x 16	27,000	0-6-0	No	No	.....	.....	Baldwin
San Jose Sugar Co. (San Dom.)	1	10 x 16	32,000	2-6-0	No	No	.....	.....	Baldwin
	1	11 x 16	.....	2-6-0	No	...	.....	.....	Baldwin
Santa Fe Plantation & Sugar Co. (San Dom.)	1	14 x 18	68,000	2-8-0	Yes	No	.....	.....	Baldwin
	1	15 x 18	.....	2-8-0	Yes	...	.....	.....	Baldwin
Shantung Ry. (China)	3	20½ x 26	158,000	2-8-0	Yes	...	.....	.....	American
Sociedad Agricola Pucala, Ltd. (Peru)	1	9 x 12	24,000	0-6-0	No	No	.....	.....	Baldwin
Societe Anonyme des Plantations de Gounoung	1	7 x 12	23,000	0-6-0	...	...	.....	.....	American
Societe de Penarroya (Spain)	1	19 x 22	158,000	2-8-2	No	Yes	.....	.....	Baldwin
Tacajo Sugar Corp. (Cuba)	2	15 x 18	72,000	2-6-0	No	Yes	.....	.....	Baldwin
Tata Iron & Steel Co. (India)	5	18 x 24	109,000	0-6-0	...	...	.....	.....	American
Togoland Military Ry.	2	15 x 20	96,000	2-8-2	...	...	.....	.....	American
Union Miniere du Haut-Katanga	8	10 x 16	45,000	0-6-0	...	...	.....	.....	American
	5	15 x 20	100,000	2-6-2	...	...	.....	.....	American
	4	7 x 12	18,000	0-4-0	No	No	.....	.....	Baldwin
United Rys. of Havana	3	20 x 26	159,000	2-8-0	Yes	...	.....	.....	American
	3	19 x 24	128,000	0-6-0	...	...	.....	.....	American
United Railways of Yucatan	2	15 x 20	73,000	4-6-0	No	No	.....	.....	Baldwin
Usina Sao Carlos (Brazil)	1	10 x 16	.....	0-4-2	No	No	.....	.....	Baldwin
Waiakea Mill Co. (Hawaii)	1	9 x 14	32,000	0-4-2	No	No	.....	.....	Baldwin
West India Management & Consultation Co.	1	12 x 18	50,000	2-6-0	...	...	.....	.....	American

MURMAN, THE NEW RUSSIAN ARCTIC PORT.—The British Board of Trade has been notified through the Foreign Office that a new town and ice-free port at the terminus of the Murman Railway, to be known as Murman, has been established by imperial proclamation. This town will be about five degrees west of Archangel and will save a sea haul for ocean vessels of about 700 miles, and, on account of its location on the northwestern portion of the Murman coast it comes within the sweep of the Gulf Stream and has free water the year round. The Murman Railway was projected several years ago, but received an impetus as a result of the war. A year ago 700 Canadian engineers were sent to Russia to work on its construction. The territory served is through valuable timber country. It is the district bordering the Arctic between Norway and the White sea known as the Murman district. The main points touched are Murman, Kola Alexandrowska, Kandalascha, Kanda, Kem and the west coast of Lake Onega and terminates at Petrograd. This will considerably reduce the rail haul from the Arctic terminal ports to Petrograd. Burman, 7 miles to the north of Kola, has temporary wooden quays for three large vessels, with 25-ton cranes. The harbor is roomy and well protected. More than forty large vessels can anchor at the same time. The Murman Railway is divided into five sections—Petrograd-Zwanka, 76 miles; Zwanka-Petrosavodsk, 171 miles; Petrosavodsk-Kem, 272 miles; Kem-Kandalascha, 215 miles, and Kandalascha-Murman, 177 miles. The Kem-Kandalascha section is the only one that has not yet reached completion.

THE TRANSPORTATION OF AMERICAN TROOPS IN 1916

During 1916, the largest movement of troops took place since the Spanish-American war. In his annual report the Quartermaster General of the U. S. Army makes the following statement: "Considering the great distances traveled by the militia from the various camps to the Mexican border, the fact that there was but a single accident, and that of a minor character, the celerity with which the trains were moved and the entire absence of congestion or delay, it is believed that there has been no case in history where troops have been as well and as safely transported or as well cared for while en route as in the recent mobilization."

The movement began early in the year when several regular army detachments of cavalry, infantry, artillery and engineers were sent to the border on March 11, March 20, May 9 and June 11. The transportation of these organizations was accomplished in an excellent manner, in exceptionally good time, and without accidents of any nature. On May 9, the militia of Arizona, New Mexico and Texas were called to the border, and on June 18, 1916, the national guard troops of all the other states were called into the service of the United States and directed to assemble at their state mobilization camps. From these points to designated stations on the frontier transportation arrangements were under the direction of the War Department. The troops began leaving their mobilization camps about midnight on June 26. On July 1, there were en route to the border from various sections of the United States 122 troop trains, carrying over 2,000 freight, passenger and baggage cars, with a total strength of 36,042 men. On July 4, 101 troop trains were en route and 52,681 militia troops (not including Arizona, New Mexico and Texas) were either at the border or on the way thereto. From the beginning of the movement up to July 31, 111,919 militia troops were moved to the international boundary.

Some idea of the task imposed upon the railroads of the country by the transportation of the national guard may be had when it is considered that 350 trains were necessary to carry the first 100,000 troops. Over 3,000 passenger cars, including standard Pullman and tourist cars and coaches, were provided, and in addition about 400 baggage cars, most of which were equipped as kitchen cars for serving hot meals en route, 1,300 box cars, 2,000 stock cars, 800 flat cars and approximately 4,900 locomotives and crews, not including switching engines, yard engines and their crews. The call upon the railroads for the transportation of the militia occurred in the fortnight which includes the Fourth of July, the time of the greatest density of passenger travel in the eastern states. Instructions were issued by all railroads concerned that the movement of troop trains was to be given preference over other travel, and it is believed that this was done in all cases.

To have effected the entire movement of all the troops in tourist sleepers would have required approximately 3,000 cars, or five times as many as were in existence. The Pullman Company, by utilizing some standard sleeping cars, made available for the movement 623 tourist cars. In all cases where it was possible to do so tourist equipment was furnished, and where they were not immediately available the troops were met en route and transferred to tourists in every possible case. Official reports from all military departments show that no organization moved in coaches in less space than three men to every four seats and wherever possible two seats for each man. The total number of men transported in coaches averaged 30 men to each coach.

Although the movement of organized militia came at a time when the commercial traffic on the railroads was the largest in years, it was accomplished with very little interference with regular train service and with no congestion whatever, either at initial or terminal points or en route. In July, there were moved into the Brownsville (Tex.) district 106 special trains, composed of 1,216 cars of passengers and 1,201 cars of freight for the army, in addition to 680 cars of army supplies, handled in freight trains and the usual commercial traffic. This district is reached only by one single-track line, and all rolling stock had to be returned over the same line.

The concentration of the militia on the Mexican border and the mobilization for the great war in 1914 are not comparable, as all civil traffic was suspended in Europe to make way for military movements and the distances involved in the movement to the Mexican border were very much greater than those in Europe. The longest run in Germany was about 700 miles and in France much less, whereas the distances traveled by the troops in the United States varied from 608 miles, in the case of Louisiana troops to 2,916 miles in the case of Connecticut troops. The majority of the troops came from northern and northeastern states and were carried over 2,000 miles, in most cases in remarkably fast time. For example, the Seventh New York Infantry with 1,400 men, equipment, ammunition and baggage left New York at 2 p. m. on June 27, and arrived at San Antonio, Tex., at 8:30 p. m., on June 30, a distance of 2,087 miles. Shipments of freight were made from Washington and vicinity to the border in four days, from New York and vicinity in five days, and from the Great Lakes in a little more than 48 hours.

As a specific example showing how the co-operation of the railroad companies assisted the army, there may be cited the case of the first motor trucks purchased for the expeditionary forces in Mexico. Twenty-seven trucks were purchased under bid in Wisconsin on March 14. They were inspected and loaded in 14 cars; the men to operate them were employed and tourist cars furnished for them, following which a train was made up which left Wisconsin at 3:11 a. m. on March 16. It arrived at Columbus, N. M., 1,591 miles away, shortly after noon on the 18th; the trucks were unloaded from the cars, loaded with supplies, and sent across the border, reaching General Pershing's command with adequate supplies of food before he had exhausted the supplies taken with him from Columbus.

A special committee on co-operation with the military authorities which was established by the American Railway Association at the request of the War Department in October, 1915, took charge of the movement of troops and freight under the orders of the quartermaster general. All matters directly affecting the operation of trains were in the hands of this committee. Freight cars carrying army supplies were appropriately placarded, were sent in the fastest moving trains, immediately delivered, and at once identified and released, without the necessity of waiting for formal bills of lading and official papers of the railways and the government. The placards, which bore the legend "United States Army" at the head, followed by the car initial, car number, point of shipment, contents, consignee, destination, routing, date shipped and consignor, served as full identification for all shipments.

French Railway Speed in Winter.—We give in tabular form below the fastest schedule times for the winter services on French railways. Under the circumstances that prevail the services are, it will be readily admitted, highly creditable. As far as we can learn, the booked speeds are very fairly adhered to in practice.

Company		Distance in miles	Speed, m.p.h.
Nord	Amiens—Paris	81.3	52.57
P.L.M.	Les Arcs—St. Raphael	16.1	52.1
P.O.	Nantes—Angers	54.0	49.05
Midi	Narbonne—Perpignan	39.7	47.6
Est	Longueville—Reuilly	54.8	45.14
Etat	Rouen—Le Havre	54.6	43.1

—*The Engineer, London.*

General News Department

The Chicago, Milwaukee & St. Paul passenger station and hotel at La Crosse, Wis., was destroyed by fire on the night of Dec. 24; estimated loss $40,000.

On the Buffalo, Rochester & Pittsburgh extra-gang foremen in charge of track gangs composed of 10 men or more are to carry a whistle for the purpose of sounding a warning to the men to step clear of the tracks when trains are approaching.

The bonuses recently granted by the Erie Railroad, according to advices from an officer of the company, go only to clerks (those who receive $100 or less a month), who have been in the service continuously since January 1, 1915, in the general offices at New York, Jersey City, Buffalo, Youngstown, Cleveland and Chicago.

Senator Poindexter, on December 20, introduced in the Senate a bill, Section 7504, to amend Section 4 of the act to regulate commerce by striking out the provision giving the Interstate Commerce Commission authority to grant relief to common carriers from the operation of a strict observance of the long and short haul rule.

Operator Walsh of the Marconi Wireless telegraph office at Honolulu, Hawaii, recently sent 67 messages to the receiving station in California in one hour, twenty minutes. The distance is 2,372 miles. The shortest message was one of 15 words. Operator Barsby, at the receiving station, copied these messages without a break or an error.

The Gulf, Sabine & Red River Railroad, which runs between Orange, Tex., and Francis, La., and which originally was built for a logging railroad, will be opened on January 1 for regular freight and passenger traffic. The line is about one hundred miles long. It was recently extended and now accommodates a large area of country of southwestern Louisiana and southeastern Texas.

The President has nominated W. M. Daniels for reappointment as a member of the Interstate Commerce Commission, but the Senate had not confirmed the appointment when it adjourned for the holidays. Mr. Daniels' term expires December 31, but his confirmation was opposed in executive sessions of the Senate on December 20, 21 and 22 by a filibuster on the part of the Progressives who opposed his original appointment.

The latest complainer concerning the confiscation of coal in transportation is a railroad company. According to a press despatch from Ft. Worth, Tex., the Kansas City, Mexico & Orient is still looking for 30 carloads of coal, which have been taken for the use of the locomotives of the road which carries the coal from the mines at Thurber to the nearest point on the Orient line. The Orient has been obliged to take off some trains.

The Wells Fargo Express made a Christmas gift of $1,000,000 to its employees. Men and women who have been in its exclusive employ for a year or more and who draw a salary of $2,000 a year or less, will receive a bonus equal to one month's wages, to be distributed in quarterly instalments on the first of January, April, July and October, 1917. Such employees who have not been in the company's service for a full year on January 1, will become eligible for participation in all payments following their attainment of a year's service. Approximately 8,000 employees will be affected.

The Manhattan & Queens Traction Corporation, a street car line operating in Manhattan and Queens boroughs, New York City, has presented two hundred of its employees with life insurance policies for $500 each. The only condition imposed is that the beneficiaries shall join the Mutual Benefit Association, which substantially all of them have done already. The policies are made out on the one-year renewable term plan. They are in the Travelers Insurance Company of Hartford, Conn., the company which made a somewhat similar arrangement with the Brooklyn Rapid Transit Company a year ago for the benefit of several thousand employees of that company.

The four new spans of the Union Pacific bridge at Omaha were rolled from erected position alongside to final place on the piers on Saturday, December 23, after the old spans had been shifted onto falsework on the opposite side. To accomplish the change in the shortest time, both old and new superstructures were each moved as a unit having a total length of 1,000 ft. In the case of the new spans the total weight moved was 3,850 tons. The operation was entirely successful, all steps being carried out exactly as planned. It was necessary to resort to this method in order to cause a minimum interference with the heavy traffic over the bridge, which is used by most of the trains of the lines connecting with the Union Pacific at Omaha. While the change was in progress trains were detoured over the Illinois Central bridge, and over the Burlington bridge at Plattsmouth. The new spans provide for double track, and replace spans on the same substructure erected in 1887 by Geo. S. Morison, a builder of many notable railway bridges. The new approaches require some changes in the substructure, and will not be completed until next spring.

Proposed Legislation Affecting Railways

Senator Newlands has introduced a bill, Section 7555, at the request of the National Association of Railway Commissioners, to amend Section 15 of the commerce act to give the Interstate Commerce Commission authority to regulate matters pertaining to car interchange.

Accident Record—Correction

An officer of the Pennsylvania writes that there is no record of a train accident at Munhall, Pa., on the 7th of November, as stated in connection with the report of train accidents in November, printed in the *Railway Age Gazette* of December 22, page 1142.

Blewette Lee On the "President's Labor Program"

Blewett Lee, general solicitor of the Illinois Central, addressed the Traffic Club of Chicago on December 22 on "the President's Labor Program." Mr. Lee said that a general railway strike in the United States would prove more disastrous to the country than any conceivable war. He referred to the legislation for which President Wilson has asked, giving the President authority to take over the operation of railway systems in times of war.

It is even more important, Mr. Lee contended, that the chief executive should have the power to take over the national transportation system in case of a strike. In refutation of the contention of the brotherhood leaders that any interference with their right to strike would impose upon them a condition of involuntary servitude, he stated that the Constitution of the United States protects the right of the individual to leave the service of another, but grants no right to bodies of men to conspire to leave that service in concert. He referred to various court decisions and statutes to show that where the right to strike interferes with the public welfare it has been curbed, among them the so-called "seamen's" decision of the United States Supreme Court in 1897, Robertson v. Baldwin, 165 U. S., 275, and statutes in various States which impose a penalty upon locomotive enginemen who leave their engines before taking their trains to terminals.

In the dissenting opinion in the seamen's case, Justice Harlan stated that members of the army and navy were not allowed to terminate their service at will because they were engaged in public service. Railroad men, Mr. Lee said, were engaged in public service in a very real sense, as the very well-being and life of the nation are dependent upon the transportation system.

Contrary to the representations of the brotherhood leaders, the Canadian Industrial Disputes Act, which prohibits a strike until a public investigation has been made of labor disputes, is a success. From March 22, 1907, until October 18, 1916, the act averted 85 out of 92 threatened railway strikes. To hold a man to his work until an investigation has been made does not take away his right to redress, but does prevent him from forcing unjust demands in the face of an unfavorable public opinion.

Mr. Lee believes the Underwood bill, which provides for the fixing of wages, like the fixing of rates, by the Interstate Commerce Commission, the best solution of the railway labor problem. He expressed his personal disapproval of the plan which, it is reported, is being formulated by representatives of the trainmen and railroads in New York at the present time, providing for a permanent national body, composed of four representatives of the brotherhoods and four representatives of the railroads, for the adjudication of labor disputes. This plan is objectionable, he said, because it gives no adequate representation to the American public.

Union Pacific Insures Employees

The board of directors of the Union Pacific have approved a plan, effective January 1, whereby every employee of the system who has been in the service of the company continuously for one year, and whose compensation does not exceed $4,000, will be provided with life, accident and sickness insurance at the expense of the company. The amount of each life insurance policy will be equal to one year's full wages, with a minimum payment of $500 and a maximum of $2,500. The accident insurance covers total disability resulting from injuries in the performance of the employee's occupation, and consists of half pay during disability, with a minimum of $5 a week and a maximum period of two years, during which payments will hold. The sickness insurance covers illness of a minimum of one week's duration, and also injuries resulting from accidents not occurring in the performance of duty. Its provisions include half pay while the employee is disabled and confined at home, with a minimum payment of $5 a week and a maximum period of 52 weeks, during which the benefits will be operative. An additional indemnity of half wages for a further period of 52 weeks will be made if it appears that an employee becomes totally and permanently disabled for life. The insurance will apply to all employees receiving less than $4,000 per annum, regardless of their age or condition of health, as well as to employees retiring after January 1, on a pension.

Railway Business Association on Rates

The eighth annual report of the general executive committee of the Railway Business Association briefly surveys the railway situation with reference to proposed legislation. Concerning rates it make this statement:

"It is now possible to focus the national thought upon the heart of the problem—the rule which is given by Congress to its regulatory arm, the commission. The present law declares that each rate shall be just, reasonable and non-discriminatory. It is our purpose to recommend that two additional elements be embodied in the statutory rule:

"1. That in regulating rates total revenues shall be permitted sufficient for total legitimate purposes.

"2. That legitimate purposes shall embrace the attraction of investment for improvements and extensions.

"We yield to none in favoring effective federal supervision under conditions advantageous to the whole public, while insuring that the states may retain such jurisdiction as local self-government requires; but at the same time we emphasize this aspect:

"If total revenues are not made adequate for total expenses no question will long remain as between federal and state authority, because sooner or later the federal government under those conditions must take over the roads. In that case the states would lose all voice whatever, and federal regulation, if any, would present the grotesque spectacle of one political officer supervising another whose tenure proceeds from the same source of power as his own. Whoever omits from his prescription statutory obligation upon the commission to permit rates adequate to carry the national business and develop the country leaves out the essential ingredient without which the whole compound is futile.

"Every substantial increase in tonnage brings car shortage. Only 933 linear miles of road were constructed in the calendar year 1915, and apparently the record for 1916 will barely exceed that figure, although the volume of industrial activity and hence railway earnings is considerably greater than in any previous year. Those who deal with investors continue, as for several years past, to report indifference of their clients toward railway securities except for refunding and for mortgage bonds, now rarely feasible, upon unencumbered property.

"We approve abstention by legislative bodies from dealing with rates. We see no exception even in so costly an item as the eight hour law. The new legislation which we urge, is that if at any time in any place rate advances should become necessary in the public interest authority and obligation to sanction them will explicitly reside by statute in a specified branch of the government."

The total membership of the Railway Business Association has increased to 321, the largest number in its history.

Brotherhoods' Wages Unchanged

All of the principal railroads have issued circulars to employees calling attention to the arrangement which has been made between the railroad committees and the attorney general of the United States, in connection with the proceedings to secure a judicial interpretation of the Adamson law. Notice is given that until the decision of the highest court shall be known, the payment of wages will be continued on the present basis; but the accounts are to be so kept that if the law is declared valid the men shall promptly receive any back pay due them under the decision of the court.

The informal conferences which have been held between the National Conference Committee, of railway officers, and representatives of the brotherhoods, during the past few weeks, were understood to have resulted, last week, in an agreement to hold a more formal meeting this week in New York City; but the uncertainty existing concerning many points, and the numerous differences of opinion as to what ought to be done have interposed so many obstacles that at this writing it is expected that no meeting will be held.

Southern Roads Want Share of Cars

In a recent statement to the New Orleans Press, W. E. Farris, vice-president and general manager of the New Orleans Great Northern, stated that unless the smaller railroads of the South get an "even break" in car exchange with the great trunk lines, they will shortly face bankruptcy and scores of industries in Louisiana and Mississippi, employing thousands of men, will be forced to close down. The New Orleans Great Northern owns 1,385 cars, or about 30 per cent more than it requires to take care of the business on its lines. Its connections on an interchange basis owe it 985 cars, and it has about 28 per cent of its ownership of cars on its own rails. Plans to reduce the free time on export shipments in cars on local bills from ten days to five days and to raise the per diem on cars held by foreign lines from 45 cents to 75 cents, will doubtless give the trunk lines a larger supply of cars, but it does not insure protection to the smaller lines.

In a letter to the *Railway Age Gazette*, Mr. Farris supplements his New Orleans interview as follows: Our contention is that Section 1 of the Act to Regulate Commerce makes it obligatory on carriers "to establish through routes and just and reasonable rates applicable thereto; and to provide reasonable facilities for operating through routes and to make reasonable rules and regulations with respect to the exchange, interchange and return of cars used therein," and that the obligation to furnish cars for the operation of through routes rests as heavily on the receiving line as it does on the originating line. The practice of the big trunk lines today is to accept cars used in the operation of through routes from lateral lines until the lateral line supply is exhausted, and then, when it suits their convenience, to give cars to lateral lines and demand a car in exchange for every car delivered.

Railway Business Association Annual Dinner

F. A. Delano, member of the Federal Reserve Board, former president of the Chicago, Indianapolis & Louisville, and Alfred P. Thom, general counsel of the Southern Railway and also general counsel of the Railway Executives' Advisory Committee are announced as the speakers for the eighth annual dinner of the Railway Business Association which will be held at the Waldorf-Astoria Hotel, New York, Tuesday evening, January 16, 1917. The business meeting of the association occurs at 11 a. m. at the Waldorf-Astoria, the election of officers at 1.30 p. m. and the dinner at 7 p. m., doors opening exactly at the hour.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 20-22, 1917, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transporation Bldg., Chicago.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago. Next convention, March 19-22, 1917, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Blrg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Next annual meeting, January 16, 1917, Waldorf-Astoria Hotel, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August .

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The southern railroads have announced a fare of one cent a mile in each direction for the 27th annual reunion of the veterans of the Confederate Army, to be held at Washington next May.

Between Christmas and New Year's each dining car on the Northern Pacific had a Santa Claus and a Christmas tree, as well as appropriate holiday decorations. By way of gifts Santa distributed souvenirs among the passengers.

The Railway Commission of Canada has authorized an increase in the rates for demurrage on freight cars beginning January 1, and continuing in force until April 30, 1917. There is no increase until the third day after the expiration of free time; then the rate is $3 a car; for the fourth and each succeeding day the rate is $5 a car.

The attorney general of Maryland, acting in the interest of the city of Baltimore, will appear at the hearing before the Interstate Commerce Commission, which is to be held in New York City January 10, on the application of Jersey City interests for a reduction in the rates on freight from the west, to Jersey City, below the rates to New York City.

The Baltimore & Ohio Southwestern, co-operating with officers of the Federal and State Agricultural Departments, is to run an educational train for farmers along its lines in southern Indiana and Illinois, the itinerary extending from February 5 until February 14, and lectures will be given on stock raising and other subjects of interest to dairymen. Prize cattle will be exhibited.

The superintendent of mail service at New York City says that the volume of mail shipped on Saturday, Sunday and Monday last, was 25 to 30 per cent greater than on any previous holiday occasion. The express companies report similar increases. One express company called on the railroad for about three times as many cars as had been planned for on the first of December.

The traffic bureau of the Boston Chamber of Commerce has called upon the Interstate Commerce Commission to modify its order requiring empty cars to be sent from New England westward. It is declared that the Boston & Albany is doing all that it can, and if it sends cars westward empty it sends them past loads waiting for them. It is claimed that this road is delivering to its western connections as many cars as it receives from them.

The Transportation Club of Fort Worth (Tex.) will hold its first annual banquet on Saturday, January 20. The speakers will include Ben E. Keith, president of the Chamber of Commerce, J. L. West, freight traffic manager of the Missouri, Kansas & Texas lines of Texas, H. M. Mayo, manager of the industrial department of the Southern Pacific, Texas and Louisiana lines, I. M. Griffin, assistant freight traffic manager of the Texas & Pacific, and Horace Booth, traffic manager of the International & Great Northern.

The first annual banquet of the Houston (Tex.) Traffic Club was held on December 15. The principal address of the evening was made by C. K. Dunlap, traffic manager of the Southern Pacific in Texas, on the transcontinental rate situation and the origin of the practices that have grown up in conection therewith. The following officers were elected for the ensuing year: H. M. Mayo, president; Clint Holliday, first vice-president; F. L. Clements, second vice-president; E. J. Peters, third vice-president; S. A. Leffingwell, secretary; A. Kimball, treasurer; A. L. Mockbee and Henry C. Cortes, directors.

In Richmond, Va., recently, a citizen of South Carolina was arrested for having in his possession some whiskey, which he had bought in Baltimore, and was taking to his home in South Carolina. At Richmond he alighted from a train at the Byrd Street station and proceeded thence to the Main Street station, and the arrest was on the charge that it was illegal to have in possession this liquor in the city of Richmond. On trial the accused was acquitted, but the judge held that in a case of this kind the person carrying the liquor must bear the burden

of proof of showing that it was not intended for use within the state of Virginia.

Senator Newlands, chairman of the Senate Committee on Interstate Commerce, at a meeting of the committee on December 20, in presenting to the committee a bill for appropriations for flood control and development in the lower Mississippi river and the Sacramento river, advocated a complete system for the co-ordination of rail, river and ocean transportation. He proposed a large expenditure for river development, declaring that waterways were as essential to transportation as the railways and would, if developed, relieve the railroads of congestion by handling low-grade bulky commodities.

The Traffic Club of Pittsburgh held a semi-annual dinner on December 18. F. A. Ogden, general freight agent of the Jones & Laughlin Steel Company, in an address, declared that freight and passenger rates should be increased to give the railroads sufficient funds to provide better transportation facilities. Commodities used by the railroads have advanced 50 to 100 per cent in price. At the same time the railroads have been granted a 5 per cent increase in rates. If the so-called eight-hour law is declared constitutional, even the small advantage of this advance will be wiped out. As it is, prices go up or down but the railway rates remain the same.

Forty-seven traveling passenger agents, city ticket agents and passenger agents of the Union Pacific system west of Salt Lake City, Utah, convened at Chicago on December 18 and 19, for the purpose of exchanging information and ideas. On the evening of December 18, a banquet was held at the Union League Club, following which W. B. Leffingwell, head of the lecture bureau of the Union Pacific System, presented motion pictures of scenes in Estes Park, Yellowstone Park and along the northern Pacific Coast. As the result of an inquiry by Gerrit Fort, passenger traffic manager, it was found that every passenger solicitor and ticket seller present had traveled over all of the main lines of the Union Pacific at least once.

Horace Bowker, president of the National Fertilizer Association, has issued a circular calling on farmers to co-operate with railroads and dealers in economizing in the use of cars during the coming season. The fertilizer movement is usually crowded into six or eight weeks, but there is likely to be a great demand the coming spring, and the railroads are likely to be unable to furnish the requisite number of cars. But, says Mr. Bowker, shipments will be moved promptly and will reach the farmers in plenty of time, if orders are made early, thereby relieving the congestion and extending the length of the shipping period. All concerned are urged to see to the ordering of as near maximum quantity in full capacity cars as possible instead of minimum cars of fifteen tons, which is the customary load. The farmer is reminded that the shipping of fertilizers early is of advantage in other ways. He can haul them to his farm before the rush of spring work starts. In many sections it is of advantage to haul on the snow before the roads break up in the spring. When the farm work is least rushing and labor costs of hauling are lowest, is the profitable time for such hauling.

Economy Under a Seventy-Five Cent Per Diem

O. C. Castle, car service agent of the Southern Pacific's Texas and Louisiana lines, recently issued a bulletin showing why the increase in the per diem rate from 45 cents to 75 cents should prove an additional incentive to efficient operation. During the months of July, August, September and October, 1916, under the old per diem rate, the Southern Pacific lines in Texas and Louisiana so increased their efficiency in moving and loading freight cars that a saving in per diem of $108,000 was made. The advance in the per diem cost on December 15, represents an increase of 66⅔ per cent in the rental cost of a freight car. The immediate effect of this increase on these Southern Pacific lines was to add to the expense of operation a net amount of approximately $1,200 a day, with no corresponding increase in revenue. If 45-cent car days are worth saving, says Mr. Castle, the 75-cent days certainly justify increased vigilance.

To give a concrete idea of what the freight car rental amounts to, Mr. Castle prepared the following computations: To pay the 75 cents for the use of one freight car one day, one ton of freight must be hauled approximately 300 miles. One day's delay to three cars represents a day's wages for a warehouseman. The entire operating cost of a switching engine and crew for 10 hours amounts to less than the per diem on 67 cars for a 24-hour period. The cost of unloading and reloading a car of lumber is less than the rental of a freight car for five days. The per diem expense of holding over the billing of four cars from 6 p. m. until the following day would pay for an additional bill clerk. To deliver 35 cars to a connecting line at 12.01 midnight, instead of two minutes earlier, is to lose an amount equivalent to the wages of a switching crew for an entire day. Ten days' delay in unloading a car of ties is equivalent to the loss of 15 ties. Two hours' delay in furnishing a locomotive called for a train of 75 cars causes car detention equivalent to the pay of a hostler for two days. Two days' unnecessary delay to a car on repair tracks costs more than a new journal brass.

Freight Congestion in the West

The embargoes placed by eastern roads on all freight from the west, with a few minor exceptions, destined to points east of the Indiana-Illinois State line, and mentioned in the *Railway Age Gazette* of December 15, have caused severe congestion on western lines. Thousands of cars consigned to eastern points are standing on the tracks in the Chicago terminal district and on sidings west of that city, in some instances, as far as the Missouri river. With the coming of severe cold weather and increased business in the holiday season, the situation became increasingly serious. One large western line, at the time of writing, would receive no freight consigned to Chicago other than from points on its own line. Other roads refused to accept cars unless it was definitely found that the consignees were prepared to unload them. Some lines were so badly congested that they would receive no cars from connecting railways unless the latter took an equal number of cars from them. Typical of the situation is an instance cited by an operating officer in Chicago to the effect that in order to get at one car he found it necessary to move 40 cars a mile and a half.

The problem has been complicated by the coal stringency, which was accentuated by the arrival of severe weather. Not only has the lack of coal been felt by industries, public utilities, public institutions and private consumers, but by the railroads themselves. An operating officer of a large western line said that never before had his road operated with such a small surplus coal supply. Another large western line, at the time of writing, had on hand only a 24-hour supply of fuel. In order to continue business railroads have been forced to buy coal on the open market at high prices, being unable to secure deliveries of contract coal. On December 21, representatives of railroads centering in Chicago met with representatives of the United States Department of Justice to discuss ways and means of relieving the coal situation. As a result of the conference the railroads agreed to co-operate in moving coal shipments as expeditiously as possible. To this end some lines have lent locomotives to others which were unable to move coal standing on their tracks.

The congestion of freight in this country, according to B. L. Winchell, director of traffic of the Union Pacific, starts at the English ports, where British railways are unable to unload ships promptly, and extends across the ocean, and thence from New York across the continent to the Pacific Coast. How far the effects of the accumulation of cars in the east have reached was brought out when the Union Pacific found it necessary to place an embargo on all competitive freight coming from, or going to, connecting lines, effective from December 26 to January 7. Some railroad officers are of the opinion that the situation will not grow much worse, and hold out hopes of gradual improvement from now on. The number of cars consigned to eastern points now being held on western lines will not be further increased because of the existence of the embargoes, but on the contrary will be decreased slowly as eastern roads find it possible to dispose of them. Wherever possible the railroads are obtaining the permission of the shipper to move his cars over alternative routes, thus being able to take advantage of any possible means of access to the east. With the holiday business disposed of, there will be less business to handle, and as trainmen become acclimated to the cold weather operating efficiency will increase. A period of mild weather would further relieve the situation, as would the lifting of some of the eastern embargoes.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended, until April 23, proposed increased rates on coal from Gallup, N. M., to various points in Arizona.

The commission has suspended until April 20, a tariff of the Old Dominion Steamship Company, providing for the withdrawal of through rates on cotton from Norfolk, Pinners Point and Portsmouth, Va., to various interior New England points.

The commission has further suspended, from December 31 until June 30, the cancellation of joint export rates on grain and grain products from points on the Kansas City, Mexico & Orient to New Orleans and other gulf ports via the St. Louis-San Francisco.

Examiner-Attorney Thurtell, of the Interstate Commerce Commission, has just completed a series of hearings regarding the adjustment of transcontinental freight rates, the case having been reopened by the commission on an order of October 17. Hearings were held at Chicago, Salt Lake City, San Francisco, Portland and Spokane. Representatives of Pacific Coast cities objected to any increase in the terminal rates because of the abatement of competition via the Panama Canal on the ground that that condition is but temporary. Representatives of the intermountain cities asked reductions in the rates to the intermountain territory. The railroads took the position that making rates to meet water competition on the coast has no relation to the rates to the intermediate points, and that the roads should be able to meet competitive conditions on the coast without affecting the intermediate rates. At the time of the hearing at Salt Lake City, representatives of the intermountain interests effected an organization to prepare data to submit to Congress in an effort to secure a repeal of the provision in the fourth section of the commerce act, which authorizes the commission to allow the carriers in its discretion to depart from the strict observance of the long and short haul rule. Senator Poindexter of Washington has introduced a bill in Congress for this purpose.

Wheat from Minneapolis

Minneapolis Traffic Association et al. v. Ann Arbor Railroad et al. Opinion by Commissioner Clark:

Following Through Routes and Through Rates, 12 I. C. C., 163, Held, That defendants having formed through routes from the points of origin of wheat milled at Minneapolis, Minn., the product of which was forwarded thence to destinations in central freight association and trunk line territories, the legal rates for the movement east of Chicago and other Illinois and Indiana junction points to such destinations were the reshipping rates on grain products in effect at the time the shipments of wheat originated. (42 I. C. C., 76.)

Print Paper from the Soo

Lake Superior Paper Company, Limited, v. Minneapolis, St. Paul & Sault Ste. Marie et al. Opinion by Commissioner Clements:

Differential of 6 cents per 100 lb. in the rates on news print paper, carloads, from Sault Ste. Marie, Ontario, over the rates from Wisconsin producing points to points west of the Mississippi river, found not to be unjustly discriminatory. Complaint dismissed. (42 I. C. C., 109.)

Rates on Tar to Kansas City

F. J. Lewis Manufacturing Company v. Chicago, Burlington & Quincy et al. Opinion by the Commission:

Charges on 18 carloads of petroleum tar, in tank cars, from Des Moines, Iowa, to Kansas City, Mo., not shown to have been unreasonable. Charges were collected at the published rate based on estimated weights for the transportation of petroleum tar in tank cars from Omaha, Neb., to Kansas City, Mo., and Memphis, Tenn.; Held, That the charges collected were unreasonable to the extent that they exceeded charges based on actual weight at a rate of 7 cents per 100 lb. for the shipments to Kansas City, and at the published rate for the shipments to Memphis. Reparation awarded. (41 I. C. C., 671.)

Stopping Hogs at Winona

Interstate Packing Company v. Chicago & North Western. Opinion by Chairman Meyer:

Defendant's rule permitting shipments of live hogs in carloads to be stopped at Winona, Minn., for sorting and finishing loading, while no like service is provided at stations within complainant's shipping territory, found unjustly discriminatory. Discrimination ordered removed. Services performed by defendant at Winona, Minn., are not unlawful if performed without unjust discrimination. (41 I. C. C., 189.)

Lumber Rates on the Santa Fe

Lutcher & Moore Lumber Company et al. v. Texas & New Orleans et al. Opinion by Chairman Meyer:

Joint rates on yellow-pine lumber from points in Texas and Louisiana, where complainants' mills are located, by way of the originating line and the Gulf, Colorado & Santa Fe Railway, to points on the lines of the Santa Fe system in the state of Oklahoma, found to be unjust and unreasonable and unjustly discriminatory to the extent that they exceed the rates in effect from points on the Santa Fe system in Texas and Louisiana to the same points of destination. (42 I. C. C., 88.)

Estimated Earnings for the Calendar Year

The Interstate Commerce Commission has given out a statement showing that for the first nine months of the year 1916, the gross earnings of the railroads of the country, including only those of class 1 (excluding those of which the total gross income is less than $1,000,000), will amount to over two and a half billions; and for the twelve months of the year, estimating the last three as being equal to the preceding quarter, $3,600,640,502. Net income from operation is calculated at over one billion.

The principal figures in the statement are:

	Nine months ending Sept. 30	Twelve months ending Dec. 31 Estimated
Gross receipts	$2,654,829,647	$3,600,642,502
Freight	1,875,019,990	
Passenger	522,103,907	
Mail	45,348,600	
Express	65,089,474	
Miscellaneous	60,414,597	
Other	76,087,611	
Operating expenses	1,744,160,022	2,346,066,990
Maintenance of way	320,157,526	
Maintenance equipment	441,740,069	
Conducting transportation	858,973,536	
Traffic	46,679,422	
Miscellaneous	19,904,769	
General	61,996,428	
Net operating income	785,558,266	1,097,982,638

The average of the gross receipts per mile of road, for 12 months, figures out at $15,655, and the average net at $4,774.

STATE COMMISSIONS

The Illinois Public Utilities Commission has suspended for 120 days the passenger tariffs, recently filed by the railroads increasing fares to 2.4 cents a mile. This increase was made for the purpose of removing the discriminating difference between intrastate rates and those for interstate traffic approved by the Interstate Commerce Commission.

The Railroad Commission of Louisiana has granted an application of the Kansas City Southern for a hearing on intrastate cotton rates to New Orleans, La. On account of a decision of the Interstate Commerce Commission in what is known as the Memphis case, the Louisiana lines are confronted with the alternative of advancing cotton rates to New Orleans or reducing the rates to Memphis, St. Louis et al. In compliance with that order they have published for intrastate application cotton rates from Louisiana points to New Orleans, showing advances.

PERSONNEL OF COMMISSIONS

Clifford Thorne, chairman of the Iowa Board of Railroad Commissioners, has resigned, effective January 1, to become special counsel of the National Live Stock Shippers' Protective

Association and the Corn Belt Meat Producers' Association, with headquarters at Chicago, Ill.

COURT NEWS

Crossing Accident—Proximate Cause

A highway was carried over railroad tracks by a bridge 20 to 30 feet wide, the approach to which was about 200 feet long. Barriers had been erected on each side of the approach next to the bridge between 60 and 80 feet long. A person driving along the highway had nearly crossed the bridge, when his horse became frightened by a passing switch engine and began backing. The horse backed across the bridge, down the approach beyond the barriers, and finally backed the buggy over the embankment, killing the occupant. In an action for his death the district court for the western district of South Carolina held that the proximate cause of the injury was the frightening of the horse, and not any defect in construction of the approach to the bridge, the horse being frightened by the necessary noise and smoke of the engine. For this the railroad was not liable. Though it was negligent in not placing barriers on the approach, the fact that the horse backed down the approach for a long distance beyond the barriers, which had been erected, constituted an intervening cause, freeing the railroad company from liability, as when the horse took fright the deceased was in a place protected by barriers.—Hunt v. Southern, 236 Fed., 157.

Notice of Claim for Damages to Live Stock

The Texas Court of Civil Appeals holds that a written contract for the interstate transportation of live stock requiring notice to an agent of the carrier, before the stock shall have been removed from the place of delivery, slaughtered or intermingled with other stock, of a claim for damage, and that the stock shall not be removed before the expiration of three hours from the giving of such notice, is valid under the interstate commerce act and amendments, the laws of Texas to the contrary notwithstanding.—Atchison v. Smyth (Tex.), 189 S. W., 70.

Assumption of Risk by Trackwalker

The Kentucky Court of Appeals holds that a track walker, who knew that the sides and roof of a tunnel were not in any way supported, and that loose stone and dirt fell on the track, and that it might fall while he was walking through the tunnel, and who knew and fully appreciated the danger, in the absence of any assurance that the place was reasonably safe in which to work, or that the dangerous condition would be remedied, and who voluntarily continued in his employment, assumed the risk of injury from the fall of stone and dirt.—Lexington & Eastern v. Stack (Ky.), 189 S. W., 25.

Crossing Accident—Contributory Negligence

Action was brought for the death of a man killed by an engine as he was walking over a crossing in the evening. He was familiar with the crossing and the path by which he approached it ran for some distance parallel to or near the tracks. The whistle cord on the engine was broken, and the whistle was not sounded for the crossing; but the bell was rung continuously, and the headlight could be seen for half a mile before the crossing was reached. The deceased was a young man in full possession of his senses. The Circuit Court of Appeals, first circuit, held that he was chargeable with contributory negligence in failing to look before going on the crossing.—Boston & Maine v. Titcomb, 236 Fed., 129.

Directions to Passenger

The failure of a ticket agent to inform a passenger on which of two nearby tracks his train will come cannot be made the basis of a recovery for taking the wrong train, in the absence of a request from the passenger for information on the subject, or for something to indicate to the agent that the passenger is likely to take the wrong train. In an action for damages the plaintiff testified that in response to her inquiry the agent (at Hendersonville, N. C.) informed her that the train for Toxaway would leave "from right there [pointing] in five minutes," there being three or four parallel tracks in the direction towards which the agent pointed. There was no evidence to show that the agent indicated any particular one of these tracks, or that the Toxaway train did not, in fact, arrive at and depart from the station at the time named and on one of the tracks indicated; and the departure of the plaintiff on a train running towards Asheville, and not towards Lake Toxaway, was not due to any misrepresentation made by the agent. The Georgia Court of Appeals held that the plaintiff was properly nonsuited.—Dawson v. Southern (Ga.), 89 S. E., 1051.

Taxation

The Georgia Railroad & Banking Company executed a lease of all its property, which required the lessee to deposit $1,000,000 in bonds. The lease was assigned to the Louisville & Nashville and the Atlantic Coast Line, and they operated the property. The required bonds were deposited in New York. The Federal district court for the northern district of Georgia holds that in view of the purpose of the requirement, and despite the fact that these railroads operated the property under a name similar to that of the lessor, the bonds deposited in New York had no situs in Georgia for taxation, on the theory that they constituted capital invested in the demised property.—Louisville & Nashville v. Wright, 236 Fed., 148.

Crossing Accident—Contributory Negligence

The Federal District Court, N. D. New York, holds, in an action for killing the driver of a buggy at a crossing, that one about to drive from behind a railroad station on to the track, who could not see the track for any great distance, is bound to look and listen before venturing on the tracks, and, if necessary, to stop. The tracks of two railroads ran parallel and only a short distance apart, so that travelers on the highway could not distinguish whether a train was on one track or another. The Court held that evidence that it was customary to equip much traveled crossings with an automatic bell is admissible in such an action, but will not, as a matter of law, establish the company's negligence. The questions of the railroad's negligence and the deceased's contributory negligence were submitted to the jury, which rendered a verdict for the railroad.—Hartwell v. Lackawanna, 234 Fed., 112.

"Mental Suffering" of Passenger Must be Proved

A conductor took up a commutation ticket presented by Miss I. H. Gerety which by mistake had been issued to "Mr. I. H. Gerety." Miss Gerety sued to recover damages resulting from the failure of the company's ticket agent to deliver to her a commutation ticket for which she had asked and paid. There was no testimony whatever that tended to show any commotion in the car, or that the plaintiff was made a spectacle of when the conductor took up the ticket, or even that there was any one else in the car at the time. The New Jersey Court of Errors and Appeals holds, reversing a judgment for the plaintiff (95 Atl., 733), that the trial judge erred in charging the jury that the plaintiff was entitled to recover for indignity and mental suffering inflicted on her in having the ticket taken away; and that, in the absence of proof of indignity, or the like, the true measure of damages was the value of the ticket at the time it was taken up.—Gerety v. New York & New Jersey (N. J.), 98 Atl., 400.

Furnishing of Cars

There may be freight of such an unusual and exceptional character that a particular railroad company would not be required to anticipate its offer for carriage and provide facilities in advance for its transportation. In an action for failure to furnish cars for the shipment of lumber, the plaintiffs alleged that they requested the railroad to furnish two cars 40 feet long. The railroad averred that the plaintiffs knew that it did not have such cars, that it endeavored to get the cars, but that there was a car famine and it could not do so. It was held that, while the mere fact that other railroads had refused to furnish the defendant with cars because of car shortage would not necessarily relieve the defendant from liability, the condition of business, the demand for cars,

whether usual or extraordinary, what the defendant had done to provide for ordinary demands, and the ability or inability to get cars at the time were facts for the jury to consider in determining whether the defendant had complied with its duty.—Whalen Southern v. Kent & Downs (Ga.), 89 S. E., 765.

Waking Sleeping Passengers

In an action against a railroad for its conductor's failure to arouse the plaintiff at his destination and for allowing him to disembark three or four miles out of the town on the representation that the train was about one mile out, the plaintiff's contention of fact was that he was asleep when his destination was reached; that the conductor assured him he would be on the lookout for that condition, but that he was not on the lookout. The South Carolina court holds that where a conductor, having cause to expect a passenger is asleep at his destination, fails to awaken him, either wilfully or negligently, when he is apparently asleep, the road is liable for carrying him beyond his destination. There is, however, no duty on the conductor to go through a day coach and arouse every sleeping passenger.—Gilkerson v. A. C. L. (S. Car.), 89 S. E., 549.

Crossing Accident—Lawful Noises

The Oklahoma Supreme Court holds that, in order to give a right of action to an individual for the violation of a city ordinance requiring a railroad to constantly keep a flagman at a street crossing, a causal connection between the failure of the company to comply with the ordinance and the injury received must be shown. The railroad has the right to make all usual noises incident to the moving of its cars, and a person in a buggy, at a public crossing, whose horse becomes frightened at the noise of the movement of the cars, runs away, and causes injury to the person, has no cause of action against the railroad unless the acts of the employees which caused the noise were unnecessary, and were made under such circumstances as to constitute lack of ordinary care; or the noise was recklessly or wantonly made, or done to frighten the horse, and done in the discharge of the servants' business for the company.—Lusk v. Pugh (Okla.), 159 Pac., 855.

Service on Foreign Railroad Corporations

In an action in the Massachusetts courts the point to be decided was whether the defendant railroad company was "engaged in or soliciting business in this commonwealth" within the meaning of the Massachusetts statute as to service of process on such corporations. The question is a federal one upon which the decisions of the United States Supreme Court are controlling. That court has said that "each case of this kind must depend on its own facts."—Washington-Virginia v. Real Estate Trust, 238 U. S., 185. That court has not undertaken to formulate any general rule defining what transactions are essential to the doing of business in the sense that will render the one conducting it liable to service of process. It has gone no further than to say that: "The business must be such in character and extent as to warrant the inference that the corporation has subjected itself to the jurisdiction and laws of the district in which it is served."—St. Louis Southwestern v. Alexander, 227 U. S., 218,227. In that case the facts were that the defendant's name was on the door of an office in New York, together with those of general freight agent, general passenger agent and traveling freight agent. Through one of these agents the plaintiff had had some negotiations and correspondence about his claim and its settlement. It was held that this made the company liable to service of process in respect of that matter in New York. In the present case the railroad engaged a resident to represent it as New England passenger agent, and invested him with considerable authority, consulted him with regard to passenger business, and he took up complaints with the company. On the authority of the Alexander case, the Massachusetts Supreme Judicial Court held the company was doing business in the state. The mere solicitation of business by a foreign corporation commonly has been held not to be the doing of business within the state. It was not necessary in the present case to decide whether a statute providing that solicitation of business would be doing business would be constitutional.—Reynolds v. Missouri, K. & T. (Mass.), 113 N. E., 413.

Railway Officers

Executive, Financial, Legal and Accounting

Benjamin McKeen, general manager of the Pennsylvania Lines West, at Pittsburgh, Pa., has been elected fifth vice-president; and R. E. McCarty, general superintendent of the Southwest system, at Columbus, Ohio, has been elected resident vice-president at Detroit, Mich.

Edward M. Smart, Wisconsin attorney for the Chicago & North Western, the announcement of whose appointment as assistant general counsel appeared in these columns last week, was born at Almond, Wis., May 24, 1851. He graduated from the Evansville (Wis.) Seminary in 1887 and then took a three-year academic course at the University of Wisconsin, graduating from the legal department of that school in 1894. After several years of private practice he entered railway service with the Chicago & North Western in 1912, as an attorney. Subsequently he was appointed attorney for Wisconsin for the same company, with headquarters at Milwaukee, Wis. His appointment as assistant general counsel, with headquarters at Chicago, Ill., becomes effective January 1, 1917.



Edward M. Smart

Edward Ormond Griffin, purchasing agent and general storekeeper of the International & Great Northern, has been appointed assistant to the first vice-president of the St. Louis Southwestern, and assistant to the president of the St. Louis Southwestern of Texas, with jurisdiction over the department of purchasing and of materials and supplies, with headquarters at St. Louis, Mo. He was born on January 3, 1867, at Madison, N. C., and received his education at Brownsville College, Southwestern Baptist University and Nashville College. He began railway work with the International & Great Northern as secretary to the receiver, and in 1891 was promoted to chief clerk to the receiver and purchasing agent of the same road. From May, 1895, to June, 1897, he was assistant to the general manager, being then appointed assistant to the vice-president and general manager in charge of transportation. In 1903 he was made passenger and ticket agent, and in 1904 passenger and freight agent. In 1905 he was appointed Southwestern passenger agent for the Missouri Pacific, and then became demurrage agent for the same company's Texas Lines in 1908. He returned to the International & Great Northern in 1909, and in 1910 was appointed chief clerk to the superintendent. In June, 1911, he was made general storekeeper, and



E. O. Griffin

in May, 1914, he was promoted to general fuel and supply agent of the same road. On the resignation of the purchasing agent and general storekeeper in September, 1914, he was promoted to this position, which he held up to the time his present appointment became effective.

A. J. Gillingham, auditor of passenger traffic of the Pennsylvania Railroad, at Philadelphia, Pa., has been appointed assistant to controller, a new position; W. J. Bingham, assistant auditor of coal traffic, succeeds Mr. Gillingham. The departments of coal traffic and auditor of merchandise traffic have been consolidated under the supervision of an auditor of freight traffic. W. B. Kraft, auditor of miscellaneous accounts, has been appointed auditor of freight traffic and will have three assistant auditors of freight traffic. They will be: A. S. Porter, now assistant auditor of merchandise traffic; J. B. Moffitt, Jr., now chief clerk to the controller, and F. M. McIntyre, now chief accountant to the auditor of merchandise traffic. George B. Rudduck, auditor of merchandise traffic, has been appointed auditor of miscellaneous accounts; and J. F. Reynolds, assistant auditor of disbursements, becomes auditor of disbursements. B. C. Henion, chief clerk to the controller, has been appointed assistant auditor of disbursements; and F. J. Fell, Jr., chief statistician of the accounting department, has been promoted to the newly created position of general accountant. Effective January 1.

Operating

P. F. Gilhula has been appointed chief despatcher of the Arkansas & Louisiana, with office at Monroe, La.

J. S. Raddoch has been appointed superintendent of terminals of the Havana Terminal Railroad, with headquarters at Havana, Cuba.

W. M. Whitenton has been appointed trainmaster of the Missouri, Kansas & Texas, of Texas, with office at Smithville, Tex., vice E. E. Hanna, assigned to other duties.

Joseph H. Elliott, general superintendent of the Texas & Pacific, has been appointed general manager, with headquarters at Dallas, Tex., and Phil Carroll, division superintendent of the Missouri Pacific at Poplar Bluff, Mo., succeeds Mr. Elliott as general superintendent. Effective January 1.

A. D. Brown, assistant to general manager of the Pittsburgh & Lake Erie, at Pittsburgh, Pa., has been appointed general superintendent, vice J. W. Riley, resigned. F. G. Minnick, superintendent of car service at Pittsburgh, has been appointed superintendent of freight transportation, vice N. K. Hoffman, assigned to other duties, and the office of superintendent of car service has been abolished. A portrait of Mr. Minnick and a sketch of his railway career were published in the *Railway Age Gazette* of May 19, 1916, page 1109.

D. F. Crawford, general superintendent of motive power of the Pennsylvania Lines West, at Pittsburgh, Pa., has been appointed general manager. I. W. Geer, general superintendent of the Central system, has been appointed general superintendent of the Southwest system. S. B. Robertson, superintendent of the Cleveland & Pittsburgh division, has been appointed general superintendent of the Central system. R. K. Rochester, superintendent of the Logansport division, has been appointed superintendent of the Cleveland & Pittsburgh division. Bruce D. Cooper, trainmaster of the Michigan division, has been appointed superintendent of the Zanesville division. George Le Boutillier, superintendent of the Richmond division, has been appointed superintendent of the Logansport division. F. J. Simpson, superintendent of the Zanesville division, has been appointed superintendent of the Richmond division.

Traffic

A. B. Calder has been appointed assistant general passenger agent of the Canadian Pacific eastern lines, with headquarters at Montreal, Que.

James Burton, Jr., has been appointed traffic manager of the Shreveport, Alexandria & Southwestern, with headquarters at Kansas City, Mo.

William Hodgdon, freight traffic manager of the Pennsylvania Lines West, at Pittsburgh, Pa., has been appointed traffic manager, and John J. Koch, assistant freight traffic manager, has been appointed freight traffic manager.

Engineering and Rolling Stock

J. E. Bebb, office engineer of the Duluth, South Shore & Atlantic, with headquarters at Duluth, Minn., has been appointed assistant bridge engineer of the Michigan Central, with headquarters at Detroit, Mich., effective January 15, 1917.

B. J. Simmons has been appointed division engineer of the Atchison, Topeka & Santa Fe, with headquarters at Needles, Cal., and with jurisdiction over maintenance of way, bridge, building and water service matters. He succeeds W. L. Bradley, transferred.

Harry C. Allen has been appointed road foreman of engines on the Rocky Mountain division of the Northern Pacific with headquarters at Missoula, Mont., succeeding H. E. Day. E. B. Le Van has been appointed road foreman of engines on the Montana division.

OBITUARY

Ora E. Butterfield, general solicitor of the New York Central lines, with headquarters at New York, died in that city on December 22, at the age of 46.

John McGuire, formerly superintendent of the Spokane, Portland & Seattle, with headquarters at Portland, Ore., died at his home in that city December 15, 1916, age 67.

William David Sanborn, general agent of the Chicago, Burlington & Quincy, with headquarters at San Francisco, Cal., died at his home in that city last week, age 65. He was born at Galesburg, Ill., on April 22, 1851. After leaving school in June, 1870, he entered the service of the Chicago, Burlington & Quincy as a station helper at Wyoming, Ill., and was later appointed relief agent. Consecutively he served as agent at Sheridan, Gladstone, Kirkwood, Wataga, Kewanee and Maquon, Ill. After a period of office work at Peoria, Ill., he was made general agent at Hannibal, Mo., and two years later was appointed district freight and passenger agent, with headquarters at St. Louis, Mo. In 1885 he was promoted to general agent, with office at San Francisco, Cal., which position he continued to hold until the time of his death. He was continuously in the employ of the Chicago, Burlington & Quincy for a period of 47 years.

Fletcher C. Rice, general inspector of transportation of the Chicago, Burlington & Quincy, with headquarters at Chicago, Ill., died at his home in that city, December 22, aged 72 years.



Fletcher C. Rice

He was born January 10, 1844, at Marion, N. Y., and entered railway service in 1863 with the Chicago, Burlington & Quincy as an assistant telegraph operator. Consecutively he passed through the grades of telegraph operator, chief clerk, train despatcher and chief operator of the Galesburg division, with office at Galesburg, Ill. Later he was made chief despatcher and then trainmaster. In August, 1881, he was appointed superintendent of the Galesburg division of this company, and held this position until May, 1888, when he was promoted to the superintendency of all the lines in Illinois. From August, 1902, to July, 1904, he was general superintendent, with headquarters at Chicago, Ill. On July 1, 1904, he was appointed general inspector of transportation for the system, with headquarters at Chicago, Ill. He had long been prominent in the study of transportation matters, and at the time of his death was chairman of the committee on transportation of the American Railway Association, in which he had been active for 23 years. He was also chairman of the joint committee on automatic train stops.

Equipment and Supplies

LOCOMOTIVES

The Union Pacific has ordered 3 Mallet (2-8-8-0) type locomotives from the Baldwin Locomotive Works.

The Virginian Railway has ordered 10 335-ton Mallet (2-10-10-2) type locomotives from the American Locomotive Company.

The Central of New Jersey, reported in the *Railway Age Gazette* of December 15 as being in the market for a number of ten-wheel locomotives, has ordered 10 locomotives of this type from the Baldwin Locomotive Works.

The St. Paul Bridge & Terminal has ordered 2 Mogul type locomotives from the American Locomotive Company. These locomotives will have 20 x 26-in. cylinders, 51-in. driving wheels and a total weight in working order of 154,000 lb.

The Paris-Orleans Railway was reported in last week's issue as having ordered 50 Mikado locomotives from the American Locomotive Company. These locomotives will have 23½ x 28-in. cylinders, 65-in. driving wheels, and a total weight in working order of 200,000 lb.

The French State Railways were reported in last week's issue as having ordered 100 Consolidation locomotives from the American Locomotive Company. These locomotives will have 23 x 26-in. cylinders, 51-in. driving wheels and a total weight in working order of 161,000 lb.

The Maine Central has ordered 3 Pacific, 4 Mikado and 2 six-wheel switching locomotives from the American Locomotive Company. The Pacific type locomotives will have 25 x 28-in. cylinders, 73-in. driving wheels and a total weight in working order of 260,000 lb. The Mikado type locomotives will have 26½ x 30-in. cylinders, 63-in. driving wheels and a total weight in working order of 275,000 lb. The six-wheel switching locomotives will have 21 x 28-in. cylinders, 51-in. driving wheels and a total weight in working order of 166,000 lb.

FREIGHT CARS

The Virginian is in the market for 1,000 freight cars.

The Stoddard Oil Company has ordered 40 40-ton tank cars from the American Car & Foundry Company.

The Economy Oil & Refining Company has ordered 10 50-ton tank cars from the American Car & Foundry Company.

The Russian Government has ordered 3,500 12-pood, 4-wheel cars, from the Eastern Car Company, New Glasgow, N. S.

The St. Louis, Brownsville & Mexico is in the market for from 500 to 1,000 wooden box cars and from 50 to 100 steel tank cars.

The Oliver Iron Mining Company, Duluth, Minn., has ordered an additional 20 all-steel, 70-ton air-dump cars from the Magor Car Company for delivery in March, 1917.

The Northern Pacific, reported in the *Railway Age Gazette* of November 24 as being in the market for 1,000 box and 500 automobile cars, has ordered these cars from the Western Steel Car & Foundry Company.

The Norfolk & Western has ordered 1,000 ventilator box cars from the Mount Vernon Car Manufacturing Company and has dropped its inquiry for 1,000 gondola cars. As reported in last week's issue, this company will also build 1,000 gondola cars in its own shops.

The Union Pacific has ordered 1,800 refrigerator cars from the American Car & Foundry Company, and will build 700 to 900 in its own shops. It has also ordered 200 box cars from the Seattle Car & Foundry Company, Seattle, Wash.; 200 box cars from the Twohy Brothers Company, Portland, Ore., and 100 tank cars from the General American Tank Car Corporation.

PASSENGER CARS

The Florida East Coast, reported in the *Railway Age Gazette* of December 1 as being in the market for 5 coaches and 3 combination cars, has ordered 8 coaches, 3 baggage and 3 express cars from the Pullman Company.

The Central of Georgia, reported in the *Railway Age Gazette* of November 3 as being in the market for passenger cars, has ordered 11 such cars from the American Car & Foundry Company.

IRON AND STEEL

The Wheeling & Lake Erie has contracted for 5,000 tons of 90-lb. open hearth steel rails for 1918 delivery, together with necessary splice bars.

The Delaware, Lackawanna & Western has ordered 25,000 tons of rails from the United States Steel Corporation, and 10,000 tons from the Bethlehem Steel Company.

The Southern Pacific has ordered 54,800 tons of rail for 1918 delivery from the Tennessee Coal & Iron Company. As 81,500 tons had already been ordered for 1917 delivery, the combined tonnage for the two years amounts to 136,300 tons.

SIGNALING

The Union Pacific is inquiring for 31 caboose cars.

The Ogden, Logan & Idaho is inquiring for material for 25 box cars which it will build in its own shops.

The Pittsburgh & Lake Erie will install a 68-lever electrical interlocking plant at McKees Rock, Pa., and a 104-lever plant at Neville, Pa.

The Southern Pacific (Texas and Louisiana lines) is to install two electrical interlockings and 9.51 miles of double-track automatic signaling.

The Grand Trunk Pacific will install a 20-lever mechanical interlocking plant at a crossing with the Canadian Northern at Prince Albert, Sask.

The Chicago, Burlington & Quincy contemplates the installation of 207 miles of double-track and 29 miles of single-track automatic signaling.

The Los Angeles & Salt Lake has increased to 1,500 the order for 1,000 50-ton general service cars reported in last week's issue as having been ordered from the Western Steel Car & Foundry Company.

The Atlantic Coast Line will install during the coming year seven mechanical interlocking plants; one of 20 levers, one of 8 levers, and five of 5 levers each, the first protecting a crossing and the remainder drawbridges.

The Illinois Central has under construction two electric interlocking plants, one of 53 working levers at Pullman, Ill., and one of 11 working levers at Rockford, Ky.; and a mechanical interlocking of 27 working levers at Freeport, Ill.

The Atchison, Topeka & Santa Fe will install 43 miles of single-track signaling in Oklahoma and 6 miles of double-track signaling in Colorado and New Mexico. Three new interlocking plants of the electro-pneumatic type will be required at the Galveston (Tex.) causeway, and two mechanical plants are also to be built.

The Atchison, Topeka & Santa Fe plans during 1917 to instal block signals on about 84 miles of its lines. This includes the lines from North Pomona, Cal., to San Bernardino, 25 miles; and from Gainesville, Tex., to Ardmore, Okla., 39 miles, both single tracks; and a half dozen short sections on other divisions. Also, the manual block system will be introduced on the line from Hicks, Cal., to Summit, 44 miles. Six interlocking plants are contemplated, including the following: Corwith, Ill., electric, 104 levers; Dallas, Tex., electric, 92 levers. These are both being installed in connection with other roads at crossings. The Corwith installation is being put in by the General Railway Signal Company, and the Chicago & Alton Railroad. The rest of the interlockings are mechanical, the largest being at Fresno, Cal., 48 levers.

Supply Trade News

John D. Ristine has been appointed manager of sales of the Perolin Railway Service Company, St. Louis, Mo., with headquarters at the Peoples Gas building, Chicago.

Robert Hughes, until recently engaged in commercial business at Toronto, Ont., has become associated with the National Railway Devices Company, Chicago, in the capacity of manager of sales, and has already entered upon his new duties.

Ralph G. Coburn, formerly eastern sales manager of the Franklin Railway Supply Company will henceforth devote his entire time to the management of the electrical department and exploitation of the Stone-Franklin lighting equipment.

At a special meeting of the board of directors of the Call Switch Company, New York, Harry A. Pike, assistant to the president, was elected a director and placed in charge of sales, in addition to his other duties, succeeding R. V. Call, director and general manager, resigned.

Harry M. Evans has been appointed eastern sales manager of the Franklin Railway Supply Company with office at 30 Church street, New York. Mr. Evans was born at Meadville, Pa., and was educated in the public schools at that place. He began railroad work as a call boy on the Erie, and served in various positions in the mechanical, transportation and traffic departments of that road. He entered the mechanical department of the Franklin Railway Supply Company, October 1, 1908, as traveling representative and was promoted to assistant western sales manager last August, which position he held at the time of his recent appointment.



H. M. Evans

The Pyle-National Company, Chicago, announces the following appointments: Robert C. Shaal, eastern representative, with headquarters in New York; N. S. Kenney, representative, Munsey building, Baltimore, Md.; W. L. Jefferies, Jr., representative, Mutual building, Richmond, Va.

Burton W. Mudge, president of Mudge & Co., has been made vice-president of the Pilliod Company, in full charge of its western territory. Mudge & Co. have been western representatives of the Pilliod Company for the past four years. A sketch and picture of Mr. Mudge appeared in the *Railway Age Gazette* of September 8, page 433.

A very complete reorganization of the Joliet Railway Supply Company, Chicago and Joliet, Ill., has been effected. The entire capital stock, good-will, patents, property, liabilities and assets of the Joliet Railway Supply Company have been purchased by the Northwestern Malleable Iron Company, Milwaukee, Wis. Possession of the offices and plants of the Joliet company has been taken by the new management and new officers elected. The new company's headquarters have been established at 4052 Princeton avenue, Chicago, where extensive additions and improvements to the plant will be made at once. The company will hereafter manufacture its own malleable iron and two new car specialties will be added to the output, which has consisted of brake beams, side and center bearings, etc. The following officers have been elected: President, C. F. Huntoon; vice-president, F. L. Sivyer; secretary and treasurer, W. F. Hoffman; manager, R. F. C. Schultz; directors, F. L. Sivyer, W. C. McMahon, C. F. Huntoon, W. L. Woods, R. F. C. Schultz, George C. Taylor and Mackey Wells.

Andrew Fletcher New President of American Locomotive Co.

At a meeting of the board of directors of the American Locomotive Company, Tuesday, Andrew Fletcher was elected president to succeed Waldo H. Marshall, who resigned last week. Mr. Fletcher has been a director and a member of the executive committee for several years. A successor to J. McNaughton, the vice-president whose resignation was also accepted by the board last week, to take effect in February, has not been selected.

Mr. Fletcher is president of the W. & A. Fletcher Company, manufacturers of marine engines, with a plant in Hoboken, N. J. The corporation is one of the oldest firms of the kind in the country. He is a director of the William Cramp & Sons Ship & Engine Building Company, president of the Consolidated Iron Works and the North River Derrick Company.

Economy Devices Corporation

J. L. Randolph has been elected vice-president of the Economy Devices Corporation with office at 30 Church Street, New York. Mr. Randolph was born in Boston, Mass., August 25, 1878, attended the public schools and graduated from the English High School of that city. He began his railroad career as a machinist apprentice in the Concord, N. H., shops of the Northern Railroad, now a part of the Boston & Maine. Subsequently he served this road in the capacity of machinist, gang foreman, general foreman, master mechanic, and superintendent of shops at Keene, N. H. In April, 1911, he accepted a position with the Franklin Railway Supply Company in the mechanical department. In February, 1914, he was appointed eastern sales manager of the Economy Devices Corporation which position he held at the time of his recent appointment.



J. L. Randolph

Lukens Steel Company

Announcement was made Tuesday that the Lukens Steel Company will be incorporated under the laws of the state of Pennsylvania, to acquire the capital stock and ultimately the entire property, business and good-will of the Lukens Iron & Steel Company, Coatesville, Pa. The purpose is to increase the capitalization to a figure more nearly commensurate with the assets and earnings than the present capital of $500,000.

The new corporation will have $8,000,000, cumulative 7 per cent first preferred, $6,000,000 cumulative convertible 7 per cent second preferred, and $10,500,000 common stock. The stockholders arranged for the recapitalization through Henry & West of Philadelphia, and White, Weld & Co., of New York, and an offering of part of the first preferred stock will be made shortly.

The Lukens Iron & Steel Company has been owned by one family continuously for more than 125 years. Its business was established at the present location in 1810. The company makes open hearth steel ingots, blooms and billets, which it rolls into sheets and plates for ships, boilers and structural purposes. The present plant has an annual capacity of about 300,000 tons, and on the completion of its new 204-inch plate mill, which will be the largest in the world, together with new open hearth furnaces, its annual capacity will be approximately 450,000 tons. None of the company's product is being sold for the manufacture of munitions or war material.

Railway Construction

Aurora, Mendota & Western (Electric).—This company plans to build a line from Aurora, Ill., to Plano, about 15 miles. The undertaking includes the erection of one pile bridge, three concrete bridges and five concrete culverts. Construction will begin in the spring. H. D. Hallet, chief engineer, Aurora, Ill.

Buffalo, Rochester & Pittsburgh Railway.—Work will be begun shortly on the construction of a 3,600-ft. passing siding at Savan, Pa. A new siding, 575 ft. long, is also under construction for the Kittanning Ceramics Company, north of Craigsville, Pa.

Hugo & Oklahoma.—This is the name of a new road, which will run from Hugo, Okla., to Atoka, on the Atchison, Topeka & Santa Fe, a distance of approximately 52 miles. At this writing practically all of the right-of-way has been secured, and it is planned to begin actual construction early in the coming year. Ben C. Eastin, secretary, Hugo Chamber of Commerce, Hugo, Okla.

Indian Valley.—The Utah Construction Company, Ogden, Utah, is constructing a new steam railroad, which will run from Paxton Junction, Cal., a point on the Western Pacific, one mile west of the forks of Spanish Creek, through Indian Falls, Crescent Mills, across Indian Valley to Taylorsville, thence to Engles Mine, following the Indian Creek drainage, a distance of about 30 miles. About 10 per cent of the work has been completed thus far, and it is expected to have the line in operation next summer. The excavation averages about 9,000 cu. yd. per mile, with a four per cent maximum grade, and a 24-deg. maximum curve. The rails and rolling stock will be supplied by the Western Pacific. The estimated cost, exclusive of rolling stock, is $350,000. Charles S. McDonald, chief engineer, San Francisco, Cal.

Kewanee & Eastern.—The Illinois Public Utilities Commission has granted permission to this company to construct a steam road from a point in Rock Island county, Ill., just opposite Muscatine, Iowa, through Kewanee, Ill., to a point near Streator, about 120 miles. (November 3, p. 825.)

Methow Valley & Eastern.—This is the name of a new railroad company, which proposes to build a line into the Methow valley in the state of Washington. The survey, which is now under way, contemplates ultimately a line from Bellingham, Wash., to Spokane, a distance of 349 miles, and provides for a 7-mile tunnel to be driven through the Cascades. The first unit, one of eight to be constructed in this system, will traverse the Methow Valley from the Columbia river to Winthrop. R. E. S. Rominger, president, Indianapolis, Ind.

Ouachita & Northwestern.—Construction work is now under way on a 10-mile line from Clarks, La., on the Jackson division, to Standard on the Standard division.

Utah-Idaho.—This company is now making surveys, and construction is expected to be started soon on a steam line from Garland, Utah, to Bear River City, a distance of about 10 miles. The line is to be built on the bank of an irrigation canal. After completion the road will be taken over by the Oregon Short Line. Thomas R. Cutler, vice-president and general manager, Salt Lake City, Utah.

RAILWAY STRUCTURES

Huntington, Ind.—The Wabash will receive bids early in the coming year for the construction of a new combination depot, the estimated cost of which will be $20,000. A. O. Cunningham, chief engineer, St. Louis, Mo.

Kansas City, Mo.—The Missouri Pacific, the Union Pacific, and the engineering department of Kansas City, are formulating plans for the rebuilding of the James Street viaduct and bridge, connecting this city with Kansas City, Kansas., at a cost of about $125,000. It is not definitely known when bids will be called for. E. A. Hadley, chief engineer, Missouri Pacific, St. Louis, Mo.

Railway Financial News

Boston & Lowell.—Stockholders are to vote on January 3 on the question of authorizing an issue of $200,000 20-year 5 per cent bonds to refund a like amount of 4 per cent bonds due October 1, 1917.

Canadian Northern.—The Commercial & Financial Chronicle says that it is proposed to take up 220 miles of track of the mountain section of the Canadian Northern, and to send the material to France. If this is done the Canadian Northern would use trackage rights over the Grand Trunk Pacific line, which parallels the 220 miles of track, which it is proposed to tear up.

Chicago, Anamosa & Northern.—It is said that this road has been sold, and will be torn up and the track material, cars and locomotives sold.

New York Central.—The New York Public Service Commission, Second district, on Wednesday heard petitions from the New York Central asking authority to issue $70,000,000 4½ per cent refunding and improvement mortgage bonds; $12,000,000 4½ per cent equipment trusts of 1917; $100,000,000 20-year 6 per cent bonds, and an amendment to the order permitting it to increase its authorized capital stock from $300,000,000 to $400,000,000.

Stockholders of record January 2 are given the right to subscribe before February 5, 1917, for $25,000,000 new stock at par to the extent of 10 per cent of their present holdings of stock.

Paducah & Illinois.—Kean, Taylor & Co. and William A. Read & Co. have bought from the railroad and resold to investors $1,500,000 first mortgage 4½ per cent 40-year sinking fund bonds, guaranteed jointly and severally by the Chicago, Burlington & Quincy and the Nashville, Chattanooga & St. Louis. This makes $4,200,000 of these bonds outstanding.

Pere Marquette.—The reorganization committee has declared the plan of reorganization operative.

Pittsburgh, Cincinnati, Chicago & St. Louis.—The Pennsylvania Public Service Commission and the Ohio Public Service Commission have approved the plan of the merger of the Pittsburgh, Cincinnati, Chicago & St. Louis and of the Vandalia.

St. Louis-San Francisco.—The executive committee representing the bondholders of the Kansas City, Ft. Scott & Memphis announces that the back coupons on these bonds are being paid under the reorganization plan, and since the bonds are not to be disturbed in the reorganization, the committee is to be dissolved.

Union Pacific.—An extra dividend of two per cent has been declared on the common stock.

Vandalia.—See Pittsburgh, Cincinnati, Chicago & St. Louis.

Cristobal Yards Being Completed.—The laying of the remainder of the tracks for a new railroad yard adjoining the concrete piers at Cristobal, Panama Canal Zone, has been begun. The yard had been partially completed for several months, but its completion has been delayed because of the non-arrival of railroad ties ordered from the United States. These are now on hand.

Glasgow Subway Railway's Penny Fare.—Glasgow Subway Railway Company has, it is stated, decided to introduce a universal penny fare over the whole system. The new arrangement comes into force on Sunday, December 10. At present ½d. is charged for traveling to one station, five stations are allowed for 1d., and 1½d. is charged for any distance beyond five stations. Under the new arrangement a penny ticket will carry a passenger to any station on the system. Children under 12 years of age will be allowed to travel for half fare.—*Railway Gazette, London.*

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